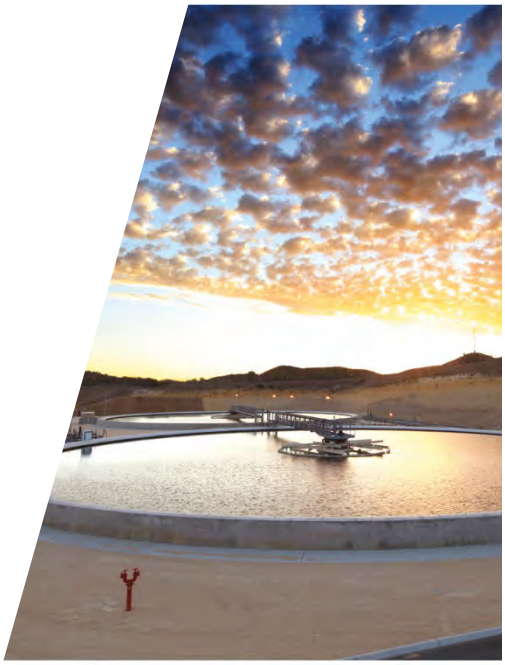


Operation and Monitoring Report

June 2018 to May 2019
Gratwick Riverside Park Site
North Tonawanda, New York

City of North Tonawanda

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. **932060**

Site Name Gratwick - Riverside Park

Site Address: River Road Zip Code: 14120
City/Town: North Tonawanda
County: Niagara
Site Acreage: 52.900

Reporting Period: May 31, 2018 to May 31, 2019

	YES	NO
1. Is the information above correct?	X	☐
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?	☐	X
3. Has there been any change of use at the site during this Reporting Period (see 6NYCRR 375-1.11(d))?	☐	X
4. Have any federal, state, and/or local permits (e.g., building, discharge) been issued for or at the property during this Reporting Period?	☐	X
If you answered YES to questions 2 thru 4, include documentation or evidence that documentation has been previously submitted with this certification form.		
5. Is the site currently undergoing development?	☐	X

Box 2

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

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. 932060

Box 3

Description of Institutional Controls

Parcel	Owner	Institutional Control
175.19-1-28	City of North Tonawanda	Landuse Restriction
		Monitoring Plan
		O&M Plan
		Building Use Restriction
		Ground Water Use Restriction

Consent Order; 1996, Index # B9-0133-91-02

Deed Restriction; December 18, 2007.

Box 4

Description of Engineering Controls

Parcel	Engineering Control
175.19-1-28	Groundwater Treatment System
	Cover System
	Leachate Collection
	Monitoring Wells
	Groundwater Containment

This site is contained/controlled by a cover system, slurry wall and a leachate collection system. The leachate collected gravity feeds into three on site pump stations. At predetermined level set points, the pumps activate and discharge the leachate to the City of North Tonawanda Municipal Wastewater Treatment Plant.

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
X	☐

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
X	☐

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.

Lee W. Marshall Jr. — Signature of Owner, Remedial Party or Designated Representative

8/29/19 — Date

IC CERTIFICATIONS
SITE NO. 932060

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 Dale W. Marshall (print name) at 216 Payne Ave. N. Tonawanda, NY 14120 (print business address)

am certifying as City Engineer (Owner or Remedial Party)

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

Dale W. Marshall P.E. 8/29/19

Signature of Owner, Remedial Party, or Designated Representative Rendering Certification — Date

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 Dale W. Marshall, PE at 216 Payne Ave, N. Tonawanda, NY, 14120
print name print business address

am certifying as a Professional Engineer for the City of North Tonawanda
(Owner or Remedial Party)

STATE OF NEW YORK DALE W. MARSHALL 082109 LICENSED PROFESSIONAL ENGINEER

Dale W. Marshall PE — — 8/29/19
Signature of Professional Engineer, for the Owner or Remedial Party, Rendering Certification — Stamp (Required for PE) — Date

Table of Contents

Figure Index

Figure Index

Table Index

Appendix Index

1. Introduction

This report is the 18th annual Operation and Monitoring Report (O&M Report) for the remedial actions constructed at the Gratwick-Riverside Park Site (Site) located in North Tonawanda, New York. This report covers the period from June 2018 to May 2019 and was prepared pursuant to Section 7.0 of the report entitled "Operation and Maintenance Manual" (O&M Manual) dated March 2002 (revised January 2004, May 2009, and June 2014). It is noted that New York State Department of Environmental Conservation (NYSDEC) approval for the O&M Manual was given on April 20, 2005. All O&M activities have been performed in accordance with the methods and frequencies specified in the O&M Manual and as modified in previous annual reports and approved by NYSDEC. In accordance with the approved monitoring changes, the groundwater is monitored annually in five wells and an additional seven wells are monitored once every 2 years as of May 2013. The surface water quality of the Niagara River adjacent to the Site is not impacted by the Site and is no longer monitored. The collected groundwater that is discharged from the Site is monitored semi-annually in accordance with the City of North Tonawanda Wastewater Discharge Permit (effective March 1, 2016). A copy of the permit is included in Appendix A.

2. Groundwater Withdrawal System (GWS)

Full-time operation of the Groundwater Withdrawal System (GWS) at the Site started on May 4, 2001. The objectives of the GWS are to:

i) Achieve and maintain an inward gradient from the Niagara River toward the GWS.

ii) Achieve and maintain an upward gradient from the fill alluvium layer beneath the GWS.

In order to determine whether the objectives are being met, hydraulic and chemical monitoring programs have been developed. These programs include Site groundwater and GWS effluent monitoring. The wells, manholes, wet wells, and storm sewer outfalls that comprise the monitoring network are shown on Figure 2.1. The monitoring programs are described in the following subsections.

2.1 Hydraulic Monitoring

Hydraulic monitoring consists of the collection of water levels in monitoring wells and manholes and River water levels at the storm sewer outfalls. These data are then used to determine the vertical and horizontal gradients for the groundwater.

The water levels in four GWS manholes and in the River were monitored to confirm that an inward gradient exists. The water levels in 5 GWS manholes and in 4 monitoring wells installed near the GWS alignment in the materials directly overlying the confining unit were monitored to confirm that an upward gradient exists. The specific manholes and monitoring wells used to determine the horizontal and vertical gradients are listed in Table 2.1.

Groundwater elevations are measured on a monthly basis. The measured water levels for the time period June 2013 through May 2019 are provided in Table 2.2. The horizontal and vertical gradients

for this reporting period are provided in Tables 2.3 and 2.4, respectively. The water levels and horizontal and vertical gradients to May 2012 were previously provided and thus are not provided in this report.

The results for the horizontal gradient evaluation show that:

i) Inward horizontal gradients were achieved by May 11, 2001, within 1 week of the start of pumping the GWS.

ii) The inward gradients were maintained for the remainder of the 17 years except for a few short intervals in isolated areas of the GWS.

There were two exceptions in the June 2018 through May 2019 reporting period as follows:

i) June 2018 through May 2019 in the area of River North/MH2 and

ii) June 2018 through May 2019 in the area of River Middle/MH8

Additionally, gradients were not measured in February 2019 due to freezing conditions at monitoring points along the river.

The distance which groundwater may have migrated into the barrier wall during the period of outward gradient can be calculated using the equation:

Distance = velocity x time

Both monitoring pair locations had outward gradients for a period of 12 months (365 days) within this monitoring period.

Groundwater velocity into the barrier wall was calculated using:

Velocity = Hydraulic conductivity (K) x Gradient/ Porosity

The design hydraulic conductivity for the barrier wall was 1E-07 centimeters per second (cm/s) (2.84E-04 feet per day [ft/day]). Testing performed during construction of the barrier wall showed all test results had lower K than 1E-07 cm/s. Thus, the design K was used for the calculation.

Gradient is calculated by the difference in water levels between the monitoring pair locations. The measured levels on December 20, 2018 had the greatest difference in water levels (i.e., 568.35 feet above mean sea level [ft amsl] in MH2 and 564.16 ft amsl in River North). Assuming the entire 4.19 foot difference occurs as head loss through the 30-inch thick barrier wall, results in a gradient of 1.676 ft/ft.

The barrier wall was constructed using fine-grained soil and clay. Clay-based soils have porosities ranging from 0.37 to 0.84 (Peck, Hanson and Thornburn, "Foundation Engineering, 2nd Edition", John Wiley & Sons, Inc.). The lower the porosity, the farther migration into the barrier wall occurs. A conservative value of 0.25 was used for calculation.

Using the maximum head loss for the entire period of outward gradient combined with using the design K, which is greater than the constructed K of the barrier wall, and a porosity of 0.25 results in a conservative (greater) distance of migration into the barrier wall.

The calculated velocity is:

V = (1.676 x 2.83E-04)/ 0.25 = 1.89E-03 ft/day (0.69 ft/yr)

and the distance which groundwater migrated into the barrier wall for the reporting period is 0.69 ft:

Another way to look at this is that it would take approximately 4 years for the groundwater to migrate through the barrier wall at this very conservative velocity.

Thus, short periods of outward gradient (even 365 days) do not adversely affect the effectiveness of the remedy because:

i) The outward gradients occurred over only a portion of the barrier wall.

ii) The 36-inch barrier wall is 6 inches thicker than the design thickness thereby providing extra protection.

iii) Any outward migration of Site groundwater into the barrier wall during the periods of outward gradient is more than offset by the inward migration of river water into the barrier wall during the long periods of inward gradient.

iv) The groundwater level on the upgradient side of the barrier wall was never higher than the elevation of the top pf the barrier wall (i.e., 568.5 ft amsl) except in the immediate vicinity of MH-2 in April and May 2019 and MH14 in May 2019 when water levels were 568.51 to 568.71 ft amsl. Thus, no overtopping occurred except for short sections of the barrier wall for 1-2 months.

The results for the vertical gradient evaluation showed that the vertical gradients during the June 2018 through May 2019 reporting period were continually upward for all four monitoring locations.

2.2 Groundwater Quality Monitoring

Groundwater quality monitoring consists of the collection of water samples from on-Site overburden monitoring wells (OGC-1 through OGC-8 and MW-6 through MW-9) and the analysis of these samples to determine the concentrations of chemicals in the groundwater. The purpose of the groundwater quality monitoring program is to monitor the anticipated improvement in the quality of the overburden groundwater:

i) Between the barrier wall and the River (OGC-1 through OGC-8)

ii) In the fill/alluvium beneath the GWS (MW-6 through MW-9)

The MWs are located on the inside of the barrier wall and the OGCs are located between the barrier wall and the river.

Groundwater quality monitoring locations are presented on Figure 2.1 and the analytical parameters and frequency are listed in Table 2.5.

Groundwater sampling was performed on an annual basis between May 2004 and May 2008. As approved in the NYSDEC letter dated February 23, 2009, the sampling frequency for May 2009 through May 2012 was:

Annual	Once Every 2 Years (2010 and 2012)
MW 8	MW-6
MW-9	MW-7
OGC-3	OGC-1
OGC-4	OGC-2
OGC-6	OGC-5
OGC-7	
OGC-8	

As approved by the NYSDEC on March 27, 2013, the sampling frequency for May 2013 through May 2018 was:

Annual	Once Every 2 Years (Even Years)
MW-8	MW-6
MW-9	MW-7
OGC-3	OGC-1
OGC-6	OGC-2
OGC-7	OGC -4
	OGC-5
	OGC-8

As approved by the NYSDEC on October 9, 2018, the sampling frequency for May 2019 to present was:

Annual	Once Every 2 Years (Even Years)
MW-6	MW-7
MW-8	OGC-1
MW-9	OGC-2
OGC-3	OGC-4
OGC-6	OGC-5
OGC-7	OGC-8

2.2.1 Sample Results

A summary of compounds detected in the groundwater samples for this reporting period is provided in Table 2.6 and pH levels are provided in Table 2.7.

To evaluate the trends in the groundwater chemistry and evaluate the appropriate frequency of future sampling, the VOCs and SVOCs were summed and plotted on Figures 2.2 through 2.13 for each of the 12 monitoring wells included in the program. It is believed that the sum of the VOCs (i.e., TVOCs) and SVOCs (i.e., TSVOCs) best represent the trends in the groundwater chemistry.

Review of the TVOC and TSVOC concentrations for the 6 wells sampled in 2019 show the following trends:

i) TVOCs:

- Low level (i.e., no individual compounds with concentrations greater than Class GA levels) in 2 of the 6 wells (i.e., OGC-3 and OGC-7)
- Relative constant concentrations with random fluctuations in MW-9
- Generally decreasing concentrations in wells MW-8 and OGC-6
- Increasing concentrations in MW-6

ii) TSVOCs:

- Low level (i.e., no individual compounds with concentrations greater than Class GA levels) in 2 of the 6 wells (i.e., OGC-6 and OCG-7).
- Relatively constant concentrations with random fluctuations in MW-9.
- Generally decreasing concentrations in two wells (MW-8 and OGC-3).
- Increasing concentrations in MW-6. MW-6 is located on the landward side of the barrier wall. Thus this chemistry is not migrating to the river.

All the wells had only low level TVOC concentrations in this reporting period, except for OGC-6 (88.4 micrograms per liter [μg/L]), which increased from 69.3 μg/L detected in May 2018, and MW-6 (93.3 μg/L), which increased from 68 μg/L detected in 2018. With regard to TSVOC concentrations, three wells had higher concentrations. MW-6 (3,198 μg/L compared to 2,488 μg/L in 2018), MW-8 (67.2 μg/L in May 2019 compared to 80 μg/L in May 2018), and MW-9 (847.7 μg/L in May 2018 compared to 926 μg/L in May 2018).

In summary, the number of wells with no individual compound concentrations above Class GA criteria and decreasing or constant but fluctuating low level concentrations, except for TSVOCs in MW-9 and MW-6, shows that the groundwater is being remediated.

Additional description of the TVOC and TSVOC concentrations is provided in the following paragraphs.

Monitoring Wells On-Site - Inside Barrier Wall

The TVOC concentrations for MW-6 shown on Figure 2.2 had been less than 5 μg/L since May 2007, but have increased to 68 μg/L in 2018 and further to 93.3 μg/L in 2019. The TSVOC concentrations, previously low level, have increased to 3,198 μg/L. The reason for these increases is unknown; however, it could be due to flushing of contaminants towards the GWS. Since the well is inside the barrier wall and water levels indicate an inward gradient, no further action is planned.

The TVOC and TSVOC concentrations for MW-7 on Figure 2.3 show that both TVOC and TSVOC have remained low level. TVOC concentrations ranged from non-detect to 4 μg/L since May 2006. TSVOC concentrations ranged from non-detect to 5 μg/L since May 2004.

The TVOC concentrations for MW-8 on Figure 2.4 show that the TVOC concentrations have decreased from 140 µg/L in May 2009 to 24 µg/L in May 2019. The TSVOC concentrations since May 2011 have generally been in the 70 to 100 µg/L range (May 2019 = 67 µg/L).

The TVOC concentrations for MW-9 on Figure 2.5 show that the TVOC concentrations have generally ranged between 9 and 30 µg/L; however, increased to 38 µg/L in 2019. The TSVOC concentrations have fluctuated between 120 to 520 µg/L between August 2002 and May 2016 and then increased to 926 µg/L in May 2018 and have since decreased to 848 µg/L in May 2019.

All MWs are located on the inside of the barrier wall and a net inward gradient has been consistently maintained in the vicinity of these wells except for the 2016/2019 time period previously described. Thus, the TVOCs and TSVOCs are not migrating to the Niagara River.

Monitoring Wells between Barrier Wall and River

The TVOC concentrations for OGC-1 on Figure 2.6 show that the concentrations since November 2003 ranged between non-detect and 7.4 µg/L. The TSVOC concentrations since November 2003 have fluctuated between non-detect and 3 µg/L.

The TVOC concentrations for OGC-2 on Figure 2.7 have been non-detect since May 2006. The TSVOC concentrations were all non-detect since monitoring of the remedy started except for the May 2014 sample which had a TSVOC concentration of 0.8 µg/L.

The TVOC concentrations for OGC-3 shown on Figure 2.8 were less than 11 µg/L between May 2009 and May 2017 with the May 2018 sample result being 24 µg/L, decreasing to 12 µg/L in 2019. The TSVOC concentrations have decreased from 300 µg/L in November 2003 to 81 µg/L in May 2019.

The TVOC concentrations for OGC-4 shown on Figure 2.9 fluctuated between non-detect and 6 µg/L for the time period from November 2002 to May 2010 and were non-detect since May 2010 until May 2018 with the exception of the May 2016 sample (3.6 µg/L). The TSVOC concentrations have fluctuated widely but have continually decreased since May 2004 with a non-detect concentration in the May 2018 sample. The single compound responsible for the higher historic concentrations was phenol.

The TVOC concentrations for OGC-5 shown on Figure 2.10, ranged from non-detect to 5 µg/L since November 2003 (except for May 2008 at 5.8 µg/L and May 2018 at 9.1 µg/L). The TSVOC concentrations ranged from non-detect to 2 µg/L since February 2003.

The TVOC concentrations for OGC-6 shown on Figure 2.11 have continually decreased from 1,650 µg/L in the May 2013 sample to 88 µg/L in the May 2019 sample. The TSVOC concentrations decreased from 157 µg/L in May 2008 to non-detect in the May 2019 sample.

The TVOC concentrations for OGC-7 shown on Figure 2.12 have decreased from 160 µg/L in November 2003 to 12.01 µg/L in the May 2019 sample. The TSVOC concentrations have been less than 2 µg/L since November 2001 (May 2018 result was 0.59 µg/L).

The TVOC concentrations for OGC-8 shown on Figure 2.13 decreased from 460 µg/L in May 2001 to 29 µg/L in May 2004 and have ranged from non-detect to 30 µg/L since that time (May 2018 was

16.5 μg/L). The TSVOC concentrations decreased from 139 μg/L in August 2001 to 25 μg/L in May 2003 and have remained low since that time with a slight increase in May 2018 to 16 μg/L.

The QA/QC Review/ Data Usability Summary of the May 2019 groundwater results are included in Appendix C. The electronic deliverables were provided to the NYSDEC by email on August 30, 2019.

2.3 Effluent Monitoring Program

Groundwater from the GWS is discharged to the POTW without the need for pretreatment. The monitoring performed during the construction phase of the remedy clearly showed that the minimal chemical presence in the groundwater collected in the GWS is easily treated at the POTW and therefore no on-Site pretreatment is necessary. The effluent samples are collected at the monitoring station (meter building), which is located at the south end of the Site as shown on Figure 2.1. The analytical parameters monitored since 2007 are listed in Table 2.8.

2.3.1 Sample Results

Effluent samples are collected semi-annually and consist of a 24-hour composite sample collected for SVOCs, metals, and wet chemistry parameters. Three grab samples are also collected for VOCs at 8-hour intervals and the measured concentrations are averaged to give a 24-hour concentration.

QA/QC reviews of the discharge results to May 2018 have already been submitted to the NYSDEC. Thus, these reviews are not being resubmitted with this O&M Report. The QA/QC reviews of the discharge results from October 2018 and May 2019 are provided in Appendix C.

The effluent sample results for this reporting period are provided in Table 2.9. To assist in evaluating the chemical concentration trends in the effluent discharge from the GWS, the measured concentrations for the following parameters are plotted: TVOCs, TSVOCs, pH, total suspended solids (TSS), and biochemical oxygen demand (BOD) (see Figures 2.14 through 2.17). It is believed that these parameters are representative of the trends in the chemistry of the water discharged to the POTW and, as such, can also be used to determine an appropriate monitoring frequency for the effluent.

As shown on Figure 2.14, the TVOCs generally peak in the spring and then decline reaching a trough in the fall. This pattern may be attributable to additional flushing during the spring snow melt. The long-term trend of the TVOC concentrations shows an overall decrease with time from a peak concentration of 760 μg/L in April 2002 to non-detect in April 2019. The effluent TSVOC results on Figure 2.14 show no apparent seasonal pattern. The TSVOC concentrations decreased with time until March 2011 (non-detect) and then showed increases in April 2015 (89 μg/L) and May 2017 (150 μg/L). The TSVOC concentration in April 2019 was 15 μg/L.

The pH levels are presented on Figure 2.15. As shown on Figure 2.15, the pH levels range between 7.3 and 11.6. An apparent trend in the pH levels is higher pH levels in the winter/spring and lower pH levels in the summer/fall.

The TSS concentrations presented on Figure 2.16 are generally low level (i.e., <20 mg/L) and show higher concentrations occurring in the early spring and late summer/fall with elevated

concentrations (maximum of 278 milligrams per liter [mg/L]) in the spring of 2005. Because TSS may be related to the discharge flow rate, the monthly discharge volume (see Table 2.10) is plotted on Figure 2.18. Comparison of the results presented on these two figures shows an apparent correlation between higher flows and greater TSS concentrations except for the 2005 spring results.

The BOD concentrations are presented on Figure 2.17. As shown on Figure 2.17, BOD concentrations have randomly ranged from 4 to 29 mg/L since May 2002 with a one-time peak of 45 μg/L in September 2012. The BOD concentrations were compared with the discharge volume but showed no apparent correlation.

In summary, the trends and low level TVOC and TSVOC concentrations described above support the semi-annual sampling frequency in the current City of North Tonawanda Industrial Wastewater Discharge Permit.

2.4 GWS Operations

The volume of water pumped on a monthly basis from the Site to the City POTW for treatment is presented in Table 2.10 and plotted on Figure 2.18. The monthly volumes show that during the time period of initial dewatering of the Site (i.e., May and June 2001) the monthly volumes ranged from 2,300,000 to 2,900,000 gallons. For the time period from June 2007 to May 2018, not including the months when the flow meter malfunctioned, the monthly volumes ranged from 23,800 to 2,661,000 gallons except for March 2009 which had a volume of 4,239,000 gallons.

The total measured volume of water discharged from the Site for the time period from May 2001 to May 2019 was 158,205,387 gallons with 11,576,787 gallons (22 gallons per minute [gpm] average) pumped during the 12 months from June 2018 through May 2019.

Section 5.0 of the O&M Manual describes the procedures to be followed in case pumping of the GWS needs to be stopped to prevent the discharge of untreated water from the Site by the City POTW (i.e., wet weather shutdown). Wet weather shutdowns occurred during this reporting period from:

Date	Time
August 18, 2018	07:10 to 13:00

Furthermore, the treatment of the Site groundwater by the City POTW did not require any modifications to the standard operations of the City POTW and did not cause any operational upsets of the City POTW from June 2018 to May 2019.

2.5 GWS Maintenance

This section describes the primary GWS maintenance activities performed during the June 2018 through May 2019 time period.

Pump Station (PS) #2 was acid washed on August 5, August 17, and October 1, 2018.

3. Site Inspections

Site inspections were performed on a monthly basis. Copies of the Inspection Logs for the time period to May 2018 were previously submitted and thus are not being resubmitted with this O&M Report. The Monthly Inspection Logs for June 2018 through May 2019 are included in Appendix B. In summary, the June 2018 through May 2019 inspections identified:

i) Higher water levels in the vicinity of MH-15 in December 2018 and January through May 2019 accompanied with the pump not running. Investigations by the City to determine the cause of these higher levels are ongoing.

ii) Soil erosion with wire mesh exposed along portions of the shoreline from June 2018 through May 2019

iii) Drift consisting of various sizes of dead trees occasionally partially blocked the River North outlet in June 2018 through January 2019. The drift was removed as needed.

Repair of the erosion is being performed on an intermittent basis by the City of North Tonawanda.

4. Conclusions/Recommendations

4.1 Operation and Maintenance

The constructed remedy is achieving the remedial action objectives.

4.2 Monitoring

Based on the most recent results for the six wells listed in Section 2.2, the groundwater VOC concentrations are:

i) Less than Class GA levels in two of the six wells sampled

ii) Decreasing in two wells

iii) Relatively constant in one well

iv) Increasing in one well

The groundwater SVOC concentrations are:

i) Less than Class GA levels in two of the six wells sampled

ii) Relatively constant in two of the wells

iii) Decreasing in one well

iv) Increasing in one well, MW-6, which is inside the barrier wall and does not discharge to the river

The groundwater sample collection frequency for 2019 was:

Annual	Once Every 2 Years (Even Years)
MW-6	MW-7
MW-8	OGC-1
MW-9	OGC-2
OGC-3	OGC-4
OGC-6	OGC-5
OGC-7	OGC-8

The individual VOC and SVOC compound concentrations in the four of the wells scheduled to be sampled once every 2 years are all less than their respective Class GA levels. This supports the scheduled frequency for these wells.

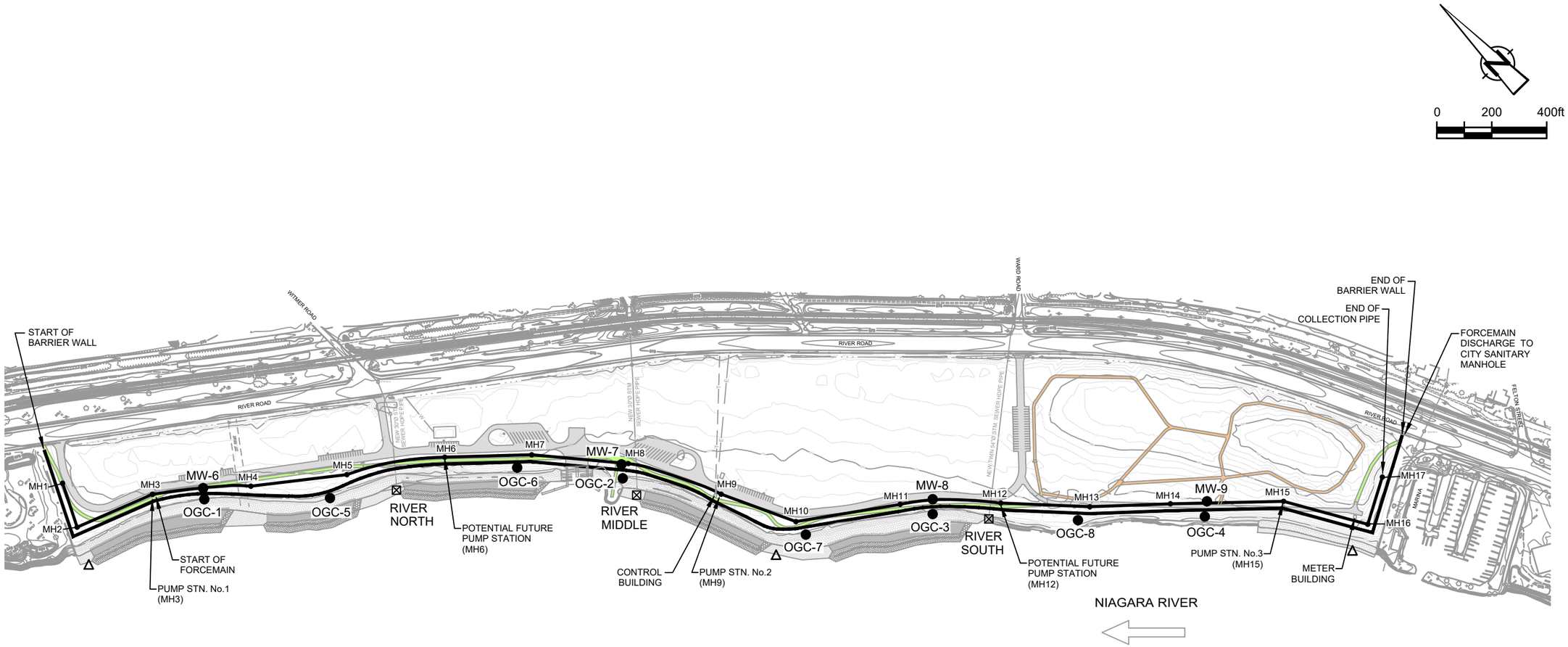
Thus, it is recommended that the same sampling frequency be used for the 5-year period from May 2019 through May 2023.

Pursuant to the discharge permit effective March 1, 2016, semi-annual monitoring was performed during the time period June 2018 through May 2019. The trends in the effluent from the GWS to the POTW support the continuation of the sampling frequency at semi-annual. Flow monitoring will continue to be performed monthly as a check on the operation of the GWS.

Monthly monitoring of the sediment thickness in the GWS manholes will continue. The sediment is to be removed once every 5 years, if necessary. The sediment will be removed during low flow conditions which typically occur in late summer.

4.3 Notifications to City of North Tonawanda

Notifications of anomalies in the visual inspections, discharge volumes and/or groundwater levels were and will continue to be provided to the City of North Tonawanda Public Works Engineering and Wastewater Treatment Department within a few days of measurement of the anomaly to allow for timely maintenance.



LEGEND

- BARRIER WALL
- MH11 — GROUNDWATER COLLECTION SYSTEM
- ● OGC-1 MW-1 — MONITORING WELL LOCATION
- ⊠ RIVER SOUTH — SURFACE WATER LEVEL MONITORING LOCATION
- △ — SURFACE WATER CHEMICAL MONITORING LOCATION (NO SAMPLING AFTER APRIL 2008)

figure 2.1

MONITORING NETWORK
GRATWICK-RIVERSIDE PARK SITE
North Tonawanda, New York

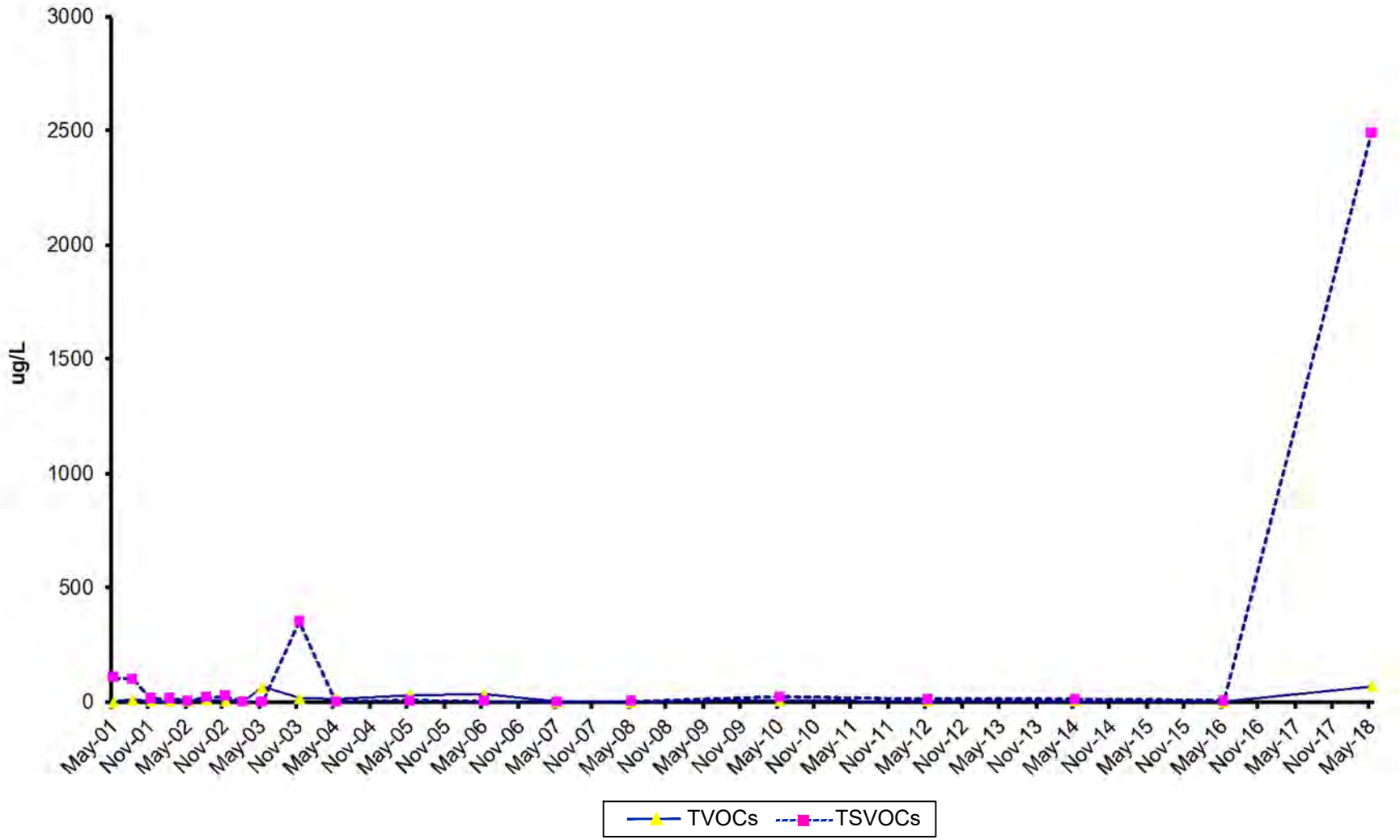


figure 2.2

MW-6 TVOC AND TSVOC CONCENTRATIONS
GRATWICK-RIVERSIDE PARK SITE
North Tonawanda, New York

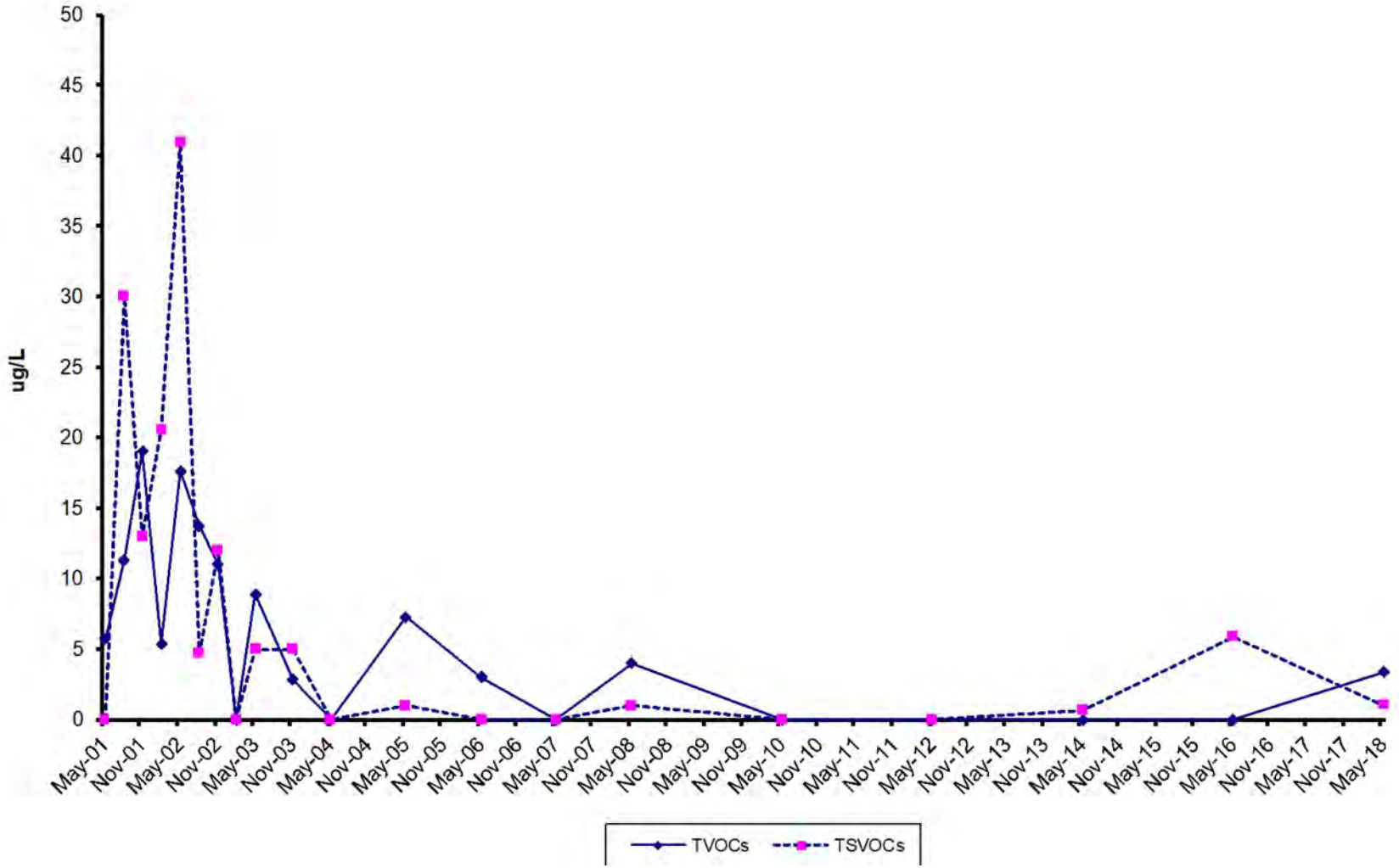


figure 2.3

MW-7 TVOC AND TSVOC CONCENTRATIONS
GRATWICK-RIVERSIDE PARK SITE
North Tonawanda, New York

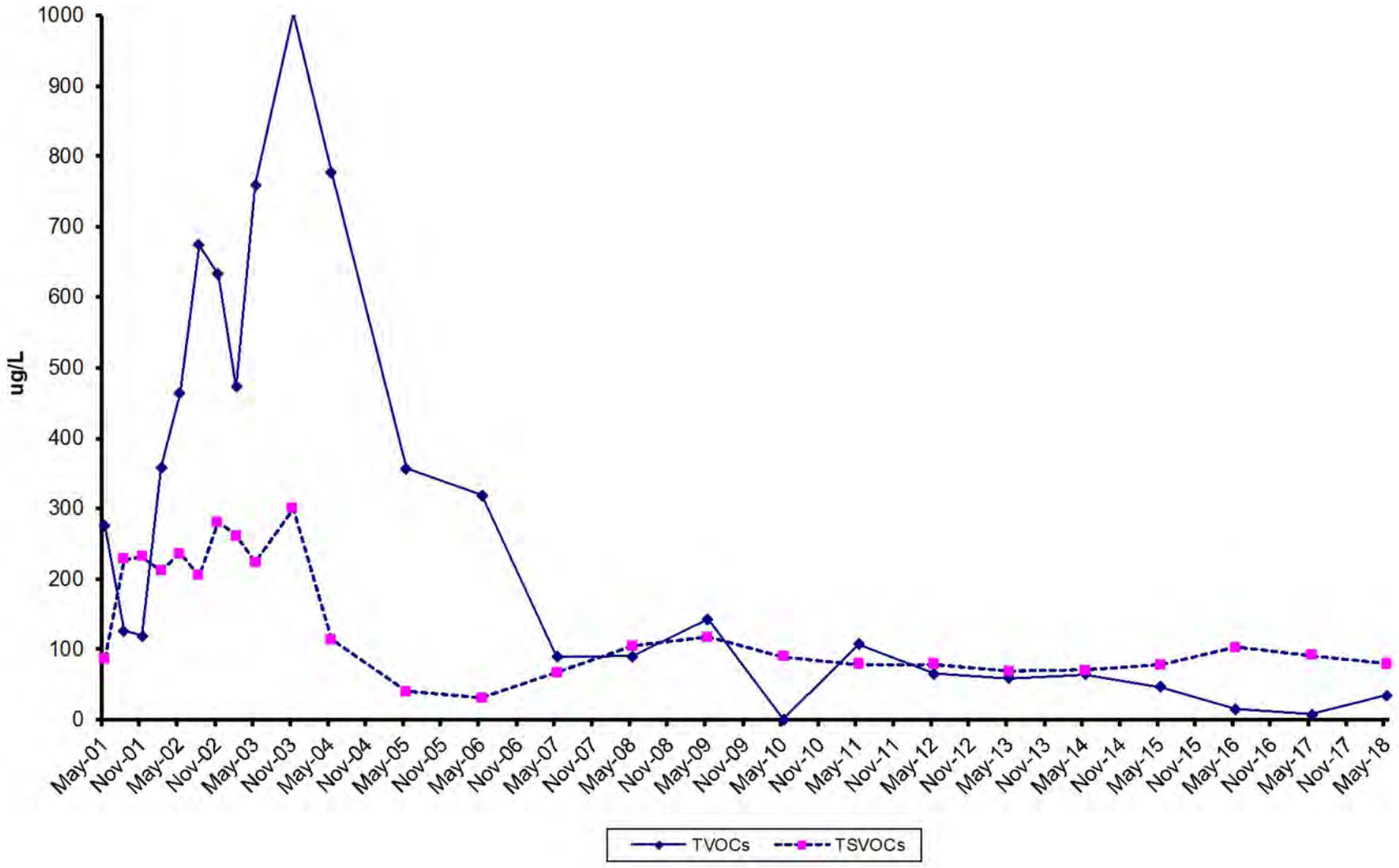


figure 2.4

MW-8 TVOC AND TSVOC CONCENTRATIONS
GRATWICK-RIVERSIDE PARK SITE
North Tonawanda, New York

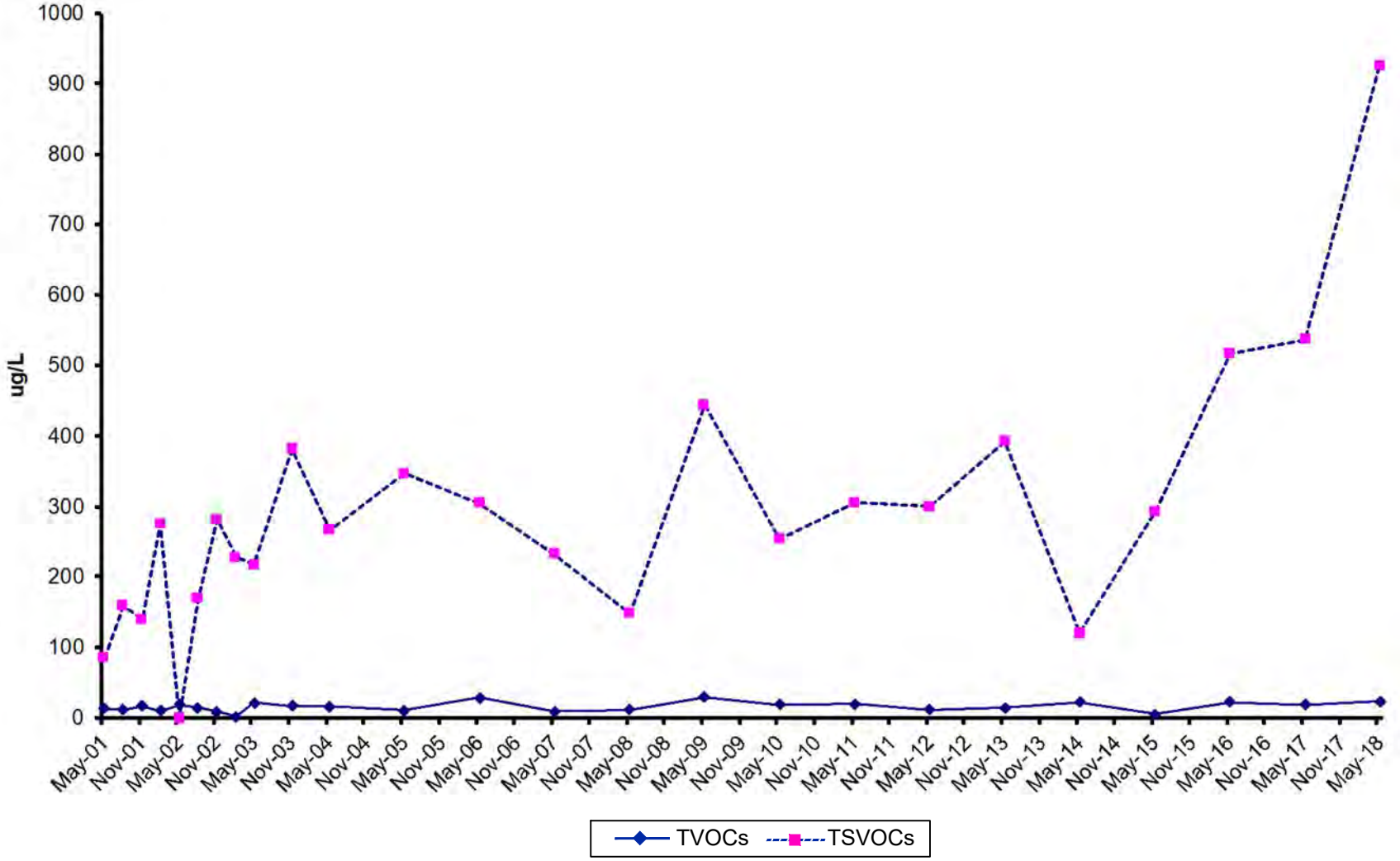


figure 2.5

MW-9 TVOC AND TSVOC CONCENTRATIONS
GRATWICK-RIVERSIDE PARK SITE
North Tonawanda, New York

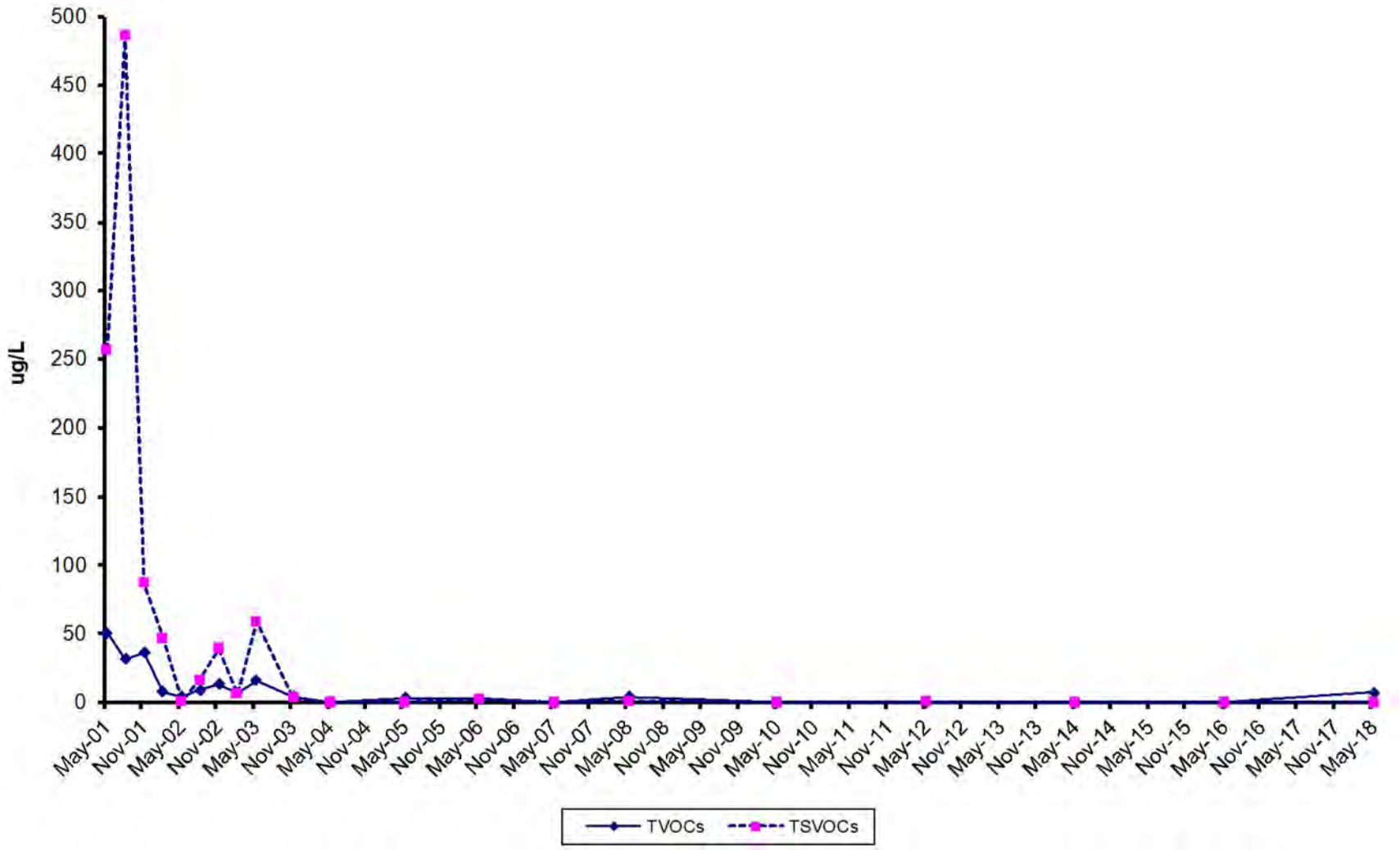


figure 2.6

OGC-1 TVOC AND TSVOC CONCENTRATIONS
GRATWICK-RIVERSIDE PARK SITE
North Tonawanda, New York

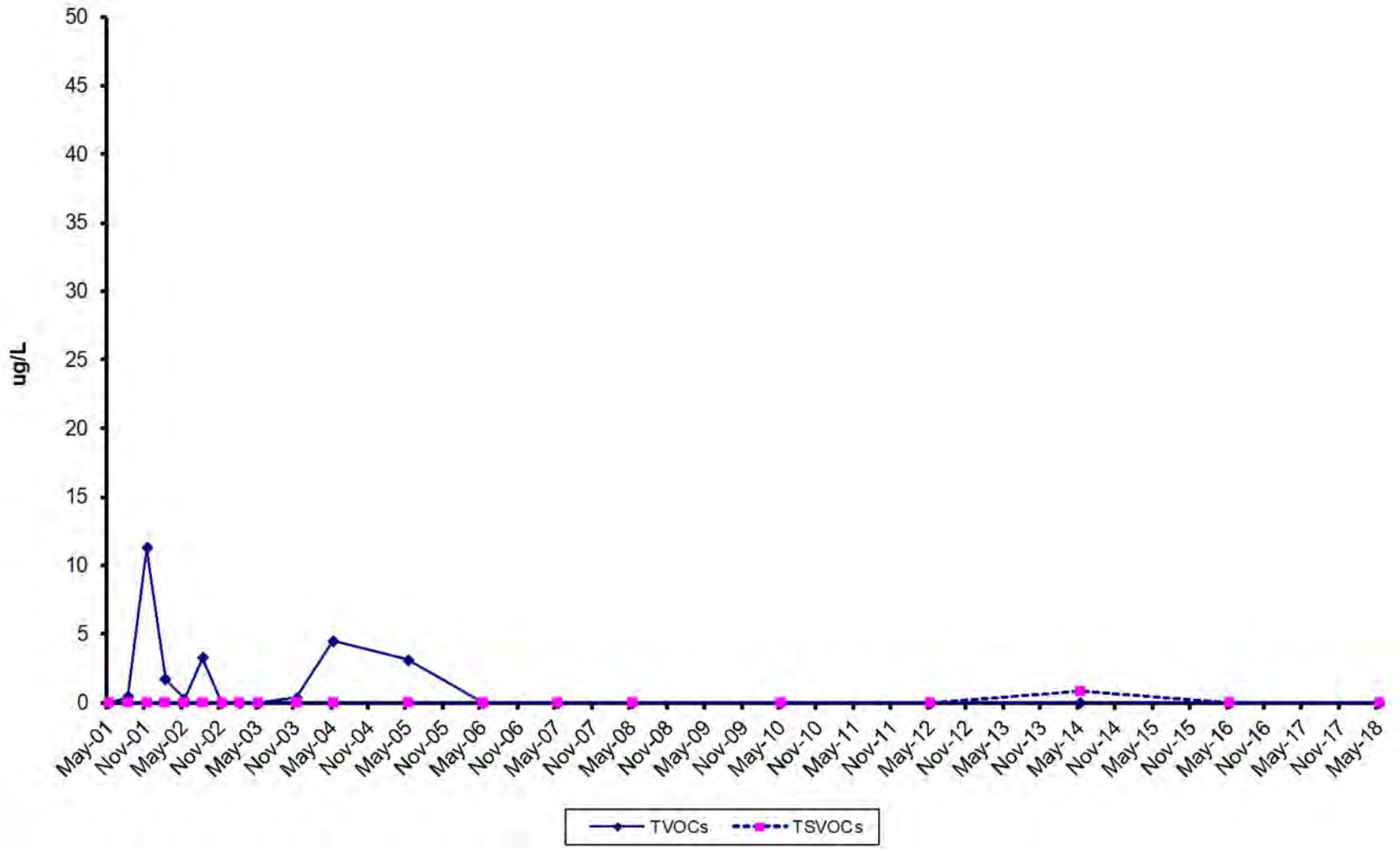


figure 2.7

OGC-2 TVOC AND TSVOC CONCENTRATIONS
GRATWICK-RIVERSIDE PARK SITE
North Tonawanda, New York

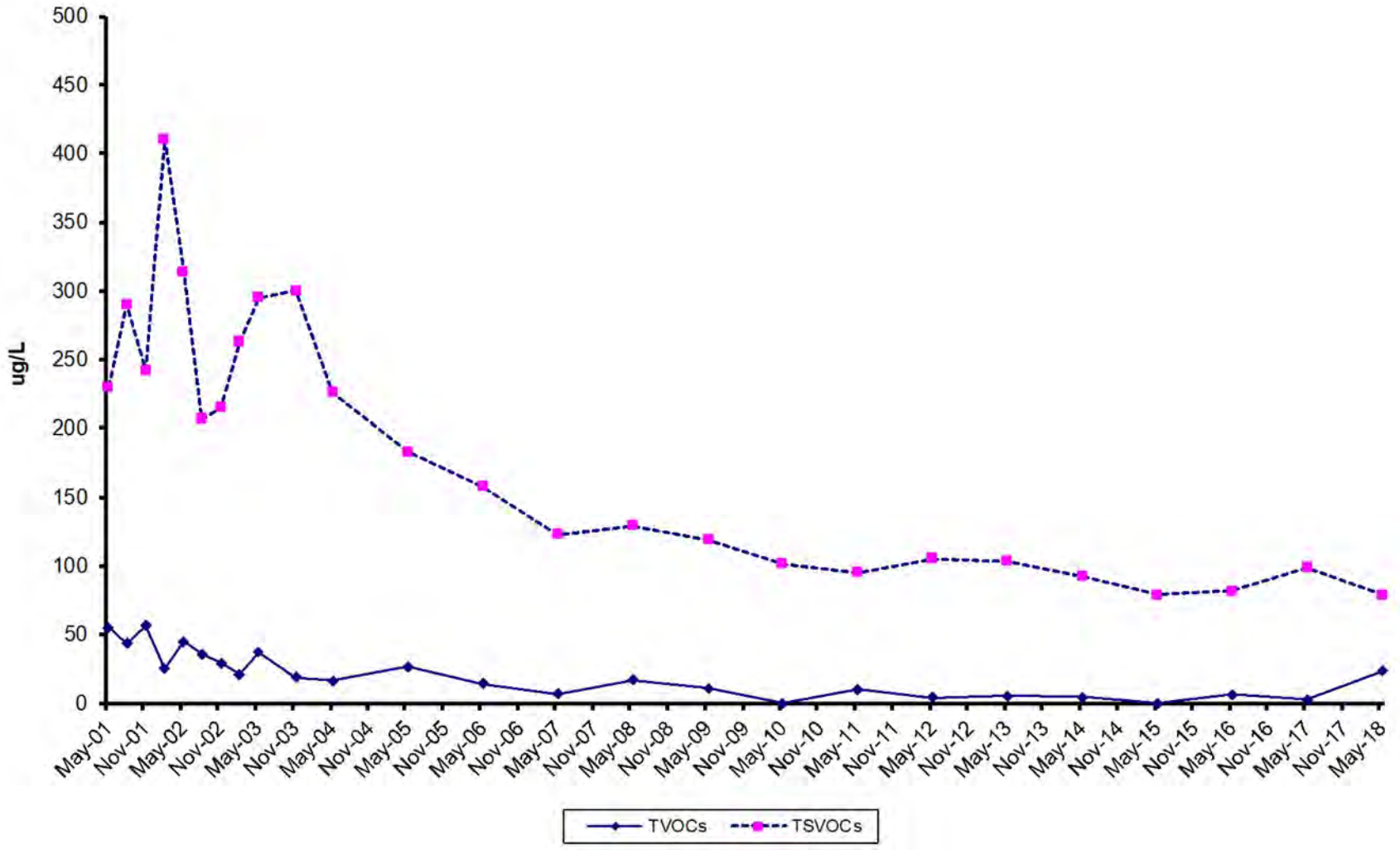


figure 2.8

OGC-3 TVOC AND TSVOC CONCENTRATIONS
GRATWICK-RIVERSIDE PARK SITE
North Tonawanda, New York

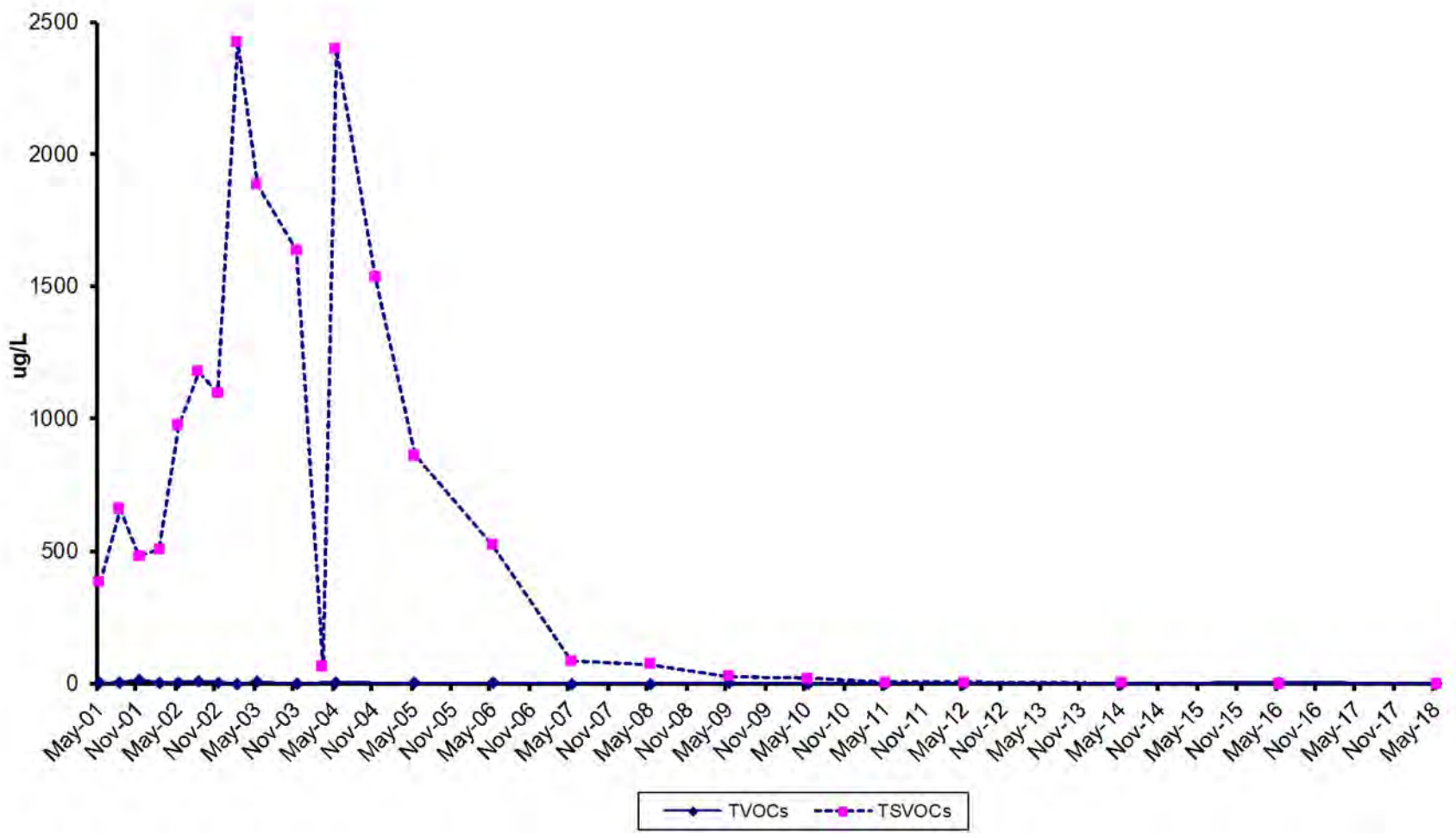


figure 2.9

OGC-4 TVOC AND TSVOC CONCENTRATIONS
GRATWICK-RIVERSIDE PARK SITE
North Tonawanda, New York

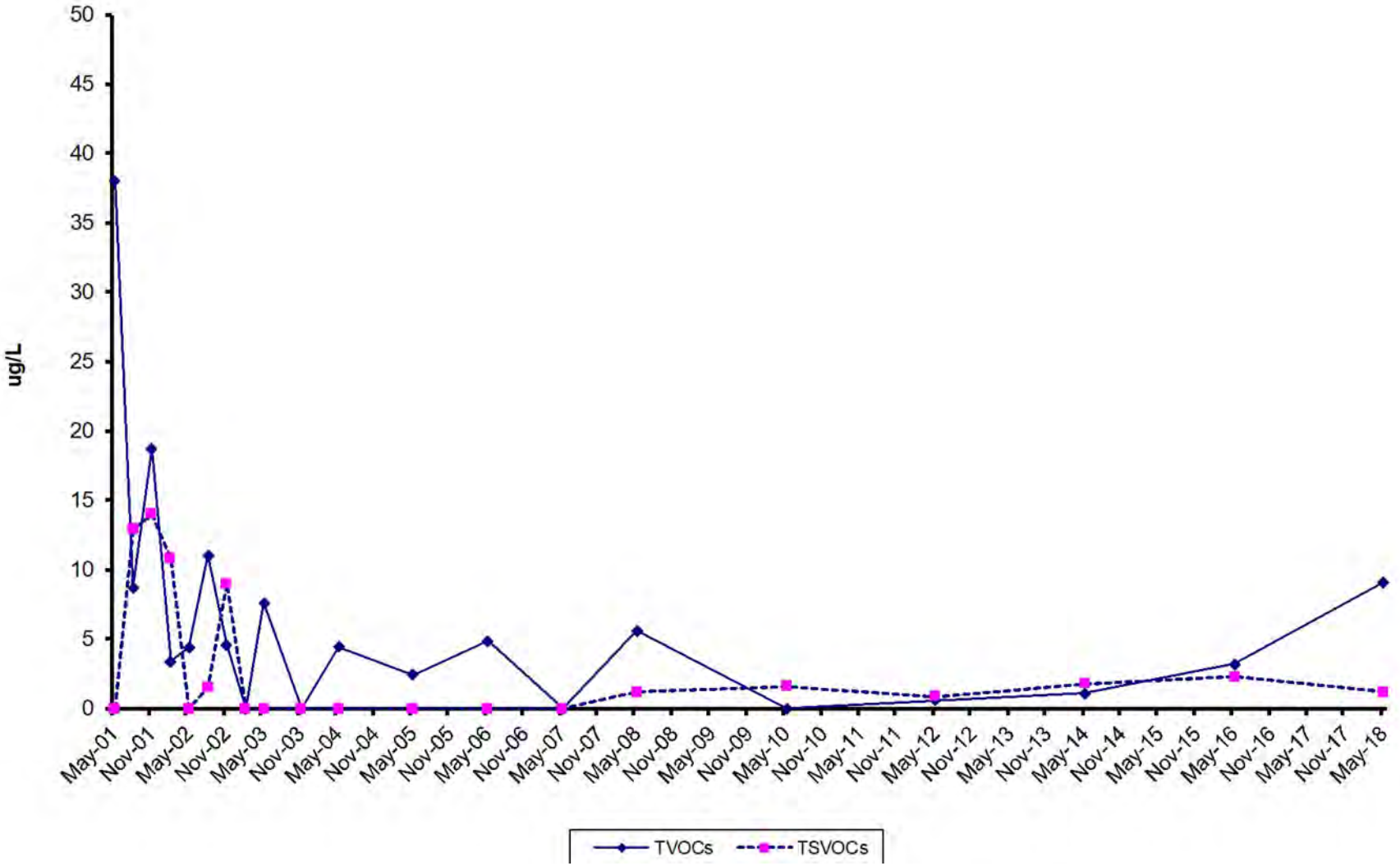


figure 2.10

OGC-5 TVOC AND TSVOC CONCENTRATIONS
GRATWICK-RIVERSIDE PARK SITE
North Tonawanda, New York

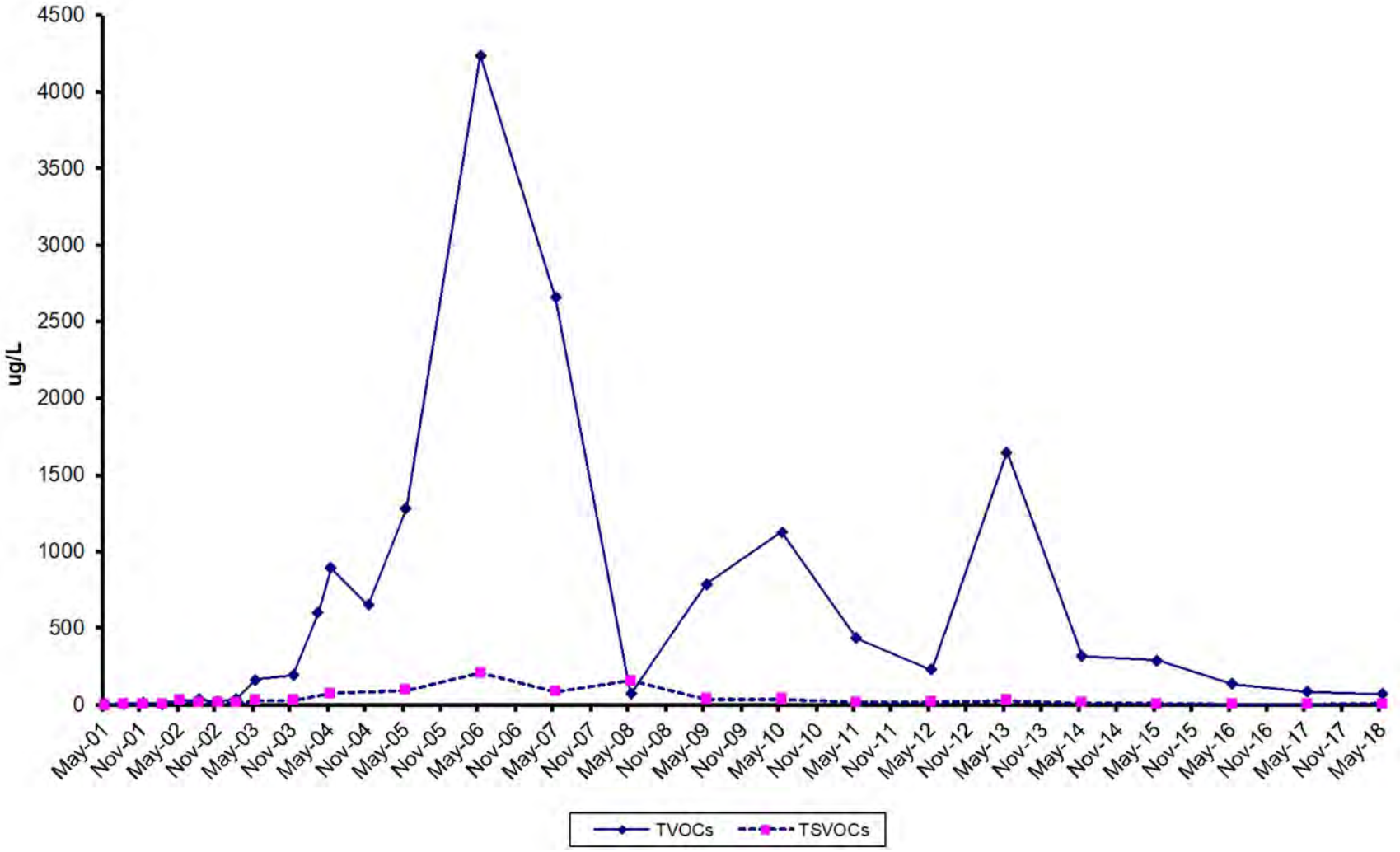


figure 2.11

OGC-6 TVOC AND TSVOC CONCENTRATIONS
GRATWICK-RIVERSIDE PARK SITE
North Tonawanda, New York

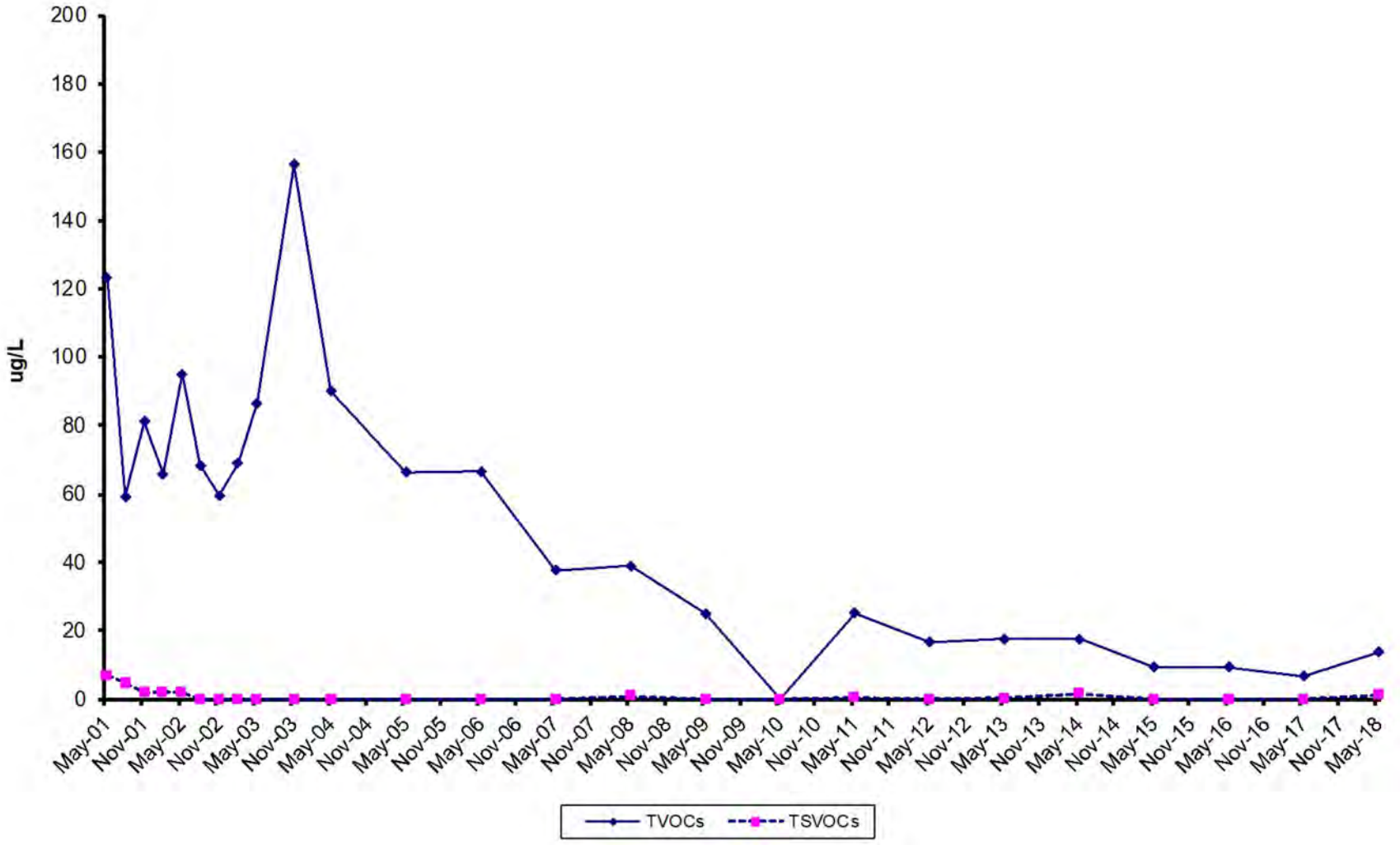


figure 2.12

OGC-7 TVOC AND TSVOC CONCENTRATIONS
GRATWICK-RIVERSIDE PARK SITE
North Tonawanda, New York

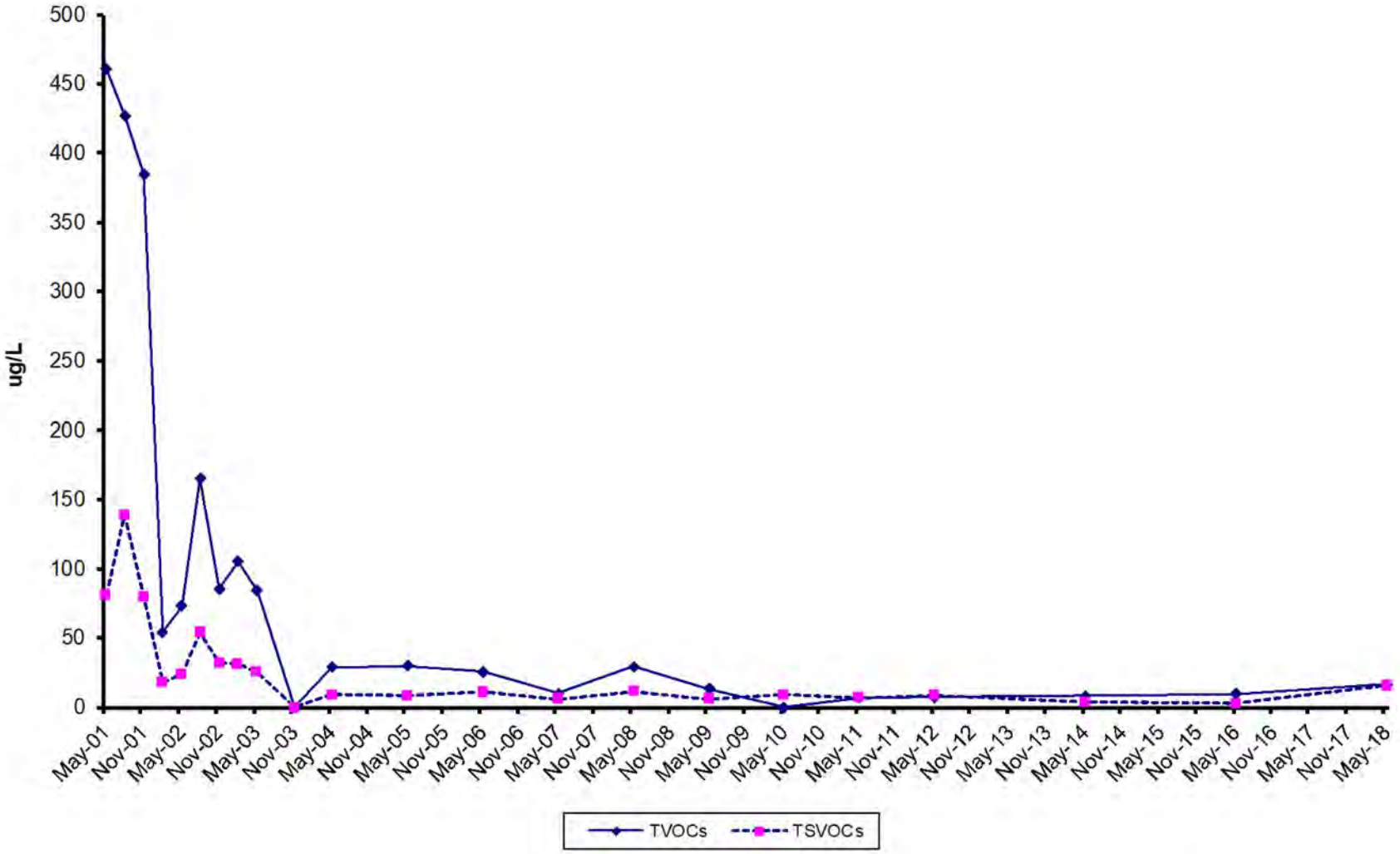


figure 2.13

OGC-8 TVOC AND TSVOC CONCENTRATIONS
GRATWICK-RIVERSIDE PARK SITE
North Tonawanda, New York

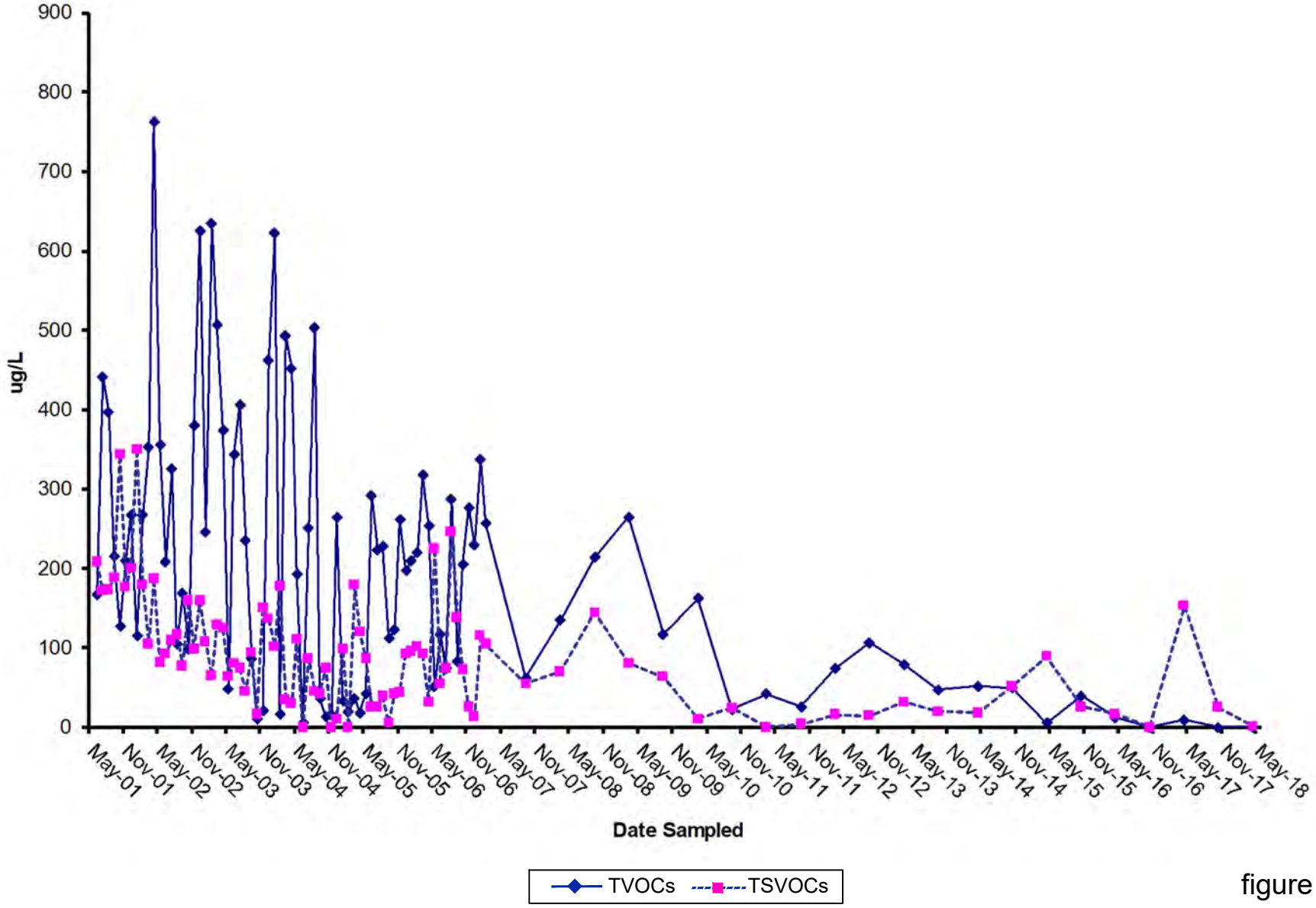


figure 2.14

EFFLUENT TVOCs AND TSVOCs vs. TIME
GRATWICK-RIVERSIDE PARK SITE
North Tonawanda, New York

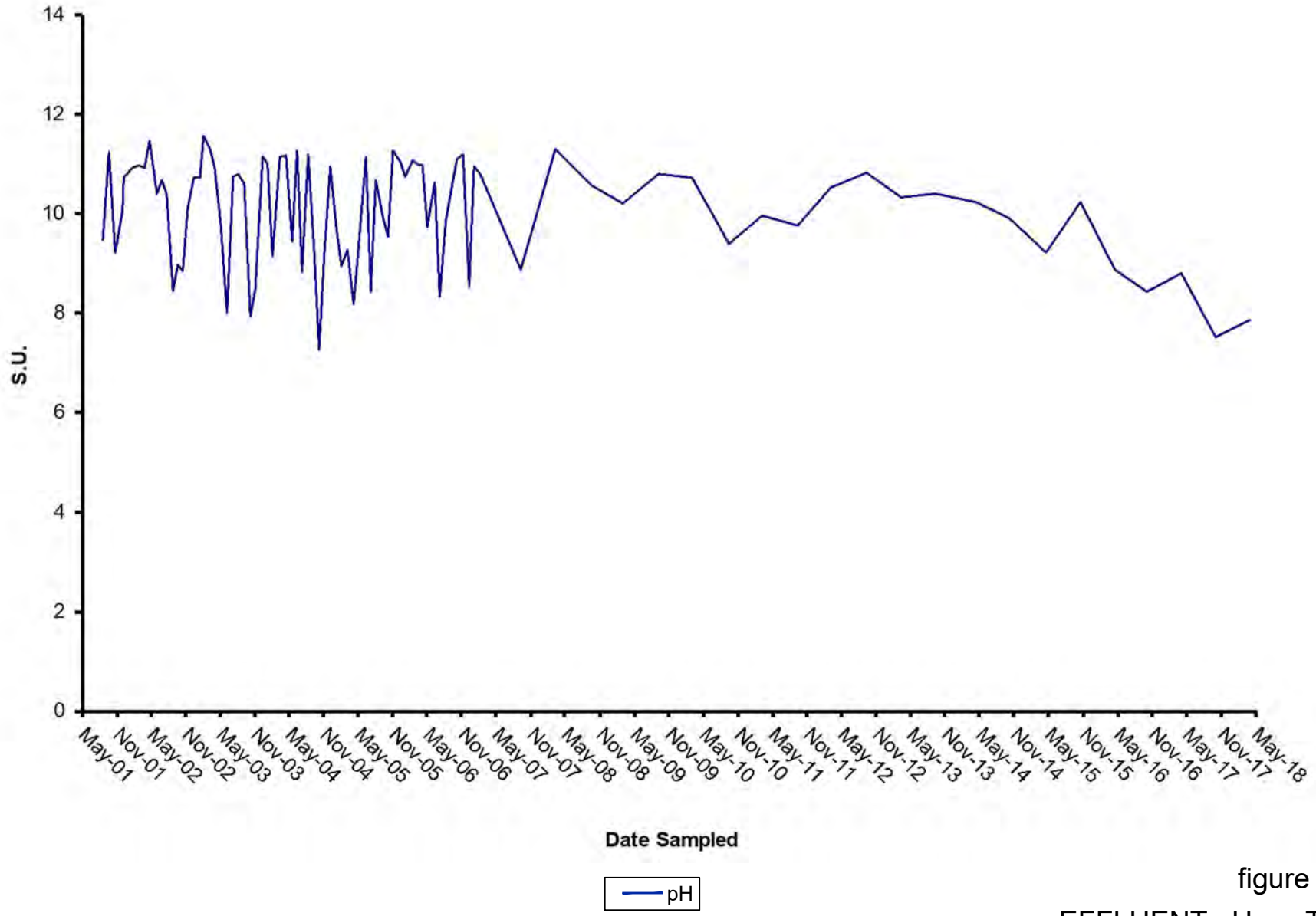


figure 2.15

EFFLUENT pH vs. TIME
GRATWICK-RIVERSIDE PARK SITE
North Tonawanda, New York

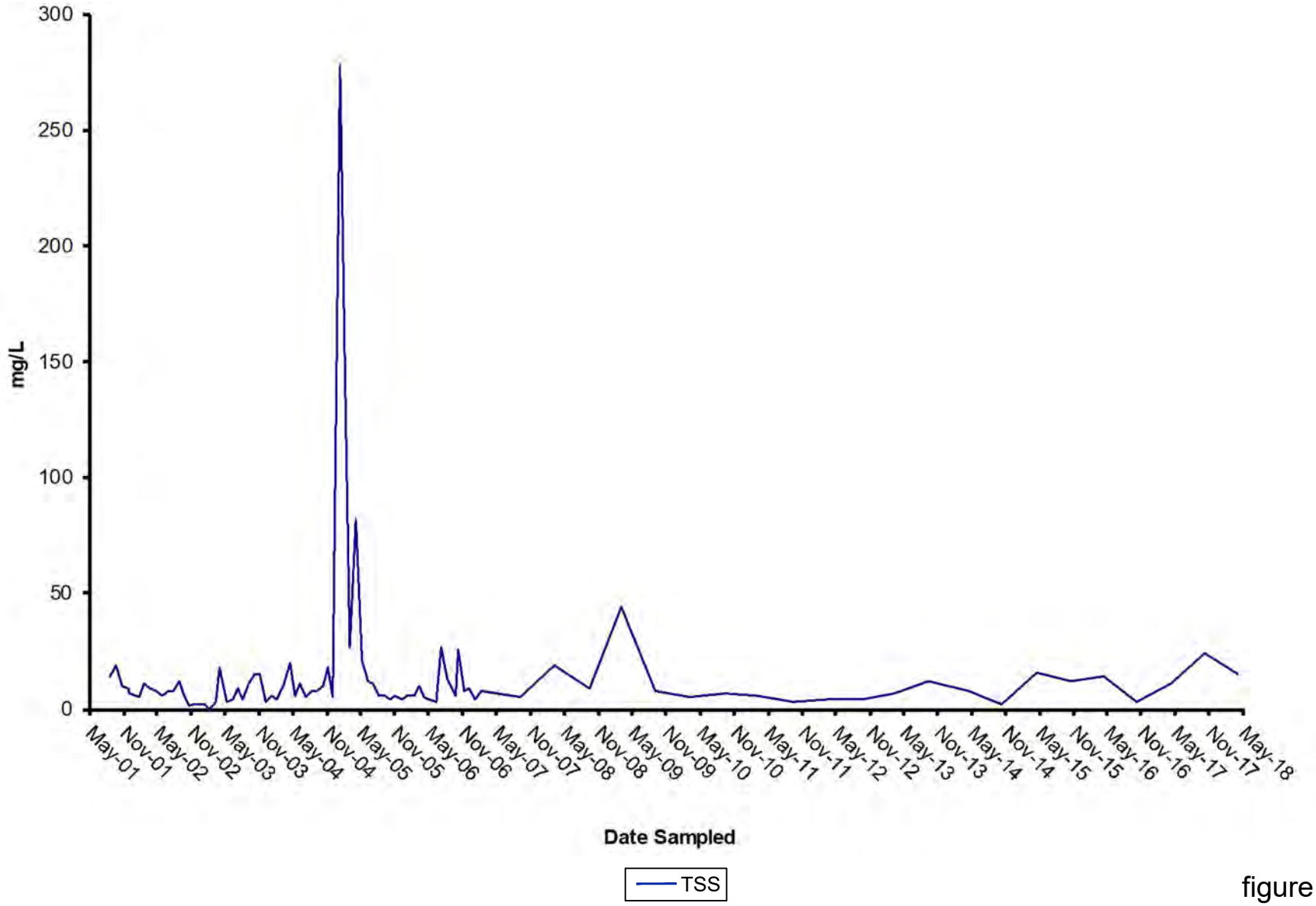


figure 2.16

EFFLUENT TOTAL SUSPENDED SOLIDS vs. TIME
GRATWICK-RIVERSIDE PARK SITE
North Tonawanda, New York

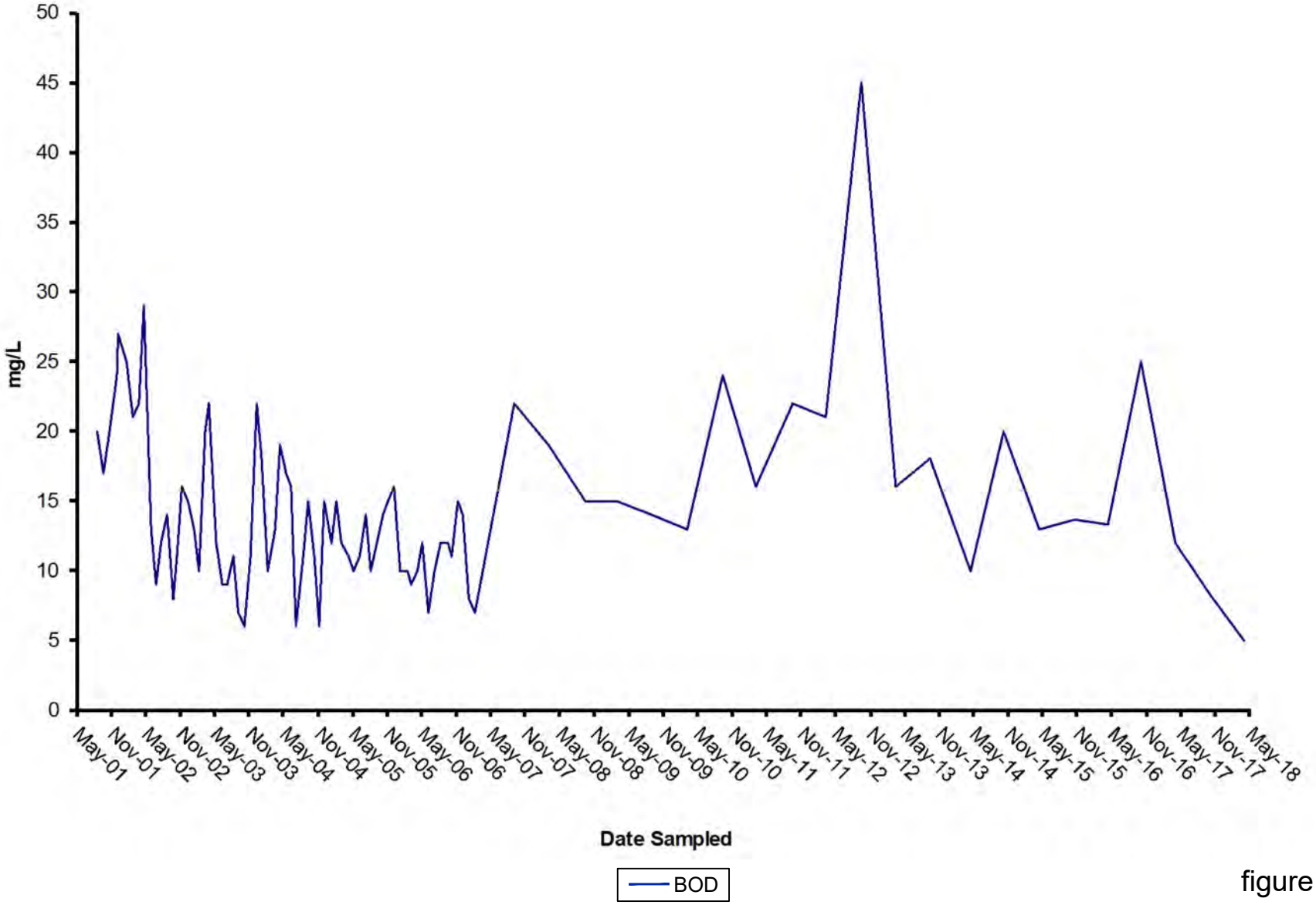


figure 2.17

EFFLUENT BOD vs. TIME
GRATWICK-RIVERSIDE PARK SITE
North Tonawanda, New York

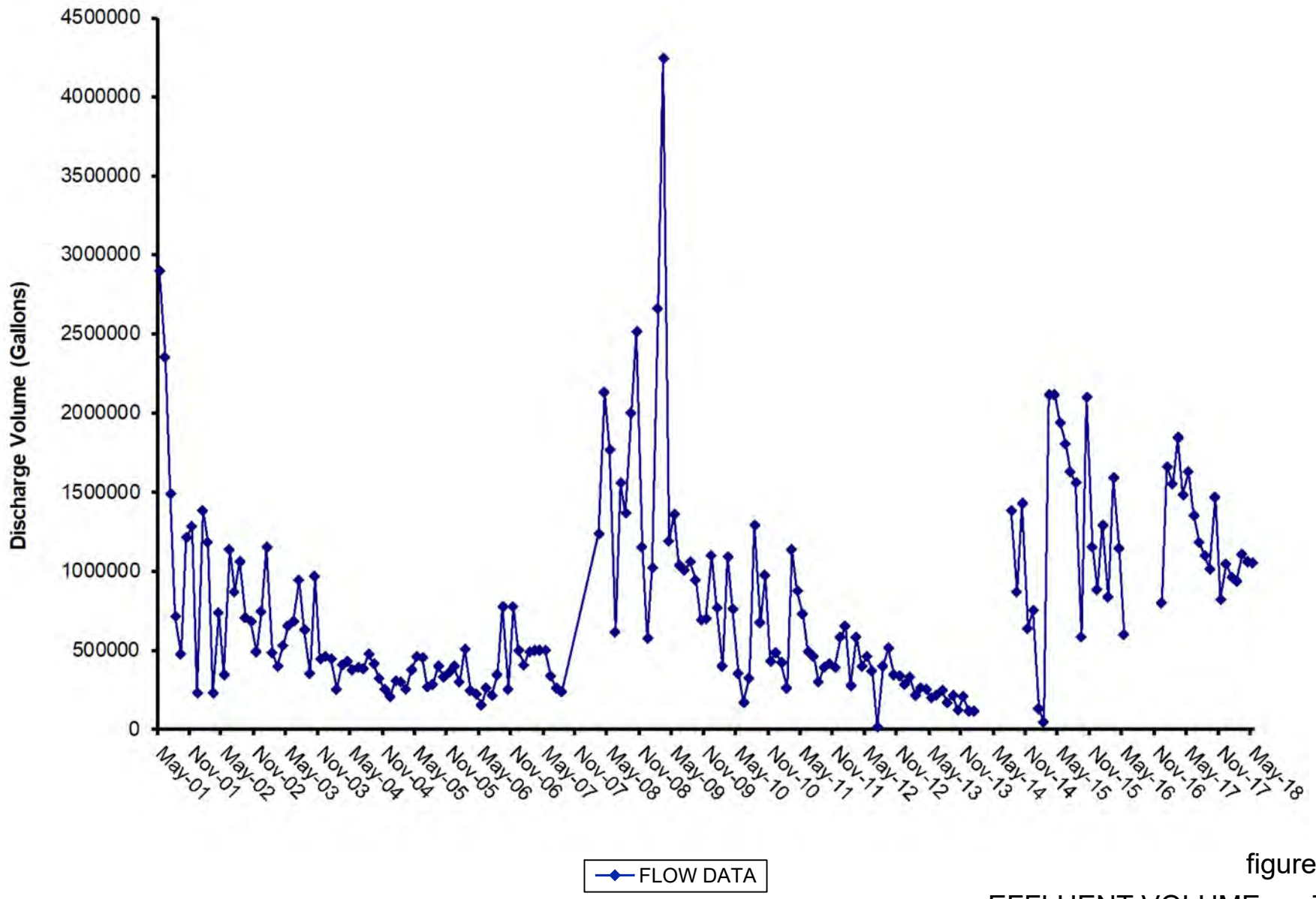


figure 2.18

EFFLUENT VOLUME vs. TIME
GRATWICK-RIVERSIDE PARK SITE
North Tonawanda, New York

Table 2.1

Groundwater Hydraulic Monitoring Locations
Operation and Maintenance
Gratwick-Riverside Park Site
North Tonawanda, New York

Inward Hydraulic Gradient Monitoring Locations

Inner [1]	Outer
MH2	Niagara River North (Downstream)
MH6	Niagara River North (Downstream)
MH8	Niagara River Middle
MH12	Niagara River South (Upstream)

Upward Hydraulic Gradient Monitoring Locations

Upper [1]	Lower
MH3	MW-6
MH8	MW-7
MH11	MW-8
MH14/MH15 [2]	MW-9

Frequency

- Weekly following GWS startup until six consecutive inward gradients are achieved.
- Monthly thereafter for the remainder of the initial 2-year period (review after 2 years).
- 2-Year and 5-Year reviews indicated that the monitoring frequency remain monthly.

Notes:

(1) These manholes will be monitored twice daily by POTW staff during a wet weather bypass event pursuant to Section 5.0 of the O&M Manual.

(2) Distance weighted averages of water levels used (MH14 - two thirds and MH15 - one third).

Table 2.2

Water Levels (FT AMSL)
Gratwick-Riverside Park Site
North Tonawanda, New York

Date	MH2	MH3	MH6	OGC-1	MW-6	OGC-5	River North	OGC-6	MH8	MW-7	OGC-2	River Middle	OGC-7
RIM Elevation	**573.28**	**573.81**	**572.03**						**572.37**				
TOC Elevation (ft amsl)				**575.01**	**575.40**	**573.82**	**566.80**	**576.65**		**575.57**	**574.08**	**566.48**	**572.49**
June 27, 2013	564.37	559.69	557.96	564.70	564.59	564.78	564.23	564.57	562.69	562.86	564.78	564.58	564.89
July 24, 2013	564.38	560.60	558.10	565.22	564.52	565.11	565.11	566.04	562.93	563.28	565.25	564.95	565.28
August 22, 2013	564.18	560.40	557.71	565.02	564.24	565.10	565.02	564.93	562.41	562.46	565.05	564.95	565.25
September 30, 2013	564.17	560.68	557.72	564.88	564.28	564.98	564.87	564.76	564.40	562.48	564.97	564.74	565.11
October 30, 2013	564.47	560.63	558.05	564.81	564.64	564.57	(1)	564.53	562.79	562.98	564.76	564.30	564.69
November 27, 2013	564.44	560.33	557.69	564.44	564.52	564.14	(1)	564.24	562.35	562.40	564.43	563.63	564.29
December 31, 2013	564.41	561.39	558.11	564.64	564.74	564.41	(1)	564.33	562.86	563.09	564.45	564.43	564.56
January 30, 2014	564.13	559.88	557.64	565.03	564.14	564.90	564.80	564.87	562.41	562.40	565.09	(2)	565.07
February 26, 2014	567.53	570.48	558.01	564.44	565.29	564.32	(1)	564.20	562.81	562.78	564.44	563.98	564.45
March 28, 2014	564.10	559.36	557.62	564.26	564.01	564.09	564.96	564.13	562.21	562.01	564.29	564.39	564.21
April 25, 2014	564.42	560.21	558.36	564.81	564.74	564.50	(1)	564.44	563.03	562.95	564.67	564.28	564.63
May 29, 2014	564.46	559.12	558.41	564.92	564.71	564.57	(1)	564.70	563.20	563.21	564.91	564.60	564.88
June 25, 2014	564.38	560.62	558.14	564.88	564.46	564.93	564.80	564.87	562.88	562.94	565.08	564.67	565.13
July 29, 2014	564.24	560.42	557.93	565.04	564.28	564.96	(1)	564.81	562.72	562.84	565.11	564.78	565.10
August 26, 2014	564.26	561.12	557.84	564.80	564.26	564.91	564.91	564.69	562.58	562.49	564.90	564.77	565.08
September 30, 2014	564.01	560.65	557.82	564.63	564.07	564.65	564.67	564.50	562.51	562.36	564.70	564.54	564.78
October 29, 2014	564.06	559.77	557.82	564.73	564.09	564.83	564.81	564.63	562.54	562.35	564.77	564.65	565.00
November 25, 2014	563.88	560.70	557.44	565.39	563.89	565.64	565.41	564.96	562.09	561.92	565.13	NM	565.71
December 30, 2014	567.26	571.05	557.71	564.58	564.53	564.29	(1)	564.33	562.31	562.20	564.40	563.90	564.45
January 28, 2015	565.60	565.06	559.07	564.59	564.82	564.91	564.85	564.46	563.96	564.72	564.55	564.78	564.98
February 24, 2015	565.75	565.39	559.45	564.37	565.18	564.55	(2)	564.21	(2)	565.17	564.62	(2)	564.66
March 25, 2015	564.69	560.93	558.97	564.50	565.07	564.04	(1)	564.16	563.76	564.14	564.36	563.63	564.21
April 23, 2015	565.70	560.48	559.94	565.13	565.89	565.03	564.82	564.93	564.85	565.34	565.03	564.60	565.17
May 29, 2015	564.77	561.40	558.47	564.74	564.58	564.70	564.78	564.70	563.26	563.59	564.93	564.65	564.95
June 24, 2015	564.80	560.99	558.20	565.15	564.62	565.20	565.15	565.07	562.96	563.10	565.23	565.07	565.28
July 28, 2015	564.79	559.51	557.84	565.31	564.53	565.40	565.27	565.25	562.60	562.76	565.41	565.16	565.53
August 27, 2015	564.62	559.38	557.71	565.23	564.29	565.30	565.13	565.14	562.46	562.41	565.36	565.06	565.45
September 25, 2015	564.70	559.57	557.81	564.99	564.47	565.06	565.01	564.92	562.53	562.55	565.07	564.91	565.23
October 30, 2015	564.69	560.63	557.51	565.76	564.31	565.06	564.71	566.07	562.24	562.34	565.42	564.49	565.41
November 30, 2015	564.59	560.10	557.23	564.35	564.23	564.12	(1)	564.16	561.85	561.80	564.42	563.83	564.23
December 30, 2015	564.50	560.89	557.26	565.32	564.18	564.57	(1)	564.33	561.94	562.35	564.75	564.18	564.88
January 28, 2016	564.77	560.05	557.42	564.79	564.48	564.60	(1)	564.56	562.05	561.98	564.68	564.15	564.76
February 23, 2016	564.86	560.75	558.15	564.81	564.69	564.19	(1)	564.29	562.94	563.51	564.46	563.48	564.38
March 31, 2016	565.66	560.53	559.61	565.28	565.97	564.83	(1)	564.84	564.43	564.91	565.01	564.20	565.03
April 28, 2016	566.56	561.19	560.20	565.22	566.08	564.91	564.76	564.89	565.05	565.69	565.20	564.55	565.05
May 26, 2016	566.95	559.81	560.61	565.10	566.38	564.96	564.82	564.97	565.45	566.20	565.38	564.64	565.10

Table 2.2

Water Levels (FT AMSL)
Gratwick-Riverside Park Site
North Tonawanda, New York

Date	MH2	MH3	MH6	OGC-1	MW-6	OGC-5	River North	OGC-6	MH8	MW-7	OGC-2	River Middle	OGC-7
RIM Elevation	**573.28**	**573.81**	**572.03**						**572.37**				
TOC Elevation (ft amsl)				**575.01**	**575.40**	**573.82**	**566.80**	**576.65**		**575.57**	**574.08**	**566.48**	**572.49**
June 30, 2016	567.09	561.03	560.81	565.18	566.51	565.21	565.21	565.13	565.65	566.94	565.49	565.09	565.30
July 28, 2016	567.28	559.17	561.01	565.29	566.67	565.24	565.18	565.17	565.79	566.61	565.59	565.05	565.45
August 24, 2016	567.40	559.53	561.12	565.32	566.81	565.23	565.22	565.26	565.96	566.77	565.68	565.12	565.47
September 27, 2016	567.56	561.19	561.30	565.33	566.98	565.58	565.48	565.33	566.15	566.94	565.56	565.38	565.77
October 25, 2016	567.57	565.12	561.25	565.19	566.97	565.02	564.76	564.94	566.08	566.84	565.32	564.60	565.26
November 30, 2016	567.37	561.33	561.11	564.39	566.79	564.22	(1)	564.29	565.95	566.75	564.76	563.86	564.36
December 28, 2016	567.41	561.39	560.85	565.09	566.82	564.51	(1)	564.58	565.60	566.37	564.98	563.88	564.69
January 31, 2017	567.41	560.44	560.72	564.73	566.67	564.41	(1)	564.53	565.46	566.18	564.86	563.66	564.49
February 28, 2017	567.06	560.62	560.36	564.98	566.44	564.56	(1)	564.67	565.23	565.88	564.89	564.08	564.69
March 31, 2017	567.37	559.48	561.11	565.45	566.78	564.53	(1)	564.52	565.58	566.36	564.90	564.23	564.83
April 27, 2017	568.05	560.59	561.53	565.32	567.45	565.15	564.91	565.14	566.36	567.14	565.41	564.76	565.25
May 31, 2017	568.17	559.79	561.73	565.54	567.57	565.55	565.56	565.54	566.53	567.34	565.75	565.29	565.66
June 27, 2017	567.87	559.53	561.47	565.73	567.28	565.70	565.62	565.65	566.29	567.03	565.91	565.50	565.80
July 26, 2017	567.85	561.04	561.34	565.58	567.25	565.54	565.42	565.54	566.19	566.96	565.91	565.23	565.67
August 29, 2017	567.98	559.69	561.52	565.30	567.37	565.34	565.19	565.26	566.44	567.21	565.67	565.04	565.50
September 25, 2017	567.81	560.63	561.50	565.21	567.24	565.34	565.22	565.16	566.37	567.21	565.54	565.06	565.50
October 24, 2017	567.89	560.12	561.49	565.15	567.32	565.53	563.37	565.13	566.35	567.12	565.44	565.25	565.51
November 27, 2017	567.95	560.69	561.59	565.09	567.37	564.88	564.55	564.87	566.45	567.17	565.30	564.40	565.05
December 21, 2017	567.87	560.98	561.45	564.98	567.27	564.60	(1)	564.67	566.32	567.08	565.15	564.09	564.73
January 31, 2018	568.03	559.93	561.64	564.83	567.48	564.97	565.09	564.75	566.48	567.36	565.00	564.59	565.18
February 26, 2018	568.36	560.72	561.98	565.58	567.73	565.09	564.86	565.00	566.85	567.65	565.32	564.69	565.27
March 23, 2018	568.25	561.20	561.85	565.12	567.61	565.04	564.86	564.96	566.70	567.48	565.21	564.62	565.17
April 27, 2018	568.56	559.09	562.20	565.64	567.92	565.46	565.30	565.52	567.09	567.86	565.68	565.09	565.58
May 23, 2018	568.28	560.61	561.92	565.69	567.68	565.59	565.41	565.52	566.76	567.57	565.87	565.19	565.76
June 11, 2018	568.21	555.80	561.91	565.48	567.61	565.43	565.29	565.43	566.69	567.18	565.79	565.13	565.60
July 25, 2018	568.14	558.78	561.85	565.73	567.57	565.59	565.51	565.44	566.55	567.09	565.95	565.40	565.85
August 27, 2018	568.16	560.13	561.78	565.40	567.55	565.37	565.25	565.36	566.63	567.10	565.68	565.08	565.60
September 21, 2018	568.06	559.41	561.71	565.22	565.08	565.37	565.30	565.24	566.54	566.97	565.56	565.13	565.53
October 31, 2018	567.93	559.80	561.45	565.24	567.30	565.14	565.20	565.13	566.26	566.75	565.46	564.99	565.40
November 21, 2018	568.10	559.70	561.72	565.37	567.48	565.80	565.52	565.27	566.55	567.06	565.43	(2)	565.80
December 20, 2018	568.35	559.91	561.99	564.93	567.71	564.80	(1)	564.82	566.86	567.38	565.19	564.29	564.93
January 28, 2019	568.38	560.20	562.06	565.87	567.80	565.80	565.30	565.73	566.89	567.44	565.90	(2)	565.91
February 28, 2019	568.33	559.05	561.94	565.27	567.68	565.06	(2)	565.06	566.76	567.40	565.52	(2)	565.26
March 26, 2019	568.15	560.19	561.77	565.10	567.53	565.04	564.95	564.94	566.58	567.22	565.18	564.72	565.18
April 26, 2019	568.56	558.73	562.30	565.72	567.96	565.56	565.71	565.54	566.96	567.80	565.64	565.48	565.67
May 29, 2019	568.71	559.20	562.49	565.74	568.13	565.72	565.42	565.70	567.30	568.02	566.05	565.20	565.86

Table 2.2

Water Levels (FT AMSL)
Gratwick-Riverside Park Site
North Tonawanda, New York

Date	MH9	OGC-3	MH11	MW-8	River South	MH12	OGC-8	OGC-4	MW-9	MH14	MH15	MH16
RIM Elevation			**572.11**			**572.37**				**574.30**	**575.84**	**574.82**
TOC Elevation (ft amsl)	**572.55**	**573.35**		**574.37**	**568.46**		**574.01**	**574.66**	**576.23**			
June 27, 2013		562.02	563.08	563.61	565.00	561.50	565.08	564.99	565.66	565.68	564.63	565.69
July 24, 2013		565.36	563.04	563.56	565.37	561.40	565.42	565.30	565.47	565.40	564.27	565.44
August 22, 2013		565.37	562.87	563.37	565.37	561.17	565.38	565.29	565.19	565.16	564.08	565.18
September 30, 2013		565.17	563.73	563.25	565.15	561.03	565.24	565.15	565.05	565.06	564.01	565.03
October 30, 2013		564.73	562.96	563.53	564.74	561.35	564.83	564.73	565.50	565.48	564.45	565.54
November 27, 2013		564.33	563.08	563.58	564.30	561.39	564.39	564.38	565.47	565.53	564.52	565.35
December 31, 2013		564.72	563.53	564.06	564.87	561.78	564.89	564.63	565.76	565.78	564.71	565.86
January 30, 2014		565.14	563.40	563.95	565.63	561.65	565.20	565.17	565.52	565.51	564.51	565.61
February 26, 2014		564.55	563.28	563.83	564.55	561.48	564.65	564.59	565.46	565.57	564.51	565.55
March 28, 2014	560.87	564.24	563.58	564.10	564.38	561.78	564.40	564.26	565.93	565.98	564.88	565.97
April 25, 2014	559.42	564.72	563.90	564.44	564.70	562.08	564.77	564.73	566.12	566.22	565.18	566.24
May 29, 2014	561.05	564.99	564.01	564.37	564.92	562.06	564.98	564.88	565.77	566.07	565.00	566.07
June 25, 2014	561.27	565.14	563.53	564.03	565.11	561.68	565.84	565.21	565.60	565.69	564.62	565.64
July 29, 2014	560.93	565.18	563.41	563.75	565.15	561.37	565.25	565.14	565.21	565.30	564.23	565.14
August 26, 2014	560.63	565.18	563.11	563.61	565.15	561.25	565.28	565.11	565.20	565.28	564.16	565.20
September 30, 2014	559.52	564.92	562.89	563.31	564.96	560.97	565.01	564.89	564.89	565.04	563.92	564.96
October 29, 2014	560.59	565.14	562.78	563.23	565.15	560.87	565.18	565.14	564.77	564.91	563.80	564.81
November 25, 2014	561.55	565.76	562.71	563.18	565.56	560.85	565.80	565.89	564.76	564.92	563.85	564.79
December 30, 2014	560.91	564.52	562.98	563.43	564.45	561.15	564.59	564.62	565.13	565.22	564.15	565.16
January 28, 2015	564.64	565.19	564.19	564.70	565.24	562.14	565.28	565.18	564.26	565.39	564.31	565.33
February 24, 2015	565.12	564.74	(2)	565.15	564.60	562.51	564.80	564.78	565.41	(2)	564.44	565.44
March 25, 2015	559.25	564.22	563.88	564.44	563.86	561.78	564.22	563.24	566.11	(2)	565.10	566.13
April 23, 2015	560.40	565.22	564.86	565.41	565.04	562.69	565.25	565.26	566.41	566.53	565.26	566.54
May 29, 2015	561.88	565.01	563.36	563.93	565.05	561.28	565.13	564.99	565.56	565.67	564.57	565.61
June 24, 2015	560.38	565.67	563.33	563.87	565.44	561.25	565.47	565.45	565.54	565.62	564.54	565.57
July 28, 2015	560.55	565.59	563.27	563.84	565.50	561.16	565.63	565.64	565.38	565.49	564.43	565.43
August 27, 2015	559.82	565.53	563.09	563.60	565.47	560.96	565.59	565.60	565.14	565.23	564.11	565.17
September 25, 2015	559.75	565.35	563.20	563.58	565.31	560.91	565.39	565.30	565.16	565.30	564.14	565.21
October 30, 2015	561.54	565.24	562.82	563.34	565.00	560.69	565.23	565.45	564.25	562.52	560.35	564.33
November 30, 2015	559.78	564.52	562.52	563.03	564.19	560.35	564.40	564.39	563.61	562.72	561.17	563.69
December 30, 2015	560.97	564.93	562.22	562.79	564.73	560.14	565.00	565.03	563.10	562.57	561.16	563.39
January 28, 2016	561.19	564.77	562.68	563.18	564.64	560.48	564.83	564.84	563.44	562.49	561.02	563.60
February 23, 2016	560.92	564.39	563.03	563.54	564.16	560.88	564.41	564.48	563.55	562.69	561.63	563.71
March 31, 2016	560.12	564.96	564.19	564.76	564.60	562.06	565.01	565.05	564.54	562.28	559.76	564.54
April 28, 2016	564.63	565.12	564.97	564.49	565.04	562.79	565.18	565.15	565.27	563.07	561.01	565.34
May 26, 2016	565.53	565.22	565.42	565.93	565.14	563.25	565.25	565.27	565.61	562.95	559.66	565.63

Table 2.2

Water Levels (FT AMSL)
Gratwick-Riverside Park Site
North Tonawanda, New York

Date	MH9	OGC-3	MH11	MW-8	River South	MH12	OGC-8	OGC-4	MW-9	MH14	MH15	MH16
RIM Elevation			**572.11**			**572.37**				**574.30**	**575.84**	**574.82**
TOC Elevation (ft amsl)	**572.55**	**573.35**		**574.37**	**568.46**		**574.01**	**574.66**	**576.23**			
June 30, 2016	566.03	565.49	565.77	566.30	565.49	563.62	565.55	565.47	566.36	566.12	567.30	566.37
July 28, 2016	565.62	565.53	565.99	566.55	565.48	563.83	565.58	565.54	566.62	568.64	567.51	566.60
August 24, 2016	565.82	565.60	566.09	566.62	565.57	563.92	565.63	565.56	566.64	568.77	568.01	566.69
September 27, 2016	566.36	565.92	566.33	566.84	565.84	564.14	565.95	565.88	566.87	568.70	567.96	566.89
October 25, 2016	565.73	565.30	566.29	566.85	565.19	564.13	565.29	565.33	566.86	566.97	567.43	566.92
November 30, 2016	566.27	564.42	566.23	566.74	564.34	564.07	564.44	564.48	566.88	568.17	567.36	566.93
December 28, 2016	559.75	564.62	565.75	566.35	564.45	563.68	564.71	564.80	566.50	562.67	559.88	566.60
January 31, 2017	559.53	564.46	565.58	566.09	564.24	563.44	564.58	564.58	566.22	562.34	560.72	566.31
February 28, 2017	564.92	564.68	565.32	565.85	564.57	563.15	564.76	564.83	565.92	562.03	559.68	565.99
March 31, 2017	559.97	565.07	565.82	566.35	564.96	563.68	565.28	565.16	566.47	562.88	560.73	566.53
April 27, 2017	560.70	565.33	566.59	567.14	565.24	564.40	565.33	565.40	567.26	563.07	560.81	567.30
May 31, 2017	559.08	565.73	566.88	567.27	565.66	564.57	565.79	565.78	567.40	564.63	560.33	567.42
June 27, 2017	560.71	565.93	566.39	566.94	565.93	564.25	566.00	565.97	567.02	564.81	561.46	567.03
July 26, 2017	560.08	565.79	566.38	566.90	565.69	564.24	565.79	565.77	567.05	564.68	560.20	567.04
August 29, 2017	560.82	565.56	566.58	567.12	565.49	564.42	565.62	565.64	567.23	565.13	561.12	567.21
September 25, 2017	567.06	565.56	566.53	567.06	565.50	564.37	565.59	564.64	567.05	565.26	561.12	567.02
October 24, 2017	560.13	565.79	566.51	567.08	565.73	564.37	565.80	565.75	567.12	565.34	559.74	567.09
November 27, 2017	561.26	565.22	566.77	567.34	564.91	564.62	565.03	565.17	567.41	565.82	560.74	567.43
December 21, 2017	559.16	564.76	566.62	567.19	564.63	564.47	564.79	564.87	567.30	565.99	561.15	567.33
January 31, 2018	559.55	565.33	566.82	567.46	565.27	564.66	565.34	565.27	567.60	566.31	560.74	567.57
February 26, 2018	559.05	565.26	567.13	567.71	565.14	564.04	565.31	565.37	567.81	566.78	561.32	567.83
March 23, 2018	560.88	565.28	567.11	567.63	565.12	563.95	565.30	565.35	567.79	566.88	561.55	567.85
April 27, 2018	560.34	565.68	567.49	568.00	565.57	565.35	565.69	565.74	568.21	567.33	559.65	567.24
May 23, 2018	559.05	565.83	567.09	567.66	565.61	564.98	565.89	565.75	567.95	567.12	559.65	567.89
June 11, 2018	559.45	565.69	567.05	567.56	565.58	564.88	562.69	565.73	567.72	567.28	559.55	567.73
July 25, 2018	559.46	565.93	566.87	567.39	565.85	564.7	562.97	565.89	567.46	567.32	560.76	567.16
August 27, 2018	560.97	565.64	566.85	567.37	565.56	564.68	562.69	565.68	567.53	567.37	560.8	567.48
September 21, 2018	559.62	566.23	566.8	567.34	565.65	564.63	562.73	565.67	567.41	567.41	560.06	567.43
October 31, 2018	560.27	565.59	566.63	567.19	565.54	564.48	562.63	565.47	567.34	567.33	562.2	567.34
November 21, 2018	560.59	566.02	566.98	567.55	565.98	564.83	563.1	566.05	567.69	567.69	563.46	567.7
December 20, 2018	560.36	564.94	567.3	567.84	564.82	565.16	561.95	565.14	567.96	568.12	567.07	568.05
January 28, 2019	559.32	565.93	567.32	567.95	565.31 (3)	565.17	562.9	566.05	568.07	568.16	567.15	568.11
February 28, 2019	561.46	565.25	567.29	567.85	(2)	565.15	562.33	565.38	568.05	568.19	567.22	568.18
March 26, 2019	559.16	565.33	567.08	567.63	565.08	564.95	562.4	565.4	567.81	567.97	566.94	567.94
April 26, 2019	560.44	565.97	567.62	568.15	566.06	565.48	563.05	565.75	568.31	568.43	567.39	568.37
May 29, 2019	560.75	565.88	567.78	568.3	565.73	565.58	562.91	565.95	568.48	568.51	567.48	568.47

Table 2.2

Water Levels (FT AMSL)
Gratwick-Riverside Park Site
North Tonawanda, New York

Notes:

(1) River level too low to obtain a measurement at the measuring location.
(2) Unable to access.
(3) Top of ice

Table 2.3

Summary of Horizontal Gradients
Gratwick-Riverside Park Site
North Tonawanda, New York

Monitoring Location		06/27/2013		07/24/2013		08/22/2013		09/30/2013		10/30/2013		11/27/2013	
		Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction
Outer	River North	564.75	Inward	565.11 [2]	Inward	565.10	Inward	564.87	Inward	564.49 [2]	Inward	564.05 [2]	Inward
Inner	MH2	564.37		564.38		564.18		564.17		564.47		564.94	
Outer	River North	564.75	Inward	565.11 [2]	Inward	565.10 [1]	Inward	564.87	Inward	564.49 [2]	Inward	564.05 [2]	Inward
Inner	MH6	557.96		558.10		557.71		557.72		558.05		557.69	
Outer	River Middle	564.58	Inward	564.95	Inward	564.95	Inward	564.74	Inward	564.30	Inward	563.63	Inward
Inner	MH8	562.69		562.93		562.41		562.48		562.79		562.35	
Outer	River South	565.00	Inward	565.37	Inward	565.37	Inward	565.15	Inward	564.74	Inward	564.30	Inward
Inner	MH12	561.50		561.40		561.17		561.03		561.35		561.39	

Monitoring Location		12/31/2013		01/30/2014		2/26/2014		3/28/2014		4/25/2014		5/29/2014	
		Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction
Outer	River North	564.62 [2]	Inward	564.80	Inward	564.30 [2]	Outward	564.96	Inward	564.45 [2]	Inward	564.67 [2]	Inward
Inner	MH2	564.41		564.13		567.53		564.10		564.42		564.46	
Outer	River North	564.62 [2]	Inward	564.80	Inward	564.30 [2]	Inward	564.96	Inward	564.45 [2]	Inward	564.67 [2]	Inward
Inner	MH6	558.11		557.64		558.01		557.62		558.36		558.41	
Outer	River Middle	564.93 [1]	Inward	565.50 [1]	Inward	563.98	Inward	564.39	Inward	564.28	Inward	564.60	Inward
Inner	MH8	562.86		562.41		562.81		562.21		563.03		563.20	
Outer	River South	564.87 [3]	Inward	565.63	Inward	564.55	Inward	564.38	Inward	564.70	Inward	564.92	Inward
Inner	MH12	561.78		561.65		561.48		561.78		562.08		562.06	

Table 2.3

Summary of Horizontal Gradients
Gratwick-Riverside Park Site
North Tonawanda, New York

Monitoring Location		06/25/2014		07/29/2014		08/26/2014		09/30/2014		10/29/2014		11/25/2014	
		Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction
Outer	River North	564.80	Inward	564.90 [2]	Inward	564.91	Inward	564.67	Inward	564.81	Inward	565.41	Inward
Inner	MH2	564.38		564.24		564.26		564.01		564.06		563.88	
Outer	River North	564.80	Inward	564.90 [2]	Inward	564.91 [1]	Inward	564.67	Inward	564.81	Inward	565.41	Inward
Inner	MH6	558.14		557.93		557.84		557.82		557.82		557.44	
Outer	River Middle	564.67	Inward	564.78	Inward	564.77	Inward	564.54	Inward	564.65	Inward	565.43 [1]	Inward
Inner	MH8	562.94		562.84		562.58		562.51		562.54		562.09	
Outer	River South	565.11	Inward	565.15	Inward	565.15	Inward	564.96	Inward	565.15	Inward	565.56	Inward
Inner	MH12	561.68		561.37		561.25		560.97		560.87		560.85	

Monitoring Location		12/30/2014		01/28/2015		02/24/2015		03/25/2015		04/23/2015		05/29/2015	
		Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction
Outer	River North	564.20 [2]	Outward	564.85	Outward	564.35 [2]	Outward	563.61 [2]	Outward	564.82	Outward	564.78	Inward
Inner	MH2	567.26		565.50		565.75		564.69		565.70		564.77	
Outer	River North	564.20 [2]	Inward	564.85	Inward	564.35 [2]	Inward	563.61 [2]	Inward	564.82	Inward	564.78	Inward
Inner	MH6	557.71		559.07		559.45		558.97		559.94		558.47	
Outer	River Middle	563.90	Inward	564.78	Inward	564.47 [1]	NC	563.63	Outward	564.60	Outward	564.65	Inward
Inner	MH8	562.20		563.96		NM		563.76		564.85		563.26	
Outer	River South	564.45	Inward	565.24	Inward	564.80	Inward	563.86	Inward	565.04	Inward	565.05	Inward
Inner	MH12	561.15		562.14		562.51		561.78		562.69		561.28	

Table 2.3

Summary of Horizontal Gradients
Gratwick-Riverside Park Site
North Tonawanda, New York

Monitoring Location		06/24/2015		07/28/2015		08/27/2015		09/25/2015		10/30/2015		11/25/2015	
		Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction
Outer	River North	565.15	Inward	565.27	Inward	565.13	Inward	565.01	Inward	564.71	Inward	563.94 (2)	Outward
Inner	MH2	564.80		564.79		564.62		564.70		564.69		564.59	
Outer	River North	565.15	Inward	565.27	Inward	565.13	Inward	565.01	Inward	564.71	Inward	563.94 (2)	Inward
Inner	MH6	558.20		557.84		557.71		557.81		557.51		557.23	
Outer	River Middle	565.07	Inward	565.16	Inward	565.06	Inward	564.91	Inward	564.49	Inward	563.83	Inward
Inner	MH8	562.96		562.60		562.46		562.53		562.24		561.85	
Outer	River South	565.44	Inward	565.50	Inward	565.47	Inward	565.31	Inward	565.00	Inward	564.19	Inward
Inner	MH12	561.25		561.16		560.96		560.91		560.69		560.35	

Monitoring Location		12/30/2015		01/28/2016		02/23/2016		03/31/2016		04/28/2016		05/26/2016	
		Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction
Outer	River North	564.48 (2)	Outward	564.39 (2)	Outward	563.91 (2)	Outward	564.35 (2)	Outward	564.76	Outward	564.82	Outward
Inner	MH2	564.50		564.77		564.86		565.66		566.56		566.95	
Outer	River North	564.48 (2)	Inward	564.39 (2)	Inward	563.91 (2)	Inward	564.35 (2)	Inward	564.76	Inward	564.82	Inward
Inner	MH6	557.26		557.42		558.15		559.61		560.20		560.61	
Outer	River Middle	564.18	Inward	564.15	Inward	563.48	Inward	564.20	Outward	564.55	Outward	564.64	Outward
Inner	MH8	561.94		562.05		562.94		564.43		565.05		565.45	
Outer	River South	564.73	Inward	564.64	Inward	564.16	Inward	564.60	Inward	565.04	Inward	565.14	Inward
Inner	MH12	560.14		560.48		560.88		562.06		562.79		563.25	

Table 2.3

Summary of Horizontal Gradients
Gratwick-Riverside Park Site
North Tonawanda, New York

Monitoring Location		6/30/2016		07/28/2016		08/24/2016		09/27/2016		10/25/2016		11/30/2016	
		Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction
Outer	River North	565.21	Outward	565.24	Outward	565.22	Outward	565.48	Outward	564.76	Outward	563.73 [1]	Outward
Inner	MH2	567.09		567.28		567.40		567.56		567.57		567.37	
Outer	River North	565.21	Inward	565.24	Inward	565.22	Inward	565.48	Inward	564.76	Inward	563.73 [1]	Inward
Inner	MH6	561.03		561.01		561.12		561.30		561.25		561.11	
Outer	River Middle	565.09	Outward	565.05	Outward	565.12	Outward	565.38	Outward	564.60	Outward	563.86	Outward
Inner	MH8	565.65		565.79		566.77		566.15		566.08		565.95	
Outer	River South	565.49	Inward	565.48	Inward	565.57	Inward	565.84	Inward	565.19	Inward	564.34	Inward
Inner	MH12	563.62		563.83		563.95		564.14		564.13		564.07	

Monitoring Location		12/28/2016		01/31/2017		02/28/2017		03/31/2017		04/27/2017		05/31/2017	
		Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction
Outer	River North	563.75 [1]	Outward	563.53 [1]	Outward	563.95 [1]	Outward	564.10 [1]	Outward	564.91	Outward	565.56	Outward
Inner	MH2	567.41		567.41		567.06		567.37		568.05		568.17	
Outer	River North	563.75 [1]	Inward	563.53 [1]	Inward	563.95 [1]	Inward	564.10 [1]	Inward	564.91	Inward	565.56	Inward
Inner	MH6	560.85		560.72		560.36		561.11		561.53		561.73	
Outer	River Middle	563.88	Outward	563.66	Outward	564.08	Outward	564.23	Outward	564.76	Outward	565.29	Outward
Inner	MH8	565.60		565.46		565.23		565.58		566.36		566.53	
Outer	River South	564.45	Inward	564.24	Inward	564.57	Inward	564.96	Inward	565.24	Inward	565.66	Inward
Inner	MH12	563.68		563.44		563.15		563.68		564.40		564.57	

Table 2.3

Summary of Horizontal Gradients
Gratwick-Riverside Park Site
North Tonawanda, New York

Monitoring Location		06/27/2017		07/26/2017		08/29/2017		09/25/2017		10/24/2017		11/27/2017	
		Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction
Outer	River North	565.62	Outward	565.42	Outward	565.19	Outward	565.22	Outward	565.37	Outward	564.55	Outward
Inner	MH2	567.87		567.85		567.98		567.81		567.89		567.95	
Outer	River North	565.62	Inward	565.42	Inward	565.19	Inward	565.22	Inward	565.37	Inward	564.55	Inward
Inner	MH6	561.47		561.34		561.52		561.50		561.49		561.59	
Outer	River Middle	565.50	Outward	565.23	Outward	565.04	Outward	565.06	Outward	565.25	Outward	564.40	Outward
Inner	MH8	566.29		566.19		566.44		566.37		566.35		566.45	
Outer	River South	565.93	Inward	565.69	Inward	565.49	Inward	565.50	Inward	565.73	Inward	564.91	Inward
Inner	MH12	564.25		564.24		564.42		564.37		564.37		564.62	

Monitoring Location		12/21/2017		01/31/2018		02/26/2018		03/23/2018		04/27/2018		05/23/2018	
		Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction
Outer	River North	563.96 [(1)]	Outward	565.09	Outward	564.86	Outward	564.86	Outward	565.30	Outward	565.41	Outward
Inner	MH2	567.87		568.03		568.36		568.25		568.56		568.28	
Outer	River North	563.96 [(1)]	Inward	565.09	Inward	564.86	Inward	564.86	Inward	565.30	Inward	565.41	Inward
Inner	MH6	561.45		561.64		561.98		561.11		562.20		561.92	
Outer	River Middle	564.09	Outward	564.59	Outward	564.69	Outward	564.62	Outward	565.09	Outward	565.19	Outward
Inner	MH8	566.32		566.48		566.85		566.70		567.09		566.76	
Outer	River South	564.63	Inward	565.27	Inward	565.14	Inward	565.12	Inward	565.57	Inward	565.61	Inward
Inner	MH12	564.47		564.61		564.04		563.95		565.35		564.98	

Table 2.3

Summary of Horizontal Gradients
Gratwick-Riverside Park Site
North Tonawanda, New York

Monitoring Location		06/21/2018		07/25/2018		08/27/2018		09/21/2018		10/31/2018		11/21/2018	
		Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction
Outer	River North	565.29	Outward	565.51	Outward	565.25	Outward	565.30	Outward	565.20	Outward	565.52	Outward
Inner	MH2	568.21		568.14		568.16		568.06		567.93		568.10	
Outer	River North	565.29	Inward	565.51	Inward	565.25	Inward	565.30	Inward	565.20	Inward	565.52	Inward
Inner	MH6	561.91		561.85		561.78		561.71		561.45		561.72	
Outer	River Middle	565.13	Outward	565.40	Outward	565.08	Outward	565.13	Outward	564.99	Outward	565.73 (2)	Outward
Inner	MH8	566.69		566.55		566.63		566.54		566.26		566.55	
Outer	River South	565.58	Inward	565.85	Inward	565.56	Inward	565.65	Inward	565.54	Inward	565.98	Inward
Inner	MH12	564.88		564.70		564.68		564.63		564.48		564.83	

Monitoring Location		12/20/2018		01/28/2019		02/28/2019		03/26/2019		04/26/2019		05/29/2019	
		Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction
Outer	River North	564.16 (1)	Outward	565.30	Outward	NM	NC	564.95	Outward	565.71	Outward	565.42	Outward
Inner	MH2	568.35		568.38		568.33		568.15		568.56		568.71	
Outer	River North	564.03 (1)	Inward	565.30	Inward	NM	NC	564.95	Inward	565.71	Inward	565.42	Inward
Inner	MH6	561.99		562.06		561.94		561.77		562.30		562.49	
Outer	River Middle	564.29	Outward	565.06 (2)	Outward	NM	NC	564.72	Outward	565.48	Outward	565.20	Outward
Inner	MH8	566.86		566.89		566.76		566.58		566.96		567.30	
Outer	River South	564.82	Outward	565.31	Inward	NM	NC	565.08	Inward	566.06	Inward	565.73	Inward
Inner	MH12	565.16		565.17		565.15		564.95		565.48		565.58	

Notes:

(1) River level too low to obtain a measurement. Water level shown is River Middle water level minus 0.13 feet.
(2) River level too low to obtain a measurement. Water level shown is River South Water level minus 0.25 feet.
(3) River level too low to obtain a measurement. Lowest recorded level (i.e., 563.92) since start of system operation used.
NM - Not Measured
NC - Not Calculated

Table 2.4

Summary of Vertical Gradients
Gratwick-Riverside Park Site
North Tonawanda, New York

Monitoring Location		06/27/2013		07/24/2013		08/22/2013		09/30/2013		10/30/2013		11/27/2013	
		Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction
Upper	MH3	559.69	Upward	560.60	Upward	560.40	Upward	560.68	Upward	560.63	Upward	560.33	Upward
Lower	MW-6	564.59		564.52		564.24		564.28		564.64		564.52	
Upper	MH8	562.69	Upward	562.95	Upward	562.41	Upward	562.40	Upward	562.79	Upward	562.35	Upward
Lower	MW-7	562.86		563.28		562.46		562.48		562.98		562.40	
Upper	MH11	563.08	Upward	563.04	Upward	562.87	Upward	562.73	Upward	561.96	Upward	563.08	Upward
Lower	MW-8	563.61		563.56		563.37		563.23		563.53		563.58	
Average [1]		565.33	Upward	565.06	Upward	564.80	Upward	564.71	Upward	565.14	Upward	565.19	Upward
Lower	MW-9	565.66		565.47		565.19		565.05		565.50		565.47	

Monitoring Location		12/31/2013		01/30/2014		2/26/2014		3/28/2014		4/25/2014		5/29/2014	
		Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction
Upper	MH3	561.39	Upward	559.88	Upward	570.48	Downward	559.36	Upward	560.21	Upward	559.12	Upward
Lower	MW-6	564.74		564.14		565.29		564.01		564.74		564.71	
Upper	MH8	562.86	Upward	562.41	Downward	562.81	Downward	562.21	Downward	563.03	Downward	563.20	Upward
Lower	MW-7	563.09		562.40		562.78		562.01		562.95		563.21	
Upper	MH11	563.53	Upward	563.40	Upward	563.28	Upward	563.58	Upward	563.90	Upward	564.01	Upward
Lower	MW-8	564.06		563.95		563.83		564.10		564.44		564.37	
Average [1]		565.42	Upward	565.18	Upward	565.22	Upward	565.61	Upward	565.87	Upward	565.71	Upward
Lower	MW-9	565.76		565.52		565.46		565.93		566.12		565.77	

Table 2.4

Summary of Vertical Gradients
Gratwick-Riverside Park Site
North Tonawanda, New York

Monitoring Location		06/25/2014		07/29/2014		08/26/2014		09/30/2014		10/29/2014		11/25/2014	
		Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction
Upper	MH3	560.62	Upward	560.42	Upward	561.12	Upward	560.65	Upward	559.77	Upward	560.70	Upward
Lower	MW-6	564.46		564.28		564.26		564.07		564.09		563.89	
Upper	MH8	562.88	Upward	562.72	Upward	562.58	Downward	562.51	Downward	562.54	Downward	562.09	Downward
Lower	MW-7	562.94		562.84		562.49		562.36		562.35		561.92	
Upper	MH11	563.53	Upward	563.41	Upward	563.11	Upward	562.89	Upward	562.78	Upward	562.71	Upward
Lower	MW-8	564.03		563.75		563.61		563.31		563.23		563.18	
Average [(1)]		565.33	Upward	564.94	Upward	564.91	Upward	564.67	Upward	564.54	Upward	564.56	Upward
Lower	MW-9	565.60		565.21		565.20		564.89		564.77		564.76	

Monitoring Location		12/30/2014		01/28/2015		2/24/2015		3/25/2015		4/23/2015		5/29/2015	
		Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction
Upper	MH3	571.05	Downward	565.06	Downward	565.39	Downward	560.93	Upward	560.48	Upward	561.40	Upward
Lower	MW-6	564.53		564.82		565.18		565.07		565.89		564.58	
Upper	MH8	562.31	Downward	563.96	Upward	NM	NA	563.76	Upward	564.85	Upward	563.26	Upward
Lower	MW-7	562.20		564.72		565.17		564.14		565.34		563.59	
Upper	MH11	562.98	Upward	564.19	Upward	NM	NA	563.88	Upward	564.86	Upward	563.36	Upward
Lower	MW-8	563.43		564.70		565.15		564.44		565.41		563.93	
Average [(1)]		564.86	Upward	565.03	Downward	NM	NA	NM	NA	566.11	Upward	565.30	Upward
Lower	MW-9	565.13		564.26		565.41		566.11		566.41		565.56	

Table 2.4

Summary of Vertical Gradients
Gratwick-Riverside Park Site
North Tonawanda, New York

Monitoring Location		06/24/2015		07/28/2015		08/28/2015		09/25/2015		10/30/2015		11/30/2015	
		Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction
Upper	MH3	560.99	Upward	559.51	Upward	559.38	Upward	559.57	Upward	560.63	Upward	560.10	Upward
Lower	MW-6	564.62		564.53		564.29		564.47		564.31		564.23	
Upper	MH8	562.96	Upward	562.60	Upward	562.46	Downward	562.53	Upward	562.24	Upward	561.85	Downward
Lower	MW-7	563.10		562.76		562.41		562.55		562.34		561.80	
Upper	MH11	563.33	Upward	563.27	Upward	563.09	Upward	563.20	Upward	562.82	Upward	562.52	Upward
Lower	MW-8	563.87		563.84		563.60		563.58		563.34		563.03	
Average [(1)]		565.26	Upward	565.14	Upward	564.86	Upward	564.91	Upward	563.80	Upward	562.20	Upward
Lower	MW-9	565.54		565.38		565.14		565.16		564.25		563.61	

Monitoring Location		12/30/2015		01/28/2016		2/23/2016		3/31/2016		4/28/2016		5/26/2016	
		Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction
Upper	MH3	560.89	Upward	560.05	Upward	560.75	Upward	560.53	Upward	561.19	Upward	559.81	Upward
Lower	MW-6	564.18		564.48		564.69		565.97		566.08		566.38	
Upper	MH8	561.94	Upward	562.05	Downward	562.94	Upward	564.43	Upward	565.05	Upward	565.45	Upward
Lower	MW-7	562.35		561.98		563.51		564.91		565.69		566.20	
Upper	MH11	562.22	Upward	562.68	Upward	563.03	Upward	564.19	Upward	564.97	Downward	565.42	Downward
Lower	MW-8	562.79		563.18		563.54		564.76		564.49		565.14	
Average [(1)]		562.10	Upward	562.00	Upward	562.34	Upward	561.44	Upward	562.38	Upward	561.85	Upward
Lower	MW-9	563.10		563.44		563.55		564.54		565.27		565.61	

Table 2.4

Summary of Vertical Gradients
Gratwick-Riverside Park Site
North Tonawanda, New York

Monitoring Location		06/30/2016		07/28/2016		08/24/2016		09/27/2016		10/25/2016		11/30/2016	
		Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction
Upper	MH3	561.03	Upward	559.17	Upward	559.53	Upward	561.19	Upward	565.12	Upward	561.33	Upward
Lower	MW-6	565.18		566.67		566.81		566.98		566.97		564.39	
Upper	MH8	565.13	Upward	565.79	Upward	565.96	Upward	566.15	Upward	566.08	Upward	565.95	Upward
Lower	MW-7	566.44		566.61		566.67		566.94		566.84		566.75	
Upper	MH11	565.77	Upward	565.99	Upward	566.09	Upward	566.33	Upward	566.29	Upward	566.23	Upward
Lower	MW-8	566.30		566.55		566.62		566.84		566.85		566.74	
Average [1]		567.85	Downward	568.26	Downward	568.52	Downward	568.45	Downward	567.12	Downward	567.90	Downward
Lower	MW-9	566.36		566.62		566.64		566.87		566.86		566.88	

Monitoring Location		12/28/2016		01/31/2017		02/28/2017		03/31/2017		04/27/2017		05/31/2017	
		Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction
Upper	MH3	561.39	Upward	560.44	Upward	560.62	Upward	559.48	Upward	560.59	Upward	559.79	Upward
Lower	MW-6	566.82		566.67		566.44		566.78		567.45		567.57	
Upper	MH8	565.60	Upward	565.46	Upward	565.23	Upward	565.58	Upward	566.36	Upward	566.53	Upward
Lower	MW-7	566.37		566.18		565.88		566.36		567.14		567.34	
Upper	MH11	565.75	Upward	565.58	Upward	565.32	Upward	565.82	Upward	566.59	Upward	566.88	Upward
Lower	MW-8	566.35		566.09		565.85		566.35		567.14		567.27	
Average [1]		561.74	Upward	561.80	Upward	561.25	Upward	562.16	Upward	562.85	Upward	563.20	Upward
Lower	MW-9	566.50		566.22		565.92		566.47		567.26		567.40	

Notes:

NA - Not Applicable.
NM - Not monitored.
(1) - Distance weighted for MH14 (two thirds) and MH15 (one third).
(2) - Buried with snow.
(3) - Not Monitored - MH14 was buried with snow and could not be accessed.

Table 2.4

Summary of Vertical Gradients
Gratwick-Riverside Park Site
North Tonawanda, New York

Monitoring Location		06/27/2017		07/26/2017		08/29/2017		09/25/2017		10/24/2017		11/27/2017	
		Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction
Upper	MH3	559.53	Upward	561.04	Upward	559.69	Upward	560.63	Upward	560.12	Upward	560.69	Upward
Lower	MW-6	567.28		567.25		567.37		567.24		567.32		567.37	
Upper	MH8	566.29	Upward	566.19	Upward	566.44	Upward	566.37	Upward	566.35	Upward	566.45	Upward
Lower	MW-7	567.03		566.96		567.21		567.21		567.12		567.17	
Upper	MH11	565.39	Upward	566.38	Upward	566.58	Upward	566.53	Upward	566.51	Upward	566.77	Upward
Lower	MW-8	566.94		566.90		567.12		567.06		567.08		567.34	
Average [1]		563.69	Upward	563.19	Upward	563.79	Upward	563.88	Upward	563.47	Upward	564.13	Upward
Lower	MW-9	567.02		567.05		567.23		567.05		567.12		567.41	

Monitoring Location		12/21/2017		01/31/2018		02/26/2018		03/23/2018		04/27/2018		05/23/2018	
		Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction
Upper	MH3	560.98	Upward	559.93	Upward	560.72	Upward	561.20	Upward	559.09	Upward	560.61	Upward
Lower	MW-6	567.27		567.48		567.73		567.61		567.92		567.68	
Upper	MH8	566.32	Upward	566.48	Upward	566.85	Upward	566.70	Upward	567.09	Upward	566.76	Upward
Lower	MW-7	567.08		567.36		567.65		567.48		567.86		567.57	
Upper	MH11	566.62	Upward	566.82	Upward	567.13	Upward	567.11	Upward	567.49	Upward	567.09	Upward
Lower	MW-8	567.19		567.46		567.71		567.63		568.00		567.66	
Average [1]		564.38	Upward	564.45	Upward	564.96	Upward	565.10	Upward	564.77	Upward	564.63	Upward
Lower	MW-9	567.30		567.60		567.81		567.79		568.21		567.95	

Table 2.4

Summary of Vertical Gradients
Gratwick-Riverside Park Site
North Tonawanda, New York

Monitoring Location		06/11/2018		07/25/2018		08/27/2018		09/21/2018		10/31/2018		11/21/2018	
		Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction
Upper	MH3	555.80	Upward	558.78	Upward	560.13	Upward	559.41	Upward	559.80	Upward	559.70	Upward
Lower	MW-6	567.61		567.57		567.55		565.08		567.30		567.48	
Upper	MH8	566.69	Upward	566.55	Upward	566.63	Upward	566.54	Upward	566.26	Upward	566.55	Upward
Lower	MW-7	567.18		567.09		567.10		566.97		566.75		567.06	
Upper	MH11	567.05	Upward	566.87	Upward	566.85	Upward	566.80	Upward	566.63	Upward	566.98	Upward
Lower	MW-8	567.56		567.39		567.37		567.34		567.19		567.55	
Average [1]		564.70	Upward	565.13	Upward	565.18	Upward	564.96	Upward	565.62	Upward	566.28	Upward
Lower	MW-9	567.72		567.46		567.53		567.41		567.34		567.69	

Monitoring Location		12/20/2018		01/28/2019		02/28/2019		03/26/2019		04/26/2019		05/29/2019	
		Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction
Upper	MH3	559.91	Upward	560.2	Upward	559.05	Upward	560.19	Upward	558.73	Upward	559.20	Upward
Lower	MW-6	567.71		567.8		567.68		567.53		567.96		568.13	
Upper	MH8	566.86	Upward	566.89	Upward	566.76	Upward	566.58	Upward	566.96	Upward	567.30	Upward
Lower	MW-7	567.38		567.44		567.40		567.22		567.80		568.02	
Upper	MH11	567.30	Upward	567.32	Upward	567.29	Upward	567.08	Upward	567.62	Upward	567.78	Upward
Lower	MW-8	567.84		567.95		567.85		567.63		568.15		568.30	
Average [1]		567.77	Upward	567.82	Upward	567.87	Upward	567.63	Upward	568.08	Upward	568.17	Upward
Lower	MW-9	567.96		568.07		568.05		567.81		568.31		568.48	

Notes:

NA - Not Applicable.
NM - Not monitored.
(1) - Distance weighted for MH14 (two thirds) and MH15 (one third).
(2) - Buried with snow.
(3) - Not Monitored - MH14 was buried with snow and could not be accessed.

Table 2.5

Groundwater Sampling Summary
Operation and Maintenance Manual
Gratwick-Riverside Park Site
North Tonawanda, New York

LOCATIONS

OGC1	MW-6
OGC2	MW-7
OGC3	MW-8
OGC4	MW-9
OGC5	OGC6
OGC7	OGC8

FREQUENCY

- quarterly for 2 years following GWS startup.
- semi-annually for Year 3 except for OGC-4 (quarterly for SVOCs) and OGC-6 (quarterly for VOCs).
- annually for Years 4 through 7 (until May 2008).

SAMPLING PROGRAM (MAY 2009 THROUGH MAY 2012)

Annual	**Once Every 2 Years (2010 and 2012)**
MW-8	MW-6
MW-9	MW-7
OGC-3	OGC-1
OGC-4	OGC-2
OGC-6	OGC-5
OGC-7	
OGC-8	

SAMPLING PROGRAM (MAY 2013 THROUGH MAY 2018)

Annual	**Once Every 2 Years (Even Years)**
MW-8	MW-6
MW-9	MW-7
OGC-3	OGC-1
OGC-6	OGC-2
OGC-7	OGC-4
	OGC-5
	OGC-8

SAMPLING PROGRAM (MAY 2019 THROUGH MAY 2022)

Annual	**Once Every 2 Years (Even Years)**
MW-6	MW-7
MW-8	OGC-1
MW-9	OGC-2
OGC-3	OGC-4
OGC-6	OGC-5
OGC-7	OGC-8

Table 2.5

Groundwater Sampling Summary
Operation and Maintenance Manual
Gratwick-Riverside Park Site
North Tonawanda, New York

PARAMETERS

Volatiles

Acetone
Benzene
2-Butanone
Chlorobenzene
1,1-Dichloroethane
trans-1,2-Dichloroethene
Ethylbenzene
Methylene Chloride
Tetrachloroethene
Toluene
Trichloroethene
Vinyl Chloride
Xylenes (Total)

Semi-Volatiles

1,2-Dichlorobenzene
1,4-Dichlorobenzene
2,4-Dimethylphenol
2-Methylphenol
4-Methylphenol
Naphthalene
Di-n-octylphthalate
Phenol

Table 2.6

Summary of Detected Compounds
Site Groundwater and River Water
Gratwick-Riverside Park
North Tonawanda, New York

Location		MW-9												
Date		**05/18/01**	**08/20/01**	**11/27/01**	**02/11/02**	**05/21/02**	**08/06/02**	**11/22/02**	**02/25/03**	**05/08/03**	**11/04/03**	**05/14/04**	**05/27/05**	**05/30/06**
Volatiles (µg/L)	**Class GA Level**													
Acetone	50	9.4J	4.3J	7.3J/6.7J		4.2J	7.0/7.2			13/12			17	17
Benzene	1		0.24J	0.39J/0.35J		0.44J	0.29J/0.30J	0.29J/0.29J		0.40J/ND0.70				0.54J
2-Butanone	50													2.6J
Chlorobenzene	5		0.50J	0.86J/0.85J		1.3		1.0/1.1		0.91J/0.87J		1.1	1.7	1.5
trans-1,2-Dichloroethene	5			0.22J/ND		0.31J	0.24J/0.24J	0.22J/0.20J						0.42J
Ethylbenzene	5		0.30J	0.46J/0.42J		0.73J	0.44J/0.42J	0.46J/0.46J		0.40J/0.38J				0.83J
Methylene Chloride	5		0.34J	0.33J/ND	4.0J	0.53J						7.2	1.6	
Tetrachloroethene	5	1.6J	1.1J	1.0J/0.92J		1.6	0.92J/0.80J	0.77J/0.74J		0.67J/0.71J				0.57J
Toluene	5		1.6J	3.0J/2.5J	2.8J	2.7	2.1/2.0	2.7/2.7	2.0	2.0/1.9	4.6	3.2	2.6	
Trichloroethene	5	2.2J	1.8J	2.4J/2.2J	3.0J	4.4	2.0/2.0	2.2/2.3		1.8/1.8	9.5	4.9	3.0	1.8
Vinyl Chloride	2									1.7/1.7			3.6	4.0
Total Xylenes	5		1.0J	1.5J/1.5J		2.5J	1.3J/1.3J	1.4J/1.4J		0.98J/1.0J	3.0			2.0J
Semi-Volatiles (µg/L)														
1,2-Dichlorobenzene	3*				0.6J									
1,4-Dichlorobenzene	3*												2J	
2,4-Dimethylphenol	50	12	12	18/17	38		20/22	30/34	30	35/36	36	42	50	58
2-Methylphenol	NL	1J	3J	3J/3J	7J		4J/4J	6J/6J	6J	6J/6J	6J	5J	8J	8J
4-Methylphenol	NL	69	110	97/92	230		100/110	190/230	150	130/130	160	190	260	190
Naphthalene	10													
Di-n-octyl phthalate	50													
Phenol	1	3J	34	28/22	24		38/41	34/35	42	46/46	180	30	27	49

Notes:

* Applies to sum of compounds
NL - Not listed
Exceeds Class GA Level
NS - Not Sampled
J - Estimated
Blank = Non-Detect

Table 2.6

Summary of Detected Compounds
Site Groundwater and River Water
Gratwick-Riverside Park
North Tonawanda, New York

Location		MW-9												
Date		**05/25/07**	**05/29/08**	**05/27/09**	**05/26/10**	**05/26/11**	**05/30/12**	**05/24/13**	**05/29/14**	**05/29/15**	**05/26/16**	**05/31/17**	**5/23/2018**	**5/29/2019**
Volatiles (µg/L)	**Class GA Level**													
Acetone	50		5.7	4.8J	5.9	4.3J			6.2		15J	5.8		12
Benzene	1			0.76		0.53J	0.44J	0.62J	0.57J			0.62J	0.87J	0.84
2-Butanone	50													
Chlorobenzene	5	2.8	1.4	5.3	2.5	2.4	2.3	2.5	3.1			3.1	4.1	4.6
trans-1,2-Dichloroethene	5		0.55J	0.74J									0.99J	1.1
Ethylbenzene	5			1.2	0.82J	1.1	0.74J	1.0	0.97J			1.1	1.4	1.5
Methylene Chloride	5													
Tetrachloroethene	5			0.82J	0.57J	0.66J	0.54J		0.66J			0.43J	0.47J	0.82J
Toluene	5	3.1	2.4	3.8	3.8	4.3	3.5	4.4	4.6	5.3J	4.4J		6.3	7.1
Trichloroethene	5	2.9	1.7	4.7	2.6	2.7	2.3	3.0	3		2.6J	4.8	3.4	3.5
Vinyl Chloride	2			4.2		1.4						2.9	2.3	2.6
Total Xylenes	5			3.3	2.2J	2.7	1.5J	2.7	2.6			3.1	3.7	4.0
Semi-Volatiles (µg/L)														
1,2-Dichlorobenzene	3*	0.9J	0.7J		1.4J	1.0J	1.1J	0.98J	1.6J	1.2J	1.5J		1.8J	1.8J
1,4-Dichlorobenzene	3*	3J	1J	2.3J	1.7J	1.6J	1.8J	0.87J	2.3J	0.48J	2.6J		2.1J	1.9J
2,4-Dimethylphenol	50	46	31	110	41	43	47	82 J	76 J	62J	130J	140	220	210
2-Methylphenol	NL	6	6	12	9.9J	11	11	12	13J	13	16	20J	24	24
4-Methylphenol	NL	170	96	300	180	230	230	280	0.75J	200	340	340	640	570
Naphthalene	10	0.2J	0.5J								1.2J			
Di-n-octyl phthalate	50													
Phenol	1	11	13	20	20	17	9.3 J	16	26	16	26	37J	38	40

Notes:

* Applies to sum of compounds
NL - Not listed
Exceeds Class GA Level
NS - Not Sampled
J - Estimated
Blank = Non-Detect

Table 2.6

Summary of Detected Compounds
Site Groundwater and River Water
Gratwick-Riverside Park
North Tonawanda, New York

Location		OGC-4												
Date		**05/18/01**	**08/20/01**	**11/27/01**	**02/11/02**	**05/21/02**	**08/06/02**	**11/22/02**	**02/25/03**	**05/08/03**	**11/04/03**	**3/04/04**	**05/14/04**	**11/23/04**
Volatiles (µg/L)	**Class GA Level**											NA		NA
Acetone	50			7.9J			4.0J							
Benzene	1		0.21J	0.2J										
2-Butanone	50													
Chlorobenzene	5		0.49J	0.66J		0.83J/0.79J		0.46J		0.83J				
trans-1,2-Dichloroethene	5			0.22J										
Ethylbenzene	5		0.41J	0.39J		0.54J/0.53J	0.48J	0.39J		0.77J				
Methylene Chloride	5				5.1J/4.9J								4.6	
Tetrachloroethene	5	1.0J	1.2J	0.87J		0.86J/0.84J	1.1	0.78J		0.77J				
Toluene	5			1.0J		1.0/0.98J	1.4	0.72J		1.2				
Trichloroethene	5	1.6J	1.4J	1.5J		1.5/1.4	1.7	0.96J		1.5				
Vinyl Chloride	2													
Total Xylenes	5		1.0J	0.94J		0.84J/0.82J	1.1J			0.95J				
Semi-Volatiles (µg/L)														
1,2-Dichlorobenzene	3*													
1,4-Dichlorobenzene	3*													
2,4-Dimethylphenol	50	8J	12	6J	8J/6J	7J/7J	8J		7J/7J	8J	4J	6J		4J
2-Methylphenol	NL	0.9J	2J	35	2J/ND	1J/2J	2J			3J		3J		2J
4-Methylphenol	NL	64	86	40	58/55	61/67	68		69/68	73	32	55		31
Naphthalene	10													
Di-n-octyl phthalate	50													
Phenol	1	310	560	400	420/460	710/1100	1100	1100	2400/2300	1800	1600		2400	1500

Notes:

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Exceeds Class GA Level
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J - Estimated
Blank = Non-Detect

Table 2.6

Summary of Detected Compounds
Site Groundwater and River Water
Gratwick-Riverside Park
North Tonawanda, New York

Location		OGC-4										
Date		**05/27/05**	**05/30/06**	**05/25/07**	**05/29/08**	**05/27/09**	**05/26/10**	**05/26/11**	**05/30/12**	**05/29/14**	**05/26/16**	**05/23/18**
Volatiles (µg/L)	**Class GA Level**											
Acetone	50					1.6J					3.6J	
Benzene	1											
2-Butanone	50											
Chlorobenzene	5											
trans-1,2-Dichloroethene	5											
Ethylbenzene	5		0.44J									
Methylene Chloride	5	2.0										
Tetrachloroethene	5											
Toluene	5											
Trichloroethene	5		0.53J									
Vinyl Chloride	2											
Total Xylenes	5											
Semi-Volatiles (µg/L)												
1,2-Dichlorobenzene	3*											
1,4-Dichlorobenzene	3*											
2,4-Dimethylphenol	50				0.9J		0.51J/ND					
2-Methylphenol	NL				0.5J	2.7J						
4-Methylphenol	NL	14	15	3J	6				2.8J	0.87J		
Naphthalene	10				0.5J		3.4J/3.4J					
Di-n-octyl phthalate	50											
Phenol	1	850	510	84	66	25	15/15	5.5	0.97J	0.68J	0.43J	

Notes:

* Applies to sum of compounds
NL - Not listed
[ ] Exceeds Class GA Level
NS - Not Sampled
J - Estimated
Blank = Non-Detect

Table 2.6

Summary of Detected Compounds
Site Groundwater and River Water
Gratwick-Riverside Park
North Tonawanda, New York

Location		OGC-8												
Date		**05/18/01**	**08/20/01**	**11/27/01**	**02/11/02**	**05/21/02**	**08/06/02**	**11/22/02**	**02/25/03**	**05/08/03**	**05/08/03**	**05/14/04**	**05/27/05**	**05/30/06**
Volatiles (µg/L)	**Class GA Level**													
Acetone	50	78	31/29	19J		4.7J	3.6J				6.2	5.8	4.7J	
Benzene	1	11	14/14	14		2.6	5.3	3.3	3.6	3.1	1.8	1.2	1.1	0.92
2-Butanone	50	4.0J												
Chlorobenzene	5	3.7J	4.1J/4.1J	4.0J		0.87J	1.7	1.1		1.1	0.65J	0.48J	0.43J	0.44J
trans-1,2-Dichloroethene	5	4.3J	3.2J/3.1J	4.0J		0.76J	1.5	0.88J		1.0	0.50J	0.41J	1.0	
Ethylbenzene	5	13	16/16	15	1.6J	2.8	5.8	3.1	3.9	3.1	1.8	1.2		0.99J
Methylene Chloride	5		0.52J/0.48J	0.62J	1.8J									
Tetrachloroethene	5	40	51/52	59	7.7J	9.9	22	12	14	11	7.0	5.0	3.8	4.0
Toluene	5	140	140/140	110	17J	21	53	28	38	27	16	11	8.1	8.3
Trichloroethene	5	120	110/110	110	20J	22	53	27	35	27	17		7.7	7.6
Vinyl Chloride	2	3.7J	3.4/3.6	3.1	1.1J		1.4	0.70J		0.78J				
Total Xylenes	5	43	55/54	46	4.8J	8.3	18	9.5	11	9.9	5.4	3.7	3.0	3.2
Semi-Volatiles (µg/L)														
1,2-Dichlorobenzene	3*													
1,4-Dichlorobenzene	3*													
2,4-Dimethylphenol	50	2J	4J/2J	4J	0.8J	0.8J	3J	1J						
2-Methylphenol	NL	18	30/25	16	4J	5J	13	7J	11	7J	4J	2J	2J	3J
4-Methylphenol	NL	30	51/45	28	8J	10	26	14	20	14J	9	5J	6J	8J
Naphthalene	10	1J	3J/25	1J			0.9J							
Di-n-octyl phthalate	50		0.1J/ND											
Phenol	1	30	49/44	31	5J	8J	11	10		4J	6J	2J		

Notes:

* Applies to sum of compounds
NL - Not listed
Exceeds Class GA Level
NS - Not Sampled
J - Estimated
Blank = Non-Detect

Table 2.6

Summary of Detected Compounds
Site Groundwater and River Water
Gratwick-Riverside Park
North Tonawanda, New York

Location		OGC-8								
Date		**05/24/07**	**05/29/08**	**05/27/09**	**05/26/10**	**05/26/11**	**05/30/12**	**05/29/14**	**05/26/16**	**5/23/2018**
Volatiles (µg/L)	**Class GA Level**									
Acetone	50		9.9	1.5J						
Benzene	1	0.54J	0.84	0.58J				0.50J	0.47J	0.87J
2-Butanone	50									
Chlorobenzene	5									0.42J
trans-1,2-Dichloroethene	5									0.39J
Ethylbenzene	5	0.53J	0.84J	0.50J						0.82J
Methylene Chloride	5									
Tetrachloroethene	5	2.0	2.3	1.6		0.94J	1.3	0.91J	1.0	1.6
Toluene	5	4.0	6.4	3.7		2.4	2.6	2.8	3.3	4.6
Trichloroethene	5	4.0	6.5	4.0		2.4	2.7	3.1	3.9	5.2
Vinyl Chloride	2									
Total Xylenes	5	1.1J	2.5J	1.5J		0.82J	0.86J	0.78J	1.0J	2.6
Semi-Volatiles (µg/L)										
1,2-Dichlorobenzene	3*									
1,4-Dichlorobenzene	3*		0.2J							
2,4-Dimethylphenol	50		1J			0.73J		0.52J	1.1J	0.86	1.4J
2-Methylphenol	NL	2J	2J			2.2J	1.5J	2.0J	2.6J	1.9J	3.3J
4-Methylphenol	NL	6	8	5.7		6.5J	5.3J	6.2J			11
Naphthalene	10									
Di-n-octyl phthalate	50									
Phenol	1									

Notes:

* Applies to sum of compounds
NL - Not listed
Exceeds Class GA Level
NS - Not Sampled
J - Estimated
Blank = Non-Detect

Table 2.6

Summary of Detected Compounds
Site Groundwater and River Water
Gratwick-Riverside Park
North Tonawanda, New York

Location		River South														
Date		**05/18/01**	**09/17/01**	**11/27/01**	**02/11/02**	**05/21/02**	**08/06/02**	**11/22/02**	**02/25/03**	**05/08/03**	**11/04/03**	**05/14/04**	**05/27/05**	**05/30/06**	**05/24/07**	**05/29/08**
Volatiles (µg/L)	**Class GA Level**															
Acetone	50						3.0J						3.2J			12
Benzene	1										0.42J					
2-Butanone	50												3.9J			3.1J
Chlorobenzene	5															
trans-1,2-Dichloroethene	5															
Ethylbenzene	5															
Methylene Chloride	5															
Tetrachloroethene	5						0.30J									
Toluene	5			0.29J			0.72J	0.35J			1.8					
Trichloroethene	5						0.44J									
Vinyl Chloride	2						0.27J									
Total Xylenes	5										1.8J					
Semi-Volatiles (µg/L)																
1,2-Dichlorobenzene	3*															
1,4-Dichlorobenzene	3*															
2,4-Dimethylphenol	50															
2-Methylphenol	NL															
4-Methylphenol	NL															
Naphthalene	10															
Di-n-octyl phthalate	50															
Phenol	1															

Notes:

* Applies to sum of compounds
NL - Not listed
Exceeds Class GA Level
NS - Not Sampled
J - Estimated
Blank = Non-Detect

Table 2.6

Summary of Detected Compounds
Site Groundwater and River Water
Gratwick-Riverside Park
North Tonawanda, New York

Location		MW-8												
Date		**05/18/01**	**08/20/01**	**11/27/01**	**02/11/02**	**05/21/02**	**08/06/02**	**11/22/02**	**02/25/03**	**05/08/03**	**11/04/03**	**05/14/04**	**05/27/05**	**05/30/06**
Volatiles (µg/L)	**Class GA Level**													
Acetone	50	52	12J	11J	75J	67	20			73		28/33	26	16
Benzene	1	6.5	4.3	4.1		8.6	12	12	8.1	12	23/24	10/12	4.2	4.4
2-Butanone	50													
Chlorobenzene	5	1.8J	1.0J	1.0J		3.2	4.9	4.4	3.6	6.2	6.0/6.4	2.7/3.3	2.4	2.4
trans-1,2-Dichloroethene	5	2.2J	1.8J	2.9J	4.8J	7.3	11	16	12	13	10/12	7.3/9.4	7.4	5.3
Ethylbenzene	5	5.7	3.7J	4.4J	8.2J	12	18	18	15	23	30/32	20/24	4.6	5.8
Methylene Chloride	5	1.1J	0.58J	0.66J	4.4J	1.2	1.4	1.6		1.3	2.2/2.2	7.3/9.2	1.7	0.64J
Tetrachloroethene	5	21	12	9.8	23J	32	61	58	54	80	91/100	120/130	62	71
Toluene	5	75	36	31	80	100	140	160	100	120	240/240	97/120	30	33
Trichloroethene	5	82	40	35	110	180	320	280	210	320	460/460	380/390	180	150
Vinyl Chloride	2	5.2	1.6J	3.3	23	12	18	14	12	18	21/21	13/16	5.8	5.1
Total Xylenes	5	22	13	16	30J	40	68	69	58	93	120/120	92/110	32	25
Semi-Volatiles (µg/L)														
1,2-Dichlorobenzene	3*				2J	2J		2J		4J	3J/3J			
1,4-Dichlorobenzene	3*			0.6J	2J	1J	1J	2J		4J	3J/3J	19U/2J	4J	5J
2,4-Dimethylphenol	50	1J	11	16	19	18	15	27	20	27	37/38	15J/14	7J	6J
2-Methylphenol	NL	33	55	41	48	44	38	56	37	35	45/46	18J/18	18J	16
4-Methylphenol	NL	10	32	34	55	60	59	83	64	75	130/130	34/31		
Naphthalene	10				0.7J	0.8J	0.8J	1J			2J/2J			
Di-n-octyl phthalate	50													
Phenol	1	43	130	140	85	110	91	110	140	78	80/80	28/28	11J	4J

Notes:

* Applies to sum of compounds
NL - Not listed
Exceeds Class GA Level
NS - Not Sampled
J - Estimated
Blank = Non-Detect

Table 2.6

Summary of Detected Compounds
Site Groundwater and River Water
Gratwick-Riverside Park
North Tonawanda, New York

Location		MW-8												
Date		**05/24/07**	**05/29/08**	**05/29/09**	**05/26/10**	**05/26/11**	**05/30/12**	**05/24/13**	**05/29/14**	**05/29/15**	**05/26/16**	**05/31/17**	**5/23/2018**	**5/29/2019**
Volatiles (µg/L)	**Class GA Level**													
Acetone	50	6.6/7.5	23	2.6J		3.1J								7.0J
Benzene	1	1.6/1.5	1.5	2.7		2.7	2.1	2.5	3.5	2.8J/2.9J			2.6	1.5
2-Butanone	50		4.4J											
Chlorobenzene	5	0.84J/0.82J	0.54J	0.99J		3.8	3.4	3.4	7.0	4.6J/4.8J			3.1	3.4
trans-1,2-Dichloroethene	5	4.4/3.9	3.6	6.8		3.5	3.4	3.4	6.5	5.3/6.1			5.4	
Ethylbenzene	5	2.5/2.2	1.8	4.2		5.2	4.4	4.4	6.2	3.9J/3.9J			2.9	1.7J
Methylene Chloride	5													
Tetrachloroethene	5	16/14	9.5	12		12	7.7	5.3	3.5	2.9J/2.8J			1.7	0.74J
Toluene	5	12/11	10	26		18	6.5	6.5	4.9	4.0J/4.1J			3.7	1.8J
Trichloroethene	5	40/36	29	68		34	22	21	22	17/17	15	7.9J	9.8	3.6
Vinyl Chloride	2					3.0								2.3
Total Xylenes	5	9.8/9.1	6.7	19		22	16	12	11	5.4J/5.0J			5.1	1.7J
Semi-Volatiles (µg/L)														
1,2-Dichlorobenzene	3*		0.4J		1.5J	1.2J	1.3J	0.87J	1.7J	1.2J/0.91J	1.4J			0.83J
1,4-Dichlorobenzene	3*	0.5J/0.4J	0.5J		2.1J	3.3J	6.9J	7.1J	21	12/11	17	11J	8.8J	12
2,4-Dimethylphenol	50	0.8J/0.6J	14	14	13	14	16	17	19	18/16	20	16J	11J	8.4J
2-Methylphenol	NL	7/7	26	32	22	16	20	16	23	21/19	29	36J	30J	23
4-Methylphenol	NL	18/16	31	29	38	41J	30	25	1.0J	27/24	28	28J	18J	12
Naphthalene	10	22/22	1J								0.98J			
Di-n-octyl phthalate	50													
Phenol	1	20/21	32	15	13	3.4J	4.0J	2.5J	4.5J	3.3J/2.7J	6.5J		12J	11

Notes:

* Applies to sum of compounds
NL - Not listed
Exceeds Class GA Level
NS - Not Sampled
J - Estimated
Blank = Non-Detect

Table 2.6

Summary of Detected Compounds
Site Groundwater and River Water
Gratwick-Riverside Park
North Tonawanda, New York

Location		OGC-3												
Date		**05/18/01**	**08/20/01**	**11/27/01**	**02/11/02**	**05/21/02**	**08/06/02**	**11/22/02**	**02/25/03**	**05/08/03**	**11/04/03**	**05/14/04**	**05/27/05**	**05/30/06**
Volatiles (µg/L)	**Class GA Level**													
Acetone	50	13J/19J	3.8J	15J		7.1	6.7			5.6			10/8.4	2.8J
Benzene	1	1.6J/1.6J	1.6	1.8		1.8	1.2	1.5		1.6	1.4		1.2/1.1	0.93J
2-Butanone	50													
Chlorobenzene	5		0.24J	0.28J		0.28J		0.22J						
trans-1,2-Dichloroethene	5	1.6J/1.6J	1.0J	1.4J	1.1J	1.1	0.98J	0.44J		1.0				
Ethylbenzene	5	1.6J/1.5J	2.0J	2.3J	1.5J	2.4	1.7	1.8		2.0			1.4/1.3	1.1
Methylene Chloride	5				1.9J							6.3	1.2/1.0	
Tetrachloroethene	5	2.4J/2.2J	3.0J	2.2J	1.7J	2.2	1.8	1.8		1.5			0.71J/0.63J	0.61J
Toluene	5	5.7/5.1	5.9	5.3		5.1	3.7	4.6	4.0	4.3	3.6	2.6	2.6/2.4	
Trichloroethene	5	20/20	18	19	14J	17	14	13	12	14	9.8	7.7	6.4/6.1	5.6
Vinyl Chloride	2	ND	0.4	0.72						0.62J				
Total Xylenes	5	5.6J/5.4J	7.5	8.7	4.8J	7.8	5.8	5.8	5.0	6.6	3.9		3.3/3.0	2.9J
Semi-Volatiles (µg/L)														
1,2-Dichlorobenzene	3*				1J									
1,4-Dichlorobenzene	3*				0.7J		0.5J							
2,4-Dimethylphenol	50	5J/5J	9	8J	11	11	7J	8J	11	12	10	9J	8J/4J	6J
2-Methylphenol	NL	98/96	120	87	160	140	100	100	120	140	150	110	83/73	64
4-Methylphenol	NL	13/13	21	17	28	23	14	15	22	23	20	17	14/12	13
Naphthalene	10													
Di-n-octyl phthalate	50													
Phenol	1	120/110	140	130J	210	140	85	92	110	120	120	90	78/74	75

Notes:

* Applies to sum of compounds
NL - Not listed
Exceeds Class GA Level
NS - Not Sampled
J - Estimated
Blank = Non-Detect

Table 2.6

Summary of Detected Compounds
Site Groundwater and River Water
Gratwick-Riverside Park
North Tonawanda, New York

Location		OGC-3												
Date		**05/24/07**	**05/29/08**	**05/27/09**	**05/26/10**	**05/26/11**	**05/30/12**	**05/24/13**	**05/29/14**	**05/29/15**	**05/26/16**	**05/31/17**	**05/23/18**	**05/29/19**
Volatiles (µg/L)	**Class GA Level**													
Acetone	50	0.76	6.0	2.9J/2.6J		3.7J			3.1J		3.3J		18J	9.1
Benzene	1		0.93	0.75/0.78		0.67J	0.45J	0.64J/0.71	5.3J		0.62J	0.50J	0.87J	0.54J
2-Butanone	50													
Chlorobenzene	5													
trans-1,2-Dichloroethene	5												0.22J	
Ethylbenzene	5	0.85J	0.92J	0.69J/0.73J		0.75J							0.38J	
Methylene Chloride	5													
Tetrachloroethene	5	0.56J												
Toluene	5	1.7	1.8	1.4/1.4		1.2	0.88J	1.2/1.3	1.2J		0.95J	0.70J	1.3	0.79J
Trichloroethene	5	4.3	4.9	3.3/3.5		2.5	0.87J	2.6/2.5	0.48J		1.6	1.4	1.6	1.1
Vinyl Chloride	2								62J					
Total Xylenes	5	2.1J	2.3J	1.7J/1.7J		1.0J	0.71J	0.81J/0.77J	13				1.1J	
									200					
Semi-Volatiles (µg/L)														
1,2-Dichlorobenzene	3*	0.6J	0.7J		0.86J	0.40J	0.61J	0.46J/0.49J	16	0.47J	0.52J			
1,4-Dichlorobenzene	3*		0.6J		0.58J									
2,4-Dimethylphenol	50		6	6.2/5.9	4.3J	3.7J	5.8J	4.8J/4.8J	4.8J	4.1J	4.9J	4.5J		5.8J
2-Methylphenol	NL	47	45	44/43	36	33	35	31/32	34	23	24	23J	20J	21
4-Methylphenol	NL	10	11	11/11	9.9	10	11	9.1J/9.5J	0.91J	7.6J	9.6	9.4J	9.3J	12
Naphthalene	10		0.8J											
Di-n-octyl phthalate	50													
Phenol	1	60	65	60/57	50	48	53	58/57	52	44J	43	62	50J	42

Notes:

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NL - Not listed
Exceeds Class GA Level
NS - Not Sampled
J - Estimated
Blank = Non-Detect

Table 2.6

Summary of Detected Compounds
Site Groundwater and River Water
Gratwick-Riverside Park
North Tonawanda, New York

Location		**GW-5S**		**OGC-7**					
Date		**12/17/87**	**08/12/88**	**05/18/01**	**08/20/01**	**11/27/01**	**02/11/02**	**05/21/02**	**08/06/02**
Volatiles (µg/L)	**Class GA Level**								
Acetone	50	293		21J	0.25J	8.2J			3.6J
Benzene	1	2				0.30J		0.28J	0.20J
2-Butanone	50	27							
Chlorobenzene	5								
trans-1,2-Dichloroethene	5	180	89	6.3	3.1J	5.4	4.9J	4.8J	4.2
Ethylbenzene	5	9	7J	1.1J	0.80J	1.0J		1.3	0.84J
Methylene Chloride	5	1							
Tetrachloroethene	5	11	7J	4.3J	3.6J	3.4J	2.9J	4.0	3.4
Toluene	5	75	49	12	5.8	6.7	5.7J	6.9	5.2
Trichloroethene	5	287	220	70	40	48	45	68	44
Vinyl Chloride	2	7	4J	2.6J	0.84	1.7J	3.5J	2.2	1.8
Total Xylenes	5	54	37	6.0J	4.8J	6.5	3.9J	7.6	5.3
Semi-Volatiles (µg/L)									
1,2-Dichlorobenzene	3*		2J						
1,4-Dichlorobenzene	3*								
2,4-Dimethylphenol	50	10	11		2J				
2-Methylphenol	NL	24	24	3J	2J	1.0J	0.8J	1J	
4-Methylphenol	NL	38				0.9J	0.7J	1J	
Naphthalene	10								
Di-n-octyl phthalate	50						0.6J		
Phenol	1	61	92	4J	0.7J				

Notes:

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J - Estimated
Blank = Non-Detect

Table 2.6

Summary of Detected Compounds
Site Groundwater and River Water
Gratwick-Riverside Park
North Tonawanda, New York

Location		OGC-7										
Date		**11/22/02**	**02/25/03**	**05/08/03**	**11/04/03**	**05/14/04**	**05/27/05**	**05/30/06**	**05/24/07**	**05/27/09**	**05/26/10**	**05/26/11**
Volatiles (µg/L)	**Class GA Level**											
Acetone	50											
Benzene	1	0.26J				0.34J	0.34J					
2-Butanone	50											
Chlorobenzene	5											
trans-1,2-Dichloroethene	5	4.7	4.0	5.4	5.0	5.9	4.9	5.8	3.8		2.7	2.7
Ethylbenzene	5	0.91J		1.4	0.93J	1.5	1.4	1.3	0.87J	0.84J	0.62J	
Methylene Chloride	5											
Tetrachloroethene	5	2.7	2.8	4.1	2.2	4.1	2.9	2.8	1.7	1.2J	0.80J	0.72J
Toluene	5	6.0	6.7	8.6	5.8	9.3	8.3	8.6	5.0	4.9J	3.3	3.4
Trichloroethene	5	38	50	56	38	56	37J	37	22	21J	14	12
Vinyl Chloride	2	1.8		2.3	2	2.9	3.0	2.9		2.6J		2.4
Total Xylenes	5	5.3	5.5	8.7	5.4	10	8.6	8.2	5.3	5.0J	3.6	4.0
Semi-Volatiles (µg/L)												
1,2-Dichlorobenzene	3*											
1,4-Dichlorobenzene	3*											
2,4-Dimethylphenol	50											
2-Methylphenol	NL								0.6J	0.5J		0.45J
4-Methylphenol	NL								0.6J	0.4J		
Naphthalene	10											
Di-n-octyl phthalate	50											
Phenol	1											

Notes:

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NL - Not listed
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NS - Not Sampled
J - Estimated
Blank = Non-Detect

Table 2.6

Summary of Detected Compounds
Site Groundwater and River Water
Gratwick-Riverside Park
North Tonawanda, New York

Location		**OGC-7**							
Date		**05/30/12**	**05/24/13**	**05/29/14**	**05/29/15**	**05/26/16**	**05/31/17**	**05/23/18**	**05/29/19**
Volatiles (µg/L)	**Class GA Level**								
Acetone	50								3.9J/4.3J
Benzene	1							0.13J	
2-Butanone	50								
Chlorobenzene	5								
trans-1,2-Dichloroethene	5	2.0	2.0	1.7		0.95J		1.5J	1.0/1.2
Ethylbenzene	5							0.51J	
Methylene Chloride	5								
Tetrachloroethene	5	0.69J	0.43J	0.50J	0.38J				0.40J/0.45J
Toluene	5	2.4	2.6	2.5	1.9	1.6	1.4/1.3	2.6J	1.1/1.3
Trichloroethene	5	7.7	9.7	8.5	5.1	4.9	4.6/4.2	6.2	4.3/4.5
Vinyl Chloride	2	1.6		1.7	0.94J				
Total Xylenes	5	2.8	2.9	2.8	0.95J	1.9J	0.93J/0.86J	2.8	0.89J/0.85J
Semi-Volatiles (µg/L)									
1,2-Dichlorobenzene	3*				0.43J				
1,4-Dichlorobenzene	3*								
2,4-Dimethylphenol	50								
2-Methylphenol	NL		0.38J	0.52J				0.63J	
4-Methylphenol	NL			1.1J				0.65J	0.59J
Naphthalene	10								
Di-n-octyl phthalate	50								
Phenol	1								

Notes:

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Blank = Non-Detect

Table 2.6

Summary of Detected Compounds
Site Groundwater and River Water
Gratwick-Riverside Park
North Tonawanda, New York

Location		River Middle														
Date		**05/18/01**	**09/17/01**	**11/27/01**	**02/11/02**	**05/21/02**	**08/06/02**	**11/22/02**	**02/25/03**	**05/08/03**	**11/04/03**	**05/14/04**	**05/27/05**	**05/31/06**	**05/24/07**	**05/29/08**
Volatiles (µg/L)	**Class GA Level**															
Acetone	50						3.1J									2.8J
Benzene	1															
2-Butanone	50															
Chlorobenzene	5															
trans-1,2-Dichloroethene	5															
Ethylbenzene	5															
Methylene Chloride	5															
Tetrachloroethene	5															
Toluene	5															
Trichloroethene	5							0.21J								
Vinyl Chloride	2															
Total Xylenes	5															
Semi-Volatiles (µg/L)																
1,2-Dichlorobenzene	3*															
1,4-Dichlorobenzene	3*															
2,4-Dimethylphenol	50															
2-Methylphenol	NL															
4-Methylphenol	NL															
Naphthalene	10															
Di-n-octyl phthalate	50							0.7J								
Phenol	1															

Notes:

* Applies to sum of compounds
NL - Not listed
[ ] Exceeds Class GA Level
NS - Not Sampled
J - Estimated
Blank = Non-Detect

Table 2.6

Summary of Detected Compounds
Site Groundwater and River Water
Gratwick-Riverside Park
North Tonawanda, New York

Location		MW-7										
Date		**05/18/01**	**08/20/01**	**11/27/01**	**02/11/02**	**05/21/02**	**08/06/02**	**11/22/02**	**02/25/03**	**05/08/03**	**11/04/03**	**05/14/04**
Volatiles (µg/L)	**Class GA Level**											
Acetone	50	5.7J		6.5J		4.3J	5.4			4.8		
Benzene	1		1.9	2.0		2.0	1.3	1.8		0.90		
2-Butanone	50											
Chlorobenzene	5											
trans-1,2-Dichloroethene	5		0.82J	1.1J		0.98J	0.89J	1				
Ethylbenzene	5		0.85J	0.81J		1.0	0.61J	0.75J				
Methylene Chloride	5				1.6J							
Tetrachloroethene	5			0.27J								
Toluene	5		3.5J	3.6J		3.3	1.9	3		1.1	2.8	
Trichloroethene	5		0.55J	0.63J		0.43J	0.45J	0.36J				
Vinyl Chloride	2		1.6J	2.0	3.8J	2.9	1.7	2.2		1.3		
Total Xylenes	5		2.1J	2.1J		2.7J	1.5J	1.9J		0.76J		
Semi-Volatiles (µg/L)												
1,2-Dichlorobenzene	3*											
1,4-Dichlorobenzene	3*											
2,4-Dimethylphenol	50			2J	2J	3J	0.7J	2J				
2-Methylphenol	NL		3J	2J	4J	6J	1J	2J			2J	
4-Methylphenol	NL		3J	2J	4J	6J	1J	2J			1J	
Naphthalene	10											
Di-n-octyl phthalate	50				0.6J							
Phenol	1		24	7J	10	26	2J	6J		5J	2J	

Notes:

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NL - Not listed
Exceeds Class GA Level
NS - Not Sampled
J - Estimated
Blank = Non-Detect

Table 2.6

Summary of Detected Compounds
Site Groundwater and River Water
Gratwick-Riverside Park
North Tonawanda, New York

Location		MW-7								
Date		**05/27/05**	**05/31/06**	**05/24/07**	**05/29/08**	**05/26/10**	**05/30/12**	**05/29/14**	**05/26/16**	**5/23/2018**
Volatiles (µg/L)	**Class GA Level**									
Acetone	50	4.3J	3.0J	3.9J	3.3J/3.4J					ND/6.7J
Benzene	1	0.58J								
2-Butanone	50									
Chlorobenzene	5									
trans-1,2-Dichloroethene	5	0.36J								
Ethylbenzene	5	0.32J								
Methylene Chloride	5									
Tetrachloroethene	5									
Toluene	5	0.93J								
Trichloroethene	5									
Vinyl Chloride	2	0.80J			0.64J/0.61J					
Total Xylenes	5									
Semi-Volatiles (µg/L)										
1,2-Dichlorobenzene	3*									
1,4-Dichlorobenzene	3*									
2,4-Dimethylphenol	50									
2-Methylphenol	NL				0.4J/0.5J				5.7J/6.1J	0.42J/1.6J
4-Methylphenol	NL			0.3J	0.5J/0.6J			0.65J		
Naphthalene	10									
Di-n-octyl phthalate	50									
Phenol	1	1J								

Notes:

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NL - Not listed
Exceeds Class GA Level
NS - Not Sampled
J - Estimated
Blank = Non-Detect

Table 2.6

Summary of Detected Compounds
Site Groundwater and River Water
Gratwick-Riverside Park
North Tonawanda, New York

Location		OGC-2										
Date		**05/18/01**	**08/20/01**	**11/27/01**	**02/11/02**	**05/21/02**	**08/06/02**	**11/22/02**	**02/25/03**	**05/08/03**	**11/04/03**	**05/14/04**
Volatiles (µg/L)	**Class GA Level**											
Acetone	50			11J			3.0J					4.5J
Benzene	1											
2-Butanone	50											
Chlorobenzene	5											
trans-1,2-Dichloroethene	5											
Ethylbenzene	5											
Methylene Chloride	5				1.7J							
Tetrachloroethene	5											
Toluene	5										0.37J	
Trichloroethene	5		0.39J									
Vinyl Chloride	2			0.26J		0.25J	0.26J					
Total Xylenes	5											
Semi-Volatiles (µg/L)												
1,2-Dichlorobenzene	3*											
1,4-Dichlorobenzene	3*											
2,4-Dimethylphenol	50											
2-Methylphenol	NL											
4-Methylphenol	NL											
Naphthalene	10											
Di-n-octyl phthalate	50											
Phenol	1											

Notes:

* Applies to sum of compounds
NL - Not listed
[ ] Exceeds Class GA Level
NS - Not Sampled
J - Estimated
Blank = Non-Detect

Table 2.6

Summary of Detected Compounds
Site Groundwater and River Water
Gratwick-Riverside Park
North Tonawanda, New York

Location		OGC-2								
Date		**05/27/05**	**05/30/06**	**05/25/07**	**05/29/08**	**05/26/10**	**05/30/12**	**05/29/14**	**05/26/16**	**5/23/2018**
Volatiles (µg/L)	**Class GA Level**									
Acetone	50	3.1								
Benzene	1									
2-Butanone	50									
Chlorobenzene	5									
trans-1,2-Dichloroethene	5									
Ethylbenzene	5									
Methylene Chloride	5									
Tetrachloroethene	5									
Toluene	5									
Trichloroethene	5									
Vinyl Chloride	2									
Total Xylenes	5									
Semi-Volatiles (µg/L)										
1,2-Dichlorobenzene	3*									
1,4-Dichlorobenzene	3*									
2,4-Dimethylphenol	50									
2-Methylphenol	NL									
4-Methylphenol	NL									0.79J
Naphthalene	10									
Di-n-octyl phthalate	50									
Phenol	1									

Notes:

* Applies to sum of compounds
NL - Not listed
[ ] Exceeds Class GA Level
NS - Not Sampled
J - Estimated
Blank = Non-Detect

Table 2.6

Summary of Detected Compounds
Site Groundwater and River Water
Gratwick-Riverside Park
North Tonawanda, New York

Location		OGC-6													
Date		**05/18/01**	**08/20/01**	**11/27/01**	**02/11/02**	**05/21/02**	**08/06/02**	**11/22/02**	**02/25/03**	**05/08/03**	**11/04/03**	**03/04/04**	**05/14/04**	**11/23/04**	**05/27/05**
Volatiles (µg/L)	**Class GA Level**														
Acetone	50			6.6J			5.0			3.7J					
Benzene	1									0.71	0.87	1.4		2.5	5.2
2-Butanone	50														
Chlorobenzene	5														
trans-1,2-Dichloroethene	5			0.23J	0.23J	0.37J	0.45J	0.55J		1.4	2.0	2.1		3.6	5.3
Ethylbenzene	5					0.31J				0.85J	1.1	2.0	3.3	3.1	7.4
Methylene Chloride	5				2.1J								4.4	2.5	2.2
Tetrachloroethene	5		1.4J	0.73J		6.6	7.4	5	12	49	51	230	300	260	550
Toluene	5			0.55J		2.0	1.6	1.5	2.4	9.3	12	27	40	35	72
Trichloroethene	5	3.0J	4.7J	3.1J	5.9	16	19	13	26	95	120	330	530	330	610
Vinyl Chloride	2					0.22J	0.25J			0.45J					
Total Xylenes	5		0.22J	0.53J	0.26J	1.7J	1.2J	1.0J		4.1	4.7	8.6	13	12	28
Semi-Volatiles (µg/L)												NA		NA	
1,2-Dichlorobenzene	3*														
1,4-Dichlorobenzene	3*														
2,4-Dimethylphenol	50							1J							
2-Methylphenol	NL		2J	2J	32	11	8J	9J	13	22	27		63		85
4-Methylphenol	NL			1J	0.02J	10							1J		2J
Naphthalene	10														
Di-n-octyl phthalate	50														
Phenol	1		7J	2J	4J	5J	3J	2J		5J	3J		9J		8J

Notes:

* Applies to sum of compounds
NL - Not listed
Exceeds Class GA Level
NS - Not Sampled
J - Estimated
Blank = Non-Detect

Table 2.6

Summary of Detected Compounds
Site Groundwater and River Water
Gratwick-Riverside Park
North Tonawanda, New York

Location		OGC-6													
Date		**05/31/06**	**05/24/07**	**05/29/08**	**05/27/09**	**05/26/10**	**05/26/11**	**05/30/12**	**05/24/13**	**05/29/14**	**05/29/15**	**05/26/16**	**05/31/17**	**05/23/18**	**05/29/19**
Volatiles (µg/L)	**Class GA Level**														
Acetone	50	8.6/8.7			1.6J										4.4J
Benzene	1	12/12	7.2		3.2	3.6	1.8	1.9	4.7	1.3/1.4			0.83	0.81J	0.81
2-Butanone	50														
Chlorobenzene	5													0.29J	
trans-1,2-Dichloroethene	5	11/12	7.1		4.4	8.2	7.6	4.8	7.3	4.5/4.6			11	17	19
Ethylbenzene	5	20/20	12		4.8	5.2	2.4	2.0	4.8	1.2/1.2				0.5J	
Methylene Chloride	5														
Tetrachloroethene	5	2000/2100	1400	34	400	640	220	100	1100	190/190	180	71	29	16	18
Toluene	5	240/260	97	2.9	34	38	14	16	57	10/10	8.1J	4.0J	2.7	3.2	3.5
Trichloroethene	5	1800/1800	1100	31	320	410	180	92	460	100/110	99	60	41	28	39
Vinyl Chloride	2	2.9/2.8	1.5			1.2							1.3	1.4	1.3
Total Xylenes	5	79/76	46		18	20	9.1	8.9	21	5.1/5.1			1.3J	2.1	2.4
Semi-Volatiles (µg/L)															
1,2-Dichlorobenzene	3*														
1,4-Dichlorobenzene	3*														
2,4-Dimethylphenol	50			0.9J						0.54J/0.59J				0.51J	
2-Methylphenol	NL	89/110	76	76	32	32	15	16	23	9.4J/9.3	4.8J	3.6J	2.4J	2J	
4-Methylphenol	NL	84/100	2J	70	1.1J	1.4J	1.2J	1.1J	1.1J		0.88J			1.7J	
Naphthalene	10	1J/2J	2J	2J	1.2J	1.4J	1.1J	1.1J	1.2J	1.1J/1.1J	0.89J	0.97J		1.2J	
Di-n-octyl phthalate	50														
Phenol	1	13/16	8	8				1.5J	57	1.2J/1.2J	0.71J			0.81J	

Notes:

* Applies to sum of compounds
NL - Not listed
Exceeds Class GA Level
NS - Not Sampled
J - Estimated
Blank = Non-Detect

Table 2.6

Summary of Detected Compounds
Site Groundwater and River Water
Gratwick-Riverside Park
North Tonawanda, New York

Location		River North												
Date		**05/18/01**	**09/17/01**	**11/27/01**	**02/11/02**	**05/21/02**	**08/06/02**	**11/22/02**	**02/25/03**	**05/08/03**	**11/04/03**	**05/14/04**	**05/27/05**	**05/30/06**	**05/31/07**
Volatiles (µg/L)	**Class GA Level**														
Acetone	50						2.4J		NS			3.6J	3.6J		
Benzene	1					0.21J					2.0	0.39J			
2-Butanone	50														
Chlorobenzene	5					1.3						3.2			
trans-1,2-Dichloroethene	5					0.25J						1.0			
Ethylbenzene	5					20						40		2.9	
Methylene Chloride	5				1.6J										
Tetrachloroethene	5					3.8						7.7		1.3	
Toluene	5			0.39J		63				0.96J		130	2.2	14	
Trichloroethene	5			0.35J		4.5						6.4		0.59J	
Vinyl Chloride	2					3.7						9.3			
Total Xylenes	5					80				0.96J		210	3.7	23	
Semi-Volatiles (µg/L)															
1,2-Dichlorobenzene	3*														
1,4-Dichlorobenzene	3*														
2,4-Dimethylphenol	50							1J							
2-Methylphenol	NL														
4-Methylphenol	NL														
Naphthalene	10														
Di-n-octyl phthalate	50														
Phenol	1														

Notes:

* Applies to sum of compounds
NL - Not listed
[ ] Exceeds Class GA Level
NS - Not Sampled
J - Estimated
Blank = Non-Detect

Table 2.6

Summary of Detected Compounds
Site Groundwater and River Water
Gratwick-Riverside Park
North Tonawanda, New York

Location		OGC-5												
Date		**05/20/01**	**08/21/01**	**11/27/01**	**02/11/02**	**05/21/02**	**08/06/02**	**11/22/02**	**02/25/03**	**05/08/03**	**11/04/03**	**05/14/04**	**05/27/05**	**05/30/06**
Volatiles (µg/L)	**Class GA Level**													
Acetone	50	38J		11J			6.4			4.9J		0.61J		3.0J
Benzene	1		1.5	1.4		0.87	0.92	0.87		0.77				0.67J
2-Butanone	50													
Chlorobenzene	5													
trans-1,2-Dichloroethene	5		0.65J	0.76J		0.42J	0.57J	0.52J				0.34J		
Ethylbenzene	5		0.21J	0.23J										
Methylene Chloride	5				3.4J								2.4	
Tetrachloroethene	5		0.38J	0.27J										
Toluene	5		2.5J	2.2J		0.99J	0.87J	1.2		0.80J		0.80J		
Trichloroethene	5		0.87J	0.66J		0.36J	0.41J	0.40J				0.28J		
Vinyl Chloride	2		1.6J	1.2J		1.1	1.5	1.2		1.1		1.4		1.2
Total Xylenes	5		1.0J	1.0J		0.67J	0.37J	0.40J				1.0J		
Semi-Volatiles (µg/L)														
1,2-Dichlorobenzene	3*													
1,4-Dichlorobenzene	3*													
2,4-Dimethylphenol	50		8J	6J	5J		1J	6J						
2-Methylphenol	NL		1J	1J	1J									
4-Methylphenol	NL		2J	5J	4J			2J						
Naphthalene	10		1J	1J			0.5J	1J						
Di-n-octyl phthalate	50			1J	0.8J									
Phenol	1		0.9J											

Notes:

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NL - Not listed
Exceeds Class GA Level
NS - Not Sampled
J - Estimated
Blank = Non-Detect

Table 2.6

Summary of Detected Compounds
Site Groundwater and River Water
Gratwick-Riverside Park
North Tonawanda, New York

Location		OGC-5						
Date		**05/24/07**	**05/29/08**	**05/26/10**	**05/30/12**	**05/29/14**	**05/26/16**	**05/23/18**
Volatiles (µg/L)	**Class GA Level**							
Acetone	50		3.5J					5.3J
Benzene	1	0.54J	0.69J		0.58J	1.1	1.4	2.1
2-Butanone	50							
Chlorobenzene	5							
trans-1,2-Dichloroethene	5							0.29J
Ethylbenzene	5							
Methylene Chloride	5							
Tetrachloroethene	5							
Toluene	5							0.38J
Trichloroethene	5						0.70J	
Vinyl Chloride	2	0.95J	1.4				1.1J	1
Total Xylenes	5							
Semi-Volatiles (µg/L)								
1,2-Dichlorobenzene	3*							
1,4-Dichlorobenzene	3*							
2,4-Dimethylphenol	50							
2-Methylphenol	NL	0.5J	0.3J					
4-Methylphenol	NL	0.9J	0.4J			0.66J		
Naphthalene	10	2J	0.5J	1.6J	0.85J	1.1J	2.3J	1.2J
Di-n-octyl phthalate	50							
Phenol	1							

Notes:

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NL - Not listed
[ ] Exceeds Class GA Level
NS - Not Sampled
J - Estimated
Blank = Non-Detect

Table 2.6

Summary of Detected Compounds
Site Groundwater and River Water
Gratwick-Riverside Park
North Tonawanda, New York

Location		GW-6S		MW-6											
Date		**12/15/1987**	**08/10/88**	**05/18/01**	**08/21/01**	**11/27/01**	**02/11/02**	**05/21/02**	**08/06/02**	**11/22/02**	**02/25/03**	**05/08/03**	**11/04/03**	**05/14/04**	**05/27/05**
Volatiles (µg/L)	**Class GA Level**														
Acetone	50	684	4.9J						4.4J			44		6.7	13
Benzene	1	3			0.64J			0.65J	0.59J	0.56J		0.57J			
2-Butanone	50														
Chlorobenzene	5		3.3J		1.5J	1.3J		0.65J		0.54J		0.81J		0.37J	
trans-1,2-Dichloroethene	5	58	4.4J		1.1J			0.37J	0.32J	0.34J		1.4		0.52J	
Ethylbenzene	5	2			0.21J										
Methylene Chloride	5						1.8J								2.1
Tetrachloroethene	5	43			0.44J							0.67J		0.25J	
Toluene	5	16	3.0J		2.2J	0.29J		1.3	0.91J	1.1		2.1	3.6	0.92J	
Trichloroethene	5	62	5.1J		2.0J		1.2J		1.1	1.5	3.2	14	12	3.7	1.5
Vinyl Chloride	2	11	1.7J					0.29J	0.24J	0.22J		0.52J			
Total Xylenes	5	7			0.90J	0.44J		0.36J	0.27J						
Semi-Volatiles (µg/L)															
1,2-Dichlorobenzene	3*														
1,4-Dichlorobenzene	3*			1J		0.7J	2J						2J		
2,4-Dimethylphenol	50	5		5J	5J	3J	2J	1J	0.9J	9J			6J		
2-Methylphenol	NL	3		5J	6J	2J	2J	2J	1J	0.9J			5J		
4-Methylphenol	NL	4		15	13	5J	4J	3J	2J	2J			12		
Naphthalene	10			67	69		1J		14	13			76		5J
Di-n-octyl phthalate	50						2J								
Phenol	1	3		14	4J	2J	0.8J						250		

Notes:

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NL - Not listed
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NS - Not Sampled
J - Estimated
Blank = Non-Detect

Table 2.6

Summary of Detected Compounds
Site Groundwater and River Water
Gratwick-Riverside Park
North Tonawanda, New York

Location		MW-6									
Date		**05/30/06**	**05/24/07**	**05/29/08**	**05/26/10**	**05/30/12**	**05/29/14**	**05/26/16**	**05/27/16**	**5/23/2018**	**5/29/2019**
Volatiles (µg/L)	**Class GA Level**										
Acetone	50	31								8.6J	11
Benzene	1									1.7	1.8
2-Butanone	50										
Chlorobenzene	5									7.5	10
trans-1,2-Dichloroethene	5									8.8	11
Ethylbenzene	5									0.54J	
Methylene Chloride	5										
Tetrachloroethene	5				0.55J					3.4	6.3
Toluene	5				0.73J					16	22
Trichloroethene	5	1.2	0.97J		2.3J	0.66J	1.0			20	28
Vinyl Chloride	2										1.5
Total Xylenes	5									1.6J	1.7 J
Semi-Volatiles (µg/L)											
1,2-Dichlorobenzene	3*				0.66J						
1,4-Dichlorobenzene	3*		0.8J	0.6J	4.2J	2.9J	2.9J		1.5J	28J	73 J
2,4-Dimethylphenol	50				1.4J	1.4J	1.0J		0.87J	36J	59 J
2-Methylphenol	NL		0.5J	0.3J	1.8J	0.71J	1.1J		0.47J	31J	46 J
4-Methylphenol	NL	1J	1J		2.5J	1.3J	1.0J			93	120 J
Naphthalene	10		2J	1J	7.8J	3.9J			2.0J		
Di-n-octyl phthalate	50										
Phenol	1	2J	0.6J	0.4J	1.9J		4.4J			2300	2900

Notes:

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J - Estimated
Blank = Non-Detect

Table 2.6

Summary of Detected Compounds
Site Groundwater and River Water
Gratwick-Riverside Park
North Tonawanda, New York

Location		OGC-1													
Date		**05/18/01**	**05/25/07**	**8/21/2001**	**11/27/01**	**02/11/02**	**05/21/02**	**08/06/02**	**11/22/02**	**02/25/03**	**05/08/03**	**11/04/03**	**05/14/04**	**05/27/05**	**05/31/06**
Volatiles (µg/L)	**Class GA Level**														
Acetone	50	20J			11J			4.8J							
Benzene	1			0.64J	0.55J				0.26J						
2-Butanone	50	1.1J													
Chlorobenzene	5	2.2J	2.8	2.0J	1.7J		0.24J		0.78J		0.91J				
trans-1,2-Dichloroethene	5	5.6		3.7J	4.6J	1.8J	0.48J	0.58J	2.7		2.8	0.85J			0.55J
Ethylbenzene	5			0.52J	0.43J				0.21J						
Methylene Chloride	5					1.6J								1.8	
Tetrachloroethene	5			0.78J	0.54J		0.42J	0.53J	0.30J			0.29J			
Toluene	5	5.2	3.1	5.4	4.2J		0.48J	0.43J	1.9	1.7	2.6	0.59J			
Trichloroethene	5	15	2.9	16	11	4.5J	2.2	2.7	6.1	5.1	8.4	2.2	0.47J	1.2	1.9
Vinyl Chloride	2	1.3J		0.51J	0.72J				0.42J		0.64J				
Total Xylenes	5			2.1J	1.6J				0.49J		0.86J				
Semi-Volatiles (µg/L)															
1,2-Dichlorobenzene	3*		0.9J												
1,4-Dichlorobenzene	3*	1J	3J	3J	2J	1J			1J						
2,4-Dimethylphenol	50	9J	46	16	8J	3J		0.6J	9J		4J				
2-Methylphenol	NL	6J	6	12	5J	2J			2J		3J				
4-Methylphenol	NL	20	170	35	15J	5J		1J	5J	6J	8J				2J
Naphthalene	10	71	0.2J	130		21		7J	18		25	3J			
Di-n-octyl phthalate	50														
Phenol	1	150	11	290	57	15	1J	8J	4J		19				

Notes:

* Applies to sum of compounds
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Exceeds Class GA Level
NS - Not Sampled
J - Estimated
Blank = Non-Detect

Table 2.6

Summary of Detected Compounds
Site Groundwater and River Water
Gratwick-Riverside Park
North Tonawanda, New York

Location		OGC-1						
Date		**05/24/07**	**05/29/08**	**05/26/10**	**05/30/12**	**05/29/14**	**05/27/16**	**5/23/2018**
Volatiles (µg/L)	**Class GA Level**							
Acetone	50							7.4J
Benzene	1							
2-Butanone	50							
Chlorobenzene	5							
trans-1,2-Dichloroethene	5							
Ethylbenzene	5							
Methylene Chloride	5							
Tetrachloroethene	5							
Toluene	5							
Trichloroethene	5	0.53J	4.2					
Vinyl Chloride	2							
Total Xylenes	5							
Semi-Volatiles (µg/L)								
1,2-Dichlorobenzene	3*							
1,4-Dichlorobenzene	3*							
2,4-Dimethylphenol	50							
2-Methylphenol	NL							
4-Methylphenol	NL		0.4J		0.46J			
Naphthalene	10		0.5J					
Di-n-octyl phthalate	50							
Phenol	1							
					0.97J		0.43J	

Notes:

* Applies to sum of compounds
NL - Not listed
Exceeds Class GA Level
NS - Not Sampled
J - Estimated
Blank = Non-Detect

Table 2.7

PH Readings
Gratwick-Riverside Park Site
North Tonawanda, New York

Monitoring Location	MH2	MH3	MW-6	OGC-1	OGC-5	MH6	OGC-6	MW-7	MH8	OGC-2	MH9
Date											
06/27/13	8.49	8.74	9.89	8.39	8.63	9.55	10.75	8.66	8.84	9.16	
07/24/13	8.02	8.59	9.75	9.16	8.13	8.73	10.82	9.68	8.43	8.80	
08/22/13	8.99	9.07	10.08	8.83	8.32	8.84	10.58	9.25	8.53	9.26	
09/30/13	8.45	9.48	9.17	8.46	8.20	8.95	10.52	9.24	8.17	9.00	
10/30/13	8.45	10.00	9.68	8.24	8.09	8.83	10.13	8.77	8.05	8.77	
11/27/13	8.70	10.06	10.01	7.99	8.04	8.62	10.38	8.89	8.29	8.90	
12/31/13	9.10	7.45	10.07	8.63	8.23	7.62	10.14	9.52	8.51	9.17	
01/30/14	8.98	8.56	9.97	9.06	8.17	8.52	10.44	9.45	8.89	9.26	
02/26/14	10.35	10.21	10.46	9.12	8.60	9.33	10.34	9.41	8.95	9.24	
03/28/14	8.97	8.54	10.15	9.24	8.43	8.61	10.37	9.24	8.63	9.06	10.33
04/25/14	8.68	8.29	10.19	8.24	8.43	8.68	10.52	8.94	8.57	9.04	10.36
05/29/14	8.81	8.42	10.74	8.76	8.57	9.34	11.23	9.88	9.04	9.81	11.01
06/25/14	8.91	9.25	10.32	8.63	8.62	9.39	10.96	9.52	9.30	9.33	10.99
07/29/14	8.51	8.59	8.75	8.26	7.99	8.35	10.34	9.37	8.18	9.25	10.39
08/26/14	8.27	8.69	8.77	8.64	7.95	8.65	10.35	8.56	8.04	8.94	10.56
09/30/14	8.43	9.64	8.94	8.39	8.26	8.70	10.34	9.22	8.15	9.05	10.66
10/29/14	8.12	9.66	9.80	8.83	8.16	8.87	10.22	9.11	8.29	8.94	10.42
11/25/14	9.11	10.59	9.72	9.19	8.44	8.90	10.84	9.25	8.60	8.80	10.74
12/30/14	10.84	10.75	10.55	9.17	8.83	9.13	10.60	9.69	8.88	9.51	10.98
01/28/15	9.25	7.51	10.18	9.01	8.40	8.65	10.33	9.11	8.63	8.94	5.97
02/24/15	9.28	9.08	10.49	9.63	8.90	9.14	9.93	9.08	NM	9.12	8.14
03/25/15	8.34	8.26	10.59	8.19	8.31	8.70	10.38	9.65	7.63	9.20	9.46
04/23/15	7.87	8.63	8.29	8.46	8.59	8.67	8.11	7.74	7.88	7.69	8.09
05/29/15	7.94	8.01	10.73	8.75	8.10	8.57	10.54	9.24	7.63	9.36	11.11
06/24/15	8.47	8.56	10.48	9.47	8.29	9.32	10.88	9.15	8.51	9.29	10.83
07/28/15	8.49	8.75	9.47	8.42	8.19	8.73	10.92	9.33	8.35	9.27	10.58
08/27/15	8.75	9.37	9.83	8.71	8.42	8.41	10.32	NM	9.30	9.58	10.53
09/25/15	8.40	10.02	9.57	8.86	8.41	9.13	10.83	9.72	8.26	9.38	10.79
10/30/15	8.24	9.60	9.50	9.42	8.65	9.43	11.08	9.49	8.35	9.38	10.81
11/30/15	9.11	10.58	9.18	8.92	8.51	9.16	9.96	9.70	8.68	9.62	11.05
12/30/15	9.17	10.26	10.32	8.63	8.77	9.53	10.34	10.00	9.02	9.57	11.28
01/28/16	9.24	10.55	9.76	9.09	8.59	8.99	10.66	9.68	8.68	9.37	10.95
02/23/16	7.85	9.87	10.36	8.65	8.75	8.67	11.03	9.98	8.63	9.56	9.55
03/31/16	9.05	9.49	10.49	8.74	8.44	8.96	10.88	9.49	8.50	9.39	9.56
04/28/16	7.72	7.71	10.43	8.12	8.44	8.53	10.84	9.39	8.41	9.49	8.97
05/26/16	8.30	8.17	10.55	8.52	8.10	9.02	10.59	8.95	7.93	9.39	9.48

Table 2.7

PH Readings
Gratwick-Riverside Park Site
North Tonawanda, New York

Monitoring Location	MH2	MH3	MW-6	OGC-1	OGC-5	MH6	OGC-6	MW-7	MH8	OGC-2	MH9
Date											
06/30/16	8.48	8.53	10.96	9.59	8.51	9.06	10.89	9.24	8.10	9.40	9.99
07/28/16	8.42	8.39	10.68	9.40	8.24	8.88	10.67	9.47	8.31	9.34	9.89
08/24/16	8.76	9.32	9.16	8.94	8.74	9.47	9.07	9.37	9.70	9.59	10.25
09/27/16	8.35	8.57	10.41	8.99	8.10	8.84	10.93	10.38	8.22	9.31	9.84
10/25/16	8.73	9.04	8.37	8.34	8.62	9.01	9.13	9.25	9.51	9.20	9.53
11/30/16	8.23	8.34	10.26	9.49	8.17	8.79	9.65	9.39	8.25	9.32	10.76
12/28/16	8.25	8.41	10.81	8.87	8.55	9.02	10.07	9.49	8.43	9.40	9.65
01/31/17	7.51	7.60	10.40	7.89	8.44	8.52	9.25	9.21	8.16	9.34	9.20
02/28/17	8.07	8.38	10.38	8.88	7.95	8.36	8.84	8.14	6.39	8.88	2.65(1)
03/31/17	7.76	7.23	10.42	7.65	8.49	8.64	9.28	9.44	8.19	9.58	9.71
04/28/17	8.37	8.60	10.58	9.08	8.29	9.11	9.50	9.45	8.37	9.55	10.10
05/31/17	8.26	8.37	10.53	10.08	8.47	8.99	9.98	9.91	8.60	9.79	10.19
06/27/17	8.19	8.18	10.67	9.88	8.36	9.09	10.92	9.37	8.38	9.60	9.84
07/26/17	7.95	8.04	10.79	8.15	8.32	9.03	10.84	9.46	8.50	9.44	9.35
08/29/17	7.82	8.06	11.04	8.60	8.13	8.79	10.13	9.13	8.30	9.36	9.47
09/25/17	7.82	8.17	10.43	9.18	8.08	8.70	9.65	9.29	8.44	9.34	9.46
10/24/17	7.99	8.23	11.28	9.33	8.36	9.11	10.28	10.21	8.68	9.64	9.71
11/27/17	7.96	8.05	10.52	9.09	8.09	8.78	9.80	9.40	8.32	9.46	9.30
12/21/17	8.39	8.40	10.74	8.64	8.26	8.98	9.63	9.52	8.68	9.56	9.53
01/31/18	8.48	8.48	10.49	9.46	8.35	8.75	9.08	9.75	8.89	9.73	9.69
02/26/18	8.22	8.36	10.74	9.00	8.19	8.87	9.23	9.64	8.89	9.57	9.21
03/23/18	8.40	8.33	11.08	9.78	8.38	9.05	9.43	9.45	8.70	9.81	9.14
04/27/18	8.39	8.38	10.84	9.00	8.31	8.83	9.04	9.30	8.47	9.49	8.92
05/23/18	7.80	7.82	11.02	8.20	7.84	8.39	9.65	8.89	8.18	9.05	8.26
06/11/18	8.19	8.23	11.04	8.80	8.23	8.93	9.19	9.18	8.73	9.24	9.51
07/25/18	8.20	8.29	10.95	8.88	7.87	8.69	8.89	9.01	8.72	9.18	9.62
08/27/18	8.20	8.23	10.83	9.10	8.22	9.20	10.18	9.38	8.84	9.56	9.86
09/21/18	8.34	8.53	10.86	9.76	8.21	9.01	9.73	9.41	8.83	9.73	9.79
10/31/18	8.06	8.38	10.18	9.60	7.87	8.74	8.92	8.80	8.62	9.05	8.82
11/21/18	8.56	8.72	11.06	9.32	8.48	9.24	10.51	9.38	8.87	9.43	9.15
12/20/18	8.12	7.81	10.91	8.77	7.89	8.36	9.19	9.59	8.17	9.24	8.53
01/28/19	8.69	9.18	11.71	9.26	8.48	9.05	9.48	9.98	8.97	9.80	9.43
02/28/19	8.15	8.25	11.10	8.39	7.89	8.19	8.83	9.65	9.42	9.39	8.68
03/26/19	8.62	8.87	10.84	9.47	8.40	8.90	8.92	9.45	9.23	9.68	9.09
04/26/19	8.14	8.23	11.18	8.82	8.05	8.55	8.86	9.09	8.62	9.29	8.59
05/29/19	8.12	8.24	11.24	9.67	8.03	8.29	8.88	9.67	8.51	9.49	8.90

Table 2.7

PH Readings
Gratwick-Riverside Park Site
North Tonawanda, New York

Monitoring Location	OGC-7	MH11	MW-8	OGC-3	MH12	OGC-8	MH14	MW-9	OGC-4	MH15	MH16
Date											
06/27/13	10.27	10.61	10.48	10.86	8.78	8.69	8.82	11.25	11.25	9.05	9.07
07/24/13	10.96	8.54	11.17	11.30	8.70	10.60	8.10	10.62	10.54	8.71	8.94
08/22/13	11.26	8.63	11.37	11.66	9.01	11.16	8.41	11.23	11.16	7.51	7.56
09/30/13	10.97	8.81	11.10	11.39	8.87	11.00	8.25	10.95	10.98	7.54	7.42
10/30/13	10.71	8.62	10.83	11.08	8.66	10.47	8.25	10.57	10.46	7.18	6.85
11/27/13	10.91	8.97	11.05	11.31	8.88	10.21	8.02	10.65	10.80	6.83	6.34
12/31/13	11.07	9.11	11.27	11.58	7.60	11.15	8.55	11.08	11.32	7.11	6.39
01/30/14	11.06	9.14	11.37	11.53	9.24	11.37	9.15	11.14	11.47	7.56	7.83
02/26/14	10.94	9.22	11.37	11.48	9.39	11.09	9.41	10.93	11.27	8.04	7.84
03/28/14	10.90	9.41	11.16	11.40	9.15	11.11	8.48	11.09	11.18	8.07	8.43
04/25/14	10.89	8.75	10.97	11.43	9.38	11.18	8.18	11.02	10.80	7.54	7.47
05/29/14	11.55	8.88	11.97	12.18	8.54	11.90	8.72	11.73	11.10	8.46	8.65
06/25/14	11.25	7.62	11.52	11.90	9.94	11.68	9.38	11.45	11.14	8.50	8.97
07/29/14	10.83	8.51	11.10	11.43	8.65	11.05	8.71	10.94	10.51	7.09	7.75
08/26/14	10.82	8.16	11.12	11.39	8.63	10.87	8.25	10.99	10.58	6.52	6.41
09/30/14	11.07	8.53	11.35	11.53	8.90	11.04	8.41	11.02	11.16	7.54	7.60
10/29/14	10.85	8.32	11.01	11.25	8.94	10.80	8.18	10.68	10.65	7.66	7.40
11/25/14	11.05	8.92	11.27	11.55	9.22	11.03	8.63	10.87	11.36	7.73	7.46
12/30/14	11.49	9.67	11.83	12.01	9.47	11.51	8.47	11.34	11.71	8.25	8.11
01/28/15	10.85	8.87	11.08	11.36	8.92	11.09	8.27	10.93	11.12	6.55	7.25
02/24/15	10.86	NM	10.85	11.00	8.57	10.88	NM	11.56	11.72	7.63	7.22
03/25/15	9.92	9.53	6.27	5.96	6.15	8.66	NM	8.97	8.96	8.99	8.89
04/23/15	8.46	8.33	8.05	8.73	9.36	8.99	9.26	11.26	11.26	8.38	8.21
05/29/15	11.49	8.35	11.58	11.95	8.77	11.92	9.32	11.54	11.40	8.21	7.51
06/24/15	11.35	7.78	11.73	11.93	9.60	11.82	8.85	11.57	11.22	7.91	8.03
07/28/15	11.09	9.33	11.57	11.69	8.54	11.20	8.37	11.08	10.91	8.05	8.12
08/27/15	11.35	9.75	11.75	11.76	10.18	11.50	9.32	11.39	10.98	7.50	7.79
09/25/15	11.37	8.35	11.55	11.94	9.05	11.44	8.63	11.41	10.93	7.97	7.77
10/30/15	11.48	8.79	11.71	12.03	9.55	11.51	11.34	11.02	11.49	10.46	7.80
11/30/15	11.26	8.82	11.63	11.93	9.52	11.36	11.52	11.10	11.45	11.16	7.98
12/30/15	11.62	9.71	11.85	12.19	9.33	11.68	11.76	11.27	11.92	11.46	8.04
01/28/16	11.36	8.77	11.62	11.86	9.37	11.75	11.42	11.09	11.62	11.01	8.08
02/23/16	11.65	9.57	11.90	12.26	9.46	11.94	11.46	11.27	11.76	10.93	8.51
03/31/16	11.43	8.72	11.69	11.99	9.20	11.77	10.02	10.95	11.40	9.09	7.81
04/28/16	11.52	8.81	11.77	12.08	9.20	11.95	10.16	11.61	11.60	9.74	7.63
05/26/16	11.60	8.72	11.69	12.02	8.90	11.94	10.10	11.53	11.49	9.74	8.41
06/30/16	11.47	8.40	11.69	12.07	9.04	11.87	10.19	11.73	11.20	9.98	9.13
07/28/16	11.30	8.20	11.56	11.93	8.90	11.78	9.96	11.57	11.18	10.34	9.44
08/24/16	10.26	10.40	11.72	11.39	10.89	11.91	10.53	11.55	11.80	8.97	7.11
09/27/16	11.38	8.09	11.46	11.95	9.03	11.62	9.91	11.44	11.37	10.80	8.33
10/25/16	9.31	8.77	10.35	10.22	10.00	10.47	10.18	10.66	9.02	8.06	7.47
11/30/16	11.20	8.60	11.53	11.87	9.14	11.54	10.43	11.45	11.48	9.94	7.45
12/28/16	11.32	8.65	11.49	11.67	8.65	11.29	8.47	11.18	11.19	7.61	7.47
01/31/17	11.51	8.78	11.89	12.03	8.91	11.89	9.19	11.66	11.49	8.92	8.05

Table 2.7

PH Readings
Gratwick-Riverside Park Site
North Tonawanda, New York

Monitoring Location	OGC-7	MH11	MW-8	OGC-3	MH12	OGC-8	MH14	MW-9	OGC-4	MH15	MH16
Date											
02/28/17	11.46	8.68	11.73	11.97	8.89	11.78	9.38	11.58	11.15	8.01	7.29
03/31/17	11.58	8.92	11.90	12.17	9.08	11.87	9.71	11.80	11.59	9.37	8.11
04/28/17	11.52	9.15	11.85	12.13	9.06	11.90	9.43	11.72	11.40	8.21	7.84
05/31/17	11.54	9.20	11.87	12.04	9.49	11.75	9.12	11.67	10.89	7.85	7.48
06/27/17	11.50	8.84	11.94	12.22	9.16	11.94	9.09	11.84	11.48	7.59	7.59
07/26/17	11.37	8.54	11.76	12.08	8.76	11.79	8.43	11.69	11.48	7.59	7.48
08/29/17	11.27	8.76	11.62	11.94	8.87	11.54	8.52	11.55	10.69	7.70	7.44
09/25/17	11.34	8.77	11.62	11.87	9.05	11.51	9.00	11.59	10.84	7.66	7.47
10/24/17	11.76	8.79	11.80	12.06	9.18	11.43	8.72	11.71	11.19	7.81	7.97
11/27/17	11.28	8.56	11.56	11.91	8.87	11.33	9.13	11.56	11.17	7.38	6.97
12/21/17	11.46	8.78	11.84	12.07	9.28	11.64	9.16	11.74	11.41	7.37	7.39
01/31/18	11.43	9.85	11.86	12.05	9.59	11.75	9.44	11.79	11.64	7.45	7.57
02/26/18	11.61	8.92	11.89	12.08	8.54	11.82	8.89	11.78	11.68	7.53	7.53
03/23/18	11.98	9.00	12.41	12.63	8.89	12.38	8.90	12.29	12.08	7.42	7.58
04/27/18	11.35	8.97	11.79	11.78	9.17	11.63	9.08	11.56	11.39	7.12	7.22
05/23/18	11.00	8.24	11.44	11.51	8.07	11.44	7.96	11.40	10.99	7.35	7.45
06/11/18	11.46	9.06	11.93	12.01	9.00	11.98	8.57	11.89	11.14	7.37	7.60
07/25/18	11.17	8.69	11.64	11.83	9.02	11.69	8.65	11.25	11.58	6.95	7.22
08/27/18	11.39	8.49	11.84	12.05	9.23	11.74	8.81	11.84	11.14	7.41	7.48
09/21/18	11.36	8.58	11.87	12.12	9.00	11.78	8.59	11.90	11.06	7.56	7.63
10/31/18	10.64	8.42	11.17	11.26	8.87	10.93	8.67	11.08	10.88	6.89	6.63
11/21/18	11.38	8.84	11.87	12.06	8.95	11.52	8.68	11.70	11.59	7.04	7.25
12/20/18	11.46	7.99	11.94	12.05	8.70	11.72	8.27	11.88	11.49	7.59	7.41
01/28/19	12.40	9.59	12.81	12.92	9.41	12.74	8.58	13.22	12.99	7.74	7.91
02/28/19	11.54	8.15	11.86	12.03	8.19	11.88	8.29	11.94	11.75	7.19	7.36
03/26/19	11.65	9.12	11.99	12.19	8.93	11.99	8.79	11.91	11.58	7.15	7.11
04/26/19	11.51	8.42	12.01	12.03	8.39	11.97	8.01	11.89	11.37	7.48	7.61
05/29/19	11.55	8.13	11.98	12.00	8.46	11.93	7.69	11.47	10.79	6.92	7.57

Table 2.7

PH Readings
Gratwick-Riverside Park Site
North Tonawanda, New York

Monitoring Location	City MH1	City MH2	City MH3
Date			
06/27/13	9.55	9.05	9.34
07/24/13	6.49	6.99	7.03
08/22/13	8.09	7.96	7.92
09/30/13	8.74	7.75	7.57
10/30/13	8.88	7.48	7.30
11/27/13	NM	NM	NM
12/31/13	NM	NM	NM
01/30/14	10.87	8.86	7.57
02/26/14	8.59	7.91	7.70
03/28/14	9.61	8.79	9.06
04/25/14	8.70	8.57	8.76
05/29/14	10.66	9.69	9.53
06/25/14	10.42	10.05	9.84
07/29/14	9.78	9.01	8.80
08/26/14	10.04	9.26	8.83
09/30/14	10.09	9.44	8.96
10/29/14	10.05	9.63	9.29
11/25/14	10.46	8.21	8.41
12/30/14	10.62	8.82	9.02
01/28/15	7.50	6.75	6.28
02/24/15	6.17	6.61	6.22
03/25/15	7.61	7.49	7.73
04/23/15	8.63	8.46	8.30
05/29/15	10.46	9.80	8.98
06/24/15	9.36	8.99	8.82
07/28/15	6.86	6.84	7.30
08/27/15	9.49	8.85	9.08
09/25/15	10.13	9.50	9.24
10/30/15	10.00	8.96	8.98
11/30/15	10.71	9.79	9.29
12/30/15	10.66	9.25	9.22
01/28/16	10.72	9.90	9.43
02/23/16	6.78	6.90	6.96
03/31/16	8.48	8.39	8.25
04/28/16	8.16	7.96	7.69
05/26/16	8.49	7.94	7.10
06/30/16	7.92	7.49	7.22
07/28/16	7.82	Dry	7.33
08/24/16	7.27	7.50	7.51
09/27/16	7.30	7.49	7.51
10/25/16	7.20	7.23	7.47
11/30/16	7.04	7.51	7.47
12/28/16	7.83	7.74	7.69

Table 2.7

PH Readings
Gratwick-Riverside Park Site
North Tonawanda, New York

Monitoring Location	City MH1	City MH2	City MH3
Date			
01/31/17	7.96	7.85	7.52
02/28/17	7.61	6.92	7.23
03/31/17	8.48	7.75	7.84
04/28/17	8.44	8.26	8.07
05/31/17	8.5	8.27	8.06
06/27/17	8.70	8.34	8.17
07/26/17	7.63	7.56	7.25
08/29/17	7.66	7.46	7.39
09/25/17	7.22	7.11	7.05
10/24/17	8.06	7.37	7.46
11/27/17	7.59	7.41	7.01
12/21/17	7.62	7.51	7.50
01/31/18	8.41	8.11	7.29
02/26/18	7.92	7.71	7.65
03/23/18	8.02	7.73	7.70
04/27/18	7.45	7.42	7.37
05/23/18	7.60	7.57	7.46
06/11/18	7.76	7.47	7.46
07/25/18	7.28	7.17	7.13
08/27/18	7.81	7.54	7.5
09/21/18	7.95	7.67	7.68
10/31/18	6.07	6.23	6.35
11/21/18	7.04	7.22	7.12
12/20/18	8.11	7.82	7.47
01/28/19	8.32	8.21	8.2
02/28/19	NM	NM	NM
03/26/19	6.64	6.82	6.85
04/26/19	7.61	7.62	7.61
05/29/19	8.51	8.12	7.94

Notes:

(1) - Affected by muriatic acid addition.
NM - Not Measured due to Unsafe Road Conditions or Inaccessible due to Snow Cover.

Table 2.8

Effluent Sampling Summary
Subsequent to February 2007
Gratwick-Riverside Park Site
North Tonawanda, New York

LOCATIONS

Effluent monitoring station at Site discharge point

FREQUENCY

Semi-Annual (Spring and Fall as dictated by the City of North Tonawanda Industrial Wastewater Discharge Permit dated March 1, 2016)

PARAMETERS

Volatiles

Acetone
Benzene
2-Butanone
Chlorobenzene
1,1-Dichloroethane
1,2-Dichloroethane
trans-1,2-Dichloroethene
Ethylbenzene
Methylene Chloride
Styrene
Tetrachloroethene
Toluene
1,1,1-Trichloroethane
Trichloroethene
Vinyl Chloride
Xylenes (Total)

Semi-Volatiles

1,4-Dichlorobenzene
1,2-Dichlorobenzene
2,4-Dimethylphenol
2-Methylphenol
4-Methylphenol
Naphthalene
Di-n-octylphthalate
Phenols (4AAP)

Wet Chemistry

Chloride
Cyanide
NH3
NO3
Phosphorous
Sulfate
Sulfide

Table 2.9

Analytical Results Summary
Site Effluent
Gratwick-Riverside Park Site

Sample ID:																	
Sample Date:		**09/13/12**	**03/14/13**	**09/12/13**	**04/16/14**	**10/07/14**	**04/16/15**	**10/8/15**	**04/14/16**	**10/04/16**	**04/06/17**	**10/05/17**	**04/05/18**	**10/04/18**	**4/11/2019**	**Surface Water Standard**	(1)
Parameter	**Unit**																
Volatiles																	
1,1,1-Trichloroethane	µg/L	5.0U	5.0U	5.0U	5.0U	5.0U	5.0U	5.0U	5.0U	5.0U	5.0U	5.0U	5.0U	5.0 U	5.0 U	5	
1,1-Dichloroethane	µg/L	5.0U	5.0U	5.0U	5.0U	5.0U	5.0U	5.0U	5.0U	5.0U	5.0U	5.0U	5.0U	5.0 U	5.0 U	5	
1,2-Dichloroethane	µg/L	5.0U	5.0U	5.0U	5.0U	5.0U	5.0U	5.0U	5.0U	5.0U	5.0U	5.0U	5.0U	5.0 U	5.0 U	0.6	
2-Butanone	µg/L	25U	25U	25U	25U	25U	25U	25U	25U	25U	25U	NA	25U	25 U	25 U	50	
Acetone	µg/L	25U	25U	25U	25U	25U	25U	25U	25U	25U	25U	NA	25U	25 U	25 U	50	
Benzene	µg/L	5.0U	5.0U	5.0U	5.0U	5.0U	5.0U	5.0U	5.0U	5.0U	5.0U	5.0U	5.0U	5.0 U	5.0 U	1	
Chlorobenzene	µg/L	5.0U	5.0U	5.0U	5.0U	5.1	5.0U	5.0U	5.0U	5.0U	9.5	5.0U	5.0U	5.0 U	5.0 U	5	
Ethylbenzene	µg/L	5.0U	5.0U	5.0U	5.0U	5.0U	5.0U	5.0U	5.0U	5.0U	5.0U	5.0U	5.0U	5.0 U	5.0 U	5	
Methylene chloride	µg/L	5.0U	5.0U	5.0U	5.0U	5.0U	5.0U	5.0U	5.0U	5.0U	5.0U	5.0U	5.0U	5.0 U	5.0 U	5	
Styrene	µg/L	5.0U	5.0U	5.0U	5.0U	5.0U	5.0U	5.0U	5.0U	5.0U	5.0U	5.0U	5.0U	5.0 U	5.0 U	5	
Tetrachloroethene	µg/L	6.3	5.0U	5.0U	5.0U	5.0U	5.0U	5.0U	5.0U	5.0U	5.0U	5.0U	5.0U	5.0 U	5.0 U	0.7	(2)
Toluene	µg/L	27	16	13	14	13	5.0U	12	5.0U	5.0U	5.0U	5.0U	5.0U	5.0 U	5.0 U	5	
trans-1,2-Dichloroethene	µg/L	5.0U	5.0U	5.0U	5.0U	5.4	5.0U	5.1	5.0U	5.0U	5.0U	5.0U	5.0U	5.0 U	5.0 U	5	
Trichloroethene	µg/L	50	45	34	38	26	5.0	23	12	5.0U	5.0U	5.0U	5.0U	5.0 U	5.0 U	5	
Vinyl chloride	µg/L	5.3	5.0U	5.0U	5.0U	5.0U	5.0U	5.0U	5.0U	5.0U	5.0U	5.0U	5.0U	5.0 U	5.0 U	0.3	(2)
Xylene (total)	µg/L	18	18	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10 U	10 U	5	
Semi-Volatiles																	
1,2-Dichlorobenzene	µg/L	0.68	1.2	6.2	0.92	4.8U	4.8U	4.7U	4.7U	4.8U	4.8U	5.0U	5.0U	4.8 U	4.8 U	3	(7)
1,4-Dichlorobenzene	µg/L	3.6	7.7	5.7	6.4	9.4	7.0	9.2	4.7U	5.9U	26	20	5.6U	5.4 U	15	3	(7)
2,4-Dimethylphenol	µg/L	5.5	7.3	6.5	10	7.8J	13	5.0	5.9	1.3U	53	5.2	1.7	1.3 UJ	1.3 U	50	(2)
2-Methylphenol	µg/L	0.62	3.4	0.22U	0.44	5.3	6.2	4.9	2.7	0.77U	7.7	0.81U	0.81U	0.77 UJ	0.77 U	NL	
4-Methylphenol	µg/L	3.0	6.7	1.3	0.62	7.4	59	3.7	8.5	0.75U	62	0.79U	0.79U	0.75 UJ	0.75 U	NL	
Di-n-octyl phthalate	µg/L	4.6U	4.6U	4.6U	4.6U	4.6U	4.6U	4.6U	4.6U	4.6U	4.6U	4.6U	4.6U	4.6 U	4.6 U	50	(2)
Naphthalene	µg/L	1.4	0.53	0.080U	0.47	0.82U	0.97	0.81U	0.81U	0.82U	1.3	0.86U	0.86U	0.82 U	0.82 U	10	
Phenol	µg/L	0.12U	5.5	0.12U	0.12U	22	4.0	3.0	0.33U	0.33U	3.0	0.35U	0.35U	0.33 UJ	0.33 U	1	
Metals																	
Aluminum	mg/L	0.20U	0.20U	0.20U	0.20U	0.20U	0.20U	0.20U	0.67	0.20U	0.20U	0.20U	0.20U	0.20 U	0.20 U	NL	
Antimony	mg/L	0.020U	0.020U	0.020U	0.020U	0.020U	0.020U	0.020U	0.020U	0.020U	0.020U	0.020U	0.020U	0.020 U	0.020 U	0.003	
Arsenic	mg/L	0.010U	0.010U	0.010U	0.010U	0.010U	0.010U	0.010U	0.015U	0.015U	0.015U	0.015U	0.015U	0.015 U	0.015 U	0.050	
Barium	mg/L	0.068	0.085	0.064	0.096	0.067	0.092	0.068	0.096	0.130	0.081	0.076	0.092	0.044	0.091	1.0	
Beryllium	mg/L	0.0020U	0.0020U	0.0020U	0.0020U	0.0020U	0.0020U	0.0020U	0.0020U	0.0020U	0.0020U	0.0020U	0.0020U	0.0020 U	0.0020 U	1.1	(6)
Cadmium	mg/L	0.0010U	0.0010U	0.0010U	0.0010U	0.0010U	0.0010U	0.0010U	0.0020U	0.0020U	0.0020U	0.0020U	0.0020U	0.0020 U	0.0020 U	0.005	
Chromium	mg/L	0.0040U	0.0040U	0.0040U	0.0040U	0.0040U	0.0040U	0.0040U	0.0040U	0.0040U	0.0040U	0.0040U	0.0040U	0.0040 U	0.0040 U	0.050	
Copper	mg/L	0.013	0.050	0.013	0.010U	0.014	0.010U	0.010U	0.010U	0.010U	0.010U	0.010U	0.010U	0.010 U	0.010 U	0.023	(3)
Iron	mg/L	0.050U	0.050U	0.050U	0.40	0.050U	0.17	0.050U	0.18	0.30	1.0	1.7	1.1	0.097	0.073	0.30	
Lead	mg/L	0.0067	0.0050U	0.0050U	0.0050U	0.0050U	0.0050U	0.0050U	0.010U	0.010U	0.010U	0.010U	0.010U	0.010 U	0.010 U	0.012	
Magnesium	mg/L	0.99	2.9	0.78	5.5	1.1	6.5	1.4	15.2	45.2	9.6	8.3	11	3.2	12.3	35	
Manganese	mg/L	0.0030U	0.0030U	0.0030U	0.010	0.0030U	0.018	0.0030U	0.26	0.062	0.053	0.099	0.068	0.0070	0.056	0.30	
Mercury	mg/L	0.00020U	0.00020U	0.00020U	0.00020U	0.00020U	0.00020U	0.00020U	0.00020U	0.00020U	0.00020U	0.00020U	0.00020U	0.00020 U	0.00020 U	2.6E-06	(4)
Nickel	mg/L	0.010U	0.010U	0.010U	0.010U	0.010U	0.010U	0.010U	0.010U	0.010U	0.014	0.010U	0.010U	0.010 U	0.010 U	0.10	
Selenium	mg/L	0.015U	0.015U	0.015U	0.015U	0.015U	0.015U	0.015U	0.025U	0.025U	0.025U	0.025U	0.025U	0.025 U	0.025 U	0.0046	(4)
Silver	mg/L	0.0030U	0.0030U	0.0030U	0.0030U	0.0030U	0.0030U	0.0030U	0.0060U	0.0060U	0.0060U	0.0060U	0.0060U	0.0060 U	0.0060 U	0.050	
Sodium	mg/L	238	353	206	359	233	361	245	351	258	319	227	260	123	266	NL	
Zinc	mg/L	0.010U	0.010U	0.010U	0.010U	0.010U	0.010U	0.010U	0.010U	0.010U	0.017	0.028	0.010U	0.010 U	0.010 U	2.0	(2)

Table 2.9

Analytical Results Summary
Site Effluent
Gratwick-Riverside Park Site

Sample ID: / Sample Date: / Parameter	Unit	09/13/12	03/14/13	09/12/13	04/16/14	10/07/14	04/16/15	10/8/15	04/14/16	10/04/16	04/06/17	10/05/17	04/05/18	10/04/18	4/11/2019	Surface Water Standard (1)
General Chemistry																
pH	S.U.	10.82	10.32	10.38	10.22	9.90	9.20	10.21	8.86	8.43	8.80	7.51	7.86	8.82	8.16	NL
Hardness	mg/L	176	250	192	252	180	340	192	332	352	276	244	316	188	276	NL
Total Dissolved Solids (TDS)	mg/L	911	1170	823	1360	872	1430	977	1450	1180	1280	995	1160	605	1120	NL
Total Suspended Solids (TSS)	mg/L	4	7	12	8	2	16	12	14	3	11	24	15	4.0 U	4	NL
Chloride	mg/L	326	398	333	633	386	662	409	648	421	576	408	411	195	405	250
BOD	mg/L	45	16	18	10.3	20	13.3	13.7	13.3	25	12	8.3	4.95	6.04	6.84	NL
COD	mg/L	70	37	21	17	75	5.0U	50U	25U	125	67	186	127	79	50 U	NL
Oil and Grease	mg/L	0.10U	0.2	0.10U	0.10U	0.10U	0.10U	0.10U	0.001	0.10U	0.20	NA	0.10U	0.10 U	0.2	NL
Organic Carbon	mg/L	8.2	8.0	7.6	6.6	13.4	5.0U	5.5	6.1	11	8.7	NA	12.7	8.37	11.76	NL
Alkalinity, Total (As CaCO3)	mg/L	44.6	48.9	47.2	29	47.3	40.0	43.5	75.3	381	94	116	115	44.6	103	NL
Bicarbonate (as CaCO3)	mg/L	5.0U	5.0U	5.0U	21	5.0U	40.0	5.0U	38.2	349	94	116	115	37.9	103.0	NL
Ammonia	mg/L	2.52	2.52	0.84	1.1	1.12	0.84	1.40	1.12	1.12	1.12	NA	0.84	0.56	1.12	2.0
Nitrate (as N)	mg/L	0.050U	0.050U	0.050U	0.050U	0.050U	0.050U	0.050U	0.15	0.050U	0.050U	0.050U	0.13UJ	0.050 U	0.050 U	10
TKN	mg/L	4.48	3.08	1.12	1.68	1.68	1.12	2.24	1.68	1.68	1.12	NA	1.12	1.68	3.00 U	NL
Sulfate	mg/L	159	118	166	183	136	216	127	237	65.4	159	160	218	157	206	250
Sulfide	mg/L	3.0	4.4	3.6	3.2	3.6	2.0	3.6	1.6	30.2	6.2	1.6	1.0U	1.0 U	16	0.002
Phenol	mg/L	0.008U	0.012U	0.011U	0.009U	0.011U	0.085U	0.11U	0.10U	0.095U	0.10U	0.10U	0.100U	0.100 U	ND	0.001
Phosphorous	mg/L	0.15	0.12	0.16	0.16	0.17	0.10	0.10U	0.10U	1.30	0.10U	0.14	0.10U	0.10 U	0.16	0.020 (2)
Cyanide	mg/L	0.005U	0.005U	0.005U	0.005U	0.005U	0.005U	0.005	0.005U	0.3	0.005U	NA	0.005U	0.010 U	ND	0.0052

Notes:

U - Non-detect at associated value
NA - Not Analyzed
ND - Not detected. No associated reporting limit
J - Estimated
NL - Not Listed
SL - Sample Lost
(1) - Lowest Standard/Guidance Value shown
(2) - Guidance Value
(3) - Calculated using a hardness of 300 ppm
(4) - Applies to dissolved form
(5) - TOC analyzer malfunction prevented analysis of this compound
(6) - Hardness >75 mg/L
(7) - Sum of isomers <5 µg/L

Table 2.10

Groundwater Volumes Discharged
to North Tonawanda POTW
Gratwick-Riverside Park Site
North Tonawanda, New York

Month	Volumes (gallons) Monthly	Total
May 2001	2,900,000	2,900,000
June 2001	2,353,800	5,253,800
July 2001	1,488,500	6,742,300
August 2001	712,800	7,455,100
September 2001	473,100	7,928,200
October 2001	1,213,100	9,141,300
November 2001	1,281,100	10,422,400
December 2001	231,700 (1)	10,654,100
January 2002	1,383,200 (2)	12,037,300
February 2002	1,186,000	13,223,300
March 2002	233,600	13,456,900
April 2002	736,000	14,192,900
May 2002	348,200	14,541,100
June 2002	1,137,200	15,678,300
July 2002	869,300	16,547,600
August 2002	1,060,800	17,608,400
September 2002	707,000	18,315,400
October 2002	679,800	18,995,100
November 2002	489,500	19,484,700
December 2002	743,500	20,228,200
January 2003	1,150,700	21,378,900
February 2003	483,300	21,862,200
March 2003	402,300	22,264,500
April 2003	531,900	22,796,400
May 2003	655,600	23,452,000
June 2003	682,100	24,134,000
July 2003	942,000	25,076,100
August 2003	627,500	25,703,600
September 2003	349,600	26,053,200
October 2003	966,500	27,019,700
November 2003	442,200	27,461,900
December 2003	463,900	27,925,800
January 2004	443,900	28,369,700
February 2004	253,700	28,623,400
March 2004	403,700	29,027,100
April 2004	433,600	29,460,700
May 2004	377,400	29,838,100
June 2004	395,000	30,233,100
July 2004	384,300	30,617,400
August 2004	479,700	31,097,100
September 2004	413,900	31,511,000
October 2004	319,400	31,902,400
November 2004	249,200	32,151,600
December 2004	209,900	32,361,500

Table 2.10

Groundwater Volumes Discharged
to North Tonawanda POTW
Gratwick-Riverside Park Site
North Tonawanda, New York

Month	Volumes (gallons) Monthly	Total
January 2005	310,100	32,671,600
February 2005	301,100	32,972,700
March 2005	250,200	33,222,900
April 2005	378,400	33,601,300
May 2005	458,800	34,060,100
June 2005	455,900	34,516,000
July 2005	270,200	34,786,200
August 2005	285,100	35,071,300
September 2005	395,600	35,466,900
October 2005	333,200	35,800,100
November 2005	360,200	36,160,300
December 2005	395,300	36,555,600
January 2006	297,500	36,853,100
February 2006	508,300	37,361,400
March 2006	244,700	37,606,100
April 2006	224,400	37,830,500
May 2006	153,300	37,983,800
June 2006	262,300	38,246,100
July 2006	212,900	38,459,000
August 2006	357,500	38,816,500
September 2006	777,000	39,593,500
October 2006	254,700	39,848,200
November 2006	778,700	40,626,900
December 2006	496,600	41,123,500
January 2007	410,500	41,534,000
February 2007	494,600	42,028,600
March, April & May 2007	1,489,200[3]	43,517,800
June 2007	334,300	43,852,100
July 2007	258,600	44,110,700
August 2007	239,000	44,349,700
September 2007	59,500[4]	44,409,200
October 2007 through January 2008	50,600[4]	44,459,800
February 2008	23,800[4]	44,483,600
March 2008	1,238,300	45,721,900
April 2008	2,126,700	47,848,600
May 2008	1,771,100	49,619,700
June 2008	618,000	50,237,700
July 2008	1,559,200	51,796,900
August 2008	1,365,900	53,162,800
September 2008	1,998,000	55,160,800
October 2008	2,511,100	57,671,900
November 2008	1,151,600	58,823,500
December 2008	572,700	59,396,200

Table 2.10

Groundwater Volumes Discharged to North Tonawanda POTW Gratwick-Riverside Park Site North Tonawanda, New York

Month	Volumes (gallons) Monthly	Total
January 2009	1,021,700	60,417,900
February 2009	2,661,400	63,079,300
March 2009	4,239,300	67,318,600
April 2009	1,189,900	68,508,500
May 2009	1,362,500	69,871,000
June 2009	1,035,200	70,906,200
July 2009	1,010,100	71,916,300
August 2009	1,058,000	72,974,400
September 2009	947,000	73,921,400
October 2009	690,800	74,612,200
November 2009	697,500	75,309,700
December 2009	1,100,900	76,410,600
January 2010	767,100	77,177,700
February 2010	398,600	77,576,300
March 2010	1,094,500	78,670,800
April 2010	761,000	79,431,800
May 2010	354,700	79,786,500
June 2010	170,300	79,956,800
July 2010	323,600	80,280,400
August 2010	1,292,400	81,572,800
September 2010	672,800	82,245,600
October 2010	972,800	83,218,400
November 2010	433,500	83,651,900
December 2010	483,900	84,135,800
January 2011	420,300	84,556,100
February 2011	257,000	84,813,100
March 2011	1,136,700	85,949,800
April 2011	875,300	86,825,100
May 2011	727,500	87,552,600
June 2011	489,500	88,042,100
July 2011	459,300	88,501,400
August 2011	296,900	88,798,300
September 2011	390,300	89,188,600
October 2011	414,800	89,603,400
November 2011	393,100	89,996,500
December 2011	583,300	90,579,800
January 2012	651,800	91,231,600
February 2012	276,900	91,508,500
March 2012	586,600	92,095,100
April 2012	400,600	92,495,700
May 2012	458,800	92,954,500
June 2012	369,300	93,323,800
July 2012	15,600[(5)]	93,339,400
August 2012	399,400	93,738,800
September 2012	513,500	94,252,300

Table 2.10

Groundwater Volumes Discharged
to North Tonawanda POTW
Gratwick-Riverside Park Site
North Tonawanda, New York

Month	Volumes (gallons) Monthly	Total
October 2012	344,500	94,596,800
November 2012	336,600	94,933,400
December 2012	286,800	95,220,200
January 2013	329,800	95,550,000
February 2013	217,400	95,767,400
March 2013	260,200	96,027,600
April 2013	249,900	96,277,500
May 2013	200,500	96,478,000
June 2013	211,300	96,689,300
July 2013	245,600	96,934,900
August 2013	165,100	97,100,000
September 2013	216,500	97,316,500
October 2013	118,600	97,435,100
November 2013	203,800	97,638,900
December 2013	117,400	97,756,300
January 2014	111,700	97,868,000
February 2014 [6]	66,700	97,934,700
March 2014 [6]	5,800	97,940,500
April 2014 [6]	5,000	97,945,500
May 2014 [6]	8,600	97,954,100
June 2014 [6]	8,500	97,962,600
July 2014 [6]	15,400	97,978,000
August 2014	1,385,800	99,363,800
September 2014	869,700	100,233,500
October 2014	1,426,200	101,659,700
November 2014	638,400	102,298,100
December 2014	753,200	103,051,300
January 2015 [7]	126,600	103,177,900
February 2015 [7]	43,200	103,221,100
March 2015	2,115,700	105,336,800
April 2015	2,113,500	107,450,300
May 2015	1,939,200	109,389,500
June 2015	1,808,100	111,197,600
July 2015	1,625,600	112,823,200
August 2015	1,557,900	114,381,100
September 2015	586,800	114,967,900
October 2015	2,094,300	117,062,200
November 2015	1,153,700	118,159,900
December 2015	884,000	119,099,900
January 2016	1,293,500	120,393,400
February 2016	834,800	121,228,200
March 2016	1,589,500	122,817,700
April 2016	1,144,200	123,961,900
May 2016	601,200	124,563,100

Table 2.10

Groundwater Volumes Discharged
to North Tonawanda POTW
Gratwick-Riverside Park Site
North Tonawanda, New York

Month	Volumes (gallons) Monthly	Total
June 2016	[8]	124,563,100
July 2016	[8]	124,563,100
August 2016	[8]	124,563,100
September 2016	[8]	124,563,100
October 2016	[8]	124,563,100
November 2016	[8]	124,563,100
December 2016	796,500	125,359,600
January 2017	1,662,500	127,022,100
February 2017	1,549,600	128,571,700
March 2017	1,840,700	130,412,400
April 2017	1,486,100	131,898,500
May 2017	1,625,700	133,524,200
June 2017	1,355,300	134,879,500
July 2017	1,181,800	136,061,300
August 2017	1,102,300	137,163,600
September 2017	1,014,200	138,177,800
October 2017	1,469,000	139,646,800
November 2017	822,400	140,469,200
December 2017	1,045,800	141,515,000
January 2018	962,100	142,477,100
February 2018	936,100	143,413,200
March 2018	1,102,800	144,516,000
April 2018	1,063,300	145,579,300
May 2018	1,049,300	146,628,600
June 2018	867,200	147,495,800
July 2018	994,300	148,490,100
August 2018	813,200	149,303,300
September 2018	828,800	150,132,100
October 2018	1,022,700	151,154,800
November 2018	960,684	152,115,484
December 2018	986,000	153,101,484
January 2019	1,045,300	154,146,784
February 2019	951,000	155,097,784
March 2019	1,059,600	156,157,384
April 2019	1,031,825	157,189,209
May 2019	1,016,178	158,205,387

Notes:

[1] To December 7, 2001.

[2] From December 8, 2001.

[3] Plotted as 496,400 gallons on Figure 2.18 for each of March, April, and May 2007.

[4] Flow Meter malfunctioned due to tar-like material buildup inside meter. Meter was cleaned on March 14, 2008. Volumes not plotted on Figure 2.18 as volumes are not representative of actual volume removed.

[5] Flow low due to pump failure. Two pumps replaced.

[6] Flow meter malfunctioning. Cleaned and repaired on August 8, 2014. Volumes not plotted on Figure 2.18.

[7] PS#1, PS#2 and PS#3 not operational as of January 28, 2015.
PS#1 operational on March 2, 2015.
PS#2 operational on March 17, 2015.

[8] Flow meter malfunctioning.

Appendices

Appendix A
City of North Tonawanda
Industrial Wastewater Discharge Permit

CITY OF NORTH TONAWANDA
INDUSTRIAL WASTEWATER DISCHARGE PERMIT

Permit Number: 2628011

In accordance with the provisions of the Clean Water Act as amended, all terms and conditions set forth in this permit, the City of North Tonawanda Local Sewer Use Ordinance and any applicable Federal, State or local laws or regulations, authorization is hereby granted to: City of North Tonawanda
830 River Road
North Tonawanda, New York 14120

Site: **Gratwick Riverside Park**
River Road
North Tonawanda, New York 14120

Classified by S.I.C. Number(s): N/A

for the discharge of remedial action ground water into the City of North Tonawanda Sewerage System.

This permit is granted in accordance with an application filed on 05/01/96 in the offices of the Wastewater Treatment Plant Superintendent located at 830 River Road, and in conformity with specifications and other required data submitted in support of the above named application, all of which are filed with and considered part of this permit. This permit is also granted in accordance with discharge limitations and requirements, monitoring and reporting requirements, and all other conditions set forth in Parts I and II hereof.

Effective this 1st day of March, 2016

To expire the 28th day of February, 2019

Wm. M. Davignon

William M. Davignon, Water Works Superintendent

Signed this 11th day of March, 2016

PART I. SPECIFIC CONDITIONS

A. DISCHARGE LIMITATIONS AND MONITORING REQUIREMENTS

During the period beginning the effective date of this permit and lasting until the expiration date, discharge from the permitted facility outfall(s) shall be limited and monitored by the permittee as specified below (Refer to attached map for sampling and monitoring sites).

Sample Point	Parameter	Discharge Limitations mg/l except pH Daily Max.	Sampling Period	Sampling Type
001	Total Flow		1 Sampling Day Monthly	continuous
	pH	Monitor Only	1 Sampling Day Monthly	grab
	Vinyl Chloride	Monitor Only	1 Sampling Day semi-annual	24 hr comp.
	Acetone	Monitor Only	1 Sampling Day semi-annual	24 hr comp.
	Methylene Chloride	Monitor Only	1 Sampling Day semi-annual	24 hr comp.
	1,1,1-Trichloroethane	Monitor Only	1 Sampling Day semi-annual	24 hr comp.
	1,1-Dichloroethane	Monitor Only	1 Sampling Day semi-annual	24 hr comp.
	1,2-Dichloroethane (total)	Monitor Only	1 Sampling Day semi-annual	24 hr comp.
	2-Butanone	Monitor Only	1 Sampling Day semi-annual	24 hr comp.
	Trichlorethene	Monitor Only	1 Sampling Day semi-annual	24 hr comp.
	Benzene	Monitor Only	1 Sampling Day semi-annual	24 hr comp.

Sample Point	Parameter	Discharge Limitations mg/l except pH Daily Max. Monthly Avg.	Sampling Period	Sampling Type
001	Tetrachloroethene	Monitor Only	1 Sampling Day semi-annual	24 hr comp.
	Toluene	Monitor Only	1 Sampling Day semi-annual	24 hr comp.
	Chlorobenzene	Monitor Only	1 Sampling Day semi-annual	24 hr comp.
	Ethylbenzene	Monitor Only	1 Sampling Day semi-annual	24 hr comp.
	Styrene	Monitor Only	1 Sampling Day semi-annual	24 hr comp.
	Xylenes (total)	Monitor Only	1 Sampling Day semi-annual	24 hr comp.
	Phenol (4AAP)	Monitor Only	1 Sampling Day semi-annual	24 hr comp.
	trans-1,2-Dichloroethene	Monitor Only	1 Sampling Day semi-annual	24 hr comp.
	1,4-Dichlorobenzene	Monitor Only	1 Sampling Day semi-annual	24 hr comp.
	1,2-Dichlorobenzene	Monitor Only	1 Sampling Day semi-annual	24 hr comp.
	2-Methylephenol	Monitor Only	1 Sampling Day semi-annual	24 hr comp.
	4-Methylephenol	Monitor Only	1 Sampling Day semi-annual	24 hr comp.
	2,4-Dimethylphenol	Monitor Only	1 Sampling Day semi-annual	24 hr comp.
	Di-n-octylphthalate	Monitor Only	1 Sampling Day semi-annual	24 hr comp.
	Napthalene	Monitor Only	1 Sampling Day semi-annual	24 hr comp.
	Cyanide	Monitor Only	1 Sampling Day semi-annual	24 hr comp.
	NH3	Monitor Only	1 Sampling Day semi-annual	grab
	Chloride	Monitor Only	1 Sampling Day semi-annual	24 hr comp.

Sample Point	Parameter	Discharge Limitations mg/l except pH Daily Max. Monthly Avg.	Sampling Period	Sampling Type
001	NO3	Monitor Only	1 Sampling Day semi-annual	24 hr comp.
	Phosphorous	Monitor Only	1 Sampling Day semi-annual	24 hr comp.
	Sulfate	Monitor Only	1 Sampling Day semi-annual	24 hr comp.
	Sulfide	Monitor Only	1 Sampling Day semi-annual	24 hr comp.

*/- See Special requirements page for sub-note requirements.

PART I. SPECIFIC CONDITIONS
DISCHARGE MONITORING AND REPORTING REQUIREMENTS

During the period beginning the effective date of this permit and lasting until the expiration date, discharge monitoring results shall be summarized and reported by the permittee no later than the days specified below.

Sample Point	Parameter	Initial Monitoring Report	Subsequent Monitoring Reports
001	Vinyl Chloride	January 31, 2007	Semi-annual for all
	Acetone	January 31, 2007	
	Carbon Disulfide	January 31, 2007	
	1,1-Dichloroethene	January 31, 2007	
	1,1-Dichloroethane	January 31, 2007	
	1,2-Dichloroethane (total)	January 31, 2007	
	2-Butanone	January 31, 2007	
	Trichlorethene	January 31, 2007	
	Benzene	January 31, 2007	
	Tetrachloroethene	January 31, 2007	
	Toluene	January 31, 2007	
	Chlorobenzene	January 31, 2007	
	Ethylbenzene	January 31, 2007	
	Styrene	January 31, 2007	
	Xylenes (total)	January 31, 2007	

Sample Point	Parameter	Initial Monitoring Report	Subsequent Monitoring Reports
001	Phenol	January 31, 2007	Semi-annual for all
	1,3-Dichlorobenzene	January 31, 2007	
	1,4-Dichlorobenzene	January 31, 2007	
	1,2-Dichlorobenzene	January 31, 2007	
	2-Methylephenol	January 31, 2007	
	4-Methylephenol	January 31, 2007	
	2,4-Dimethylphenol	January 31, 2007	
	1,2,4-Trichlorobenzene	January 31, 2007	
	Napthalene	January 31, 2007	
	2-Methylnaphthalene	January 31, 2007	
	n-Nitrosodidiphenylamine	January 31, 2007	
	Di-n-butylphthalate	January 31, 2007	

PART I. SPECIFIC CONDITIONS

C. SPECIAL REQUIREMENTS

1) This permit is written for a duration of three (3) years. Upon renewal of this permit, all parameters will be re-evaluated to develop a parameter list based on chemical concentrations present in the extracted groundwater.

2) Fequency of monitoring is to be re-evaluated after each year. Sampling to be done semi-annual (Spring – Fall).

3) All monitoring reports (initial and subsequent), are to be received by the Superintendent, no later than thirty (30) days after receipt of validated data.

4) It is required that the Permittee have a Site Operations Manual available at all times. All emergency phone numbers must be listed in an appropriate place for easy access by operations personnel. All pumping operations shall be accomplished under no-bypass conditions. The Permittee is required to cease all pumping operations upon verbal request of the North Tonawanda Water/Wastewater Superintendent or his designee. Pumping operations shall not recommence until approval by the North Tonawanda Water/Wastewater Superintendent or his designee.

5) Analysts are required to use GC/MS method detection limits for most organics (if GC/MS is appropriate); GC/ECD for PCB's/Pesticides and GF method detection limits for metals (where GF is appropriate), as contained in attachment 5 of the NYSDEC TOGs 1.3.8 – New Discharges to Publicly Owned Treatment Works – dated 10/26/94.

Appendix B
Monthly Inspection Logs
(June 2018 to May 2019)

GRATWICK-RIVERSIDE PARK SITE
MONTHLY INSPECTION LOG

PROJECT NAME: Gratwick-Riverside Park Site

LOCATION: North Tonawanda, New York

DATE: 0 6 / 1 1 / 1 8 (MM DD YY)

INSPECTOR(S): S GARDNER, D TYRAN

	Item	*Inspect For*	*Action Required*	*Comments*
1.	**Perimeter Collection System/Off-Site Forcemain**			
☒	Manholes	- cover on securely	NONE	
☒		- condition of cover		
☒		- condition of inside of manhole		
☒		- flow conditions		
☒	Wet Wells	- cover on securely		
☒		- condition of cover		
☒		- condition of inside of wet well		
2.	**Landfill Cap**			
☒	Vegetated Soil Cover	- erosion	NONE	
☒		- bare areas		
☒		- washouts		
☒		- leachate seeps		
☒		- length of vegetation		
☒		- dead/dying vegetation		

FORM 17

Shawn Gardner

CRA 7987 (24)

GRATWICK-RIVERSIDE PARK SITE
MONTHLY INSPECTION LOG

PROJECT NAME: Gratwick-Riverside Park Site

LOCATION: North Tonawanda, New York

DATE: 06/11/18 (MM DD YY)

INSPECTOR(S): S GARDNER, D TYRAN

Item	*Inspect For*	*Action Required*	*Comments*
2. Landfill Cap (continued)			
Access Roads	- bare areas, dead/dying veg.	NONE	
	- erosion		
	- potholes or puddles		
	- obstruction		
3. Wetlands (Area "F")	- dead/dying vegetation		
	- change in water budget		
	- general condition of wetlands		
4. Other Site Systems			
Perimeter Fence	- integrity of fence	NA	
	- integrity of gates		
	- integrity of locks		
	- placement and condition of signs		

FORM 17

Shawn Gardner

CRA 7987 (24)

GRATWICK-RIVERSIDE PARK SITE
MONTHLY INSPECTION LOG

PROJECT NAME: Gratwick-Riverside Park Site

LOCATION: North Tonawanda, New York

DATE: 06/11/18 (MM DD YY)

INSPECTOR(S): S GARDNER, D TYRAN

	Item	*Inspect For*	*Action Required*	*Comments*
	4. Other Site Systems (continued)			
X	Drainage Ditches/ Swale Outlets	- sediment build-up		
X		- erosion	LOTS OF DRIFT WOOD ALL	ALONG SHORELINE
X		- condition of erosion protection		
X		- flow obstructions	24" DIA 30' LONG LOG	BLOCKING RIVER
X		- dead/dying vegetation	NORTH OUTFALL	
X		- cable concrete/gabion mats and riprap		
X	Culverts	- sediment build-up	NONE	
X		- erosion		
X		- condition of erosion protection		
X		- flow obstructions		
	Gas Vents	- intact / damage		
X	Wells	- locks secure	GABION MATS EXPOSED	ALONG LARGE
X	Shoreline Stabilization	- condition of gabion mats and riprap	PARTS OF THE SHORELINE	

FORM 17

GRATWICK-RIVERSIDE PARK SITE
MONTHLY INSPECTION LOG

PROJECT NAME: Gratwick-Riverside Park Site

LOCATION: North Tonawanda, New York

DATE: 07/25/18 (MM DD YY)

INSPECTOR(S): D TYRAN, MIKE LUCAS

Item	Inspect For	Action Required	Comments
1. **Perimeter Collection System/Off-Site Forcemain**			
☒ Manholes	- cover on securely	NONE	
	- condition of cover		
	- condition of inside of manhole		
	- flow conditions		
☒ Wet Wells	- cover on securely		
	- condition of cover		
	- condition of inside of wet well		
2. **Landfill Cap**			
☒ Vegetated Soil Cover	- erosion	NONE	
	- bare areas		
	- washouts		
	- leachate seeps		
	- length of vegetation		
	- dead/dying vegetation		

FORM 17

Shawn Haldner

GRATWICK-RIVERSIDE PARK SITE
MONTHLY INSPECTION LOG

PROJECT NAME: Gratwick-Riverside Park Site

LOCATION: North Tonawanda, New York

DATE: 07/25/18 (MM DD YY)

INSPECTOR(S): D TYRAN, MIKE LUCAS

	Item	*Inspect For*	*Action Required*	*Comments*
	2. Landfill Cap (continued)			
X	Access Roads	- bare areas, dead/dying veg.	NONE	
X		- erosion		
X		- potholes or puddles		
X		- obstruction		
	3. Wetlands (Area "F")	- dead/dying vegetation		
X		- change in water budget		
X		- general condition of wetlands		
	4. Other Site Systems			
	Perimeter Fence	- integrity of fence	NA	
		- integrity of gates		
		- integrity of locks		
		- placement and condition of signs		

FORM 17

Shawn Haidner

GRATWICK-RIVERSIDE PARK SITE
MONTHLY INSPECTION LOG

PROJECT NAME: Gratwick-Riverside Park Site

LOCATION: North Tonawanda, New York

DATE: 07/25/18 (MM DD YY)

INSPECTOR(S): D TYRAN, MIKE LUCAS

	Item	Inspect For	Action Required	Comments
4.	Other Site Systems (continued)			
X	Drainage Ditches/ Swale Outlets	- sediment build-up		
X		- erosion	LOTS OF DRIFT WOOD ALL ALONG SHORELINE	
X		- condition of erosion protection		
X		- flow obstructions	24" DIA, 30' LONG LOG BLOCKING RIVER NORTH OUTFALL	
X		- dead/ dying vegetation		
X		- cable concrete/ gabion mats and riprap		
X	Culverts	- sediment build-up	NONE	
X		- erosion		
X		- condition of erosion protection		
X		- flow obstructions		
	Gas Vents	- intact / damage		
X	Wells	- locks secure		
X	Shoreline Stabilization	- condition of gabion mats and riprap	GABION MATS EXPOSED ALONG LARGE AREAS OF THE SHORELINE	

FORM 17

Shawn Gardner

GRATWICK-RIVERSIDE PARK SITE
MONTHLY INSPECTION LOG

PROJECT NAME: Gratwick-Riverside Park Site

LOCATION: North Tonawanda, New York

DATE: 08/27/18 (MM DD YY)

INSPECTOR(S): S GARDNER, D TYRAN

	Item	*Inspect For*	*Action Required*	*Comments*
1.	**Perimeter Collection System/Off-Site Forcemain**			
X	Manholes	- cover on securely	NONE	
		- condition of cover		
		- condition of inside of manhole		
		- flow conditions		
X	Wet Wells	- cover on securely		
		- condition of cover		
		- condition of inside of wet well		
2.	**Landfill Cap**			
X	Vegetated Soil Cover	- erosion	NONE	
		- bare areas		
		- washouts		
		- leachate seeps		
		- length of vegetation		
		- dead/dying vegetation		

FORM 17

Shawn Gardner

GRATWICK-RIVERSIDE PARK SITE
MONTHLY INSPECTION LOG

PROJECT NAME: Gratwick-Riverside Park Site

LOCATION: North Tonawanda, New York

DATE: 08/27/18 (MM DD YY)

INSPECTOR(S): S GARDNER, D TYRAN

Item	*Inspect For*	*Action Required*	*Comments*
2. Landfill Cap (continued)			
☒ Access Roads	- bare areas, dead/dying veg.	NONE	
	- erosion		
	- potholes or puddles		
	- obstruction		
3. Wetlands (Area "F")	- dead/dying vegetation		
☒	- change in water budget		
	- general condition of wetlands		
4. Other Site Systems			
☐ Perimeter Fence	- integrity of fence	NA	
☐	- integrity of gates		
☐	- integrity of locks		
☐	- placement and condition of signs		

FORM 17

Sharon Gardner

GRATWICK-RIVERSIDE PARK SITE
MONTHLY INSPECTION LOG

PROJECT NAME: Gratwick-Riverside Park Site

LOCATION: North Tonawanda, New York

DATE: 08/27/18 (MM DD YY)

INSPECTOR(S): S GARDNER, D TYRAN

	Item	*Inspect For*	*Action Required*	*Comments*
4.	Other Site Systems (continued)			
X	Drainage Ditches/ Swale Outlets	- sediment build-up		
		- erosion		
		- condition of erosion protection		
		- flow obstructions	24" DIA 30' LONG LOG BLOCKING RIVER NORTH OUTFALL OBSTRUCTING FLOW	
		- dead/dying vegetation		
		- cable concrete/gabion mats and riprap		
X	Culverts	- sediment build-up	NONE	
		- erosion		
		- condition of erosion protection		
		- flow obstructions		
	Gas Vents	- intact / damage		
X	Wells	- locks secure	GABION MATS EXPOSED ALONG LARGE AREAS OF THE SHORELINE	
	Shoreline Stabilization	- condition of gabion mats and riprap		

FORM 17

Sharon Gardner

GRATWICK-RIVERSIDE PARK SITE
MONTHLY INSPECTION LOG

PROJECT NAME: Gratwick-Riverside Park Site

LOCATION: North Tonawanda, New York

DATE: 01/21/18 (MM DD YY)

INSPECTOR(S): D TYRAN, S GARDNER

	Item	*Inspect For*	*Action Required*	*Comments*
1.	**Perimeter Collection System/Off-Site Forcemain**			
X	Manholes	- cover on securely	NONE	
		- condition of cover		
		- condition of inside of manhole		
		- flow conditions		
X	Wet Wells	- cover on securely		
		- condition of cover		
		- condition of inside of wet well		
2.	Landfill Cap			
X	Vegetated Soil Cover	- erosion	NONE	
		- bare areas		
		- washouts		
		- leachate seeps		
		- length of vegetation		
		- dead/dying vegetation		

FORM 17

Sharon Hardner

GRATWICK-RIVERSIDE PARK SITE
MONTHLY INSPECTION LOG

PROJECT NAME: Gratwick-Riverside Park Site

LOCATION: North Tonawanda, New York

DATE: 09/21/18 (MM DD YY)

INSPECTOR(S): D TYRAN, S GARDNER

	Item	*Inspect For*	*Action Required*	*Comments*
2.	Landfill Cap (continued)			
X	Access Roads	- bare areas, dead/dying veg.	NONE	
X		- erosion		
X		- potholes or puddles		
X		- obstruction		
3.	Wetlands (Area "F")	- dead/dying vegetation		
X		- change in water budget		
X		- general condition of wetlands		
4.	Other Site Systems			
	Perimeter Fence	- integrity of fence	NA	
		- integrity of gates		
		- integrity of locks		
		- placement and condition of signs		

FORM 17

Sharon Haldun

GRATWICK-RIVERSIDE PARK SITE
MONTHLY INSPECTION LOG

PROJECT NAME: Gratwick-Riverside Park Site

LOCATION: North Tonawanda, New York

DATE: 09/21/18 (MM DD YY)

INSPECTOR(S): D TYRAN, S GARDNER

	Item	*Inspect For*	*Action Required*	*Comments*
4.	Other Site Systems (continued)			
X	Drainage Ditches/ Swale Outlets	- sediment build-up		
X		- erosion		
X		- condition of erosion protection		
X		- flow obstructions	24" DIA 30' LONG LOG BLOCKING RIVER NORTH OUTFALL, OBSTRUCTING FLOW	
X		- dead/dying vegetation		
X		- cable concrete/gabion mats and riprap		
X	Culverts	- sediment build-up	NONE	
X		- erosion		
X		- condition of erosion protection		
X		- flow obstructions		
	Gas Vents	- intact / damage		
X	Wells	- locks secure		
X	Shoreline Stabilization	- condition of gabion mats and riprap	GABION MATS EXPOSED ALONG LARGE AREAS OF THE SHORELINE	

FORM 17

Sharon Gardner

GRATWICK-RIVERSIDE PARK SITE
MONTHLY INSPECTION LOG

PROJECT NAME: Gratwick-Riverside Park Site

LOCATION: North Tonawanda, New York

DATE: 10/31/18 (MM DD YY)

INSPECTOR(S): D TYRAN, S GARDNER

Item	Inspect For	Action Required	Comments
1. **Perimeter Collection System/Off-Site Forcemain**			
Manholes	- cover on securely	NONE	
	- condition of cover		
	- condition of inside of manhole		
	- flow conditions		
Wet Wells	- cover on securely		
	- condition of cover		
	- condition of inside of wet well		
2. **Landfill Cap**			
Vegetated Soil Cover	- erosion	NONE	
	- bare areas		
	- washouts		
	- leachate seeps		
	- length of vegetation		
	- dead/dying vegetation		

FORM 17

Sharon Gardner

GRATWICK-RIVERSIDE PARK SITE
MONTHLY INSPECTION LOG

PROJECT NAME: Gratwick-Riverside Park Site

LOCATION: North Tonawanda, New York

DATE: 10311 18 (MM DD YY)

INSPECTOR(S): D TYRAN, S GARDNER

Item	Inspect For	Action Required	Comments
2. Landfill Cap (continued)			
X Access Roads	- bare areas, dead/dying veg.	NONE	
X	- erosion		
X	- potholes or puddles		
X	- obstruction		
3. Wetlands (Area "F")	- dead/dying vegetation		
X	- change in water budget		
X	- general condition of wetlands		
4. Other Site Systems			
☐ Perimeter Fence	- integrity of fence	NA	
☐	- integrity of gates		
☐	- integrity of locks		
☐	- placement and condition of signs		

FORM 17

Shayne Gardner

GRATWICK-RIVERSIDE PARK SITE
MONTHLY INSPECTION LOG

PROJECT NAME: Gratwick-Riverside Park Site

LOCATION: North Tonawanda, New York

DATE: 1 1 0 3 1 1 8 (MM DD YY)

INSPECTOR(S): D TYRAN, S GARDNER

	Item	*Inspect For*	*Action Required*	*Comments*
4.	Other Site Systems (continued)			
X	Drainage Ditches/ Swale Outlets	- sediment build-up		
		- erosion		
		- condition of erosion protection	24" DIA 30' LONG TREE BLOCKING RIVER NORTH OUTFALL OBSTRUCTING FLOW	
		- flow obstructions		
		- dead/ dying vegetation		
		- cable concrete/ gabion mats and riprap		
X	Culverts	- sediment build-up	NONE	
		- erosion		
		- condition of erosion protection		
		- flow obstructions		
X	Gas Vents	- intact / damage	GABION MATS EXPOSED ALONG LARGE AREAS OF THE SHORELINE	
	Wells	- locks secure		
	Shoreline Stabilization	- condition of gabion mats and riprap	DRIFT WOOD ALL ALONG SHORE LINE	

FORM 17

Shawn Gardner

GRATWICK PARK

DAILY LOG

11/21/18 HORIBA D-51 PH METER #NF07184 CALABRATION USING PH 4.00 AUTO CAL LOT# 18085808 EXP. 3/19, PH 7.00 CAL SOLUTION LOT# 1811086092 EXP. 3/20, READING AFTER CAL.
READING 4.00 - 4.01
READING 7.00 - 7.00
0818 ON SITE SG/DJT WEATHER - CLOUDY, SNOWING 32°F WINDY WSW 20-30MPH
GET POLICE FOR MH'S IN MIDDLE OF RIVER ROAD
0843 START MONTHLY W/LS, PH READINGS ONSITE
1033 W/L'S, PH READINGS COMPLETE
1035 OFFSITE

11/21/18

7987

Shawn Maedner

GRATWICK-RIVERSIDE PARK SITE
MONTHLY INSPECTION LOG

PROJECT NAME: Gratwick-Riverside Park Site

LOCATION: North Tonawanda, New York

DATE: 12/20/18 (MM DD YY)

INSPECTOR(S): D TYRAN, S GARDINER

Item	Inspect For	Action Required	Comments
2. Landfill Cap (continued)			
☒ Access Roads	- bare areas, dead/dying veg.	NONE	
☒	- erosion		
☒	- potholes or puddles		
☒	- obstruction		
3. Wetlands (Area "F")	- dead/dying vegetation		
☒	- change in water budget		
☒	- general condition of wetlands		
4. Other Site Systems			
☐ Perimeter Fence	- integrity of fence	NA	
☐	- integrity of gates		
☐	- integrity of locks		
☐	- placement and condition of signs		

FORM 17

Shawn Gardiner

GRATWICK-RIVERSIDE PARK SITE
MONTHLY INSPECTION LOG

PROJECT NAME: Gratwick-Riverside Park Site

LOCATION: North Tonawanda, New York

DATE: 12/20/18 (MM DD YY)

INSPECTOR(S): D TYRAN, S GARDNER

Item	Inspect For	Action Required	Comments
1.	**Perimeter Collection System/Off-Site Forcemain**		
☒	Manholes - cover on securely	NONE	
☒	Manholes - condition of cover	NONE	
☒	Manholes - condition of inside of manhole	NONE	
☒	Manholes - flow conditions	NONE	
☒	Wet Wells - cover on securely	CHAMBER PUMP 3 (MH 15) NOT RUNNING W/L VERY HIGH	
☒	Wet Wells - condition of cover	CHAMBER PUMP 3 (MH 15) NOT RUNNING W/L VERY HIGH	
☒	Wet Wells - condition of inside of wet well	CHAMBER PUMP 3 (MH 15) NOT RUNNING W/L VERY HIGH	
2.	**Landfill Cap**		
☒	Vegetated Soil Cover - erosion	NONE	
☒	Vegetated Soil Cover - bare areas	NONE	
☒	Vegetated Soil Cover - washouts	NONE	
☒	Vegetated Soil Cover - leachate seeps	NONE	
☒	Vegetated Soil Cover - length of vegetation	NONE	
☒	Vegetated Soil Cover - dead/dying vegetation	NONE	

FORM 17

Sharon Gardner

GRATWICK-RIVERSIDE PARK SITE
MONTHLY INSPECTION LOG

PROJECT NAME: Gratwick-Riverside Park Site

LOCATION: North Tonawanda, New York

DATE: 12/20/18 (MM DD YY)

INSPECTOR(S): D TYRAN, S GARDNER

	Item	*Inspect For*	*Action Required*	*Comments*
4.	Other Site Systems (continued)			
☒	Drainage Ditches/ Swale Outlets	- sediment build-up		
		- erosion		
		- condition of erosion protection	24" DIA, 30' LONG TREE BLOCKING RIVER NORTH OUTFALL. OBSTRUCTING FLOW	
		- flow obstructions		
		- dead/dying vegetation		
		- cable concrete/gabion mats and riprap		
☒	Culverts	- sediment build-up		
		- erosion		
		- condition of erosion protection		
		- flow obstructions		
☐	Gas Vents	- intact / damage	GABION MATS EXPOSED ALONG LARGE AREAS OF THE SHORELINE	
☒	Wells	- locks secure		
☒	Shoreline Stabilization	- condition of gabion mats and riprap	DRIFT WOOD ALL ALONG SHORELINE	

FORM 17

Shayne Gardner

7987
Gratwick

DAILY LOG

1/28/19 Calibrate Horiba pH meter control # NF08272 with pH 7.00 buffer Lot # 18168692 expires 3/23/2020 and with pH 4.00 buffer Lot # 18262406 expires 9/24/2019

	Before	After
pH 7.00	7.02	7.01
pH 4.00	4.29	4.00

0840 on-site mostly sunny 8°F winds WNE 5-8 mph
call NT police for traffic control on River Rd
grab 3 MH locations in street
0910 on-site begin readings on MH's & monitoring wells
Due to extreme cold the level rod sections would not lock into place making it impossible to check the depth of sediment in the select MH's.
River North is partially blocked by a 24"~~18"~~ inch diameter piece of driftwood. Log is approx 30' Long
complete readings
1155 off-site

DSP

David J Turan

GRATWICK-RIVERSIDE PARK SITE
MONTHLY INSPECTION LOG

PROJECT NAME: Gratwick-Riverside Park Site

LOCATION: North Tonawanda, New York

DATE: 01/28/19 (MM DD YY)

INSPECTOR(S): D. Tyran M. Lucas

	Item	Inspect For	Action Required	Comments
1.	**Perimeter Collection System/Off-Site Forcemain**			
X	Manholes	- cover on securely	None	
X		- condition of cover		
X		- condition of inside of manhole		
X		- flow conditions		
X	Wet Wells	- cover on securely		
X		- condition of cover		
X		- condition of inside of wet well		
2.	**Landfill Cap**			
X	Vegetated Soil Cover	- erosion	None	
X		- bare areas		
X		- washouts		
X		- leachate seeps		
X		- length of vegetation		
X		- dead/dying vegetation		

FORM 17

CRA 7987 (24)

Dan J Tyran

GRATWICK-RIVERSIDE PARK SITE
MONTHLY INSPECTION LOG

PROJECT NAME: Gratwick-Riverside Park Site

LOCATION: North Tonawanda, New York

DATE: 01/28/19 (MM DD YY)

INSPECTOR(S): D. Tyran M. Lucas

	Item	*Inspect For*	*Action Required*	*Comments*
2.	Landfill Cap (continued)			
X	Access Roads	- bare areas, dead/dying veg.	None	
X		- erosion		
X		- potholes or puddles		
X		- obstruction		
3.	Wetlands (Area "F")			
X		- dead/dying vegetation		
X		- change in water budget		
X		- general condition of wetlands		
4.	Other Site Systems			
	Perimeter Fence	- integrity of fence	NA	
		- integrity of gates		
		- integrity of locks		
		- placement and condition of signs		

FORM 17

CRA 7987 (24)

David J. Tyran

GRATWICK-RIVERSIDE PARK SITE
MONTHLY INSPECTION LOG

PROJECT NAME: Gratwick-Riverside Park Site

LOCATION: North Tonawanda, New York

DATE: 01/28/19 (MM DD YY)

INSPECTOR(S): D. Tyran M. Lucas

	Item	*Inspect For*	*Action Required*	*Comments*
4.	Other Site Systems (continued)			
X	Drainage Ditches/ Swale Outlets	- sediment build-up		
X		- erosion		
X		- condition of erosion protection		
X		- flow obstructions	24" Ø 30' Long log blocking River North Outfall obstructing flow	
X		- dead/dying vegetation		
X		- cable concrete/gabion mats and riprap		
X	Culverts	- sediment build-up		
X		- erosion		
X		- condition of erosion protection		
X		- flow obstructions		
	Gas Vents	- intact / damage		
X	Wells	- locks secure		
X	Shoreline Stabilization	- condition of gabion mats and riprap	Gabion mats exposed at various points along the shoreline	

FORM 17

CRA 7987 (24)

David J Tyran

GRATWICK-RIVERSIDE PARK SITE
MONTHLY INSPECTION LOG

PROJECT NAME: Gratwick-Riverside Park Site

LOCATION: North Tonawanda, New York

DATE: 01/21/19 (MM DD YY)

INSPECTOR(S): D TYRAN, S GARDNER

Item	Inspect For	Action Required	Comments
1. **Perimeter Collection System/Off-Site Forcemain**			
Manholes	- cover on securely	NONE	
	- condition of cover		
	- condition of inside of manhole		
	- flow conditions		
Wet Wells	- cover on securely	PUMP CHAMBER 3 (MH 15) NOT RUNNING	W/L HIGH, PUMP
	- condition of cover		
	- condition of inside of wet well		
2. Landfill Cap			
Vegetated Soil Cover	- erosion	NONE	SNOW COVERED DORMANT FOR WINTER
	- bare areas		
	- washouts		
	- leachate seeps		
	- length of vegetation		
	- dead/dying vegetation		

FORM 17

Shawn Gardner

GRATWICK-RIVERSIDE PARK SITE
MONTHLY INSPECTION LOG

PROJECT NAME: Gratwick-Riverside Park Site

LOCATION: North Tonawanda, New York

DATE: 02/28/19 (MM DD YY)

INSPECTOR(S): D TYRAN, S GARDNER

Item	Inspect For	Action Required	Comments
2. Landfill Cap (continued)			
[X] Access Roads	- bare areas, dead/dying veg.	NONE	COVERED UNDER SNOW
	- erosion		
	- potholes or puddles		
	- obstruction		
3. Wetlands (Area "F")	- dead/dying vegetation		
[X]	- change in water budget		
	- general condition of wetlands		
4. Other Site Systems			
[ ] Perimeter Fence	- integrity of fence	NA	
	- integrity of gates		
	- integrity of locks		
	- placement and condition of signs		

FORM 17

Shawn Gardner

GRATWICK-RIVERSIDE PARK SITE
MONTHLY INSPECTION LOG

PROJECT NAME: Gratwick-Riverside Park Site

LOCATION: North Tonawanda, New York

DATE: 02/26/19 (MM DD YY)

INSPECTOR(S): D TYRAN, S. GARDNER

	Item	*Inspect For*	*Action Required*	*Comments*
4.	Other Site Systems (continued)			
☒	Drainage Ditches/ Swale Outlets	- sediment build-up	NONE	
☒		- erosion		
☒		- condition of erosion protection		
☒		- flow obstructions		
☒		- dead/ dying vegetation		SNOW COVERED
☒		- cable concrete/ gabion mats and riprap		ICY CONDITIONS
☒	Culverts	- sediment build-up		
☒		- erosion		
☒		- condition of erosion protection		
☒		- flow obstructions		
☐	Gas Vents	- intact / damage		
☒	Wells	- locks secure		
☒	Shoreline Stabilization	- condition of gabion mats and riprap	GABION MATS COVERED UNDER SNOW AND ICE	

FORM 17

Shawn Gardner

GRATWICK-RIVERSIDE PARK SITE
MONTHLY INSPECTION LOG

PROJECT NAME: Gratwick-Riverside Park Site

LOCATION: North Tonawanda, New York

DATE: 10|3|2|6|1|9| (MM DD YY)

INSPECTOR(S): D TYRAN, S GARDNER

Item	Inspect For	Action Required	Comments
1.	**Perimeter Collection System/Off-Site Forcemain**		
☒	Manholes - cover on securely	NONE	
	- condition of cover		
	- condition of inside of manhole		
	- flow conditions		
☒	Wet Wells - cover on securely	PUMP CHAMBER 3 (MH 15) NOT RUNNING	W/L HIGH PUMP
	- condition of cover		
	- condition of inside of wet well		
2.	**Landfill Cap**		
☒	Vegetated Soil Cover - erosion	NONE	
	- bare areas		
	- washouts		
	- leachate seeps		
	- length of vegetation		DORMANT FOR WINTER
	- dead/dying vegetation		

FORM 17

Shayne Gardner

CRA 7987 (24)

GRATWICK-RIVERSIDE PARK SITE
MONTHLY INSPECTION LOG

PROJECT NAME: Gratwick-Riverside Park Site

LOCATION: North Tonawanda, New York

DATE: 03/26/19 (MM DD YY)

INSPECTOR(S): D TYRAN, S GARDNER

Item	Inspect For	Action Required	Comments
2. Landfill Cap (continued)			
[X] Access Roads	- bare areas, dead/dying veg.	NONE	DORMANT FOR WINTER
[X]	- erosion		
[X]	- potholes or puddles		
[X]	- obstruction		
3. Wetlands (Area "F")	- dead/dying vegetation		
[X]	- change in water budget		
[X]	- general condition of wetlands		
4. Other Site Systems			
[ ] Perimeter Fence	- integrity of fence	NA	
[ ]	- integrity of gates		
[ ]	- integrity of locks		
[ ]	- placement and condition of signs		

FORM 17

CRA 7987 (24)

GRATWICK-RIVERSIDE PARK SITE
MONTHLY INSPECTION LOG

PROJECT NAME: Gratwick-Riverside Park Site

LOCATION: North Tonawanda, New York

DATE: 03/26/19 (MM DD YY)

INSPECTOR(S): D TYRAN, S GARDNER

	Item	*Inspect For*	*Action Required*	*Comments*
4.	Other Site Systems (continued)			
☒	Drainage Ditches/ Swale Outlets	- sediment build-up	NONE	
☒		- erosion		
☒		- condition of erosion protection		
☒		- flow obstructions		
☒		- dead/dying vegetation		
☒		- cable concrete/gabion mats and riprap		
☒	Culverts	- sediment build-up		
☒		- erosion		
☒		- condition of erosion protection		
☒		- flow obstructions		
☐	Gas Vents	- intact / damage		
☒	Wells	- locks secure		
☒	Shoreline Stabilization	- condition of gabion mats and riprap	GABION MATS EXPOSED ALL ALONG SHORELINE	

FORM 17

Shayne Gardner

GRATWICK-RIVERSIDE PARK SITE
MONTHLY INSPECTION LOG

PROJECT NAME: Gratwick-Riverside Park Site

LOCATION: North Tonawanda, New York

DATE: 04/26/19 (MM DD YY)

INSPECTOR(S): D TYRAN, S GARDNER

Item	Inspect For	Action Required	Comments
1. Perimeter Collection System/Off-Site Forcemain			
Manholes	- cover on securely	NONE	
	- condition of cover		
	- condition of inside of manhole		
	- flow conditions		
Wet Wells	- cover on securely	PUMP CHAMBER 3 (MH 15) W/L VERY HIGH PUMP NOT RUNNING	
	- condition of cover		
	- condition of inside of wet well		
2. Landfill Cap			
Vegetated Soil Cover	- erosion	NONE	
	- bare areas		
	- washouts		
	- leachate seeps		
	- length of vegetation		
	- dead/dying vegetation		

FORM 17

Shawn Gardner

GRATWICK-RIVERSIDE PARK SITE
MONTHLY INSPECTION LOG

PROJECT NAME: Gratwick-Riverside Park Site

LOCATION: North Tonawanda, New York

DATE: 04/26/19 (MM DD YY)

INSPECTOR(S): D TYRAN, S GARDNER

Item	*Inspect For*	*Action Required*	*Comments*
2. Landfill Cap (continued)			
☒ Access Roads	- bare areas, dead/dying veg.	NONE	
	- erosion		
	- potholes or puddles		
	- obstruction		
3. Wetlands (Area "F")	- dead/dying vegetation		
☒	- change in water budget		
	- general condition of wetlands		
4. Other Site Systems			
☐ Perimeter Fence	- integrity of fence	NA	
	- integrity of gates		
	- integrity of locks		
	- placement and condition of signs		

FORM 17

Sharon Gardner

GRATWICK-RIVERSIDE PARK SITE
MONTHLY INSPECTION LOG

PROJECT NAME: Gratwick-Riverside Park Site

LOCATION: North Tonawanda, New York

DATE: 04/26/19 (MM DD YY)

INSPECTOR(S): D TYRAN, S GARDNER

	Item	Inspect For	Action Required	Comments
4.	Other Site Systems (continued)			
X	Drainage Ditches/ Swale Outlets	- sediment build-up	NONE	
X		- erosion		
X		- condition of erosion protection		
X		- flow obstructions		
X		- dead/dying vegetation		
X		- cable concrete/gabion mats and riprap		
X	Culverts	- sediment build-up		
X		- erosion		
X		- condition of erosion protection		
X		- flow obstructions		
	Gas Vents	- intact / damage		
X	Wells	- locks secure		
X	Shoreline Stabilization	- condition of gabion mats and riprap	GABION MATS EXPOSED ALL ALONG SHORELINE, LOTS OF DRIFTWOOD	

FORM 17

Shawn O Gardner

GRATWICK-RIVERSIDE PARK SITE
MONTHLY INSPECTION LOG

PROJECT NAME: Gratwick-Riverside Park Site

LOCATION: North Tonawanda, New York

DATE: 05/29/19 (MM DD YY)

INSPECTOR(S): D TYRAN, S GARDNER

Item	Inspect For	Action Required	Comments
1.	**Perimeter Collection System/Off-Site Forcemain**		
☒	Manholes - cover on securely	NONE	
	- condition of cover		
	- condition of inside of manhole		
	- flow conditions		
☒	Wet Wells - cover on securely	PUMP CHAMBER 3 (MH 15) PUMP NOT RUNNING	W/L VERY HIGH
	- condition of cover		
	- condition of inside of wet well		
2.	**Landfill Cap**		
☒	Vegetated Soil Cover - erosion	NONE	
	- bare areas		
	- washouts		
	- leachate seeps		
	- length of vegetation		
	- dead/dying vegetation		

FORM 17

Steve Gardner

GRATWICK-RIVERSIDE PARK SITE
MONTHLY INSPECTION LOG

PROJECT NAME: Gratwick-Riverside Park Site

LOCATION: North Tonawanda, New York

DATE: 05/29/19 (MM DD YY)

INSPECTOR(S): D TYRAN, S GARDNER

	Item	*Inspect For*	*Action Required*	*Comments*
2.	Landfill Cap (continued)			
X	Access Roads	- bare areas, dead/dying veg.	NONE	
X		- erosion		
X		- potholes or puddles		
X		- obstruction		
	3. Wetlands (Area "F")	- dead/dying vegetation		
X		- change in water budget		
X		- general condition of wetlands		
	4. Other Site Systems			
	Perimeter Fence	- integrity of fence	NA	
		- integrity of gates		
		- integrity of locks		
		- placement and condition of signs		

FORM 17

Shayne Gardner

GRATWICK-RIVERSIDE PARK SITE
MONTHLY INSPECTION LOG

PROJECT NAME: Gratwick-Riverside Park Site

LOCATION: North Tonawanda, New York

DATE: 05/29/19 (MM DD YY)

INSPECTOR(S): D TYRAN, S GARDNER

	Item	*Inspect For*	*Action Required*	*Comments*
4.	Other Site Systems (continued)			
☒	Drainage Ditches/ Swale Outlets	- sediment build-up	NONE	
		- erosion		
		- condition of erosion protection		
		- flow obstructions		
		- dead/dying vegetation		
		- cable concrete/gabion mats and riprap		
☒	Culverts	- sediment build-up		
		- erosion		
		- condition of erosion protection		
		- flow obstructions		
☐	Gas Vents	- intact / damage	GABION MATS EXPOSED ALL ALONG SHORELINE	
☒	Wells	- locks secure	DRIFTWOOD BUILT UP ALL ALONG SHORELINE	
☒	Shoreline Stabilization	- condition of gabion mats and riprap		

FORM 17

Shawn Gardner

Appendix C
QA/QC Reviews and Data Usability Summary

Memorandum

May 1, 2019

To:	John Pentilchuk	Ref. No.:	007987
From:	Susan Scrocchi/adh/30	Tel:	716-205-1984

Subject: **Analytical Results and Reduced Validation**
Site Effluent
Gratwick-Riverside Park
North Tonawanda, New York
October-November 2018

1. Introduction

This document details a reduced validation of analytical results for one effluent sample collected in support of the semiannual monitoring program at the North Tonawanda Waste Water Treatment Plant during October and November 2018. Samples were submitted to TestAmerica Laboratories, Inc. located in Amherst, New York. A sample collection and analysis summary is presented in Table 1. The validated analytical results are summarized in Table 2. A summary of the analytical methodology is presented in Table 3.

Standard GHD report deliverables were submitted by the laboratory. The final results and supporting quality assurance/quality control (QA/QC) data were assessed. Evaluation of the data was based on information obtained from the chain of custody forms, finished report forms, method blank data, and recovery data from surrogate spikes/laboratory control samples (LCS)/matrix spikes (MS).

The QA/QC criteria by which these data have been assessed are outlined in the analytical methods referenced in Table 3 and applicable guidance from the documents entitled:

i) "National Functional Guidelines for Superfund Organic Methods Data Review", United States Environmental Protection Agency (USEPA) 540-R-2016-002, September 2016

ii) "National Functional Guidelines for Inorganic Superfund Data Review", USEPA 540-R-2016-001, September 2016

These items will subsequently be referred to as the "Guidelines" in this Memorandum.

2. Sample Holding Time and Preservation

The sample holding time criteria for the analyses are summarized in Table 3. Sample chain of custody documents and analytical reports were used to determine sample holding times. All samples were prepared and analyzed within the required holding times.

All samples were properly preserved, delivered on ice, and stored by the laboratory at the required temperature (0-6°C).

3. Laboratory Method Blank Analyses

Method blanks are prepared from a purified matrix and analyzed with investigative samples to determine the existence and magnitude of sample contamination introduced during the analytical procedures.

For this study, laboratory method blanks were analyzed at a minimum frequency of 1 per 20 investigative samples and/or 1 per analytical batch.

All method blank results were non-detect, indicating that laboratory contamination was not a factor for this investigation.

4. Surrogate Spike Recoveries - Organic Analyses

In accordance with the methods employed, all samples, blanks, and QC samples analyzed for organics are spiked with surrogate compounds prior to sample extraction and/or analysis. Surrogate recoveries provide a means to evaluate the effects of laboratory performance on individual sample matrices.

All samples submitted for volatile and semi-volatile determinations were spiked with the appropriate number of surrogate compounds prior to sample extraction and/or analysis.

Each individual surrogate compound is expected to meet the laboratory control limits with the exception of semi-volatile organic compound (SVOC) analyses. According to the "Guidelines" for SVOC analyses, up to one outlying surrogate in the base/neutral or acid fractions is acceptable as long as the recovery is at least 10 percent.

Surrogate recoveries were assessed against laboratory control limits. Low surrogate recoveries were observed. Associated sample results were qualified as estimated (see Table 4).

5. Laboratory Control Sample Analyses

LCS are prepared and analyzed as samples to assess the analytical efficiencies of the methods employed, independent of sample matrix effects. For this study, LCS were analyzed at a minimum frequency of 1 per 20 investigative samples and/or 1 per analytical batch.

Organic Analyses

The LCS contained all compounds of interest. All LCS recoveries were within the laboratory control limits, demonstrating acceptable analytical accuracy.

Inorganic Analyses

The LCS contained all analytes of interest. LCS recoveries were assessed per the "Guidelines". All LCS recoveries were within the control limits, demonstrating acceptable analytical accuracy.

6. Matrix Spike Analyses

To evaluate the effects of sample matrices on the distillation process, measurement procedures, and accuracy of a particular analysis, samples are spiked with a known concentration of the analyte of concern and analyzed as MS samples.

An MS was analyzed for metals, sulfide, and alkalinity. All recoveries were acceptable with the exception of a slightly low alkalinity recovery. The associated sample result was qualified as estimated (see Table 5).

7. Field QA/QC Samples

The field QA/QC consisted of one trip blank sample.

Trip Blank Sample Analysis

To evaluate contamination from sample collection, transportation, storage, and analytical activities, one trip blank was submitted to the laboratory for volatile organic compound (VOC) analysis. All results were non-detect for the compounds of interest.

8. Analyte Reporting

The laboratory reported detected results down to the laboratory's method detection limit (MDL) for each analyte. Positive analyte detections less than the reporting limit (RL) but greater than the MDL were qualified as estimated (J) in Table 2 unless qualified otherwise in this memorandum. Non-detect results were presented as non-detect at the RL in Table 2.

9. Conclusion

Based on the assessment detailed in the foregoing, the data summarized in Table 2 are acceptable with the qualifications mentioned.

Table 1

Sample Collection and Analysis Summary
Site Effluent
Gratwick-Riverside Park
North Tonawanda, New York
October-November 2018

					Analysis/Parameters										
Sample Identification	**Location**	**Matrix**	**Collection Date (mm/dd/yyyy)**	**Collection Time (hr:min)**	**Volatile Organic Compounds**	**Semi-volatile Organic Compounds**	**Metals**	**Cyanide**	**Sulfate, Chloride**	**Nitrate**	**Alkalinity**	**Hardness**	**Total Dissolved Solids**	**Sulfide**	**Comments**
NTWWTP - GRP	Effluent	Water	11/29/2018	10:35				X							
NTWWTP - GRP	Effluent	Water	10/04/2018	08:20	X	X	X		X	X	X	X	X	X	
TRIP BLANK	-	Water	10/04/2018	-	X										Trip Blank

Notes:

- - Not applicable

Table 2

Analytical Results Summary
Site Effluent
Gratwick-Riverside Park
North Tonawanda, New York
October-November 2018

	Location ID:	**Effluent**
	Sample Name:	**NTWWTP - GRP**
	Sample Date:	**10/04/2018**
Parameters	**Unit**	
Volatile Organic Compounds		
1,1,1-Trichloroethane	µg/L	5.0 U
1,1-Dichloroethane	µg/L	5.0 U
1,2-Dichloroethane	µg/L	5.0 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/L	25 U
Acetone	µg/L	25 U
Benzene	µg/L	5.0 U
Chlorobenzene	µg/L	5.0 U
Ethylbenzene	µg/L	5.0 U
Methylene chloride	µg/L	5.0 U
Styrene	µg/L	5.0 U
Tetrachloroethene	µg/L	5.0 U
Toluene	µg/L	5.0 U
trans-1,2-Dichloroethene	µg/L	5.0 U
Trichloroethene	µg/L	5.0 U
Vinyl chloride	µg/L	5.0 U
Xylenes (total)	µg/L	10 U
Semi-volatile Organic Compounds		
1,2-Dichlorobenzene	µg/L	4.8 U
1,4-Dichlorobenzene	µg/L	5.4 U
2,4-Dimethylphenol	µg/L	1.3 UJ
2-Methylphenol	µg/L	0.77 UJ
4-Methylphenol	µg/L	0.75 UJ
Di-n-octyl phthalate (DnOP)	µg/L	4.6 U
Naphthalene	µg/L	0.82 U
Phenol	µg/L	0.33 UJ
Metals		
Aluminum	mg/L	0.20 U
Antimony	mg/L	0.020 U
Arsenic	mg/L	0.015 U
Barium	mg/L	0.044
Beryllium	mg/L	0.0020 U
Cadmium	mg/L	0.0020 U
Chromium	mg/L	0.0040 U
Copper	mg/L	0.010 U
Iron	mg/L	0.097
Lead	mg/L	0.010 U
Magnesium	mg/L	3.2
Manganese	mg/L	0.0070
Mercury	mg/L	0.00020 U
Nickel	mg/L	0.010 U
Selenium	mg/L	0.025 U

Table 2

Analytical Results Summary
Site Effluent
Gratwick-Riverside Park
North Tonawanda, New York
October-November 2018

	Location ID:	**Effluent**
	Sample Name:	**NTWWTP - GRP**
	Sample Date:	**10/04/2018**
Parameters	**Unit**	
Metals-Continued		
Silver	mg/L	0.0060 U
Sodium	mg/L	123
Zinc	mg/L	0.010 U
General Chemistry		
Alkalinity, bicarbonate	mg/L	37.9
Alkalinity, carbonate	mg/L	37.9
Alkalinity, total (as CaCO3)	mg/L	44.6
Ammonia-N	mg/L	0.56
Biochemical oxygen demand (BOD)	mg/L	6.04
Chemical oxygen demand (COD)	mg/L	79
Chloride	mg/L	195
Cyanide (total)	mg/L	0.010 U
Hardness	mg/L	188
Nitrate (as N)	mg/L	0.050 U
Oil and grease	mg/L	0.10 U
Phenolics (total)	mg/L	0.100 U
Phosphate phosphorus	mg/L	0.10 U
Sulfate	mg/L	157
Sulfide	mg/L	1.0 U
Total dissolved solids (TDS)	mg/L	605
Total kjeldahl nitrogen (TKN)	mg/L	1.68
Total organic carbon (TOC)	mg/L	8.37
Total suspended solids (TSS)	mg/L	4.0 U
pH (water)	s.u.	8.82

Notes:

U - Not detected at the associated reporting limit
UJ - Not detected; associated reporting limit is estimated

Table 3

Analytical Methods
Site Effluent
Gratwick-Riverside Park
North Tonawanda, New York
October-November 2018

Parameter	Method	Matrix	Holding Time	
			Collection to Extraction (Days)	Collection or Extraction to Analysis (Days)
Volatile Organic Compounds	EPA 624[1]	Water	-	14
Semi-volatile Organic Compounds	EPA 625[1]	Water	7	40
Target Analyte List Metals	EPA 200.7[1]	Water	-	180
Mercury	EPA 245.1[1]	Water	-	28
Chloride/Sulfate	EPA 300.0[1]	Water	-	28
Cyanide	EPA 335.4[1]	Water	-	14
Nitrate	EPA 353.2[1]	Water	-	48 hours
Hardness	SM 2340[2]	Water	-	180
Alkalinity	SM2320B[2]	Water	-	14
Total Dissolved Solids	SM2540C[2]	Water	-	7
Sulfide	SM4500-S2-F[2]	Water	-	7

Notes:

- - Not applicable

Method References:

[1] - "Standard Methods for the Examination of Water and Wastewater", 18th Edition, 1992, with subsequent revisions

[2] - "Methods for Chemical Analysis of Water and Wastes", USEPA-600/4-79-020, March 1983, with subsequent revisions

USEPA - United States Environmental Protection Agency

Table 4

Qualified Sample Data Due to Outlying of Surrogate Recoveries
Site Effluent
Gratwick-Riverside Park
North Tonawanda, New York
October-November 2018

Parameter	Sample ID	Surrogate	Surrogate % Recovery	Control Limits % Recovery	Analyte	Qualified Result	Units
SVOCs	NTWWTP - GRP	2,4,6-Tribromophenol	47	52 - 151	2,4-Dimethylphenol	1.4 UJ	µg/L
		2-Fluorophenol	13	17 - 120	2-Methylphenol	0.81 UJ	µg/L
					4-Methylphenol	0.79 UJ	µg/L

Notes:

UJ - Not detected; associated reporting limit is estimated
SVOCs - Semi-volatile Organic Compounds

Table 5

Qualified Sample Data Due to Outlying Matrix Spike Recoveries
Site Effluent
Gratwick-Riverside Park
North Tonawanda, New York
October-November 2018

Parameter	Spiked Sample ID	Analyte	MS % Recovery	Control Limits % Recovery	Associated Sample IDs	Qualified Result	Units
General Chemistry	NTWWTP - GRP	Alkalinity, total (as CaCO3)	59	60-140	NTWWTP - GRP	44.6 J	mg/L

Notes:

MS - Matrix Spike
J - Estimated concentration

Memorandum

July 15, 2019

To:	John Pentilchuk	Ref. No.:	007987
From:	Susan Scrocchi/adh/31	Tel:	716-205-1984

Subject: **Analytical Results and Reduced Validation**
Site Effluent
Gratwick-Riverside Park
North Tonawanda, New York
April 2019

1. Introduction

This document details a reduced validation of analytical results for one effluent sample collected in support of the semiannual monitoring program at the North Tonawanda Waste Water Treatment Plant during April 2019. Samples were submitted to TestAmerica Laboratories, Inc. located in Amherst, New York. A sample collection and analysis summary is presented in Table 1. The validated analytical results are summarized in Table 2. A summary of the analytical methodology is presented in Table 3. Some analytical parameters were performed at the Waste Water Treatment Plant lab. The results are presented in Table 2. No assessment of these parameters was performed.

Standard GHD report deliverables were submitted by the laboratory. The final results and supporting quality assurance/quality control (QA/QC) data were assessed. Evaluation of the data was based on information obtained from the chain of custody forms, finished report forms, method blank data, and recovery data from surrogate spikes/laboratory control samples (LCS)/matrix spikes (MS).

The QA/QC criteria by which these data have been assessed are outlined in the analytical methods referenced in Table 3 and applicable guidance from the documents entitled:

i) "National Functional Guidelines for Superfund Organic Methods Data Review", United States Environmental Protection Agency (USEPA) 540-R-2016-002, September 2016

ii) "National Functional Guidelines for Inorganic Superfund Data Review", USEPA 540-R-2016-001, September 2016

These items will subsequently be referred to as the "Guidelines" in this Memorandum.

2. Sample Holding Time and Preservation

The sample holding time criteria for the analyses are summarized in Table 3. Sample chain of custody documents and analytical reports were used to determine sample holding times. All samples were prepared and analyzed within the required holding times.

All samples were properly preserved, delivered on ice, and stored by the laboratory at the required temperature (0-6°C).

3. Laboratory Method Blank Analyses

Method blanks are prepared from a purified matrix and analyzed with investigative samples to determine the existence and magnitude of sample contamination introduced during the analytical procedures.

For this study, laboratory method blanks were analyzed at a minimum frequency of 1 per 20 investigative samples and/or 1 per analytical batch.

All method blank results were non-detect, indicating that laboratory contamination was not a factor for this investigation.

4. Surrogate Spike Recoveries - Organic Analyses

In accordance with the methods employed, all samples, blanks, and QC samples analyzed for organics are spiked with surrogate compounds prior to sample extraction and/or analysis. Surrogate recoveries provide a means to evaluate the effects of laboratory performance on individual sample matrices.

All samples submitted for volatile and semi-volatile determinations were spiked with the appropriate number of surrogate compounds prior to sample extraction and/or analysis.

Each individual surrogate compound is expected to meet the laboratory control limits with the exception of semi-volatile organic compound (SVOC) analyses. According to the "Guidelines" for SVOC analyses, up to one outlying surrogate in the base/neutral or acid fractions is acceptable as long as the recovery is at least 10 percent.

Surrogate recoveries were assessed against laboratory control limits. All surrogate recoveries were acceptable.

5. Laboratory Control Sample Analyses

LCS are prepared and analyzed as samples to assess the analytical efficiencies of the methods employed, independent of sample matrix effects. For this study, LCS were analyzed at a minimum frequency of 1 per 20 investigative samples and/or 1 per analytical batch.

Organic Analyses

The LCS contained all compounds of interest. All LCS recoveries were within the laboratory control limits, demonstrating acceptable analytical accuracy.

Inorganic Analyses

The LCS contained all analytes of interest. LCS recoveries were assessed per the "Guidelines". All LCS recoveries were within the control limits, demonstrating acceptable analytical accuracy.

6. Matrix Spike Analyses

To evaluate the effects of sample matrices on the distillation process, measurement procedures, and accuracy of a particular analysis, samples are spiked with a known concentration of the analyte of concern and analyzed as MS samples.

An MS was analyzed for metals only. All recoveries were acceptable.

7. Field QA/QC Samples

No field QA/QC samples were submitted for this sampling event.

8. Analyte Reporting

The laboratory reported detected results down to the laboratory's method detection limit (MDL) for each analyte. Positive analyte detections less than the reporting limit (RL) but greater than the MDL were qualified as estimated (J) in Table 2 unless qualified otherwise in this memorandum. Non-detect results were presented as non-detect at the RL in Table 2.

9. Conclusion

Based on the assessment detailed in the foregoing, the data summarized in Table 2 are acceptable without qualification.

Table 1

Sample Collection and Analysis Summary
Site Effluent
Gratwick-Riverside Park
North Tonawanda, New York
April 2019

					Analysis/Parameters								
Sample Identification	**Location**	**Matrix**	**Collection Date (mm/dd/yyyy)**	**Collection Time (hr:min)**	**Volatile Organic Compounds**	**Semi-volatile Organic Compounds**	**Metals**	**Sulfate, Chloride**	**Nitrate**	**Alkalinity**	**Hardness**	**Total Dissolved Solids**	**Sulfide**
NTWWTP - GRP	Effluent	Water	04/11/2019	08:05	X	X	X	X	X	X	X	X	X

Table 2

Analytical Results Summary
Site Effluent
Gratwick-Riverside Park
North Tonawanda, New York
April 2019

Location ID:		**Effluent**
Sample Name:		**NTWWTP-GRP**
Sample Date:		**04/11/2019**
Parameters	**Unit**	
Volatile Organic Compounds		
1,1,1-Trichloroethane	µg/L	5.0 U
1,1-Dichloroethane	µg/L	5.0 U
1,2-Dichloroethane	µg/L	5.0 U
1,4-Dichlorobenzene	µg/L	15.00
2-Butanone (Methyl ethyl ketone) (MEK)	µg/L	25 U
Acetone	µg/L	25 U
Benzene	µg/L	5.0 U
Chlorobenzene	µg/L	5.0 U
Ethylbenzene	µg/L	5.0 U
Methylene chloride	µg/L	5.0 U
Styrene	µg/L	5.0 U
Tetrachloroethene	µg/L	5.0 U
Toluene	µg/L	5.0 U
trans-1,2-Dichloroethene	µg/L	5.0 U
Trichloroethene	µg/L	5.0 U
Vinyl chloride	µg/L	5.0 U
Xylenes (total)	µg/L	10 U
Semi-volatile Organic Compounds		
1,2-Dichlorobenzene	µg/L	4.8 U
1,4-Dichlorobenzene	µg/L	15
2,4-Dimethylphenol	µg/L	1.3 U
2-Methylphenol	µg/L	0.77 U
4-Methylphenol	µg/L	0.75 U
Di-n-octyl phthalate (DnOP)	µg/L	4.6 U
Naphthalene	µg/L	0.82 U
Phenol	µg/L	0.33 U
Metals		
Aluminum	mg/L	0.20 U
Antimony	mg/L	0.020 U
Arsenic	mg/L	0.015 U
Barium	mg/L	0.091
Beryllium	mg/L	0.0020 U
Cadmium	mg/L	0.0020 U
Chromium	mg/L	0.0040 U
Copper	mg/L	0.010 U
Iron	mg/L	0.073
Lead	mg/L	0.010 U
Magnesium	mg/L	12.3
Manganese	mg/L	0.056
Mercury	mg/L	0.00020 U
Nickel	mg/L	0.010 U

Table 2

Analytical Results Summary
Site Effluent
Gratwick-Riverside Park
North Tonawanda, New York
April 2019

	Location ID:	**Effluent**
	Sample Name:	**NTWWTP-GRP**
	Sample Date:	**04/11/2019**
Parameters	**Unit**	
Metals-Continued		
Selenium	mg/L	0.025 U
Silver	mg/L	0.0060 U
Sodium	mg/L	266
Zinc	mg/L	0.010 U
General Chemistry		
Alkalinity, bicarbonate	mg/L	103
Alkalinity, carbonate	mg/L	103
Alkalinity, total (as CaCO3)	mg/L	103
Ammonia-N	mg/L	1.12
Biochemical oxygen demand (BOD)	mg/L	6.84
Chemical oxygen demand (COD)	mg/L	50 U
Chloride	mg/L	405
Hardness	mg/L	276
Nitrate (as N)	mg/L	0.050 U
Oil and grease	mg/L	0.2
Phenolics (total)	mg/L	ND
Phosphate phosporus	mg/L	0.16
Sulfate	mg/L	206
Sulfide	mg/L	16
Total CN	mg/L	ND
Total dissolved solids (TDS)	mg/L	1120
Total kjeldahl nitrogen (TKN)	mg/L	3.00 U
Total organic carbon (TOC)	mg/L	11.76
Total suspended solids (TSS)	mg/L	4.0
pH (water)	s.u.	8.16

Notes:

ND - Not detected. No associated reporting limit.
U - Not detected at the associated reporting limit

Table 3

Analytical Methods
Site Effluent
Gratwick-Riverside Park
North Tonawanda, New York
April 2019

Parameter	Method	Matrix	Holding Time	
			Collection to Extraction (Days)	Collection or Extraction to Analysis (Days)
Volatile Organic Compounds	EPA 624[1]	Water	-	14
Semi-volatile Organic Compounds	EPA 625[1]	Water	7	40
Target Analyte List Metals	EPA 200.7[1]	Water	-	180
Mercury	EPA 245.1[1]	Water	-	28
Chloride/Sulfate	EPA 300.0[1]	Water	-	28
Nitrate	EPA 353.2[1]	Water	-	48 hours
Hardness	SM 2340[2]	Water	-	180
Alkalinity	SM2320B[2]	Water	-	14
Total Dissolved Solids	SM2540C[2]	Water	-	7
Sulfide	SM4500-S2-F[2]	Water	-	7

Notes:

- - Not applicable

Method References:

[1] - "Standard Methods for the Examination of Water and Wastewater", 18th Edition, 1992, with subsequent revisions

[2] - "Methods for Chemical Analysis of Water and Wastes", USEPA-600/4-79-020, March 1983, with subsequent revisions

USEPA - United States Environmental Protection Agency

Memorandum

July 18, 2019

To:	John Pentilchuk	Ref. No.:	007987
From:	Kathy Shaw/mkd/32-NF	Tel:	860 747-1800
CC:	Susan Scrocchi		

Subject: **Analytical Results and Full Validation**
Annual Groundwater Monitoring
Gratwick-Riverside Park Site
North Tonawanda, New York
May 2019

1. Introduction

This Data Usability Summary Report (DUSR) has been prepared per the New York State Department of Environmental Conservation (NYSDEC) Division of Environmental Remediation DER-10, Technical Guidance for the Site Investigation and Remediation, Appendix 2B-Guidance for the Data Deliverables and Development of Data Usability Summary Reports, May 2010.

The following document details a full validation of analytical results for groundwater samples collected in support of the Annual Monitoring Program at the Gratwick-Riverside Park Site during May 2019.

2. Analytical Methodologies and Data Validation

Samples were submitted to Eurofins TestAmerica Laboratories, Inc. located in Amherst, New York. Samples were analyzed for:

i) Selected Volatile Organic Compounds (VOCs) by United States Environmental Protection Agency (USEPA) Method SW-846 8260

ii) Selected Semi-volatile Organic Compounds (SVOCs) by USEPA Method SW-846 8270

The quality assurance/quality control (QA/QC) criteria by which these data have been assessed are outlined in the analytical methods and the document entitled "National Functional Guidelines for Superfund Organic Methods Data Review", USEPA 540-R-2016-002, September 2016

The full validation included a review of completeness of all required deliverables to determine if the data are within acceptable QC limits and specification.

These included reviews of holding times, instrument tunes, calibration summaries, blanks, spike recoveries, field duplicate analyses, and surrogate/internal standard recoveries. Evaluation of the data was based on information obtained from the chain of custody form, finished report forms, QC summary forms, and calibration summary forms.

A summary of qualified data is presented in Table 1.

3. Sample Holding Time and Preservation

The sample holding time criteria for the analyses are summarized in the methods. Sample chain of custody document and analytical reports were used to determine sample holding times. All samples were prepared and analyzed within the required holding times.

All samples were properly preserved, delivered on ice, and stored by the laboratory at the required temperature (0-6°C).

4. Gas Chromatography/Mass Spectrometer (GC/MS) – Tuning and Mass Calibration (Instrument Performance Check)

Prior to VOC and SVOC analysis, GC/MS instrumentation is tuned to ensure optimization over the mass range of interest. To evaluate instrument tuning, methods require the analysis of specific tuning compounds bromofluorobenzene (BFB) and decafluorotriphenylphosphine (DFTPP), respectively. The resulting spectra must meet the criteria cited in the methods before analysis is initiated. Analysis of the tuning compound must then be repeated every 12 hours throughout sample analysis to ensure the continued optimization of the instrument.

Tuning compounds were analyzed at the required frequency throughout VOC and SVOC analysis periods. All tuning criteria were met, indicating that proper optimization of the instrumentation was achieved.

5. Initial and Continuing Calibration

Initial and continuing calibration summary forms were reviewed for VOCs and SVOCs.

The proper calibration procedures were followed, and all compounds met the method criteria for sensitivity and linearity.

6. Laboratory Blank Analyses

Method blanks are prepared from a purified matrix and analyzed with investigative samples to determine the existence and magnitude of sample contamination introduced during the analytical procedures.

For this study, laboratory method blanks were analyzed at a minimum frequency of 1 per 20 investigative samples and/or 1 per analytical batch.

A low concentration of phenol was detected in an SVOC method blank indicating potential for laboratory contamination. All associated samples containing similar concentrations of phenol were assumed to be a reflection of laboratory contamination and were qualified non-detect at the RL in Table 1.

7. Surrogate Spike Recoveries

In accordance with the methods employed, all samples, blanks, and QC samples analyzed for organics are spiked with surrogate compounds prior to sample extraction and/or analysis. Surrogate recoveries provide a means to evaluate the effects of laboratory performance on individual sample matrices.

All samples submitted for VOC and SVOC determinations were spiked with the appropriate number of surrogate compounds prior to sample extraction and/or analysis.

Surrogate recoveries were assessed against laboratory control limits. All surrogate recoveries met the laboratory criteria.

8. Internal Standards (IS) Analyses

IS data were evaluated for all VOC and SVOC sample analyses. To ensure that changes in the GC/MS sensitivity and response do not affect sample analysis results, IS compounds are added to each sample prior to analysis. All results are then calculated as a ratio of the IS responses. All IS recoveries and retention times met the above criteria

9. Laboratory Control Sample Analyses

Laboratory control samples (LCS) are prepared and analyzed as samples to assess the analytical efficiencies of the methods employed, independent of sample matrix effects.

For this study, LCS were analyzed at a minimum frequency of 1 per 20 investigative samples and/or 1 per analytical batch.

The LCS contained all compounds of interest. All LCS recoveries were within the laboratory control limits, demonstrating acceptable analytical accuracy.

10. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analyses

To evaluate the effects of sample matrices on the distillation process, measurement procedures, and accuracy of a particular analysis, samples are spiked with a known concentration of the analyte of concern and analyzed as MS/MSD samples. The relative percent difference (RPD) between the MS and MSD is used to assess analytical precision.

MS/MSD analyses were performed using investigative sample MW8.

The MS/MSD samples were spiked with all compounds of interest. The percent recoveries were within the acceptable criteria and all RPD values were within the laboratory control limits.

11. Field QA/QC Samples

The field QA/QC consisted of one trip blank sample and one field duplicate sample set.

11.1 Trip Blank Sample Analysis

To evaluate contamination from sample collection, transportation, storage, and analytical activities, one trip blank was submitted to the laboratory for VOC analysis. All results were non-detect for the compounds of interest.

11.2 Field Duplicate Sample Analysis

To assess the analytical and sampling protocol precision, one field duplicate sample was collected and submitted "blind" to the laboratory. The RPDs associated with these duplicate samples must be less than 50 percent for water samples. If the reported concentration in either the investigative sample or its duplicate is less than five times the reporting limit (RL), the evaluation criterion is the RL value for water samples.

All field duplicate results were within acceptable agreement, demonstrating acceptable sampling and analytical precision.

12. Analyte Reporting

The laboratory reported detected results down to the laboratory's method detection limit (MDL) for each analyte. Positive analyte detections less than the practical quantitation limit (PQL) but greater than the MDL were qualified as estimated (J) in Table 1 unless qualified otherwise in this memorandum. Non-detect results were presented as non-detect at the RL in Table 1.

13. Conclusion

Based on the assessment detailed in the foregoing, the data summarized in Table 1 are acceptable with the qualification noted above.

Table 1

Analytical Results Summary
Annual Groundwater Monitoring
Gratwick-Riverside Park Site
North Tonawanda, New York
May 2019

Location ID:		MW6	MW8	MW9	OGC3	OGC6	OGC7	OGC7
Sample Name:		WG-7987-052919-DT-007	WG-7987-052919-DT-002	WG-7987-052919-DT-001	WG-7987-052919-DT-003	WG-7987-052919-DT-006	WG-7987-052919-DT-004	WG-7987-052919-DT-005
Sample Date:		05/29/2019	05/29/2019	05/29/2019	05/29/2019	05/29/2019	05/29/2019	05/29/2019 Duplicate
Parameters	**Unit**							
Volatile Organic Compounds								
1,1-Dichloroethane	µg/L	0.46 J	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/L	5.0 U	10 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Acetone	µg/L	11	7.0 J	12	9.1	4.4 J	3.9 J	4.3 J
Benzene	µg/L	1.8	1.5	0.84	0.54 J	0.81	0.70 U	0.70 U
Chlorobenzene	µg/L	10	3.4	4.6	1.0 U	1.0 U	1.0 U	1.0 U
Ethylbenzene	µg/L	1.0 U	1.7 J	1.5	1.0 U	1.0 U	1.0 U	1.0 U
Methylene chloride	µg/L	1.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene	µg/L	6.3	0.74 J	0.82 J	1.0 U	18	0.40 J	0.45 J
Toluene	µg/L	22	1.8 J	7.1	0.79 J	3.5	1.1	1.3
trans-1,2-Dichloroethene	µg/L	11	2.0 U	1.1	1.0 U	19	1.0	1.2
Trichloroethene	µg/L	28	3.6	3.5	1.1	39	4.3	4.5
Vinyl chloride	µg/L	1.5	2.3	2.6	1.0 U	1.3	1.0 U	1.0 U
Xylenes (total)	µg/L	1.7 J	1.7 J	4.0	2.0 U	2.4	0.89 J	0.85 J
Semi-volatile Organic Compounds								
1,2-Dichlorobenzene	µg/L	1000 U	0.83 J	1.8 J	10 U	50 U	10 U	10 U
1,4-Dichlorobenzene	µg/L	73 J	12	1.9 J	10 U	50 U	10 U	10 U
2,4-Dimethylphenol	µg/L	59 J	8.4 J	210	5.8 J	50 U	10 U	10 U
2-Methylphenol	µg/L	46 J	23	24	21	50 U	10 U	10 U
4-Methylphenol	µg/L	120 J	12	570	12	50 U	0.59 J	10 U
Di-n-octyl phthalate (DnOP)	µg/L	1000 U	10 U	10 U	10 U	50 U	10 U	10 U
Naphthalene	µg/L	1000 U	10 U	10 U	10 U	50 U	10 U	10 U
Phenol	µg/L	2900	11	40	42	50 U	10 U	10 U

Notes:

U - Not detected at the associated reporting limit
J - Estimated concentration

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