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. 932110

Site Name Frontier Chemical - Royal Avenue

Site Address: 4626 Royal Avenue Zip Code: 14303
City/Town: Niagara Falls
County: Niagara
Site Acreage: 9.8

Reporting Period: August 15, 2014 to November 18, 2015

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

Box 2

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

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

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

Signature of Owner, Remedial Party or Designated Representative Date

SITE NO. 932110

Box 3

Description of Institutional Controls

Parcel	Owner	Institutional Control
160.09-1-6	4626 Royal Avenue Holding LLC	Ground Water Use Restriction Soil Management Plan Landuse Restriction Site Management Plan Monitoring Plan IC/EC Plan

Environmental Easement and Site Management Plan

Box 4

Description of Engineering Controls

Parcel	Engineering Control
160.09-1-6	Cover System

12" clean cover system consisting of crushed concrete or crushed stone with some asphalt

Box 5

Periodic Review Report (PRR) Certification Statements

1. I certify by checking "YES" below that: RGA 3/7/16

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

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

YES	NO
☑	☐

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

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

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

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

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

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

YES	NO
☑	☐

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

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

Signature of Owner, Remedial Party or Designated Representative

Date

IC CERTIFICATIONS
SITE NO. 932110

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 Michael J. Hansen (print name) at 4001 Packard Rd. NFNY. 14302 (print business address)

am certifying as Norampac Industries Inc (Owner or Remedial Party)

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

Michael J Hansen
Signature of Owner, Remedial Party, or Designated Representative Rendering Certification

3/7/16
Date

IC/EC CERTIFICATIONS

Box 7

Qualified Environmental Professional 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 ROBERT G. ADAMS (print name) at GHD CONSULTING SERVICES INC. 285 DELAWARE AVE, BUFFALO NY, 14202 (print business address)

am certifying as a Qualified Environmental Professional for the OWNER (Owner or Remedial Party)

STATE OF NEW YORK ★ ROBERT G. ADAMS ★ LICENSED PROFESSIONAL ENGINEER 084918

Robert G. Adams — Signature of Qualified Environmental Professional, for the Owner or Remedial Party, Rendering Certification

Stamp (Required for PE)

03/07/16 — Date

NIAGARA FALLS WATER BOARD
WASTEWATER FACILITIES
SIGNIFICANT INDUSTRIAL USER
WASTEWATER DISCHARGE PERMIT

PERMIT NO. 78 Norampac- Frontier Site

In accordance with all terms and conditions of the Niagara Falls Water Board Wastewater Regulations Part 1960 and also with all applicable provisions of Federal and State Law or regulation.

Permission is Hereby Granted To: Norampac Industries, Inc.- Niagara Falls Division

Located at: 4626 Royal Avenue, Niagara Falls, NY 14303

Classified by SIC No(s): None, non production facility

For the contribution of wastewater into the Niagara Falls Water Board Publicly-Owned Treatment Works (POTW).

Effective this 1st day of October 2015
To expire this 1st day of October 2020

For

Paul J. Drof
Executive Director of The Niagara Falls Water Board

Signed this 29th day of September, 2015

DISCHARGE IDENTIFICATION

OUTFALL	DESCRIPTION	LOCATION	RECEIVING
MS #1	Monitoring Wells in Bedrock Zones A, B	4626 Royal Avenue	Contaminated Site Ground Water
MS #2	Remedial Water	Manhole located at corner of Royal Ave. and 47th St.	Above Ground Remedial Water

WASTEWATER DISCHARGE PERMIT REQUIREMENTS FOR:		**ACTION REQUIRED**	**REQUIRED DATE OF SUBMISSION**
A.	**<u>Discharges to the Niagara Falls Water Board (NFWB) Sewer</u>**		
1.	Identification of all discharges to the NFWB Sewer System on a current plant sewer map certified by a New York State licensed professional engineer.	NONE	SUBMISSION RECEIVED 9/22/15
2.	Identification of each contributing waste stream to each discharge to the NFWB Sewer System clearly marked on, or referenced to, a current plant sewer map certified by a New York State licensed professional engineer.	NONE	SUBMISSION RECEIVED 9/22/15
3.	Elimination of all uncontaminated discharges to the NFWB Sewer System. All uncontaminated flows should be clearly identified on a current sewer map certified by a New York State licensed professional engineer.	NONE	SUBMISSION RECEIVED 9/22/15
4.	Establishment of a control manhole that is continuously and immediately accessible for each discharge to the NFWB Sewer System.	NONE	SUBMISSION RECEIVED 9/22/15
B.	**<u>Wastewater Discharge Management Practices</u>**		
1.	Identification of a responsible person(s) (day to day and in emergencies).	NONE	SUBMISSION RECEIVED 9/22/15

WASTEWATER DISCHARGE PERMIT REQUIREMENTS FOR:

C. Slug Control Plan**

Pursuant to Section 40 CFR 403.12 (v) of the Federal Pretreatment Standards the Niagara Falls Water Board will evaluate the permittee, a minimum of once every two years for the need for a "Slug Control Plan." If a plan is required by the Niagara Falls Water Board, then the plan will contain, at a minimum, the following elements:

a) Description of discharge practices, including non-routine batch discharges;
b) Description of stored chemicals;
c) Procedures for immediately notifying the POTW of slug discharges, including any discharge that would violate a prohibition under 40 CFR 403.5 (b), with procedures for follow-up written notification within five days;
d) If necessary, procedures to prevent adverse impact from accidental spills, including inspection and maintenance of storage areas, handling and transfer of materials, loading and unloading operations, control of plant site runoff, worker training, building of containment structures or equipment, measures for containing toxic organic pollutants (including solvents), and/or measures and equipment necessary for emergency response.

**This section applies to all pollutants limited by the Niagara Falls Water Board SPDES Permit and all prohibited wastewater discharges (See Section 1960.5 of the Niagara Falls Water Board - Wastewater Regulations).

D. General Wastewater Discharge Permit Conditions

1. Flow monitoring should be performed concurrently with any Wastewater Discharge Permit sampling and should be reported at the same time as analytical results. If it is not feasible to perform flow monitoring, an estimate of flow (method of estimated flow preapproved by the Niagara Falls Water Board) should be submitted with the analytical results.

2. All sampling for billing and pretreatment compliance purposes will be coordinated through the Niagara Falls Water Board Industrial Monitoring Coordinator

3. All analysis must be performed by a State certified laboratory using analytical methods promulgated and consistent with 40 CFR 136 and amendments thereto. The permittee will request their contract laboratory to report both Practical Quantization Limit (PQL) and Method Detection Limit (MDL). The PQL and MDL are defined in the NYSDEC Technical Guidance Series 1.3.7.

   The permittee should report results that are less than the MDL or PQL on the NFWB Self Monitoring Report, as non-detect (ND), by placing a less than sign (<) followed by the analytical result. Every effort should be made to attain results down to the MDL. If this is not possible, then results less than PQL but greater than MDL must also be additionally flagged with the qualifier "J" on the Self Monitoring Report. For example, a result less than 5 PQL would be reported <5 (J). In either case the calculated load in lbs per day would be zero.

   Monitoring results which are lower than the PQL must be reported but will not be used to determine compliance with the permit limit.

4. An estimate of relative production levels for wastewater contributing processes at the time of any pretreatment compliance sampling will be submitted upon request of the Director of Niagara Falls Water Board-Wastewater Facilities.

5. All samples will be handled in accordance with EPA approved methods. Chain of Custody records will be submitted with all sampling results.

6. All conditions, standards and numeric limitations of the Niagara Falls Water Board Wastewater Regulations are hereby incorporated into this permit by reference. These conditions, standards and numeric limitations must be complied with. Failure to comply with any part of said ordinances constitutes a violation and is subject to enforcement actions(s) described in Section 1960.9 of said Regulations, and in the Niagara Falls Water Board Pretreatment Administrative Procedure Number Five (5) - "Enforcement Response Guide." Violators are subject to all applicable Civil and Criminal penalties. In the event of a violation, including slug discharges or spills, the Niagara Falls Water Board must be notified immediately by phone and confirmed by letter within five (5) working days.

   Any person adjudicated of violating any provision in the Niagara Falls Water Board Wastewater Regulations shall be assessed a fine in the amount of up to $10,000. This amount is available for each violation, and each day of a violation is a separate incident for which penalties may be sought.

The person violating any of the provisions of the Niagara Falls Water Board Wastewater Regulations will be liable for any expense, loss, or damage occasioned by reason of such violation. The expense, loss or damage will be taken to be to the extent determined by the Director.

In addition, any person who knowingly makes any false statements; representation or certification in any application, record, report, plan or other document filed or required to be maintained pursuant to the Niagara Falls Water Board Wastewater Regulations or Wastewater Discharge Permit, or who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required under the Niagara Falls Water Board Wastewater Regulations will, upon conviction be punished by a fine up to $5,000. Furthermore, the Niagara Falls Water Board may recover reasonable attorney's fees, court costs, court reporting fees, and other expenses of litigation by appropriate suit at law against the person found to have violated applicable laws, orders, rules and permits required by the Niagara Falls Water Board Wastewater Regulations.

7. In accordance with Federal Regulation CFR 40, Part 403.12(g), any exceedance of a numeric limitation noted by the SIU must be re-sampled, analyzed and resubmitted to the Niagara Falls Water Board - Wastewater Facilities within 30 days.

   Specifically, if any limit that is listed in Section F of this permit is exceeded, then the permittee will undertake a short term monitoring program for that pollutant. Samples will be collected identical to those required for routine monitoring purposes and will be collected on each of at least two (2) operating days and analyzed. Results will be reported in both concentration and mass, and will be submitted within 30 days of becoming aware of the exceedance.

8. Sampling frequency for any permitted compounds may be increased beyond the requirements set forth in Section F and G of this permit. If the permittee monitors (sample and analysis) more frequent than required under this permit, **all** results of this monitoring must be reported.

9. As noted in Section 1960.5g of the Niagara Falls Water Board Wastewater Regulations, "Personnel as designated by the Director will be permitted at any time for reasonable cause to enter upon all properties served by the Niagara Falls Water Board – Wastewater Facilities for the purpose of, and to carry out, inspection of the premises, observation, measurement, sampling and testing, in accordance with provisions of the Ordinance."

10. As noted in Section 1960.5c of the Niagara Falls Water Board Regulations, significant changes in discharge characteristics or volume must be reported immediately to the Niagara Falls Water Board – Wastewater Facilities.

11. As noted in Section 1960.6b of the Niagara Falls Water Board Regulations, samples required to be collected via a 24-hour composite sampler must be retained refrigerated for an additional 24 hour plus un-refrigerated an additional 48 hours (total 78 hours).

12. As noted in Section 1960.5d of the Niagara Falls Water Board Wastewater Regulations, all "SIU's will keep on file for a minimum of three (3) years, all records, flow charts, laboratory calculations or any other pertinent data on their discharge to the Niagara Falls Water Board – Wastewater Facilities."

13. As noted in Section 1960.6g of the Niagara Falls Water Board Wastewater Regulations, "Permits are issued to a specific user for a specific monitoring station. A permit will not be reassigned or transferred without the approval of the Director which approval will not be unreasonably withheld. Any succeeding owner or user to which a permit has been transferred and approved will also comply with all the terms and conditions of the existing permit."

14. The Annual Average Limitation is equivalent to the specific SIU allocation, and will be defined as the permissible long-term average discharge of a particular pollutant. These limitations are listed in Section F of this permit. The computation of the Annual Average will be as follows; for each compound listed in Section G of this permit, the Annual Average will be the average of the present monitoring quarter and three previous quarters' data.

15. The Daily Maximum Limitation will be defined as the maximum allowable discharge on anyone day. The Daily Maximum Limitation will allow for periodic short term discharge fluctuations. These specific limitations are listed in Section F of this permit.

16. Enforcement of the Annual Average Limitation will be based on the reported average of the last four quarters data vs. the Annual Average Limited listed in Section F of this permit. Enforcement of the Daily Maximum Limitation will be based on individual analysis results vs. the Daily Maximum Limit listed in Section F of this permit. These results may be obtained from self- monitoring (Section G), Niagara Falls Water Board Verification, incident investigation or billing samples.

17. The Niagara Falls Water Board Administrative Procedure Number 6 "Procedure for Determination and Use of Local Limits" lists all pollutants noted in the Niagara Fall Water Board – Wastewater Facilities SPDES Permit. The limits defined in the procedure are values which are based on the quantity of substances discharged which can be easily related to the Treatment Plant's removal capacity.

17. The pollutants listed in this procedure, which are <u>not</u> specifically listed in Section F and G of this permit, may be present in the permittee's wastewater discharge, but at levels which do not require specific permit limitations. Consequently, if any of the limits listed in this procedure, for pollutants <u>not</u> identified in Section F and G of this permit, are exceeded then the permittee will undertake a short-term, high intensity monitoring program for that pollutant. Samples identical to those required for routine monitoring purposes will be collected on each of at least three operating days and analyzed. Results will be expressed in terms of both concentration and mass, and will be submitted no later than the end of the third month following the month when the limit was first exceeded.

    If levels higher than the limit are confirmed, the permit may be reopened by the Niagara Falls Water Board for consideration of revised permit limits.

E. Specific Wastewater Discharge Permit Conditions

1. Billing Agreement:

Sewer use billing will be calculated based on the information provided in the periodic self monitoring reports and will follow the procedures outlined in the Niagara Falls Water Board Regulations for SIUs Part 1960.

2. Flow Measurement:

The permittee will not discharge wastewater in the conventional way through a point source discharge and therefore not through a typical monitoring station. As such the flow will be based on the calculation as described in the attached Table 1, pages one and two.

3. Sample Collection:

a) This site has been designated as a hazardous waste remedial site. Ground water exits the site and passively enters the NFWB combined sewers on 47th Street and Royal Avenue. The "discharge" cannot be easily, nor economically be combined into a point source discharge.

Because of this issue pollutant monitoring will be conducted by sampling monitoring wells which most accurately represent the pollutant quality of the wastewater exiting the site. The wells designated for this purpose are from the Zones A and B Fracture Bedrock. They are identified on the attached Figures 3-5 and 3-6. The original enlarged copies of these figures are contained in the original permit application.

These wells will be collectively identified as Monitoring Station #1 (MS #1).

b) Surface site remediation to remove contaminated soil will result in the generation or collection of surface water, equipment decontamination wastewater, storm water, air scrubber unit wastewater and sanitary sewage. The discharge of these wastewaters will enter the NFWB sanitary sewer at MS #2.

A representative sample of the discharge including all sources noted above will be collected as follows; every second week a composite of eight grab samples over eight (8) hours will be collected and analyzed for the pollutants listed on Attachment – A, which is entitled "Discharge Monitoring and Reporting Requirements Part B".

The discharge will remain within the limits listed on Attachment – A, which is entitled "Interim Discharge Limits and Monitoring Requirements Part B".

F. Discharge Limitations & 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) will be limited and monitored by the permittee as specified below.

OUTFALL NUMBER/ EFFLUENT PARAMETER	DISCHARGE LIMITATIONS		UNITS	MINIMUM MONITORING REQUIREMENTS	
	ANNUAL AVERAGE	DAILY MAXIMUM		MEASUREMENT FREQUENCY	SAMPLE TYPE
MS #1 Flow		3,600	Gals/day	2 per year	See E-2
MS #1 Arsenic		0.008	Lbs/day	2 per year	See E-3
MS #1 Iron		0.24	Lbs/day	2 per year	See E-3
MS #1 Potassium		400	Lbs/day	2 per year	See E-3
MS #1 Sodium		40.0	Lbs/day	2 per year	See E-3
MS #1 T. Phenol		0.05	Lbs/day	2 per year	See E-3
MS #1 1,1-Dichloroethane		0.13	Lbs/day	2 per year	See E-3
MS #1 1,2,4-Trichlorobenzene		0.026	Lbs/day	2 per year	See E-3
MS #1 1,2-Dichlorobenzene		0.26	Lbs/day	2 per year	See E-3
MS #1 1,3-Dichlorobenzene		0.11	Lbs/day	2 per year	See E-3
MS #1 1,4-Dichlorobenzene		0.17	Lbs/day	2 per year	See E-3
MS #1 Acetone		0.026	Lbs/day	2 per year	See E-3
MS #1 Benzene		0.15	Lbs/day	2 per year	See E-3
MS #1 Chlorobenzene		0.10	Lbs/day	2 per year	See E-3
MS #1 Cis-1,2-Dichloroethene		0.060	Lbs/day	2 per year	See E-3
MS #1 Tetrachloroethene		0.05	Lbs/day	2 per year	See E-3
MS #1 Toluene		0.03	Lbs/day	2 per year	See E-3
MS #1 Trichloroethene		0.15	Lbs/day	2 per year	See E-3
MS #1 Vinyl Chloride		0.012	Lbs/day	2 per year	See E-3
MS #1 Monochlorotoluene		0.2	Lbs/day	2 per year	See E-3

G. Discharge Monitoring Reporting Requirements

During the period beginning the effective date of this permit and lasting until its expiration date, discharge monitoring results will be summarized and reported by the permittee; Monthly - 14 days after monitoring period, Quarterly - by the last day of the monitoring period = February 28, May 31, August 31, November 30. *Semiannual reports* will be submitted on the last day of the monitoring period = **November 30, May 31**. The annual average for each parameter listed in Section F, will be computed and reported quarterly. The individual sample analysis for present quarter will also be reported quarterly unless directed otherwise in this permit.

OUTFALL NO	PARAMETER	REPORTING FREQUENCY
MS #1	Flow	Semi-Annual
MS #1	Arsenic	Semi-Annual
MS #1	Iron	Semi-Annual
MS #1	Potassium	Semi-Annual
MS #1	Sodium	Semi-Annual
MS #1	T. Phenol	Semi-Annual
MS #1	1,1-Dichloroethane	Semi-Annual
MS #1	1,2,4-Trichlorobenzene	Semi-Annual
MS #1	1,2-Dichlorobenzene	Semi-Annual
MS #1	1,3-Dichlorobenzene	Semi-Annual
MS #1	1,4- Dichlorobenzene	Semi-Annual
MS #1	Acetone	Semi-Annual
MS #1	Benzene	Semi-Annual
MS #1	Chlorobenzene	Semi-Annual
MS #1	Cis-1,2-Dichloroethene	Semi-Annual
MS #1	Tetrachloroethene	Semi-Annual
MS #1	Toluene	Semi-Annual
MS #1	Trichloroethene	Semi-Annual
MS #1	Vinyl Chloride	Semi-Annual
MS #1	Monochlorotoluene	Semi-Annual

H. Comments/Revisions

December 23, 2015 Reference No. 11109628

Mr. Greg Sutton
New York State Department of Environmental Conservation
270 Michigan Avenue
Buffalo, NY 14203-2999

Dear Mr. Sutton:

Re: 2015 Periodic Review Report
Norampac Facility (Former Frontier Chemical Site)

Pursuant to the Site Management Plan - Frontier Chemical Site, Niagara Falls, New York (SMP) dated April 23, 2014 by GHD Services Inc. (GHD) (formerly Conestoga-Rovers & Associates [CRA]), this letter provides the 2015 Periodic Review Report (PRR) for the Norampac Industries, Inc. (Norampac) Facility (Former Frontier Chemical Site) located in Niagara Falls, New York.

1. Introduction

The Frontier Chemical Royal Avenue Site PRP Group (the Frontier Group) entered into an Order on Consent (Index #89-0571-00-01, executed on August 15, 2008) with the New York State Department of Environmental Conservation (NYSDEC) to perform additional Site characterization and remediation of the conditions at the Norampac Facility (Site). The Frontier Group consisted of the Site owner and numerous parties who performed the additional investigations and completed the remediation of the Site in accordance with the approved Remedial Design Report (CRA-February 2013). The Site is now owned and maintained by Norampac. The Site is a 9-acre property located in the industrialized area of Niagara Falls, New York.

Following completion of the additional Site characterization, the Frontier Group worked with the NYSDEC to develop and implement the various components of the Site remedy. The overburden and shallow bedrock groundwater remedy was implemented as specified in the 2006 Record of Decision (ROD). The deep bedrock groundwater, designated as OU2, was investigated, and a remedial action consisting of monitored natural attenuation was determined to be the appropriate remedy and set forth in the OU2 ROD (March 2011). For the source area soil, a remedy consisting of excavation and ex situ thermal treatment was selected and implemented as the appropriate remedy.

After completion of the remedial work described in the Remedial Design Report, the Remedial Action Objectives were met although some minimal residual contamination remains in place at subsurface locations on the Site, which is hereafter referred to as "residual material". The SMP was prepared to manage the residual material at the Site until the Environmental Easement is removed in accordance with ECL Article 71, Title 36.

GHD Services Inc.
2055 Niagara Falls Boulevard Niagara Falls New York 14304 USA
T 716 297 6150 **F** 716 297 2265 **W** www.ghd.com

This 2015 Periodic Review Report presents the measures taken in 2015 for evaluating the performance and effectiveness of the remedy to reduce or mitigate contamination at the Site and to assess the conditions of the asphalt/concrete and soil cover system at the Site.

2. Site Overview

The Norampac Facility is located in an industrial area of the City of Niagara Falls, County of Niagara, New York and is identified as Block 1 and Lot 6 on the Niagara County Tax Map (160.09). The Site is an approximately 9-acre area parcel bordered to the north by property identified as owned by Sentry Metals, to the northwest by Norampac, to the west by the Greenpac Mill, to the south by Elkem Metal Company, and to the east by 47th Street, beyond which is an industrial site (Strator).

After Site remediation activities were completed in early 2014, the SMP provided a series of Engineering Controls (ECs) and Industrial Controls (ICs). The ROD requires that the Site surface either be covered with the existing asphalt or concrete surface or 1 foot of clean fill material. At the completion of excavation activities associated with the source area soil remediation that was completed in 2014, the cover system was made compliant with the ROD. The existing undisturbed asphalt and concrete-covered areas were allowed to remain "as is". All previously existing soil cover areas and the area disturbed due to the excavation of the source area soil were covered with clean fill material. Recycled concrete and hard demolition material from the Site remediation project were also used as part of the 1 foot of clean surface material that was placed over all previously existing and post-excavation soil cover areas. The recycled concrete/demolition material was crushed to 2-inch-minus prior to placement and compacted in place. The remainder of the 1 foot of clean cover was completed using imported crushed stone from a quarry.

Adherence to these ICs on the Site is required by the Environmental Easement and is being implemented under the SMP. The ICs that are implemented are as follows:

- Compliance with the Environmental Easement and the SMP by the Grantor (Site owner) and the Grantor's successors and assigns (Norampac)
- All ECs must be operated and maintained as specified in the SMP
- All ECs on the Controlled Property must be inspected at a frequency and in the manner defined in the SMP
- Groundwater and other environmental or public health monitoring must be performed as defined in the SMP
- Data and information pertinent to Site Management of the Controlled Property must be reported at the frequency and in the manner defined in the SMP

ICs identified in the Environmental Easement may not be discontinued without an amendment to or extinguishment of the Environmental Easement.

The Site has a series of ICs in the form of Site restrictions. Adherence to these ICs is required by the Environmental Easement. Site restrictions that apply to the Controlled Property are:

- The industrial zoned property may only be used for industrial use provided that the long-term ECs and ICs included in the SMP are employed.
- The property may not be used for a higher level of use, such as unrestricted, restricted residential, or commercial use without additional evaluation (including possible additional remediation) and amendment of the Environmental Easement, as approved by the NYSDEC.
- All future activities on the property that will disturb remaining contaminated material must be conducted in accordance with the SMP.
- The use of the groundwater underlying the property as a source of potable or process water is prohibited without treatment rendering it safe for the intended use as determined by the NYSDEC, New York State Department of Health (NYSDOH), or Niagara County Health Department.
- The potential for vapor intrusion must be evaluated for any building developed on the Site in the future, and any potential impacts that are identified must be monitored or managed through implementation of appropriate vapor mitigation measures.
- Vegetable gardens and farming on the property are prohibited.
- The Site owner will submit to NYSDEC a written statement that certifies, under penalty of perjury, that:
    - Controls employed at the Controlled Property are unchanged from the previous certification or that any changes to the controls were approved by the NYSDEC.
    - Nothing has occurred that impairs the ability of the controls to protect public health and the environment or that constitutes a violation or failure to comply with the SMP. NYSDEC retains the right to access such Controlled Property at any time in order to evaluate the continued maintenance of any and all controls. This certification shall be submitted annually, or an alternate period of time that NYSDEC may allow and will be made by an expert that the NYSDEC finds acceptable.

3. Evaluate Remedy Performance, Effectiveness, and Protectiveness

In accordance with the SMP, annual inspections are made of the asphalt/concrete cover system, soil cover system, and monitoring wells at the Site. The 2015 annual inspection was conducted on October 7, 2015. A copy of the annual inspection report is presented in Attachment A. The inspection indicated that the perimeter fence line is in need of repairs in sections along Royal Avenue and 47th Street. The inspection also indicated that well MW88-13A requires repairs to the well casing, which is broken at the ground surface. Those repairs will be made in 2016 and will be documented in the 2016 Periodic Review Report. The 2015 inspection shows that the asphalt/concrete cover system is in good condition. No repairs or maintenance were made in 2015.

4. Monitoring Plan Compliance

Commencing in November 2010, groundwater samples have been collected on a semiannual basis from eight on-Site wells in the A-Zone and B-Zone of the bedrock formation at the Site, in accordance

with the monitoring plan provided in the SMP. The results of the semiannual groundwater monitoring were used to calculate the volume of groundwater and the chemical loading associated with the groundwater that discharges into the Falls Street Tunnel and the 47th Street Tunnel, which are located immediately adjacent to the Norampac Site. Semiannual Groundwater Discharge Reports are submitted to the Niagara Falls Water Board (NFWB). In addition to the semiannual groundwater sampling, annual groundwater samples were collected from three on-Site deep groundwater monitoring wells (C-Zone). As stated in the SMP, the annual sampling of the deep groundwater monitoring wells will continue for a period of 5 years, starting in 2014 and continuing until 2018. Thereafter, a determination will be made as to the need for and frequency of future sampling.

4.1 Semiannual Groundwater Sampling

Semiannual groundwater sampling was performed on April 3, 2015 and October 7-8, 2015. The eight wells were sampled for Target Compound List (TCL) volatile organic compounds (VOCs), Target Analyte List (TAL) metals, and total phenols and in accordance with Environmental Protection Act (EPA) Low-Flow (Minimal Drawdown) Groundwater Sampling Procedures. The calculated groundwater volumes and chemical loadings were presented in the Semiannual Groundwater Discharge Reports submitted to the NFWB on May 8, 2015 and December 3, 2015. The 2015 Semiannual Groundwater Discharge Reports are presented in Attachment B. There were no exceedances of the discharge limitations and monitoring requirements in either the May or December reports.

For the May 2015 Semiannual Groundwater Discharge Report, the calculated groundwater volumes and chemical loadings were compared to the discharge limitations and monitoring requirements presented in the NFWB Significant Industrial User (SIU) Permit #72, which was issued on September 30, 2010 (modified October 6, 2010, November 29, 2011, May 17, 2012, June 10, 2013, and November 12, 2013) by the NFWB to the Frontier Chemical Site PRP Group. On October 1, 2015, the NFWB issued SIU Permit #78 to the Norampac-Frontier Site. The December 2015 Semiannual Groundwater Discharge Report compared the calculated groundwater volumes and chemical loadings to the discharge limitations and monitoring requirements presented in SIU Permit #78. There were no changes to the limitations and requirements between the two permits.

4.2 Annual Groundwater Sampling

Annual sampling of three C-Zone wells (MW1-C-08, MW2-C-08, and MW3-C-08) was conducted on October 7-8, 2015. The wells were sampled in order to monitor for groundwater quality to assess the bedrock groundwater quality over time. The wells were sampled for VOCs in accordance with EPA Low-Flow (Minimal Drawdown) Groundwater Sampling Procedures. Table 1 presents the 2015 analytical results for the groundwater samples from the three C-Zone wells.

The C-Zone wells had previously been sampled in December 2008 and March-April 2009, as described in the Remedial Pre-Investigation Design Report (CRA, September 2010), as well as in October 2014. Table 2 shows the 2015 analytical results for the three C-Zone wells as compared to the results from the 2008, 2009, and 2014 samples, as well as the New York State Technical and Operational Guidance Series (NYS TOGs) guidance values and standards. As seen in Table 2, the 2015 sample from MW1-C-08 had results that were below the NYS TOGs standards, as well as below

the results from 2008, 2009, and 2014. However, the 2015 sample results from MW2-C-08 exceeded the NYS TOGS standards for 1,2-dichlorobenzene, 1,3-dichlorobenzene, 1,4-dichlorobenzene, benzene, and chlorobenzene. The 2015 results at MW2-C-08 were also higher for those parameters than the 2008, 2009, and 2014 samples, with the exception of benzene (which was lower than the 2008 and 2009 samples, but higher than the 2014 sample). The 2015 sample results for MW3-C-08 exceeded the NYS TOGs standards for 1,4-dichlorobenzene and cis-1,2-dichloroethene, and the results for those parameters were also higher than during the 2008, 2009, and 2014 sampling events.

In accordance with the current schedule, semiannual sampling events will occur in April and October 2016. Semiannual groundwater discharge reports will be submitted to the NFWB in May and November 2016. The next annual sampling event, as well as the annual inspection, will occur in October 2016, followed by the preparation and submission of the next Periodic Review Report.

4.3 Vertical Gradients

Groundwater elevations were collected from wells in the C-Zone (MW1-C-08, MW2-C-08, and MW3-C-08) during the October 2015 semiannual and annual groundwater sampling activities. The groundwater elevations were compared to the groundwater contours in the B-Zone at the same locations of the C-Zone wells that were generated using groundwater elevations from B-Zone wells during the October 2015 sampling activities. The following table shows the groundwater elevations (measured in feet above mean sea level) in the B-Zone and C-Zone at the locations of MW1-C-08, MW2-C-08, and MW3-C-08 in October 2015.

Zone	MW-1	MW-2	MW-3
B	546	555	555
C	556.2	556.33	557.11

The upward gradient between the C-Zone and B-Zone was confirmed by the groundwater elevations collected from the C-Zone wells and the B-Zone groundwater contours in October 2015.

5. Overall Conclusions and Recommendations

All of the required work was completed and is reported herein. The remedy has effectively isolated and secured the residual material, and there is no risk to human health or the environment. It is noted that there are a few chemicals present in the C-Zone groundwater that exceed the NYS TOGS standards. However, there is an upward gradient from the C-Zone into the B-Zone that should protect the C-Zone from impact associated with any of the residual materials left in the Site soils. It is recommended that the annual groundwater monitoring of the C-Zone wells continue as described in the SMP in order to track the current condition. Semiannual groundwater monitoring and annual inspections will also continue as described in the SMP.

As required, a signed certification with language from the PRR notice regarding Institutional and Engineering Controls is attached.

Should there be any questions, please do not hesitate to contact me at 716-297-6150 or Bill Rajczak of Norampac at 716-490-0595.

Sincerely,

GHD

Shaun McEvoy

SM/adh/1

Encl.

cc: Bill Rajczak, Norampac

Certification

For each institutional or engineering control identified for the Site, I, Robert Adams, P.E., as a currently registered professional engineer licensed by the State of New York, and as Norampac's Designated Site Representative, certify that all of the following information and statements are true:

- The inspection of the Site to confirm the effectiveness of the ECs/ICs required by the Site Management Plan was performed under my direction.
- The ECs/ICs employed at this Site are unchanged from the date the controls were put in place, or last approved by the USEPA.
- Nothing has occurred that would impair the ability of the controls to protect public health and environment.
- Access to the Site will continue to be provided to USEPA and NYSDEC to evaluate the soil and groundwater remedy.
- Use of the Site is compliant with the environmental easement.
- The EC systems are performing as designed and are effective.
- 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 Management Plan.
- The information presented in this report is accurate and complete.
- To the best of my knowledge, nothing has occurred that would constitute a violation or failure to comply with the SMP. I understand that a false statement made herein is punishable as a Class "A" misdemeanor, pursuant to Section 210.45 of the Penal Law.

Robert G. Adams Date: Dec. 22, 2015

GHD Services Inc.
2055 Niagara Falls Boulevard Niagara Falls New York 14304 USA
T 716 297 6150 F 716 297 2265 W www.ghd.com

Table 1

Analytical Results Summary
C-Zone Groundwater Sampling
Norampac-Frontier Site
Niagara Falls, New York
October 2015

Location ID:	**MW1-C-08**	**MW2-C-08**	**MW3-C-08**
Sample Name:	**WG-11109628-100815-SG-012**	**WG-11109628-100715-SG-008**	**WG-11109628-100715-DT-007**
Sample Date:	**10/08/2015**	**10/07/2015**	**10/07/2015**
Depth:	**--**	**--**	**--**
Parameters	**Unit**		
Volatile Organic Compounds			
1,1,1-Trichloroethane	µg/L	5.0 U	5.0 U	5.0 U
1,1,2,2-Tetrachloroethane	µg/L	5.0 U	5.0 U	5.0 U
1,1,2-Trichloroethane	µg/L	5.0 U	5.0 U	5.0 U
1,1-Dichloroethane	µg/L	0.65 J	5.0 U	5.0 U
1,1-Dichloroethene	µg/L	5.0 U	5.0 U	5.0 U
1,2,4-Trichlorobenzene	µg/L	5.0 U	5.0 U	5.0 U
1,2-Dichlorobenzene	µg/L	5.0 U	6.2	0.98 J
1,2-Dichloroethane	µg/L	5.0 U	5.0 U	5.0 U
1,2-Dichloroethene (total)	µg/L	10 U	10 U	46
1,2-Dichloropropane	µg/L	5.0 U	5.0 U	5.0 U
1,3-Dichlorobenzene	µg/L	5.0 U	13	1.7 J
2-Chloroethyl vinyl ether	µg/L	25 U	25 U	25 U
2-Chlorotoluene	µg/L	5.0 U	9.1	5.0 U
3-Chlorotoluene	µg/L	5.0 U	0.45 J	5.0 U
4-Chlorotoluene	µg/L	5.0 U	0.29 J	5.0 U
Acetone	µg/L	25 U	25 U	25 U
Acrolein	µg/L	100 U	100 U	100 U
Acrylonitrile	µg/L	50 U	50 U	50 U
Benzene	µg/L	0.62 J	12	5.0 U
Bromodichloromethane	µg/L	5.0 U	5.0 U	5.0 U
Bromoform	µg/L	5.0 U	5.0 U	5.0 U
Bromomethane (Methyl bromide)	µg/L	5.0 U	5.0 U	5.0 U
Carbon tetrachloride	µg/L	5.0 U	5.0 U	5.0 U
Chlorobenzene	µg/L	5.0 U	86	1.1 J
Chloroethane	µg/L	5.0 U	5.0 U	5.0 U
Chloroform (Trichloromethane)	µg/L	5.0 U	5.0 U	5.0 U
Chloromethane (Methyl chloride)	µg/L	5.0 U	5.0 U	5.0 U
cis-1,2-Dichloroethene	µg/L	5.0 U	0.67 J	45
cis-1,3-Dichloropropene	µg/L	5.0 U	5.0 U	5.0 U
Dibromochloromethane	µg/L	5.0 U	5.0 U	5.0 U
Ethylbenzene	µg/L	5.0 U	5.0 U	5.0 U
Methylene chloride	µg/L	5.0 U	5.0 U	5.0 U
Tetrachloroethene	µg/L	5.0 U	5.0 U	5.0 U
Toluene	µg/L	5.0 U	0.56 J	5.0 U
trans-1,2-Dichloroethene	µg/L	5.0 U	5.0 U	0.70 J
trans-1,3-Dichloropropene	µg/L	5.0 U	5.0 U	5.0 U
Trichloroethene	µg/L	5.0 U	5.0 U	1.8 J
Vinyl chloride	µg/L	5.0 U	1.1 J	9.0

Notes:

U - Not present at or above the associated MDL
J - Estimated concentration between the MDL and Reporting Limit

Table 2

Summary of Deep Groundwater (C-Zone) Analytical Results
Norampac - Frontier Site
Niagara Falls, New York

			Location ID:	**MW1-C-08**	**MW1-C-08**
			Sample Name:	**GW-47392-120308-JJW-001**	**GW-47392-033109-JJW-014**
			Sample Date:	**12/3/2008**	**3/31/2009**
		New York State TOGs			
Parameter	**Units**	**Guidance Value**	**Standard**		
Volatile Organic Compounds					
1,1,1-Trichloroethane	µg/L	NC	5	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	µg/L	NC	5	1.0 U	1.0 U
1,1,2-Trichloroethane	µg/L	NC	1	1.0 U	1.0 U
1,1-Dichloroethane	µg/L	NC	5	1.0 U	1.0 U
1,1-Dichloroethene	µg/L	NC	5	1.0 U	1.0 U
1,2,4-Trichlorobenzene	µg/L	NC	5	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/L	NC	0.04	1.0 U	1.0 U
1,2-Dibromoethane (Ethylene Dibromide)	µg/L	NC	0.0006	1.0 U	1.0 U
1,2-Dichlorobenzene	µg/L	NC	3	1.0 U	1.0 U
1,2-Dichloroethane	µg/L	NC	0.6	1.0 U	1.0 U
1,2-Dichloropropane	µg/L	NC	1	1.0 U	1.0 U
1,3-Dichlorobenzene	µg/L	NC	3	1.0 U	1.0 U
1,4-Dichlorobenzene	µg/L	NC	3	1.0 U	1.0 U
2-Butanone (Methyl Ethyl Ketone)	µg/L	50	NC	5.0 U	5.0 U
2-Chlorotoluene	ug/L	NC	5	1.0 U	1.0 U
2-Chloroethyl vinyl ether	µg/L	NC	NC	--	--
2-Hexanone	µg/L	50	NC	5.0 U	5.0 U
3-Chlorotoluene	µg/L	NC	5	1.0 U	1.0 U
4-Chlorotoluene	µg/L	NC	5	1.0 U	1.0 U
4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	µg/L	NC	NC	5.0 U	5.0 U
Acetone	µg/L	50	NC	5.0 U	5.0 U
Acrolein	µg/L	NC	5	--	--
Acrylonitrile	µg/L	NC	5	--	--
Benzene	µg/L	NC	1	0.84 J	**3.1**
Bromodichloromethane	µg/L	50	NC	1.0 U	1.0 U
Bromoform	µg/L	50	NC	1.0 U	1.0 U
Bromomethane (Methyl Bromide)	µg/L	NC	5	1.0 U	1.0 U
Carbon disulfide	µg/L	60	NC	1.0 U	1.0 U
Carbon tetrachloride	µg/L	NC	5	1.0 U	1.0 U
Chlorobenzene	µg/L	NC	5	1.0 U	1.0 U
Chloroethane	µg/L	NC	5	1.0 U	1.0 U
Chloroform (Trichloromethane)	µg/L	NC	7	**10**	1.0 U
Chloromethane (Methyl Chloride)	µg/L	NC	5	1.0 U	1.0 UJ
cis-1,2-Dichloroethene	µg/L	NC	5	1.0 U	1.6
cis-1,3-Dichloropropene	µg/L	NC	NC	1.0 U	1.0 U
Cyclohexane	µg/L	NC	NC	1.1	1.0 U
Dibromochloromethane	µg/L	50	NC	1.0 U	1.0 U
Dibromodifluoromethane	µg/L	NC	NC	--	1.0 U
Dichlorodifluoromethane (CFC-12)	µg/L	NC	5	1.0 U	--

Table 2

Summary of Deep Groundwater (C-Zone) Analytical Results
Norampac - Frontier Site
Niagara Falls, New York

			Location ID:	**MW1-C-08**	**MW1-C-08**
			Sample Name:	**GW-47392-120308-JJW-001**	**GW-47392-033109-JJW-014**
			Sample Date:	**12/3/2008**	**3/31/2009**
		New York State TOGs			
Parameter	**Units**	**Guidance Value**	**Standard**		
Volatile Organic Compounds					
Ethylbenzene	µg/L	NC	5	1.0 U	1.0 U
Isopropylbenzene	µg/L	NC	5	1.0 U	1.0 U
Methyl acetate	µg/L	NC	NC	1.0 U	1.0 U
Methyl cyclohexane	µg/L	NC	NC	1.8	1.0 U
Methyl Tert Butyl Ether	µg/L	10	NC	1.0 U	1.0 U
Methylene chloride	µg/L	NC	5	1.0 U	1.0 U
Styrene	µg/L	NC	5	1.0 U	1.0 U
Tetrachloroethene	µg/L	NC	5	1.0 U	1.0 U
Toluene	µg/L	NC	5	1.6	4.7 J
Total Monochlorotoluenes	µg/L	NC	NC	1 U	1 U
trans-1,2-Dichloroethene	µg/L	NC	5	1.0 U	1.0 U
trans-1,3-Dichloropropene	µg/L	NC	NC	1.0 U	1.0 U
Trichloroethene	µg/L	NC	5	1.0 U	1.0 U
Trichlorofluoromethane (CFC-11)	µg/L	NC	5	1.0 U	1.0 U
Trifluorotrichloroethane (Freon 113)	µg/L	NC	5	1.0 U	1.0 U
Vinyl chloride	µg/L	NC	2	1.0 U	1.5
Xylene (total)	µg/L	NC	NC	3.0 U	2.0 U
Total VOCs	µg/L	NC	NC	15.34	10.9

Notes:

6.24 Concentration exceed NYS TOGS
U - Not present at or above the associated MDL
J - Estimated concentration between the MDL and Reporting Limit
MDL - Method Detection Limit
NC - No criteria
-- - Not analyzed
NYSDEC TOGS - New York State Technical and Operational Guidance Series

Table 2

Summary of Deep Groundwater (C-Zone) Analytical Results
Norampac - Frontier Site
Niagara Falls, New York

Parameter	Units	New York State TOGs Guidance Value	New York State TOGs Standard	Location ID: MW1-C-08 Sample Name: GW-47392-033109-JJW-015 Sample Date: 3/31/2009 Duplicate	MW1-C-08 WG-47392-100714-DJT-010 10/7/2014	MW1-C-08 WG-11109628-100815-SG-012 10/8/2015
Volatile Organic Compounds						
1,1,1-Trichloroethane	µg/L	NC	5	1.0 U	5.0 U	5.0 U
1,1,2,2-Tetrachloroethane	µg/L	NC	5	1.0 U	5.0 U	5.0 U
1,1,2-Trichloroethane	µg/L	NC	1	1.0 U	5.0 U	5.0 U
1,1-Dichloroethane	µg/L	NC	5	1.0 U	0.77J	0.65 J
1,1-Dichloroethene	µg/L	NC	5	1.0 U	5.0 U	5.0 U
1,2,4-Trichlorobenzene	µg/L	NC	5	1.0 U	5.0 U	5.0 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/L	NC	0.04	1.0 U	--	--
1,2-Dibromoethane (Ethylene Dibromide)	µg/L	NC	0.0006	1.0 U	--	--
1,2-Dichlorobenzene	µg/L	NC	3	1.0 U	5.0 U	5.0 U
1,2-Dichloroethane	µg/L	NC	0.6	1.0 U	5.0 U	5.0 U
1,2-Dichloropropane	µg/L	NC	1	1.0 U	5.0 U	5.0 U
1,3-Dichlorobenzene	µg/L	NC	3	1.0 U	5.0 U	5.0 U
1,4-Dichlorobenzene	µg/L	NC	3	1.0 U	5.0 U	5.0 U
2-Butanone (Methyl Ethyl Ketone)	µg/L	50	NC	5.0 U	--	--
2-Chlorotoluene	ug/L	NC	5	1.0 U	--	--
2-Chloroethyl vinyl ether	µg/L	NC	NC	--	25 U	25 U
2-Hexanone	µg/L	50	NC	5.0 U	--	--
3-Chlorotoluene	µg/L	NC	5	1.0 U	--	--
4-Chlorotoluene	µg/L	NC	5	1.0 U	--	--
4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	µg/L	NC	NC	5.0 U	--	--
Acetone	µg/L	50	NC	5.0 U	25 U	25 U
Acrolein	µg/L	NC	5	--	100 U	100 U
Acrylonitrile	µg/L	NC	5	--	50 U	50 U
Benzene	µg/L	NC	1	**2.6**	**1.6 J**	0.62 J
Bromodichloromethane	µg/L	50	NC	1.0 U	5.0 U	5.0 U
Bromoform	µg/L	50	NC	1.0 U	5.0 U	5.0 U
Bromomethane (Methyl Bromide)	µg/L	NC	5	1.0 U	5.0 U	5.0 U
Carbon disulfide	µg/L	60	NC	1.0 U	--	--
Carbon tetrachloride	µg/L	NC	5	1.0 U	5.0 U	5.0 U
Chlorobenzene	µg/L	NC	5	1.0 U	5.0 U	5.0 U
Chloroethane	µg/L	NC	5	1.0 U	5.0 U	5.0 U
Chloroform (Trichloromethane)	µg/L	NC	7	0.65 J	5.0 U	5.0 U
Chloromethane (Methyl Chloride)	µg/L	NC	5	1.0 UJ	5.0 U	5.0 U
cis-1,2-Dichloroethene	µg/L	NC	5	1.2	0.84 J	5.0 U
cis-1,3-Dichloropropene	µg/L	NC	NC	1.0 U	5.0 U	5.0 U
Cyclohexane	µg/L	NC	NC	1.0 U	--	--
Dibromochloromethane	µg/L	50	NC	1.0 U	5.0 U	5.0 U
Dibromodifluoromethane	µg/L	NC	NC	1.0 U	--	--
Dichlorodifluoromethane (CFC-12)	µg/L	NC	5	--	--	--

Table 2

Summary of Deep Groundwater (C-Zone) Analytical Results
Norampac - Frontier Site
Niagara Falls, New York

Parameter	Units	New York State TOGs Guidance Value	New York State TOGs Standard	Location ID: MW1-C-08 Sample Name: GW-47392-033109-JJW-015 Sample Date: 3/31/2009 Duplicate	MW1-C-08 WG-47392-100714-DJT-010 10/7/2014	MW1-C-08 WG-11109628-100815-SG-012 10/8/2015
Volatile Organic Compounds						
Ethylbenzene	µg/L	NC	5	1.0 U	5.0 U	5.0 U
Isopropylbenzene	µg/L	NC	5	1.0 U	--	--
Methyl acetate	µg/L	NC	NC	1.0 U	--	--
Methyl cyclohexane	µg/L	NC	NC	1.0 U	--	--
Methyl Tert Butyl Ether	µg/L	10	NC	1.0 U	--	--
Methylene chloride	µg/L	NC	5	1.0 U	5.0 U	5.0 U
Styrene	µg/L	NC	5	1.0 U	--	--
Tetrachloroethene	µg/L	NC	5	1.0 U	5.0 U	5.0 U
Toluene	µg/L	NC	5	**9.8 J**	5.0 U	5.0 U
Total Monochlorotoluenes	µg/L	NC	NC	1 U	5.0 U	5.0 U
trans-1,2-Dichloroethene	µg/L	NC	5	1.0 U	0.96 J	5.0 U
trans-1,3-Dichloropropene	µg/L	NC	NC	1.0 U	5.0 U	5.0 U
Trichloroethene	µg/L	NC	5	1.0 U	5.0 U	5.0 U
Trichlorofluoromethane (CFC-11)	µg/L	NC	5	1.0 U	--	--
Trifluorotrichloroethane (Freon 113)	µg/L	NC	5	1.0 U	--	--
Vinyl chloride	µg/L	NC	2	0.97 J	1.5 J	5.0 U
Xylene (total)	µg/L	NC	NC	2.0 U	--	--
Total VOCs	µg/L	NC	NC	15.22	5.67	1.27

Notes:

6.24 Concentration exceed NYS TOGS
U - Not present at or above the associated MDL
J - Estimated concentration between the MDL and Reporting Limit
MDL - Method Detection Limit
NC - No criteria
-- - Not analyzed
NYSDEC TOGS - New York State Technical and Operational Guidance Series

Table 2

Summary of Deep Groundwater (C-Zone) Analytical Results
Norampac - Frontier Site
Niagara Falls, New York

				Location ID:	MW2-C-08	MW2-C-08
				Sample Name:	GW-47392-120508-JJW-011	GW-47392-040309-JJW-023
				Sample Date:	12/5/2008	4/3/2009
		New York State TOGs				
Parameter	**Units**	**Guidance Value**	**Standard**			
Volatile Organic Compounds						
1,1,1-Trichloroethane	µg/L	NC	5		1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	µg/L	NC	5		1.0 U	1.0 U
1,1,2-Trichloroethane	µg/L	NC	1		1.0 U	1.0 U
1,1-Dichloroethane	µg/L	NC	5		1.0 U	1.0 U
1,1-Dichloroethene	µg/L	NC	5		1.0 U	1.0 U
1,2,4-Trichlorobenzene	µg/L	NC	5		1.0 UJ	1.0 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/L	NC	0.04		1.0 U	1.0 U
1,2-Dibromoethane (Ethylene Dibromide)	µg/L	NC	0.0006		1.0 U	1.0 U
1,2-Dichlorobenzene	µg/L	NC	3		1.5	1.5
1,2-Dichloroethane	µg/L	NC	0.6		1.0 U	1.0 U
1,2-Dichloropropane	µg/L	NC	1		1.0 U	1.0 U
1,3-Dichlorobenzene	µg/L	NC	3		2.3	**3.1**
1,4-Dichlorobenzene	µg/L	NC	3		**3.6**	**4.0**
2-Butanone (Methyl Ethyl Ketone)	µg/L	50	NC		5.0 U	5.0 U
2-Chlorotoluene	ug/L	NC	5		2.0	1.0 U
2-Chloroethyl vinyl ether	µg/L	NC	NC		--	--
2-Hexanone	µg/L	50	NC		5.0 U	5.0 U
3-Chlorotoluene	µg/L	NC	5		1.0 U	2.3
4-Chlorotoluene	µg/L	NC	5		1.0 U	1.0 U
4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	µg/L	NC	NC		5.0 U	5.0 U
Acetone	µg/L	50	NC		5.0 UJ	5.0 U
Acrolein	µg/L	NC	5		--	--
Acrylonitrile	µg/L	NC	5		--	--
Benzene	µg/L	NC	1		**33**	**30**
Bromodichloromethane	µg/L	50	NC		1.0 U	1.0 U
Bromoform	µg/L	50	NC		1.0 U	1.0 U
Bromomethane (Methyl Bromide)	µg/L	NC	5		1.0 U	1.0 U
Carbon disulfide	µg/L	60	NC		0.57 J	1.0 U
Carbon tetrachloride	µg/L	NC	5		1.0 U	1.0 U
Chlorobenzene	µg/L	NC	5		**24**	**26**
Chloroethane	µg/L	NC	5		1.0 U	1.0 U
Chloroform (Trichloromethane)	µg/L	NC	7		1.0 U	1.0 U
Chloromethane (Methyl Chloride)	µg/L	NC	5		1.0 U	1.0 U
cis-1,2-Dichloroethene	µg/L	NC	5		2.8	2.6
cis-1,3-Dichloropropene	µg/L	NC	NC		1.0 U	1.0 U
Cyclohexane	µg/L	NC	NC		1.0 U	1.0 U
Dibromochloromethane	µg/L	50	NC		1.0 U	1.0 U
Dibromodifluoromethane	µg/L	NC	NC		--	1.0 U
Dichlorodifluoromethane (CFC-12)	µg/L	NC	5		1.0 U	--

Table 2

Summary of Deep Groundwater (C-Zone) Analytical Results
Norampac - Frontier Site
Niagara Falls, New York

				Location ID:	MW2-C-08	MW2-C-08
				Sample Name:	GW-47392-120508-JJW-011	GW-47392-040309-JJW-023
				Sample Date:	12/5/2008	4/3/2009
		New York State TOGs				
Parameter	**Units**	**Guidance Value**	**Standard**			
Volatile Organic Compounds						
Ethylbenzene	µg/L	NC	5		1.0 U	1.0 U
Isopropylbenzene	µg/L	NC	5		1.0 U	1.0 U
Methyl acetate	µg/L	NC	NC		1.0 UJ	1.0 UJ
Methyl cyclohexane	µg/L	NC	NC		1.0 U	1.0 U
Methyl Tert Butyl Ether	µg/L	10	NC		1.0 U	1.0 U
Methylene chloride	µg/L	NC	5		1.0 U	1.0 U
Styrene	µg/L	NC	5		1.0 U	1.0 U
Tetrachloroethene	µg/L	NC	5		1.0 U	1.0 U
Toluene	µg/L	NC	5		1.0	1.0 U
Total Monochlorotoluenes	µg/L	NC	NC		2	2.3
trans-1,2-Dichloroethene	µg/L	NC	5		0.80 J	0.61 J
trans-1,3-Dichloropropene	µg/L	NC	NC		1.0 U	1.0 U
Trichloroethene	µg/L	NC	5		0.63 J	0.52 J
Trichlorofluoromethane (CFC-11)	µg/L	NC	5		1.0 U	1.0 U
Trifluorotrichloroethane (Freon 113)	µg/L	NC	5		1.0 U	1.0 U
Vinyl chloride	µg/L	NC	2		2.0	**3.0**
Xylene (total)	µg/L	NC	NC		3.0 U	2.0 U
Total VOCs	µg/L	NC	NC		74.2	73.63

Notes:

6.24 Concentration exceed NYS TOGS
U - Not present at or above the associated MDL
J - Estimated concentration between the MDL and Reporting Limit
MDL - Method Detection Limit
NC - No criteria
-- - Not analyzed
NYSDEC TOGS - New York State Technical and Operational Guidance Series

Table 2

Summary of Deep Groundwater (C-Zone) Analytical Results
Norampac - Frontier Site
Niagara Falls, New York

				Location ID:	MW2-C-08	MW2-C-08
				Sample Name:	WG-47392-100714-SG-011	WG-11109628-100715-SG-008
				Sample Date:	10/7/2014	10/07/2015
		New York State TOGs				
Parameter	**Units**	**Guidance Value**	**Standard**			
Volatile Organic Compounds						
1,1,1-Trichloroethane	µg/L	NC	5		5.0 U	5.0 U
1,1,2,2-Tetrachloroethane	µg/L	NC	5		5.0 U	5.0 U
1,1,2-Trichloroethane	µg/L	NC	1		5.0 U	5.0 U
1,1-Dichloroethane	µg/L	NC	5		5.0 U	5.0 U
1,1-Dichloroethene	µg/L	NC	5		5.0 U	5.0 U
1,2,4-Trichlorobenzene	µg/L	NC	5		5.0 U	5.0 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/L	NC	0.04		--	--
1,2-Dibromoethane (Ethylene Dibromide)	µg/L	NC	0.0006		--	--
1,2-Dichlorobenzene	µg/L	NC	3		2.8 J	**6.2**
1,2-Dichloroethane	µg/L	NC	0.6		5.0 U	5.0 U
1,2-Dichloropropane	µg/L	NC	1		5.0 U	5.0 U
1,3-Dichlorobenzene	µg/L	NC	3		**3.4 J**	**13**
1,4-Dichlorobenzene	µg/L	NC	3		**7.8**	**25**
2-Butanone (Methyl Ethyl Ketone)	µg/L	50	NC		--	--
2-Chlorotoluene	ug/L	NC	5		--	--
2-Chloroethyl vinyl ether	µg/L	NC	NC		25 U	25 U
2-Hexanone	µg/L	50	NC		--	--
3-Chlorotoluene	µg/L	NC	5		--	--
4-Chlorotoluene	µg/L	NC	5		--	--
4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	µg/L	NC	NC		--	--
Acetone	µg/L	50	NC		25 U	25 U
Acrolein	µg/L	NC	5		100 U	100 U
Acrylonitrile	µg/L	NC	5		50 U	50 U
Benzene	µg/L	NC	1		**8.6**	**12**
Bromodichloromethane	µg/L	50	NC		5.0 U	--
Bromoform	µg/L	50	NC		5.0 U	5.0 U
Bromomethane (Methyl Bromide)	µg/L	NC	5		5.0 U	5.0 U
Carbon disulfide	µg/L	60	NC		--	--
Carbon tetrachloride	µg/L	NC	5		5.0 U	5.0 U
Chlorobenzene	µg/L	NC	5		**38**	**86**
Chloroethane	µg/L	NC	5		5.0 U	5.0 U
Chloroform (Trichloromethane)	µg/L	NC	7		5.0 U	5.0 U
Chloromethane (Methyl Chloride)	µg/L	NC	5		5.0 U	5.0 U
cis-1,2-Dichloroethene	µg/L	NC	5		5.0 U	0.67 J
cis-1,3-Dichloropropene	µg/L	NC	NC		5.0 U	5.0 U
Cyclohexane	µg/L	NC	NC		--	--
Dibromochloromethane	µg/L	50	NC		5.0 U	5.0 U
Dibromodifluoromethane	µg/L	NC	NC		--	--
Dichlorodifluoromethane (CFC-12)	µg/L	NC	5		--	--

Summary of Deep Groundwater (C-Zone) Analytical Results
Norampac - Frontier Site
Niagara Falls, New York

			Location ID:	**MW2-C-08**	**MW2-C-08**
			Sample Name:	**WG-47392-100714-SG-011**	**WG-11109628-100715-SG-008**
			Sample Date:	**10/7/2014**	**10/07/2015**
		New York State TOGs			
Parameter	**Units**	**Guidance Value**	**Standard**		
Volatile Organic Compounds					
Ethylbenzene	µg/L	NC	5	5.0 U	5.0 U
Isopropylbenzene	µg/L	NC	5	--	--
Methyl acetate	µg/L	NC	NC	--	--
Methyl cyclohexane	µg/L	NC	NC	--	--
Methyl Tert Butyl Ether	µg/L	10	NC	--	--
Methylene chloride	µg/L	NC	5	5.0 U	5.0 U
Styrene	µg/L	NC	5	--	--
Tetrachloroethene	µg/L	NC	5	5.0 U	5.0 U
Toluene	µg/L	NC	5	5.0 U	0.56 J
Total Monochlorotoluenes	µg/L	NC	NC	3.0 J	9.84 J
trans-1,2-Dichloroethene	µg/L	NC	5	5.0 U	5.0 U
trans-1,3-Dichloropropene	µg/L	NC	NC	5.0 U	5.0 U
Trichloroethene	µg/L	NC	5	5.0 U	5.0 U
Trichlorofluoromethane (CFC-11)	µg/L	NC	5	--	--
Trifluorotrichloroethane (Freon 113)	µg/L	NC	5	--	--
Vinyl chloride	µg/L	NC	2	0.85 J	1.1 J
Xylene (total)	µg/L	NC	NC	--	--
Total VOCs	µg/L	NC	NC	64.45	154.37

Notes:

6.24 Concentration exceed NYS TOGS
U - Not present at or above the associated MDL
J - Estimated concentration between the MDL and Reporting Limit
MDL - Method Detection Limit
NC - No criteria
-- - Not analyzed
NYSDEC TOGS - New York State Technical and Operational Guidance Series

Table 2

Summary of Deep Groundwater (C-Zone) Analytical Results
Norampac - Frontier Site
Niagara Falls, New York

			Location ID:	**MW3-C-08**	**MW3-C-08**
			Sample Name:	**GW-47392-120408-JJW-006**	**GW-47392-040109-JJW-019**
			Sample Date:	**12/4/2008**	**4/1/2009**
		New York State TOGs			
Parameter	**Units**	**Guidance Value**	**Standard**		
Volatile Organic Compounds					
1,1,1-Trichloroethane	µg/L	NC	5	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	µg/L	NC	5	1.0 U	1.0 U
1,1,2-Trichloroethane	µg/L	NC	1	1.0 U	1.0 U
1,1-Dichloroethane	µg/L	NC	5	1.0 U	1.0 U
1,1-Dichloroethene	µg/L	NC	5	1.0 U	1.0 U
1,2,4-Trichlorobenzene	µg/L	NC	5	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/L	NC	0.04	1.0 U	1.0 U
1,2-Dibromoethane (Ethylene Dibromide)	µg/L	NC	0.0006	1.0 U	1.0 U
1,2-Dichlorobenzene	µg/L	NC	3	0.54 J	0.58 J
1,2-Dichloroethane	µg/L	NC	0.6	1.0 U	1.0 U
1,2-Dichloropropane	µg/L	NC	1	1.0 U	1.0 U
1,3-Dichlorobenzene	µg/L	NC	3	0.50 J	0.47 J
1,4-Dichlorobenzene	µg/L	NC	3	1.0	1.2
2-Butanone (Methyl Ethyl Ketone)	µg/L	50	NC	5.0 U	5.0 U
2-Chlorotoluene	ug/L	NC	5	0.67 J	1.0 U
2-Chloroethyl vinyl ether	µg/L	NC	NC	--	--
2-Hexanone	µg/L	50	NC	5.0 U	5.0 U
3-Chlorotoluene	µg/L	NC	5	1.0 U	0.56 J
4-Chlorotoluene	µg/L	NC	5	1.0 U	1.0 U
4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	µg/L	NC	NC	5.0 U	5.0 U
Acetone	µg/L	50	NC	5.0 U	5.0 U
Acrolein	µg/L	NC	5	--	--
Acrylonitrile	µg/L	NC	5	--	--
Benzene	µg/L	NC	1	0.83 J	1.0 U
Bromodichloromethane	µg/L	50	NC	1.0 U	1.0 U
Bromoform	µg/L	50	NC	1.0 U	1.0 U
Bromomethane (Methyl Bromide)	µg/L	NC	5	1.0 U	1.0 U
Carbon disulfide	µg/L	60	NC	1.0 U	1.0 U
Carbon tetrachloride	µg/L	NC	5	1.0 U	1.0 U
Chlorobenzene	µg/L	NC	5	1.3	1.1
Chloroethane	µg/L	NC	5	1.0 U	1.0 U
Chloroform (Trichloromethane)	µg/L	NC	7	0.60 J	1.0 U
Chloromethane (Methyl Chloride)	µg/L	NC	5	1.0 U	1.0 UJ
cis-1,2-Dichloroethene	µg/L	NC	5	1.8	1.9
cis-1,3-Dichloropropene	µg/L	NC	NC	1.0 U	1.0 U
Cyclohexane	µg/L	NC	NC	1.0 U	1.0 U
Dibromochloromethane	µg/L	50	NC	1.0 U	1.0 U
Dibromodifluoromethane	µg/L	NC	NC	--	1.0 U
Dichlorodifluoromethane (CFC-12)	µg/L	NC	5	1.0 U	--

Table 2

Summary of Deep Groundwater (C-Zone) Analytical Results
Norampac - Frontier Site
Niagara Falls, New York

			Location ID:	MW3-C-08	MW3-C-08
			Sample Name:	GW-47392-120408-JJW-006	GW-47392-040109-JJW-019
			Sample Date:	12/4/2008	4/1/2009
		New York State TOGs			
Parameter	**Units**	**Guidance Value**	**Standard**		
Volatile Organic Compounds					
Ethylbenzene	µg/L	NC	5	1.0 U	1.0 U
Isopropylbenzene	µg/L	NC	5	1.0 U	1.0 U
Methyl acetate	µg/L	NC	NC	1.0 U	1.0 U
Methyl cyclohexane	µg/L	NC	NC	1.0 U	1.0 U
Methyl Tert Butyl Ether	µg/L	10	NC	1.0 U	1.0 U
Methylene chloride	µg/L	NC	5	1.0 U	1.0 U
Styrene	µg/L	NC	5	1.0 U	1.0 U
Tetrachloroethene	µg/L	NC	5	1.0 U	1.0 U
Toluene	µg/L	NC	5	1.0 U	1.0 U
Total Monochlorotoluenes	µg/L	NC	NC	0.67 J	0.56 J
trans-1,2-Dichloroethene	µg/L	NC	5	0.54 J	0.73 J
trans-1,3-Dichloropropene	µg/L	NC	NC	1.0 U	1.0 U
Trichloroethene	µg/L	NC	5	1.0 U	1.0 U
Trichlorofluoromethane (CFC-11)	µg/L	NC	5	1.0 U	1.0 U
Trifluorotrichloroethane (Freon 113)	µg/L	NC	5	1.0 U	1.0 U
Vinyl chloride	µg/L	NC	2	1.5	1.0 U
Xylene (total)	µg/L	NC	NC	3.0 U	2.0 U
Total VOCs	µg/L	NC	NC	9.28	6.54

Notes:

6.24 Concentration exceed NYS TOGS
U - Not present at or above the associated MDL
J - Estimated concentration between the MDL and Reporting Limit
MDL - Method Detection Limit
NC - No criteria
-- - Not analyzed
NYSDEC TOGS - New York State Technical and Operational Guidance Series

Table 2

Summary of Deep Groundwater (C-Zone) Analytical Results
Norampac - Frontier Site
Niagara Falls, New York

			Location ID:	**MW3-C-08**	**MW3-C-08**
			Sample Name:	**WG-47392-100714-SG-012**	**WG-11109628-100715-DT-007**
			Sample Date:	**10/7/2014**	**10/07/2015**
		New York State TOGs			
Parameter	**Units**	**Guidance Value**	**Standard**		
Volatile Organic Compounds					
1,1,1-Trichloroethane	µg/L	NC	5	5.0 U	5.0 U
1,1,2,2-Tetrachloroethane	µg/L	NC	5	5.0 U	5.0 U
1,1,2-Trichloroethane	µg/L	NC	1	5.0 U	5.0 U
1,1-Dichloroethane	µg/L	NC	5	5.0 U	5.0 U
1,1-Dichloroethene	µg/L	NC	5	5.0 U	5.0 U
1,2,4-Trichlorobenzene	µg/L	NC	5	5.0 U	5.0 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/L	NC	0.04	--	--
1,2-Dibromoethane (Ethylene Dibromide)	µg/L	NC	0.0006	--	--
1,2-Dichlorobenzene	µg/L	NC	3	5.0 U	0.98 J
1,2-Dichloroethane	µg/L	NC	0.6	5.0 U	5.0 U
1,2-Dichloropropane	µg/L	NC	1	5.0 U	5.0 U
1,3-Dichlorobenzene	µg/L	NC	3	5.0 U	1.7 J
1,4-Dichlorobenzene	µg/L	NC	3	1.0 J	**3.3 J**
2-Butanone (Methyl Ethyl Ketone)	µg/L	50	NC	--	--
2-Chlorotoluene	ug/L	NC	5	--	--
2-Chloroethyl vinyl ether	µg/L	NC	NC	25 U	25 U
2-Hexanone	µg/L	50	NC	--	--
3-Chlorotoluene	µg/L	NC	5	--	--
4-Chlorotoluene	µg/L	NC	5	--	--
4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	µg/L	NC	NC	--	--
Acetone	µg/L	50	NC	25 U	25 U
Acrolein	µg/L	NC	5	100 U	100 U
Acrylonitrile	µg/L	NC	5	50 U	50 U
Benzene	µg/L	NC	1	5.0 U	5.0 U
Bromodichloromethane	µg/L	50	NC	5.0 U	5.0 U
Bromoform	µg/L	50	NC	5.0 U	5.0 U
Bromomethane (Methyl Bromide)	µg/L	NC	5	5.0 U	5.0 U
Carbon disulfide	µg/L	60	NC	--	--
Carbon tetrachloride	µg/L	NC	5	5.0 U	5.0 U
Chlorobenzene	µg/L	NC	5	5.0 U	1.1 J
Chloroethane	µg/L	NC	5	5.0 U	5.0 U
Chloroform (Trichloromethane)	µg/L	NC	7	5.0 U	5.0 U
Chloromethane (Methyl Chloride)	µg/L	NC	5	5.0 U	5.0 U
cis-1,2-Dichloroethene	µg/L	NC	5	1.6 J	**45**
cis-1,3-Dichloropropene	µg/L	NC	NC	5.0 U	5.0 U
Cyclohexane	µg/L	NC	NC	--	--
Dibromochloromethane	µg/L	50	NC	5.0 U	5.0 U
Dibromodifluoromethane	µg/L	NC	NC	--	--
Dichlorodifluoromethane (CFC-12)	µg/L	NC	5	--	--

Table 2

Summary of Deep Groundwater (C-Zone) Analytical Results
Norampac - Frontier Site
Niagara Falls, New York

			Location ID:	**MW3-C-08**	**MW3-C-08**
			Sample Name:	**WG-47392-100714-SG-012**	**WG-11109628-100715-DT-007**
			Sample Date:	**10/7/2014**	**10/07/2015**
		New York State TOGs			
Parameter	**Units**	**Guidance Value**	**Standard**		
Volatile Organic Compounds					
Ethylbenzene	µg/L	NC	5	5.0 U	5.0 U
Isopropylbenzene	µg/L	NC	5	--	--
Methyl acetate	µg/L	NC	NC	--	--
Methyl cyclohexane	µg/L	NC	NC	--	--
Methyl Tert Butyl Ether	µg/L	10	NC	--	--
Methylene chloride	µg/L	NC	5	5.0 U	5.0 U
Styrene	µg/L	NC	5	--	--
Tetrachloroethene	µg/L	NC	5	5.0 U	5.0 U
Toluene	µg/L	NC	5	5.0 U	5.0 U
Total Monochlorotoluenes	µg/L	NC	NC	5.0 U	5.0 U
trans-1,2-Dichloroethene	µg/L	NC	5	5.0 U	0.70 J
trans-1,3-Dichloropropene	µg/L	NC	NC	5.0 U	5.0 U
Trichloroethene	µg/L	NC	5	5.0 U	1.8 J
Trichlorofluoromethane (CFC-11)	µg/L	NC	5	--	--
Trifluorotrichloroethane (Freon 113)	µg/L	NC	5	--	--
Vinyl chloride	µg/L	NC	2	0.93 J	**9**
Xylene (total)	µg/L	NC	NC	--	--
Total VOCs	µg/L	NC	NC	3.53	63.58

Notes:

6.24 Concentration exceed NYS TOGS
U - Not present at or above the associated MDL
J - Estimated concentration between the MDL and Reporting Limit
MDL - Method Detection Limit
NC - No criteria
-- - Not analyzed
NYSDEC TOGS - New York State Technical and Operational Guidance Series

Attachment A
Annual Inspection Report

SITE INSPECTION FORM
FRONTIER CHEMICAL SITE
NIAGARA FALLS, NEW YORK
NYSDEC SITE NO. 932110

INSPECTION DATE: 10-7-15

INSPECTED BY: D. Tyron / S. Gardner

Overall Site

Has the Site use changed since the last inspection? *Yes* _____ *No* ✓

If yes, please describe the changes: _____

Have neighboring property uses changed? *Yes* _____ *No* ✓

If yes, please describe the changes: _____

Asphalt/Concrete Cover System

Potential Problems	***Concern***	***Corrective Action***
Potholes and cracks	• Deterioration of asphalt pavement or concrete • Safety hazard	• Use cold mix or hot mix asphalt and liquid bituminous material to patch, repair, or replace asphalt • For concrete, select repair method based on type and extent of damage
Ponding water	• Safety hazard	• No action required if ponding is minor • If ponding is significant, install drainage holes in asphalt/concrete pavement
Obstructions/Debris	• Safety hazard	• Remove obstructions as soon as possible

Inspect For	***Inspection Item Identified (circle one)***		***Action Required (circle one)***		***Comments***
Deterioration	Yes	(No)	Yes	(No)	
Obstruction/Debris	Yes	(No)	Yes	(No)	
Potholes	Yes	(No)	Yes	(No)	
Drainage/Puddles	(Yes)	No	Yes	(No)	
Other	Yes	(No)	Yes	(No)	

D. Tyron

SITE INSPECTION FORM
FRONTIER CHEMICAL SITE
NIAGARA FALLS, NEW YORK
NYSDEC SITE NO. 932110

INSPECTION DATE: 10-7-15

INSPECTED BY: D. Tyron / S. Gardner

Soil Cover System

Potential Problems	***Concern***	***Corrective Action***
Erosion	• Deterioration of integrity of crushed concrete cover • Washed out cover	• Backfill with additional imported crushed stone as needed • If persistent erosion occurs, erosion control mats may be required in selected areas
Animal burrows	• Potential for crushed concrete erosion • Safety hazard	• Contract exterminator regarding trapping and relocation of persistent rodents • Fill all holes with crushed stone
Damage to fence	• Potential access to Site by unauthorized persons	• No action if damage is minor and does not allow access by unauthorized persons • Repair fence if appropriate

Inspect For	***Inspection Item Identified (circle one)***		***Action Required (circle one)***		***Comments***
Erosion	(Yes)	No	Yes	(No)	Some large ruts from truck traffic
Animal Burrows	Yes	(No)	Yes	(No)	
Damage to fence	(Yes)	No	(Yes)	No	*
Other	Yes	(No)	Yes	(No)	

* Large hole in fence along Royal Ave about 100' East of the SW corner of the site.

Large section of the fence along 47th St. towards the north end of the site is laying down.

Dave Tyron

SITE INSPECTION FORM
FRONTIER CHEMICAL SITE
NIAGARA FALLS, NEW YORK
NYSDEC SITE NO. 932110

INSPECTION DATE: 10-7-15

INSPECTED BY: D. Tyran / S. Gardner

Monitoring Wells

Potential Problems	***Concern***	***Corrective Action***
Missing locks	• Potential access by unauthorized persons	• Replace lock
Missing J-plugs	• Potential well contamination from surface water or rain water	• Replace J-plug
Concrete surface seal	• Damaged seal can allow water infiltration around casing and contamination of groundwater	• Contract drilling subcontractor to have surface seal replaced
Damaged flush-mount or stickup casing	• Damaged casing can result in damage to riser	• Contract drilling subcontractor to have casing replaced

Monitoring Well	***Well Condition (circle one)***			***Comments***
MW3C-08	(Good)	Fair	Needs Repair	
BH87-3A	(Good)	Fair	Needs Repair	
BH87-3B	(Good)	Fair	Needs Repair	
MW01-9A	(Good)	Fair	Needs Repair	
MW-9	Good	(Fair)	Needs Repair	
MW2C-08	(Good)	Fair	Needs Repair	
MW88-13A	Good	Fair	(Needs Repair)	casing broken @ ground surface
BH87-28	Good	(Fair)	Needs Repair	
MW-12	(Good)	Fair	Needs Repair	
MW1C-08	(Good)	Fair	Needs Repair	
MW-13	(Good)	Fair	Needs Repair	

David J. Tyran

Attachment B
2015 Semiannual Groundwater Discharge Reports

CONESTOGA-ROVERS & ASSOCIATES

651 Colby Drive, Waterloo, Ontario, N2V 1C2
Telephone: (519) 884-0510 Fax: (519) 884-0525
www.CRAworld.com

May 8, 2015 Reference No. 047392

Mr. Joel Paradise
Niagara Falls Water Board
5815 Buffalo Avenue
Niagara Falls, NY 14304

Dear Mr. Paradise:

Re: Semi Annual Groundwater Discharge Report
SIU Permit #72
Frontier Chemical Site

This semi-annual report has been prepared in accordance with Paragraph G of the Significant Industrial User Permit #72 issued on September 30, 2010 (modified October 6, 2010, November 29, 2011, May 17, 2012, June 10, 2013, and November 12, 2013) by the Niagara Falls Water Board to the Frontier Chemical Site PRP Group in Niagara Falls, New York. The report presents the analytical data and field measurements taken for the semi-annual period covering December 2014 through May 2015. The data collected have been used to calculate the volume of groundwater and the chemical loading associated with the groundwater that discharges into the Falls Street Tunnel and the 47th Street Tunnel which are located immediately adjacent to the Frontier Chemical Site.

Data Collection

Groundwater levels were measured in all of the available monitoring wells in the A Zone and B Zone of the bedrock formation at the Site. The groundwater levels were measured on March 31, 2015 and the data are presented on attached Figures 1 and 2.

Groundwater samples were collected from the following monitoring wells on April 3, 2015 and analyzed for the list of parameters specified in Paragraphs F and G of the Permit.

A Zone

- MW01-9A
- MW88-13A

- BH87-28
- BH-87-3A

B Zone

- BH87-3B
- MW-9
- MW-12
- MW-13

Flow Calculation

The groundwater flow volume is calculated based upon the thickness of the bedrock aquifer through which the groundwater flows, the aquifer permeability, and the gradient (slope) of the groundwater table. These three factors are combined, using Darcy's Law of hydraulic flow, to determine the flow volume (Flow = permeability x gradient x cross sectional saturated area). The groundwater gradients used in the flow calculation are presented on Figures 1 and 2. The calculation of groundwater flow is presented in Table 1. The Bedrock A Zone migration boundary along the south side of the Site has been divided into the west side and the east side. The April 2015 groundwater levels show that a portion of the A Zone groundwater discharge from the Site continues along the western half of the Site along Royal Avenue. The most likely receiver of the A Zone groundwater in this area is the underlying B Zone, which is captured by the 47th Street Tunnel.

The calculated volume of groundwater discharge to the tunnels from the entire Site for the December 2014 through May 2015 time period is 2,395 gallons per day.

It is noted that the groundwater in the B Zone continues to flow to the east toward 47th Street with no migration to the south. This flow pattern is consistent with the pattern that developed after the closure of a portion of the FST and was first measured during the October 19, 2012 groundwater monitoring event.

Loading Calculation

The chemical loading to the tunnel sewer system is determined by multiplying groundwater flow volume by the concentration of the chemicals in the groundwater at the downgradient boundary of the Site, adjacent to where the groundwater enters the tunnels. Since there are multiple wells available along the tunnels, the chemical concentrations of this group of wells have been averaged to provide the best estimate of chemical loading. The concentrations of chemicals present in the April 2015 groundwater samples and the calculated chemical loadings to the tunnel sewers for each individual compound for each flow zone are presented in Tables 2a, 2b, 2c, 3a, and 3b. The total daily chemical loading for each compound is summarized in Table 4.

Discharge Limitations

The calculated volume of groundwater discharge to the tunnels and the associated chemical loadings have been compared to the limitations of the Permit (see Table 5). The calculations show that all parameters are within the Permit limits.

It is noted that, while it is expected that the chemical loadings will decrease over time, some variability should be expected in the groundwater hydraulics and concentrations used to calculate the infiltration conditions and therefore some flexibility is needed in the Permit limits for the Site. It is believed that the Permit limits are reasonable, given the current conditions and making allowance for some continued variation over time. However, if conditions change, modifications may be necessary.

Next Report

The next semiannual report will be submitted to the Niagara Falls Water Board by November 30, 2015.

CONESTOGA-ROVERS & ASSOCIATES

May 8, 2015 Reference No. 047392

Should you have any questions, please contact me.

Yours truly,

CONESTOGA-ROVERS & ASSOCIATES

James Kay

James Kay, P.Eng.

KDS/mg/1
Encl. SIU Permit Calculations and Permit Submittal Sheets

cc: Rick Roll
Paul Drof
David Share
Tim Webster

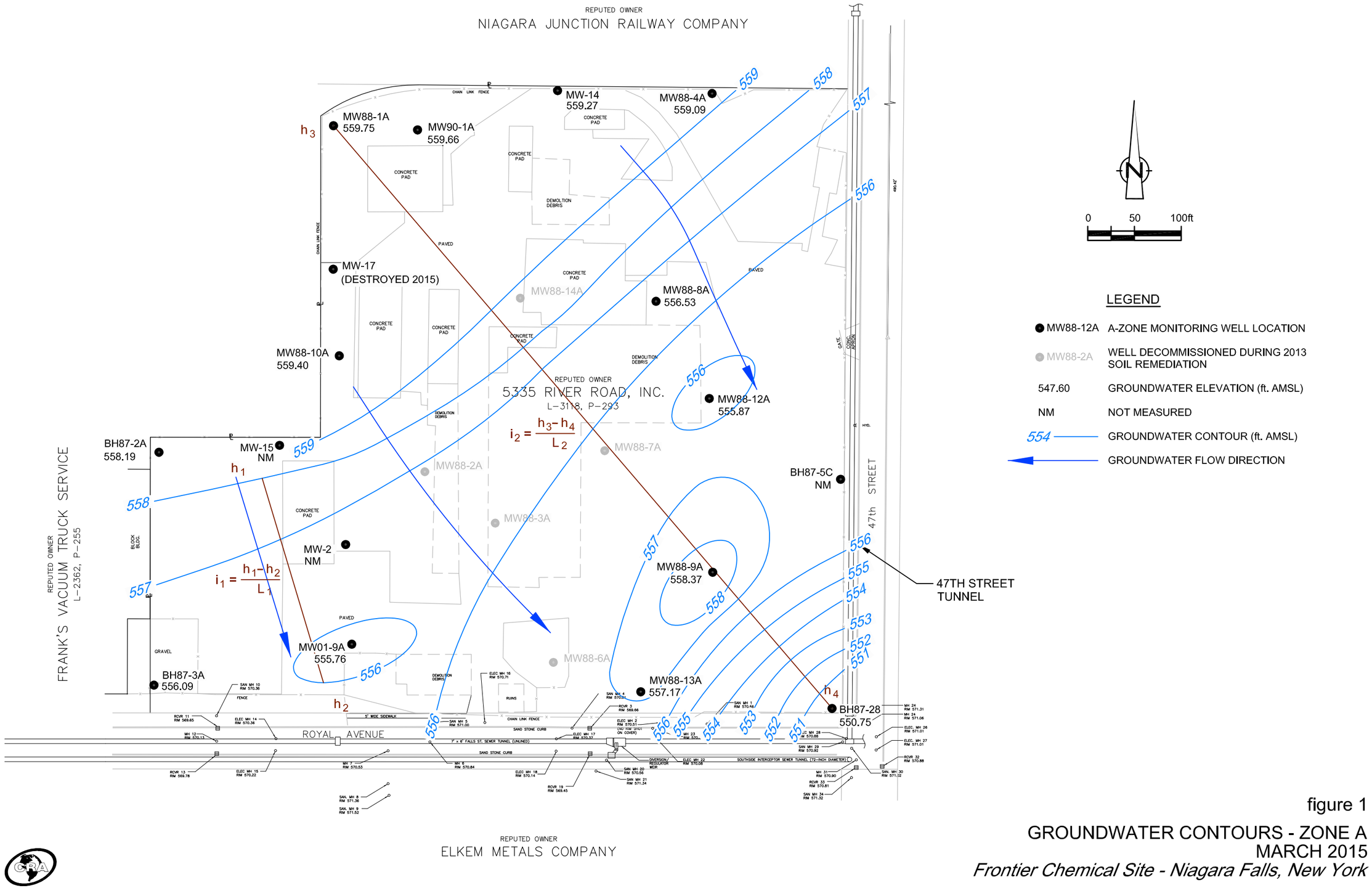


figure 1

GROUNDWATER CONTOURS - ZONE A
MARCH 2015
Frontier Chemical Site - Niagara Falls, New York

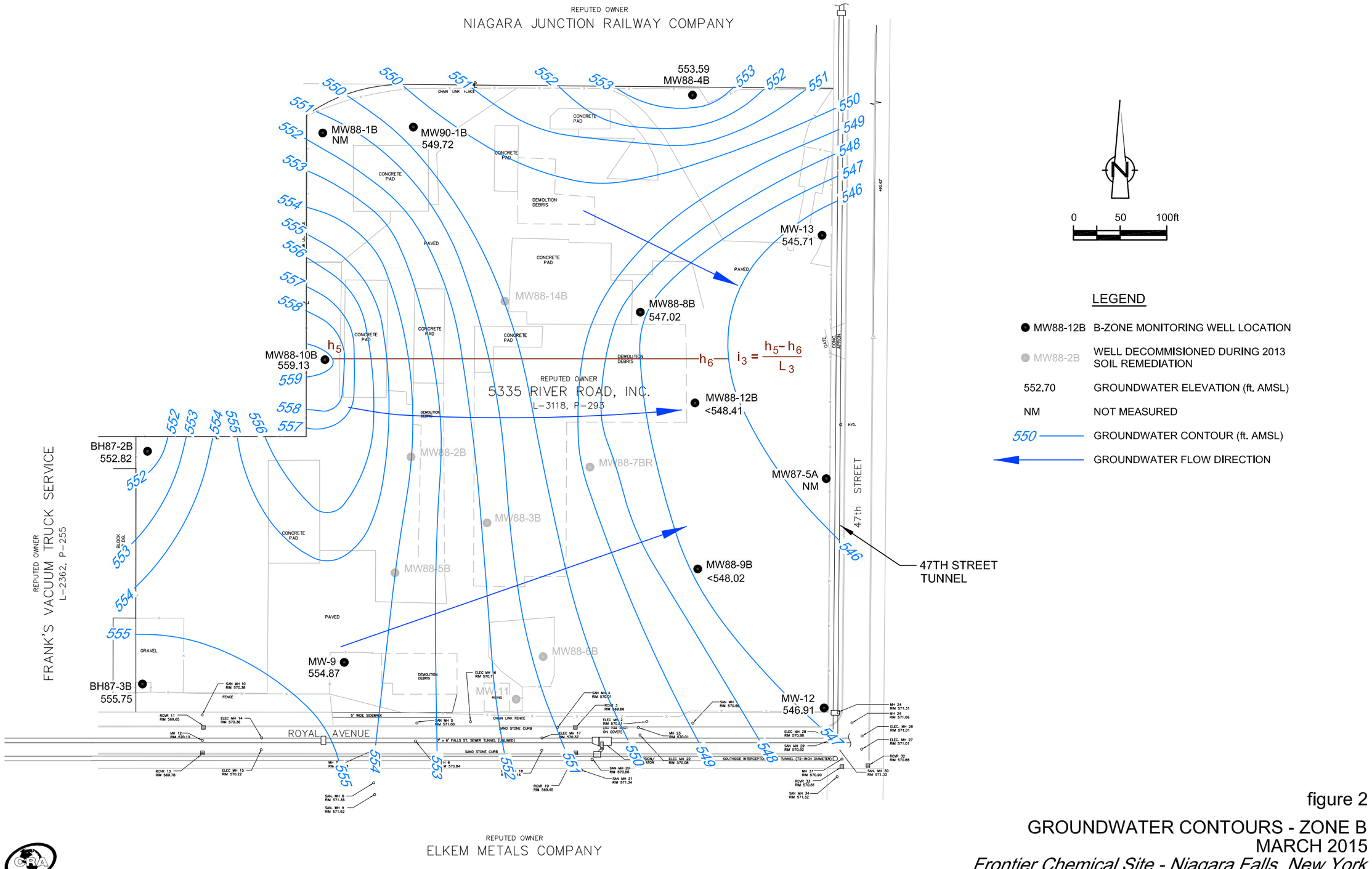


figure 2

GROUNDWATER CONTOURS - ZONE B
MARCH 2015
Frontier Chemical Site - Niagara Falls, New York

TABLE 1

APRIL 2015 GROUNDWATER FLOW RATE ESTIMATE
FRONTIER CHEMICAL SITE
NIAGARA FALLS, NEW YORK

A) Bedrock A-Zone (Figure 1)

Royal Avenue West Side
Flow Thickness: Upper 3 to 5 feet of bedrock
Head Difference: = h1-h2
= 2.00 ft

Distance between h1 & h2 = 230 ft

i = 2.00/230 = 0.009

Flow Width: 320 ft
K = 2.5×10^{-5} to 5.2×10^{-5} ft/sec
Flow rate: = 5ft x 0.009 x 320 ft x 5.2×10^{-5} ft/sec
= 7.49×10^{-4} ft^3/sec
= 480 USgal/day
= 176,700 USgal/year

Royal Avenue East Side
Flow Thickness: Upper 3 to 5 feet of bedrock
Head Difference: = h3-h4
= 9.00 ft

Distance between h3 & h4 = 825 ft

i = 9.00/825 = 0.011

Flow Width: 440 ft
K = 2.5×10^{-5} to 5.2×10^{-5} ft/sec
Flow rate: = 5ft x 0.011 x 440 ft x 5.2×10^{-5} ft/sec
= 1.26×10^{-3} ft^3/sec
= 810 USgal/day
= 297,000 USgal/year

47th Street South Side
Flow Thickness: Upper 3 to 5 feet of bedrock
Head Difference: = h3-h4
=9.00ft

Distance between h_3 & h_4 = 825 ft

i = 9.00/825 = 0.011

Flow Width: 400 ft
K = 2.5×10^{-5} to 5.2×10^{-5} ft/sec
Flow rate: = 5ft x 0.011x 400 ft x 5.2×10^{-5} ft/sec
= 1.14×10^{-3} ft^3/sec
= 740 USgal/day
= 270,000 USgal/year

APRIL 2015 GROUNDWATER FLOW RATE ESTIMATE
FRONTIER CHEMICAL SITE
NIAGARA FALLS, NEW YORK

Note:

See Figure 1 for locations of $h_{1,}$ $h_{2,\ h3\ and\ h4}$

B) Bedrock B-Zone (Figure 2)

Flow Thickness: 2-foot-thick fracture zone from 8 to 10 feet beneath A-Zone
Flow from B-Zone now discharges to the east

• Easterly Flow:

Head Difference: = h_5-h_6 = 13 feet
Distance between h_5 & h_6 = 420 ft
Gradient: = 0.031
Flow Width: = 650 ft
Hydraulic Conductivity: = 1.4 x 10^{-5} ft/sec
Flow rate: = 2ft x 0.031 x 650 ft x 1.4 x 10^{-5} ft/sec
= 5.64 x 10^{-4} ft^3/sec
= 365 USgal/day
= 133,300 USgal/year

Note:

See Figure 2 for locations of h_5 and h_6.

TABLE 2A

A-FRACTURE ZONE BEDROCK, ROYAL AVENUE WEST SIDE DISCHARGE
APRIL 2015 CHEMICAL FLUX
FRONTIER CHEMICAL SITE

	Adjacent Wells		*Average Concentration (µg/L)*	*Mass Flux (lbs/day)*
Analyte	*MW-01-9A 4/3/2015*	*BH87-3A 4/3/2015*	*Adjacent Wells*	*Adjacent Wells*
VOCs by Method OLM04.2 (µg/L)				
1,1-Dichloroethane	**100/100**	25U	51.3	0.0002
1,2,4-Trichlorobenzene	100U/100U	**25**	17.5	0.0001
1,2-Dichlorobenzene	**110/110**	**1100**	605.0	0.0024
1,3-Dichlorobenzene	**290/280**	**2200**	1242.5	0.0050
1,4-Dichlorobenzene	**290/290**	**2100**	1195.0	0.0048
Acetone	500U/500U	130U	31.5	0.0001
Benzene	**30J/27J**	**34**	31.3	0.0001
Chlorobenzene	**350/340**	**1000**	672.5	0.0027
cis-1,2-Dichloroethene	**67J/65J**	**54**	60.0	0.0002
Tetrachloroethene	100U/100U	**8.1J**	9.1	0.0000
Toluene	**26J/23J**	**10J**	17.3	0.0001
Trichloroethene	100U/100U	**39**	24.5	0.0001
Vinyl chloride	**83J/82J**	**4.7J**	43.6	0.0002
Monochlorotoluene	**600/610**	**310**	457.5	0.0018
SVOCs by Method OLM04.2 (µg/L)				
Phenol	**22.5/24.9**	**17.2**	20.6	0.0001
TAL Metals by Method ILM04.0 (µg/L)				
Arsenic	**28/29**	10U	14.8	0.0001
Iron	**847/945**	**163**	529.5	0.0021
Potassium	**1530000/1400000**	**100000**	782500.0	3.1333
Sodium	**232000/234000**	**69800**	151400.0	0.6062

Notes:

(1) For U Values where compound was detected in one or more of the listed wells, 10 percent of U value was used to calculate average concentration.

(2) For U values where compound was not detected in any listed wells, the average concentration was set to 0 µg/L.

(3) Flow rate = 480 US gal/day.

TABLE 2B

A-FRACTURE ZONE BEDROCK, ROYAL AVENUE EAST SIDE DISCHARGE
APRIL 2015 CHEMICAL FLUX
FRONTIER CHEMICAL SITE

	Adjacent Wells			*Average Concentration (ug/L)*	*Mass Flux (lbs/day)*
Analyte	***BH87-28 4/3/2015***	***MW-88-6A***	***MW-88-13A 4/3/2015***	***Adjacent Wells***	***Adjacent Wells***
VOCs by Method OLM04.2 (µg/L)					
1,1-Dichloroethane	100U	NS	**1700**	855.0	0.0058
1,2,4-Trichlorobenzene	100U	NS	**340**	175.0	0.0012
1,2-Dichlorobenzene	**75J**	NS	**5600**	2837.5	0.0192
1,3-Dichlorobenzene	**59J**	NS	**1500**	779.5	0.0053
1,4-Dichlorobenzene	**50J**	NS	**3300**	1675.0	0.0113
Acetone	500U	NS	**340J**	195.0	0.0013
Benzene	**130**	NS	**1900**	1015.0	0.0069
Chlorobenzene	**49J**	NS	**2300**	1174.5	0.0079
cis-1,2-Dichloroethene	**100**	NS	**1300**	700.0	0.0047
Tetrachloroethene	100U	NS	**2900**	1455.0	0.0098
Toluene	**14J**	NS	**690**	352.0	0.0024
Trichloroethene	100U	NS	**6800**	3405.0	0.0230
Vinyl chloride	**59J**	NS	**86J**	72.5	0.0005
Monochlorotoluene	100U	NS	**5300**	2655.0	0.0179
SVOCs by Method OLM04.2 (µg/L)					
Phenol	**60.2**	NS	**625**	342.5	0.0023
TAL Metals by Method ILM04.0 (µg/L)					
Arsenic	**23.5**	NS	**146**	84.8	0.0006
Iron	**345**	NS	**3230**	1787.5	0.0121
Potassium	**6590000**	NS	**2080000**	4335000.0	29.2924
Sodium	**415000**	NS	**325000**	370000.0	2.5002

Notes:

(1) For U Values where compound was detected in one or more of the listed wells, 10 percent of U value was used to calculate average concentration.

(2) For U values where compound was not detected in any listed wells, the average concentration was set to 0 ug/L.
(3) Flow rate = 810 US gal/day.
NS - Not Samplable (Abandoned)

TABLE 2C

A-FRACTURE ZONE BEDROCK, 47TH STREET DISCHARGE
APRIL 2015 CHEMICAL FLUX
FRONTIER CHEMICAL SITE

	Adjacent Wells		*Average Concentration (ug/L)*	*Mass Flux (lbs/day)*
Analyte	***BH-87-28 4/3/2015***	***BH87-5C***	***Adjacent Wells***	***Adjacent Wells***
VOCs by Method OLM04.2 (µg/L)				
1,1-Dichloroethane	100U	NS	0.0	0.0000
1,2,4-Trichlorobenzene	100U	NS	0.0	0.0000
1,2-Dichlorobenzene	**75J**	NS	75.0	0.0005
1,3-Dichlorobenzene	**59J**	NS	59.0	0.0004
1,4-Dichlorobenzene	**50J**	NS	50.0	0.0003
Acetone	500U	NS	0.0	0.0000
Benzene	**130**	NS	130.0	0.0008
Chlorobenzene	**49J**	NS	49.0	0.0003
cis-1,2-Dichloroethene	**100**	NS	100.0	0.0006
Tetrachloroethene	100U	NS	0.0	0.0000
Toluene	**14J**	NS	14.0	0.0001
Trichloroethene	100U	NS	0.0	0.0000
Vinyl chloride	**59J**	NS	59.0	0.0004
Monochlorotoluene	100U	NS	0.0	0.0000
SVOCs by Method OLM04.2 (µg/L)				
Phenol	**60.2**	NS	60.2	0.0004
TAL Metals by Method ILM04.0 (µg/L)				
Arsenic	**23.5**	NS	23.5	0.0001
Iron	**345**	NS	345.0	0.0021
Potassium	**6590000**	NS	6590000.0	40.6816
Sodium	**415000**	NS	415000.0	2.5619

Notes:

(1) For U Values where compound was detected in one or more of the listed wells, 10 percent of U value was used to calculate average concentration.

(2) For U values where compound was not detected in any listed wells, the average concentration was set to 0 ug/L.

(3) Flow rate = 740 US gal/day.

NS - Well not sampleable.

TABLE 3B

B-FRACTURE ZONE BEDROCK - EASTERLY DISCHARGE
APRIL 2015 CHEMICAL FLUX
FRONTIER CHEMICAL SITE

Analyte	*Adjacent Wells*			*Average Concentration (ug/L)*	*Mass Flux (lbs/day)*
	MW-12 4/3/2015	*MW-13 4/3/2015*	*BH87-5A*	*Easterly Discharge*	*Adjacent Wells*
VOCs by Method OLM04.2 (µg/L)					
1,1-Dichloroethane	**33**	50U	NS	19.0	5.78532E-05
1,2,4-Trichlorobenzene	10U	50U	NS	0.0	0
1,2-Dichlorobenzene	**1.7J**	**8.1J**	NS	4.9	1.492E-05
1,3-Dichlorobenzene	**6.1J**	**31J**	NS	18.6	5.6483E-05
1,4-Dichlorobenzene	**2.0J**	**60**	NS	31.0	9.4392E-05
Acetone	50U	250U	NS	0.0	0
Benzene	**27**	50U	NS	16.0	4.87184E-05
Chlorobenzene	**4.1J**	**69**	NS	36.6	0.000111291
cis-1,2-Dichloroethene	**190**	50U	NS	97.5	0.000296878
Tetrachloroethene	10U	50U	NS	0.0	0
Toluene	**5.7J**	50U	NS	5.4	1.62902E-05
Trichloroethene	**2.3J**	50U	NS	3.7	1.11139E-05
Vinyl chloride	**32**	50U	NS	18.5	5.63307E-05
Monochlorotoluene	10U	**510**	NS	255.5	0.000777973
SVOCs by Method OLM04.2 (µg/L)					
Phenol	**31.8**	10U	NS	16.4	4.99364E-05
TAL Metals by Method ILM04.0 (µg/L)					
Arsenic	**30**	10U	NS	15.5	4.7196E-05
Iron	**171**	**5090**	NS	2630.5	0.008009617
Potassium	**7020000**	**53600**	NS	3536800.0	10.76921293
Sodium	**553000**	**201000**	NS	377000.0	1.147928431

Notes:

(1) For U Values where compound was detected in one or more of the listed wells, 10 percent of U value was used to calculate average concentration.

(2) For U values where compound was not detected in any listed well, the average concentration was set to 0 ug/L.
(3) Flow rate = 365 US gal/day.
NS - Not Samplable (Abandoned)

TABLE 4

TOTAL CHEMICAL FLUX
APRIL 2015
FRONTIER CHEMICAL SITE

Analyte	*Zone A Royal Ave West Side Mass Flux Adjacent Wells (lbs/day)*	*Zone A Royal Avenue East Side Mass Flux Adjacent Wells (lbs/day)*	*Zone A 47th Street Mass Flux Adjacent Wells (lbs/day)*	*Zone B Easterly Flow Mass Flux Adjacent Wells (lbs/day)*	*Total (lbs/day)*
VOCs by Method OLM04.2 (µg/L)					
1,1-Dichloroethane	0.0002	0.0058	0.0000	< 0.0001	0.0060
1,2,4-Trichlorobenzene	0.0001	0.0012	0.0000	0.0000	0.0013
1,2-Dichlorobenzene	0.0024	0.0192	0.0005	< 0.0001	0.0221
1,3-Dichlorobenzene	0.0050	0.0053	0.0004	< 0.0001	0.0107
1,4-Dichlorobenzene	0.0048	0.0113	0.0003	< 0.0001	0.0164
Acetone	0.0001	0.0013	0.0000	0.0000	0.0014
Benzene	0.0001	0.0069	0.0008	< 0.0001	0.0078
Chlorobenzene	0.0027	0.0079	0.0003	0.0001	0.0110
cis-1,2-Dichloroethene	0.0002	0.0047	0.0006	0.0003	0.0058
Tetrachloroethene	0.0000	0.0098	0.0000	0.0000	0.0098
Toluene	0.0001	0.0024	0.0001	< 0.0001	0.0026
Trichloroethene	0.0001	0.0230	0.0000	< 0.0001	0.0231
Vinyl chloride	0.0002	0.0005	0.0004	< 0.0001	0.0011
Monochlorotoluene	0.0018	0.0179	0.0000	0.0008	0.0205
TOTAL VOCs	0.0178	0.1172	0.0034	0.0012	0.1396
SVOCs by Method OLM04.2 (µg/L)					
Phenol	0.0001	0.0023	0.0004	< 0.0001	0.0028
TAL Metals by Method ILM04.0 (µg/L)					
Arsenic	0.0001	0.0006	0.0001	< 0.0001	0.0008
Iron	0.0021	0.0121	0.0021	0.0080	0.0243
Potassium	3.1333	29.2924	40.6816	10.7692	74.8765
Sodium	0.6062	2.5002	2.5619	1.1479	6.8162

TABLE 5

COMPARISONS OF LOADING TO INTERIM DISCHARGE LIMITATIONS
FRONTIER CHEMICAL SITE – APRIL 2015

Outfall Number Effluent Parameter	***Discharge Limitations***		***Units***	***Minimum monitoring Requirements***		***Calculated Daily Discharge April 2015 Lbs. /day Except as noted (Gals/day)***
	Annual Average	***Daily Maximum***		***Measurement Frequency***	***Sample Type***	
MS #1 Flow		3600	Gals/day	2 per year	See E-2	2395
MS #1 Arsenic		0.008	Lbs/day	2 per year	See E-3	0.0008
MS#1 Iron		0.24	Lbs/day	2 per year	See E-3	0.0243
MS #1 Potassium		400	Lbs/day	2 per year	See E-3	74.87
MS #1 Sodium		40.0	Lbs/day	2 per year	See E-3	6.816
MS #1 T. Phenol		0.05	Lbs/day	2 per year	See E-3	0.0028
MS #1 1,1-Dichloroethane		0.13	Lbs/day	2 per year	See E-3	0.0060
MS#1 1,2,4-Trichlorobenzene		0.026	Lbs/day	2 per year	See E-3	0.0013
MS #1 1,2-Dichlorobenzene		0.26	Lbs/day	2 per year	See E-3	0.0221
MS #1 1,3-Dichlorobenzene		0.11	Lbs/day	2 per year	See E-3	0.0107
MS#1 1,4-Dichlorobenzene		0.17	Lbs/day	2 per year	See E-3	0.0164
MS #1 Acetone		0.026	Lbs/day	2 per year	See E-3	0.0014
MS #1 Benzene		0.15	Lbs/day	2 per year	See E-3	0.0078
MS #1 Chlorobenzene		0.10	Lbs/day	2 per year	See E-3	0.0110
MS #1 Cis-1,2-Dichloroethene		0.060	Lbs/day	2 per year	See E-3	0.0058
MS #1 Tetrachloroethene		0.05	Lbs/day	2 per year	See E-3	0.0098
MS#1 Toluene		0.03	Lbs/day	2 per year	See E-3	0.0026
MS #1 Trichloroethene		0.15	Lbs/day	2 per year	See E-3	0.0231
MS #1 Vinyl Chloride		0.012	Lbs/day	2 per year	See E-3	0.0011
MS #1 Monochlorotoluene		0.2	Lbs/day	2 per year	See E-3	0.0205

Attachment 1

NIAGARA FALLS WATER BOARD
WASTEWATER FACILITIES
ENFORCEMENT DIVISION

SELF-MONITORING REPORT
SIGNIFICANT INDUSTRIAL USERS

PERMIT NO. 072 SEMI-ANNUAL DECEMBER 2014 – MAY 2015

INDUSTRY NAME: FRONTIER CHEMICAL SITE PRP GROUP

Pursuant to federal pretreatment reporting requirements and the Niagara Falls Water Board Regulations Part 1960, Significant Industrial Users shall submit periodic self-monitoring and compliance reports. Such reports shall be submitted using this form, according to the following schedule:

Quarterly	-	1st Quarter by February 28th
	-	2nd Quarter by May 31st
	-	3rd Quarter by August 31st
	-	4th Quarter by November 30th
Semi-Annual	-	by May 31st and
	-	by November 30th

Each section of this report form shall be filled out for those parameters listed in Section "C" of the company's Wastewater Discharge Permit. The analysis results must be reported in both concentration and mass. In addition, the calculated annual average load (lbs/day) for each pollutant shall also be reported.

The samples shall be collected at the monitoring points identified in the user permit. Identification of those points in this report should be as listed on page two (2) of the User Permit.

SELF-MONITORING REPORT
Significant Industrial Users (SIUs)

PAGE 2

PART II of the report is the Compliance Monitoring section. The user is obligated to determine if the analysis results indicates compliance. All violations noted should be brought to the Niagara Falls Water Board – Wastewater Facilities attention immediately upon noting and should also be reported in this section. The analysis result should be compared against all applicable federal, state and local standards and limitations. If no violations are noted then **"NO VIOLATIONS"** should appear on the report.

Pursuant to 40 CFR Part 403.12g of the Federal Standards, all violations noted must be followed up by a sample recollect/analysis and the results submitted to the Niagara Falls Water Board within thirty (30) days of first becoming aware of the violation.

Pursuant to 40 CFR Part 403.12g all Periodic Self-Monitoring Reports must be signed by a "responsible company official" certifying the following statement:

> I, certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signed: James Kay

Title: Consultant for the Frontier Chemical PRP Group

Date: April 28, 2015

PART I

ANALYTICAL RESULTS

SIU PERMIT NAME: **Frontier Chemical Site PRP Group**

SIU PERMIT NO.: **072**

SAMPLE LOCATION: **Monitoring Wells in Bedrock A Zone Royal Avenue- West Side**

	RESULTS ug/ℓ / ug/ℓ		RESULTS lbs/day / lbs/day		ANNUAL AVERAGE ug/ℓ	ANNUAL AVERAGE lbs/day
DATE SAMPLED: April 3, 2015						
24-HOUR FLOW IN MGD	0.00048				0.00096	
BENZENE	51		0.0001		54	0.0004
MONOCHLOROBENZENE	673		0.0027		513	0.0035
1,2 - DICHLOROBENZENE	605		0.0024		449	0.0030
1,3 - DICHLOROBENZENE	1,243		0.0050		796	0.0046
1,4 - DICHLOROBENZENE	1,195		0.0048		763	0.0044
1,2,4 - TRICHLOROBENZENE	18		0.0001		14	0.0001
1,1 - DICHLOROETHANE	51		0.0002		85	0.0008
CIS – 1,2 - DICHLOROETHYLENE	60		0.0002		147	0.0015
ACETONE	32		0.0001		145	0.0016
TETRACHLOROETHYLENE	9.1		0.0000		8.0	0.0001
TOLUENE	17		0.0001		43	0.0005
TRICHLOROETHYLENE	25		0.0001		18	0.0001
VINYL CHLORIDE	44		0.0002		35	0.0003
MONOCHLOROTOLUENES	458		0.0018		579	0.0051
TOTAL PHENOL	21		0.0001		187	0.0022
ARSENIC	15		0.0001		32	0.0004
IRON	530		0.0021		1,375	0.0144
POTASSIUM	782,500		3.133		719,500	5.510
SODIUM	151,400		0.6062		222,200	2.063

PART I

ANALYTICAL RESULTS

SIU PERMIT NAME: **Frontier Chemical Site PRP Group**

SIU PERMIT NO.: **072**

SAMPLE LOCATION: **Monitoring Wells in Bedrock A Zone - Royal Avenue East Side**

	RESULTS ug/ℓ / ug/ℓ		RESULTS lbs/day / lbs/day		ANNUAL AVERAGE ug/ℓ	ANNUAL AVERAGE lbs/day
DATE SAMPLED: April 3, 2015						
24-HOUR FLOW IN MGD	0.00081				0.00070	
BENZENE	1,015		0.0069		1,058	0.0062
MONOCHLOROBENZENE	1,174		0.0079		885	0.0054
1,2 - DICHLOROBENZENE	2,838		0.0192		1,899	0.0120
1,3 - DICHLOROBENZENE	780		0.0053		523	0.0033
1,4 - DICHLOROBENZENE	1,675		0.0113		1,101	0.0070
1,2,4 - TRICHLOROBENZENE	175		0.0012		123	0.0008
1,1 - DICHLOROETHANE	855		0.0058		573	0.0036
CIS – 1,2 - DICHLOROETHYLENE	1,455		0.0047		1,083	0.0041
ACETONE	1,015		0.0013		670	0.0015
TETRACHLOROETHYLENE	1,455		0.0098		828	0.0054
TOLUENE	352		0.0024		267	0.0017
TRICHLOROETHYLENE	3,405		0.0230		2,035	0.0131
VINYL CHLORIDE	73		0.0005		112	0.0006
MONOCHLOROTOLUENES	2,655		0.0179		1,770	0.0111
TOTAL PHENOL	343		0.0023		331	0.0020
ARSENIC	85		0.0006		92	0.0006
IRON	1,788		0.0121		6,094	0.0315
POTASSIUM	4,335,000		29.29		3,882,500	23.02
SODIUM	370,000		2.500		335,000	1.982

PART I

ANALYTICAL RESULTS

SIU PERMIT NAME: **Frontier Chemical Site PRP Group**

SIU PERMIT NO.: **072**

SAMPLE LOCATION: **Monitoring Wells in Bedrock A-Zone 47th Street**

	RESULTS ug/ℓ / ug/ℓ		RESULTS lbs/day / lbs/day		ANNUAL AVERAGE ug/ℓ	ANNUAL AVERAGE lbs/day
DATE SAMPLED: April 3, 2015						
24-HOUR FLOW IN MGD	0.00074				0.00078	
BENZENE	130		0.0008		665	0.0045
MONOCHLOROBENZENE	49		0.0003		120	0.0008
1,2 - DICHLOROBENZENE	75		0.0005		98	0.0007
1,3 - DICHLOROBENZENE	59		0.0004		49	0.0003
1,4 - DICHLOROBENZENE	75		0.0003		52	0.0004
1,2,4 - TRICHLOROBENZENE	0.0		0.0000		0.0	0.0000
CIS – 1,2 - DICHLOROETHYLENE	100		0.0006		495	0.0033
ACETONE	0.0		0.0000		0.0	0.0000
TETRACHLOROETHYLENE	0.0		0.0000		5.5	0.0001
TOLUENE	14		0.0001		49	0.0004
TRICHLOROETHYLENE	0.0		0.0000		65	0.0005
VINYL CHLORIDE	59		0.0004		175	0.0012
MONOCHLOROTOLUENES	0		0.0000		40	0.0003
TOTAL PHENOL	60		0.0004		94	0.0007
ARSENIC	24		0.0001		26	0.0001
IRON	345		0.0021		225	0.0014
POTASSIUM	6,590,000		40.68		5,710,000	36.60
SODIUM	415,000		2.562		371,500	2.385
1,1-DICHLOROETHANE	0.0		0.0000		30	0.0002

PART I

ANALYTICAL RESULTS

SIU PERMIT NAME: **Frontier Chemical Site PRP Group**

SIU PERMIT NO.: **072**

SAMPLE LOCATION: **Monitoring Wells in Bedrock B Zone (South)**

	RESULTS ug/ℓ / ug/ℓ		RESULTS lbs/day / lbs/day		ANNUAL AVERAGE ug/ℓ	ANNUAL AVERAGE lbs/day
DATE SAMPLED: April 3, 2015						
24-HOUR FLOW IN MGD	0.000000[(1)]				0.000000	
BENZENE	14		0.0000		51	0.0000
MONOCHLOROBENZENE	52		0.0000		199	0.0000
1,2 – DICHLOROBENZENE	26		0.0000		91	0.0000
1,3 - DICHLOROBENZENE	50		0.0000		162	0.0000
1,4 - DICHLOROBENZENE	54		0.0000		168	0.0000
1,2,4 - TRICHLOROBENZENE	0.0		0.0000		4.5	0.0000
1,1 - DICHLOROETHANE	30		0.0000		95	0.0000
CIS – 1,2 - DICHLOROETHYLENE	88		0.0000		111	0.0000
ACETONE	0.0		0.0000		28	0.0000
TETRACHLOROETHYLENE	5.3		0.0000		8.1	0.0000
TOLUENE	6.9		0.0000		11	0.0000
TRICHLOROETHYLENE	19		0.0000		18	0.0000
VINYL CHLORIDE	82		0.0000		82	0.0000
MONOCHLOROTOLUENES	50		0.0000		76	0.0000
TOTAL PHENOL	22		0.0000		19	0.0000
						0.0000
ARSENIC	21		0.0000		28	0.0000
IRON	368		0.0000		433	0.0000
POTASSIUM	3,162,900		0.0000		2,977,100	0.0000
SODIUM	309,300		0.0000		300,650	0.0000

[(1)] No discharge to south for the time period December 2014 through May 2015.

PART I

ANALYTICAL RESULTS

SIU PERMIT NAME: **Frontier Chemical Site PRP Group**

SIU PERMIT NO.: **072**

SAMPLE LOCATION: **Monitoring Wells in Bedrock B Zone (East)**

	RESULTS ug/ℓ / ug/ℓ		RESULTS lbs/day / lbs/day		ANNUAL AVERAGE ug/ℓ	ANNUAL AVERAGE lbs/day
DATE SAMPLED: April 3, 2015						
24-HOUR FLOW IN MGD	0.00037				0.00038	
BENZENE	16		<0.0001		51	0.0002
MONOCHLOROBENZENE	37		0.0001		29	0.0001
1,2 - DICHLOROBENZENE	4.9		<0.0001		8	<0.0001
1,3 - DICHLOROBENZENE	19		<0.0001		17	<0.0001
1,4 - DICHLOROBENZENE	31		<0.0001		25	<0.0001
1,2,4 - TRICHLOROBENZENE	0.0		0.0		0.0	0.0
1,1 - DICHLOROETHANE	19		<0.0001		21	<0.0001
CIS – 1,2 - DICHLOROETHYLENE	98		0.0003		112	0.0003
ACETONE	0.0		0.0		60	0.0002
TETRACHLOROETHYLENE	0.0		0.0		0.0	0.0
TOLUENE	5.4		<0.0001		2.7	<0.0001
TRICHLOROETHYLENE	3.7		<0.0001		1.9	<0.0001
VINYL CHLORIDE	19		<0.0001		20	<0.0001
MONOCHLOROTOLUENES	256		0.0008		153	0.0005
TOTAL PHENOL	16		<0.0001		21	<0.0001
ARSENIC	16		<0.0001		19	<0.0001
IRON	2,631		0.0080		2,638	0.0083
POTASSIUM	3,536,800		10.769		3,076,600	9.619
SODIUM	377,000		1.1479		314,050	0.9804

PART I

ANALYTICAL RESULTS

SIU PERMIT NAME: **Frontier Chemical Site PRP Group**

SIU PERMIT NO.: **072**

SAMPLE LOCATION: **Total Sum of Bedrock A and B Zones**

	RESULTS ug/ℓ	/ ug/ℓ	RESULTS lbs/day	/ lbs/day	ANNUAL AVERAGE ug/ℓ	ANNUAL AVERAGE lbs/day
DATE SAMPLED: April 3, 2015						
24-HOUR FLOW IN MGD	0.002395				0.002808	
BENZENE			0.0078			0.0112
MONOCHLOROBENZENE			0.0110			0.0097
1,2 - DICHLOROBENZENE			0.0221			0.0156
1,3 - DICHLOROBENZENE			0.0107			0.0083
1,4 - DICHLOROBENZENE			0.0164			0.0117
1,2,4 - TRICHLOROBENZENE			0.0013			0.0009
1,1 - DICHLOROETHANE			0.0060			0.0046
CIS – 1,2 - DICHLOROETHYLENE			0.0058			0.0093
ACETONE			0.0014			0.0033
TETRACHLOROETHYLENE			0.0098			0.0055
TOLUENE			0.0026			0.0025
TRICHLOROETHYLENE			0.0231			0.0137
VINYL CHLORIDE			0.0011			0.0021
MONOCHLOROTOLUENES			0.0205			0.0170
TOTAL PHENOL			0.0028			0.0048
ARSENIC			0.0008			0.0011
IRON			0.0243			0.0556
POTASSIUM			74.88			70.25
SODIUM			6.816			7.411

PART II

COMPLIANCE MONITORING

SIU NAME: Frontier Chemical Site PRP Group

PERMIT NO.: 072

NO VIOLATIONS

VIOLATION PARAMETER	DATE	FLOW [MGD]	SAMPLE POINT LOCATION	ACTUAL* DISCHARGE	PERMIT LIMIT	TYPE** LIMIT VIOLATED

NOTE:

* - Actual discharge – list actual analytical results and appropriate units.

** - Type Limit Violated – List Type:

A.A. = Annual Average

D.M. = Daily Maximum

L.L. = Local Limits (Regulation 1960.5)

ADMIN\WINWORD\ZAEPFEL\SIU\SELF-MONITORING REPORT FORM - BLANK

December 3, 2015 Reference No. 11109628

Mr. Joel Paradise
Niagara Falls Water Board
5815 Buffalo Avenue
Niagara Falls, New York 14304

Dear Mr. Paradise:

Re: Semiannual Groundwater Discharge Report
SIU Permit #78
Norampac - Frontier Site

This semiannual report has been prepared in accordance with Paragraph G of the Significant Industrial User Permit #78 issued on October 1, 2015 by the Niagara Falls Water Board to Norampac Industries, Inc. (formerly Frontier Chemical Site PRP Group) in Niagara Falls, New York (Site). The report presents the analytical data and field measurements taken for the semi-annual period covering June 2015 through November 2015. The data collected have been used to calculate the volume of groundwater and the chemical loading associated with the groundwater that discharges into the Falls Street Tunnel (FST) and the 47th Street Tunnel which are located immediately adjacent to the Frontier Chemical Site.

1. Data Collection

Groundwater levels were measured in all of the available monitoring wells in the A Zone and B Zone of the bedrock formation at the Site. The groundwater levels were measured on October 7, 2015 and the data are presented on attached Figures 1 and 2.

Groundwater samples were collected from the following monitoring wells on October 7 and 8, 2015 and analyzed for the list of parameters specified in Paragraphs F and G of the Permit.

A Zone

- MW01-9A
- MW88-13A
- BH87-28
- BH-87-3A

GHD Services Inc.
2055 Niagara Falls Boulevard Niagara Falls New York 14304 USA
T 716 297 6150 **F** 716 297 2265 **W** www.ghd.com

B Zone

- BH87-3B
- MW-9
- MW-12
- MW-13

2. Flow Calculation

The groundwater flow volume is calculated based upon the thickness of the bedrock aquifer through which the groundwater flows, the aquifer permeability, and the gradient (slope) of the groundwater table. These three factors are combined, using Darcy's Law of hydraulic flow, to determine the flow volume (Flow = permeability x gradient x cross sectional saturated area). The groundwater gradients used in the flow calculation are presented on Figures 1 and 2. The calculation of groundwater flow is presented in Table 1. The Bedrock A Zone migration boundary along the south side of the Site has been divided into the west side and the east side. The October 2015 groundwater levels show that a portion of the A Zone groundwater discharge from the western half of the Site continues to discharge towards Royal Avenue. The most likely receiver of the A Zone groundwater in this area is the underlying B Zone, which is captured by the 47th Street Tunnel.

The calculated volume of groundwater discharge to the tunnels from the entire Site for the June 2015 through November 2015 time period is 2,097 gallons per day.

It is noted that the groundwater in the B Zone continues to flow to the east toward 47th Street with no migration to the south. This flow pattern is consistent with the pattern that developed after the closure of a portion of the FST and was first measured during the October 19, 2012 groundwater monitoring event.

3. Loading Calculation

The chemical loading to the tunnel sewer system is determined by multiplying groundwater flow volume by the concentration of the chemicals in the groundwater at the downgradient boundary of the Site, adjacent to where the groundwater enters the tunnels. Since there are multiple wells available along the tunnels, the chemical concentrations of this group of wells have been averaged to provide the best estimate of chemical loading. The concentrations of chemicals present in the October 2015 groundwater samples and the calculated chemical loadings to the tunnel sewers for each individual compound for each flow zone are presented in Tables 2a, 2b, 2c, 3a, and 3b. The total daily chemical loading for each compound is summarized in Table 4.

4. Discharge Limitations

The calculated volume of groundwater discharge to the tunnels and the associated chemical loadings, have been compared to the limitations of the Permit (see Table 5). The calculations show that all parameters are within the Permit limits.

It is noted that, while it is expected that the chemical loadings will decrease over time, some variability should be expected in the groundwater hydraulics and concentrations used to calculate the infiltration conditions and therefore some flexibility is needed in the Permit limits for the Site. It is believed that the Permit limits are reasonable, given the current conditions and making allowance for some continued variation over time. However, if conditions change, modifications may be necessary.

5. Next Report

The next semiannual report will be submitted to the Niagara Falls Water Board by May 30, 2016.

Should you have any questions, please contact me.

Sincerely,

GHD

Shaun McEvoy

SM/km/1

Encl. SIU Permit Calculations and Permit Submittal Sheets

cc: Rick Roll
Paul Drof
Bill Rajczak

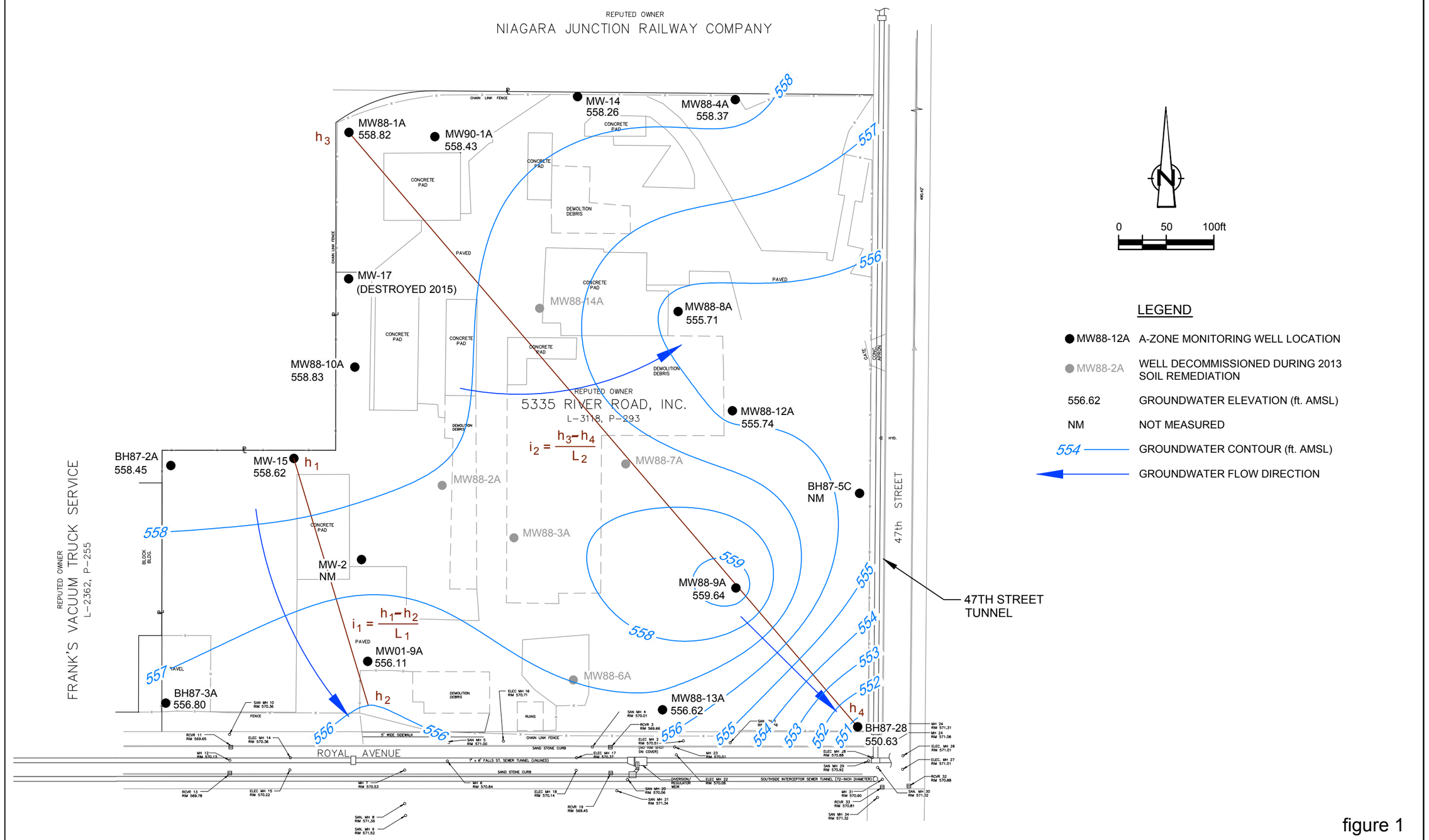


figure 1

GROUNDWATER CONTOURS - ZONE A
OCTOBER 2015
Norampac-Frontier Site - Niagara Falls, New York

11109628-00(PARA001)GN-WA001 DEC 3/2015

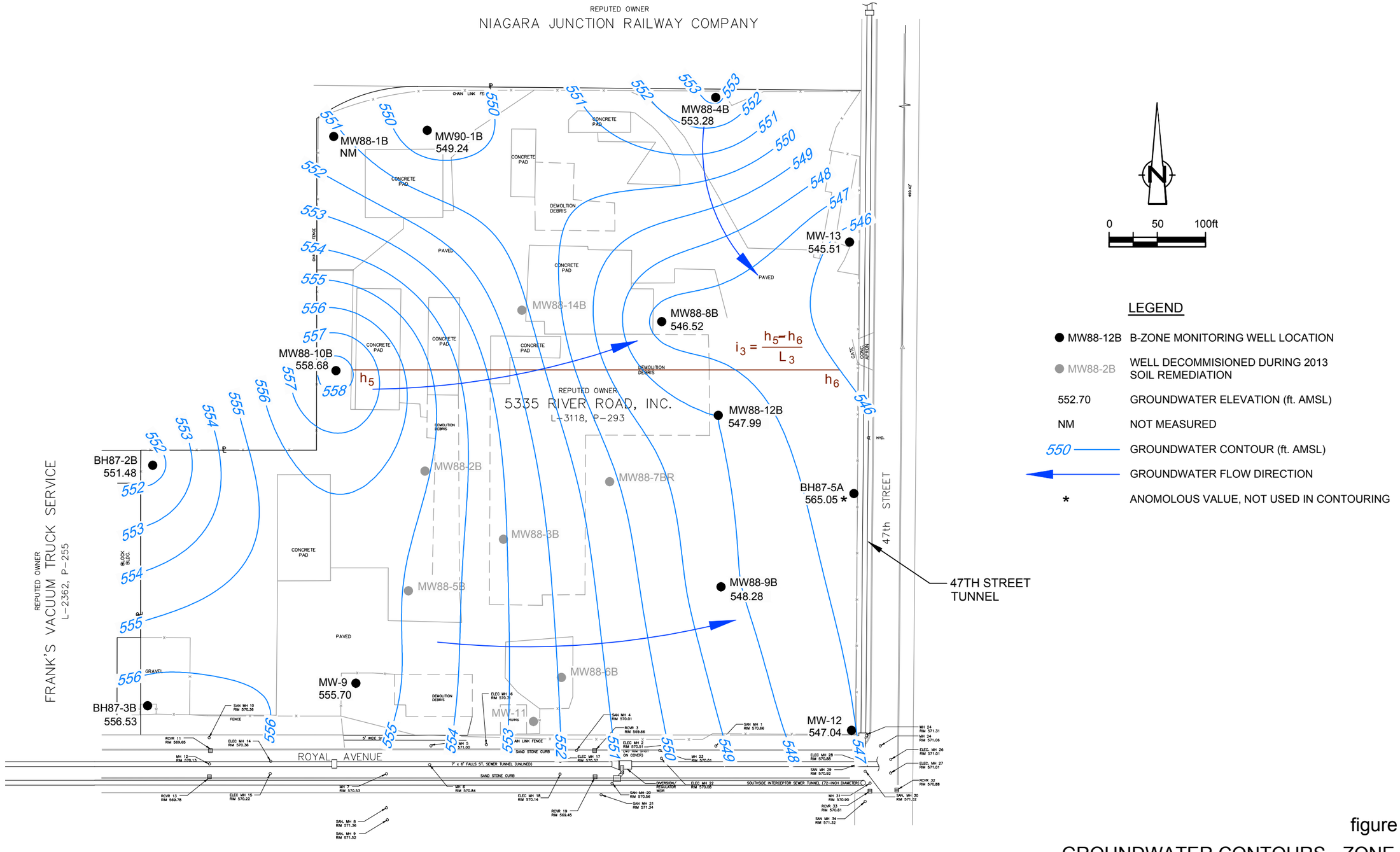


figure 2

GROUNDWATER CONTOURS - ZONE B
OCTOBER 2015
Norampac-Frontier Site - Niagara Falls, New York

11109628-00(PARA001)GN-WA002 DEC 3/2015

Table 1

October 2015 Groundwater Flow Rate Estimate
Norampac - Frontier Site
Niagara Falls, New York

A) Bedrock A-Zone (Figure 1)

Royal Avenue West Side
Flow Thickness: Upper 3 to 5 feet of bedrock
Head Difference = h1-h2
= 2.62 feet

Distance between h1 & h2 = 271 feet

i = 2.62/271 = 0.010

Flow Width: 410 feet
K = 2.5×10^{-5} to 5.2×10^{-5} feet/second
Flow rate: = 5 feet x 0.010 x 410 feet x 5.2×10^{-5} feet/second
= 1.07×10^{-3} $feet^3$/second
= 689 US gallons/day
= 251,458 US gallons/year

Royal Avenue East Side
Flow Thickness: Upper 3 to 5 feet of bedrock
Head Difference = h3-h4
= 8.19 feet

Distance between h3 & h4 = 821 feet

i = 8.19/821 = 0.010

Flow Width: 350 feet
K = 2.5×10^{-5} to 5.2×10^{-5} feet/second
Flow rate: = 5 feet x 0.010 x 350 feet x 5.2×10^{-5} feet/second
= 9.1×10^{-4} $feet^3$/second
= 588 US gallons/day
= 214,659 US gallons/year

47th Street South Side
Flow Thickness: Upper 3 to 5 feet of bedrock
Head Difference = h3-h4
=8.19 feet

Distance between h_3 & h_4 = 825 feet

i = 8.19/821 = 0.010

Flow Width: 320 feet
K = 2.5×10^{-5} to 5.2×10^{-5} feet/second
Flow rate: = 5 feet x 0.010 x 320 feet x 5.2×10^{-5} feet/second
= 8.32×10^{-4} $feet^3$/second
= 538 US gallons/day
= 196,260 US gallons/year

October 2015 Groundwater Flow Rate Estimate
Norampac - Frontier Site
Niagara Falls, New York

Notes:

See Figure 1 for locations of h_1, $h_{2, h3 \text{ and } h4}$

B) Bedrock B-Zone (Figure 2)

Flow Thickness: 2-foot thick fracture zone from 8 to 10 feet beneath A Zone
Flow from B-Zone now discharges to the east

• Easterly Flow:

Head Difference = h_5-h_6 = 12 feet
Distance between h_5 & h_6 = 505 feet
Gradient: = 0.024
Flow Width: = 650 feet
Hydraulic Conductivity: = 1.4×10^{-5} feet/second
Flow rate: = 2 feet x 0.024 x 650 feet x 1.4×10^{-5} feet/second
= 4.37×10^{-4} $feet^3$/second
= 282 US gallons/day
= 103,036 US gallons/year

Notes:

See Figure 2 for locations of h_5 and h_6.

Table 2A

A-Fracture Zone Bedrock, Royal Avenue West Side Discharge
October 2015 Chemical Flux
Norampac - Frontier Site
Niagara Falls, New York

Analyte	Adjacent Wells MW-01-9A 10/07/2015	Adjacent Wells BH87-3A 10/07/2015	Average Concentration (µg/L) Adjacent Wells	Mass Flux (pounds/day) Adjacent Wells
VOCs by Method OLM04.2 (µg/L)				
1,1-Dichloroethane	**110**	**1.5 J/1.5 J**	55.8	0.0003
1,2,4-Trichlorobenzene	**6.7 J**	**19/19**	12.9	0.0001
1,2-Dichlorobenzene	**180**	**2200/2100**	1165.0	0.0067
1,3-Dichlorobenzene	**340**	**3200/3300**	1795.0	0.0103
1,4-Dichlorobenzene	**360**	**3400/3500**	1905.0	0.0109
Acetone	**35 J**	25 U/25 U	13.2	0.0001
Benzene	**33J**	**43/43**	38.0	0.0002
Chlorobenzene	**320**	**1200/1300**	785.0	0.0045
cis-1,2-Dichloroethene	**51**	**37/38**	44.3	0.0003
Tetrachloroethene	50 U	**5.6/5.9**	5.4	0.0000
Toluene	**23 J**	**5.7/5.5**	14.3	0.0001
Trichloroethene	50 U	**27/29**	16.5	0.0001
Vinyl chloride	**54**	**6.7/6.8**	30.4	0.0002
Monochlorotoluene	**565**	**660.5/670.5**	615.3	0.0035
SVOCs by Method OLM04.2 (µg/L)				
Phenol	**52**	26.9 UJ **/79.6 J**	46.6	0.0003
TAL Metals by Method ILM04.0 (µg/L)				
Arsenic	**31.4**	10 U/10 U	16.2	0.0001
Iron	**1090 J**	**178 J/178 J**	634.0	0.0036
Potassium	**1540000**	**163000/156000**	849750.0	4.8842
Sodium	**279000**	**58900/58500**	168850.0	0.9705

Notes:

(1) For U Values where compound was detected in one or more of the listed wells, 10 percent of U value was used to calculate average concentration
(2) For U values where compound was not detected in any listed wells, the average concentration was set to 0 µg/L
(3) Flow rate = 1440 US gallons/day
VOCs - Volatile Organic Compounds
SVOCs - Semivolatile Organic Compounds
TAL - Target Analyte List
J - Estimated concetration

Table 2B

A-Fracture Zone Bedrock, Royal Avenue East Side Discharge
October 2015 Chemical Flux
Norampac - Frontier Site
Niagara Falls, New York

Analyte	Adjacent Wells BH87-28 10/08/2015	Adjacent Wells MW-88-6A	Adjacent Wells MW-88-13A 10/07/2015	Average Concentration (µg/L) Adjacent Wells	Mass Flux (pounds/day) Adjacent Wells
VOCs by Method OLM04.2 (µg/L)					
1,1-Dichloroethane	**25 J**	**NS**	**1200**	612.5	0.0030
1,2,4-Trichlorobenzene	100U	**NS**	**430**	220.0	0.0011
1,2-Dichlorobenzene	**220**	**NS**	**5200**	2710.0	0.0133
1,3-Dichlorobenzene	**160**	**NS**	**1600**	880.0	0.0043
1,4-Dichlorobenzene	**130**	**NS**	**3400**	1765.0	0.0087
Acetone	500U	**NS**	**610 J**	330.0	0.0016
Benzene	**430**	**NS**	**1600**	1015.0	0.0050
Chlorobenzene	**180**	**NS**	**2200**	1190.0	0.0058
cis-1,2-Dichloroethene	**340**	**NS**	**960**	650.0	0.0032
Tetrachloroethene	100 U	**NS**	**2500**	1255.0	0.0062
Toluene	**34 J**	**NS**	**550**	292.0	0.0014
Trichloroethene	100 U	**NS**	**4000**	2005.0	0.0098
Vinyl chloride	**220**	**NS**	**53 J**	136.5	0.0007
Monochlorotoluene	**141 J**	**NS**	**5620**	2880.5	0.0141
SVOCs by Method OLM04.2 (µg/L)					
Phenol	**73.1**	**NS**	**544**	308.6	0.0015
TAL Metals by Method ILM04.0 (µg/L)					
Arsenic	**28.1**	**NS**	**198**	113.1	0.0006
Iron	**148**	**NS**	**2250 J**	1199.0	0.0059
Potassium	**4820000**	**NS**	**1880000**	3350000.0	16.4325
Sodium	**370000**	**NS**	**324000**	347000.0	1.7021

Notes:

(1) For U Values where compound was detected in one or more of the listed wells, 10 percent of U value was used to calculate average concentration
(2) For U values where compound was not detected in any listed wells, the average concentration was set to 0 µg/L
(3) Flow rate = 585 US gallons/day
NS - Not samplable (Abandoned)
VOCs - Volatile Organic Compounds
SVOCs - Semivolatile Organic Compounds
TAL - Target Analyte List
J - Estimated concentration

Table 2C

A-Fracture Zone Bedrock, 47th Street Discharge
October 2015 Chemical Flux
Norampac - Frontier Site
Niagara Falls, New York

Analyte	Adjacent Wells: BH-87-28 10/08/2015	Adjacent Wells: BH87-5C	Average Concentration (µg/L): Adjacent Wells	Mass Flux (pounds/day): Adjacent Wells
VOCs by Method OLM04.2 (µg/L)				
1,1-Dichloroethane	**25 J**	NS	25.0	0.0001
1,2,4-Trichlorobenzene	100U	NS	0.0	0.0000
1,2-Dichlorobenzene	**220**	NS	220.0	0.0010
1,3-Dichlorobenzene	**160**	NS	160.0	0.0007
1,4-Dichlorobenzene	**130**	NS	130.0	0.0006
Acetone	500U	NS	0.0	0.0000
Benzene	**430**	NS	430.0	0.0019
Chlorobenzene	**180**	NS	180.0	0.0008
cis-1,2-Dichloroethene	**340**	NS	340.0	0.0015
Tetrachloroethene	100 U	NS	0.0	0.0000
Toluene	**34 J**	NS	34.0	0.0002
Trichloroethene	100 U	NS	0.0	0.0000
Vinyl chloride	**220**	NS	220.0	0.0010
Monochlorotoluene	**131 J**	NS	131.0	0.0006
SVOCs by Method OLM04.2 (µg/L)				
Phenol	**73.1**	NS	73.1	0.0003
TAL Metals by Method ILM04.0 (µg/L)				
Arsenic	**28.1**	NS	28.1	0.0001
Iron	**148**	NS	148.0	0.0007
Potassium	**4820000**	NS	4820000.0	21.6327
Sodium	**370000**	NS	370000.0	1.6606

Notes:

(1) For U Values where compound was detected in one or more of the listed wells, 10 percent of U value was used to calculate average concentration
(2) For U values where compound was not detected in any listed wells, the average concentration was set to 0 µg/L
(3) Flow rate = 740 US gallons/day
NS - Well not sampleable
VOCs - Volatile Organic Compounds
SVOCs - Semivolatile Organic Compounds
TAL - Target Analyte List
J - Estimated concentration

Table 3A

B-Fracture Zone Bedrock - Southerly Discharge
October 2015 Chemical Flux
Norampac - Frontier Site
Niagara Falls, New York

Analyte	Adjacent Wells					Average Concentration (µg/L) Southerly Discharge	Mass Flux (pounds/day) Adjacent Wells
	MW-9 10/08/2015	MW-11	MW-12 10/08/2015	BH87-3B 10/07/2015	MW-88-6B		
VOCs by Method OLM04.2 (µg/L)							
1,1-Dichloroethane	**68 J**	**NS**	**24 J**	**2.1 J**	**NS**	31.4	0.0000
1,2,4-Trichlorobenzene	100 U	**NS**	100 U	5 U	**NS**	0.0	0.0000
1,2-Dichlorobenzene	**37 J**	**NS**	100 U	**36**	**NS**	27.7	0.0000
1,3-Dichlorobenzene	**76 J**	**NS**	**13 J**	**73**	**NS**	54.0	0.0000
1,4-Dichlorobenzene	**76 J**	**NS**	**12 J**	**93**	**NS**	60.3	0.0000
Acetone	500 U	**NS**	500 U	25 U	**NS**	0.0	0.0000
Benzene	100 U	**NS**	100 U	**3.3 J**	**NS**	7.8	0.0000
Chlorobenzene	**79 J**	**NS**	100 U	**160**	**NS**	83.0	0.0000
cis-1,2-Dichloroethene	100 U	**NS**	100 U	**33**	**NS**	17.7	0.0000
Tetrachloroethene	100 U	**NS**	100 U	**9**	**NS**	9.7	0.0000
Toluene	100 U	**NS**	100 U	5 U	**NS**	0.0	0.0000
Trichloroethene	100 U	**NS**	100 U	**42**	**NS**	20.7	0.0000
Vinyl chloride	100 U	**NS**	100 U	**4.2 J**	**NS**	8.1	0.0000
Monochlorotoluene	**169 J**	**NS**	500 U	**17.1**	**NS**	78.7	0.0000
SVOCs by Method OLM04.2 (µg/L)							
Phenol	**27.7**	**NS**	15.1 U	10 U	**NS**	10.1	0.0000
TAL Metals by Method ILM04.0 (µg/L)							
Arsenic	**33.5**	**NS**	**32.1**	10U	**NS**	22.2	0.0000
Iron	**456**	**NS**	**120**	**119**	**NS**	231.7	0.0000
Potassium	**2090000**	**NS**	**5650000**	**80300**	**NS**	2606766.7	0.0000
Sodium	**2970000**	**NS**	**479000**	**72700**	**NS**	282900.0	0.0000

Notes:

(1) For U Values where compound was detected in one or more of the listed wells, 10 percent of U value was used to calculate average concentration
(2) For U values where compound was not detected in any listed well, the average concentration was set to 0 µg/L
(3) Flow rate = 0 US gallons/day
NS - Not sampleable (Abandoned)
VOCs - Volatile Organic Compounds
SVOCs - Semivolatile Organic Compounds
TAL - Target Analyte List
J - Estimated concentration

Table 3B

B-Fracture Zone Bedrock - Easterly Discharge
October 2015 Chemical Flux
Norampac - Frontier Site
Niagara Falls, New York

Analyte	Adjacent Wells			Average Concentration (µg/L)	Mass Flux (pounds/day)
	MW-12 10/07/2015	MW-13 10/07/2015	BH87-5A	Easterly Discharge	Adjacent Wells
VOCs by Method OLM04.2 (µg/L)					
1,1-Dichloroethane	**24 J**	2.9 J	NS	13.5	3.16411E-05
1,2,4-Trichlorobenzene	100 U	5U	NS	0.0	0
1,2-Dichlorobenzene	100 U	**11**	NS	10.5	2.47013E-05
1,3-Dichlorobenzene	**13 J**	**24**	NS	18.5	4.35213E-05
1,4-Dichlorobenzene	**12 J**	**27**	NS	19.5	4.58738E-05
Acetone	500 U	25 U	NS	0.0	0
Benzene	100 U	**1.2 J**	NS	5.6	1.3174E-05
Chlorobenzene	100 U	**22**	NS	16.0	3.764E-05
cis-1,2-Dichloroethene	100 U	**2.6 J**	NS	6.3	1.48208E-05
Tetrachloroethene	100 U	**0.80 J**	NS	5.4	1.27035E-05
Toluene	100 U	5U	NS	0.0	0
Trichloroethene	100 U	**2.2 J**	NS	6.1	1.43503E-05
Vinyl chloride	100 U	5U	NS	0.0	0
Monochlorotoluene	500 U	**431.9**	NS	241.0	0.000566835
SVOCs by Method OLM04.2 (µg/L)					
Phenol	**15.1 U**	**10 U**	NS	0.0	0
TAL Metals by Method ILM04.0 (µg/L)					
Arsenic	**32.1**	10U	NS	16.6	3.89339E-05
Iron	**120**	**2110**	NS	1115.0	0.002623038
Potassium	**5650000**	**29000**	NS	2839500.0	6.679924886
Sodium	**479000**	**118000**	NS	298500.0	0.702221369

Notes:

(1) For U Values where compound was detected in one or more of the listed wells, 10 percent of U value was used to calculate average concentraion
(2) For U values where compound was not detected in any listed well, the average concentration was set to 0 µg/L
(3) Flow rate = 388 US gallons/day
NS - Not samplable (Abandoned)
VOCs - Volatile Organic Compounds
SVOCs - Semivolatile Organic Compounds
TAL - Target Analyte List
J - Estimated concentration

Table 4

Total Chemical Flux
October 2015
Norampac - Frontier Site
Niagara Falls, New York

Analyte	Zone A Royal Ave West Side Mass Flux Adjacent Wells (pounds/day)	Zone A Royal Avenue East Side Mass Flux Adjacent Wells (pounds/day)	Zone A 47th Street Mass Flux Adjacent Wells (pounds/day)	Zone B Easterly Flow Mass Flux Adjacent Wells (pounds/day)	Total (pounds/day)
VOCs by Method OLM04.2 (µg/L)					
1,1-Dichloroethane	0.0003	0.0030	0.0001	< 0.0001	0.0034
1,2,4-Trichlorobenzene	0.0001	0.0011	0.0000	0.0000	0.0013
1,2-Dichlorobenzene	0.0067	0.0133	0.0010	< 0.0001	0.0210
1,3-Dichlorobenzene	0.0103	0.0043	0.0007	< 0.0001	0.0153
1,4-Dichlorobenzene	0.0109	0.0087	0.0006	< 0.0001	0.0202
Acetone	0.0001	0.0016	0.0000	0.0000	0.0017
Benzene	0.0002	0.0050	0.0019	< 0.0001	0.0071
Chlorobenzene	0.0045	0.0058	0.0008	< 0.0001	0.0111
cis-1,2-Dichloroethene	0.0003	0.0032	0.0015	< 0.0001	0.0077
Tetrachloroethene	0.0000	0.0062	0.0000	< 0.0001	0.0062
Toluene	0.0001	0.0014	0.0002	0.0000	0.0017
Trichloroethene	0.0001	0.0098	0.0000	< 0.0001	0.0099
Vinyl chloride	0.0002	0.0007	0.0010	0.0000	0.0019
Monochlorotoluene	0.0035	0.0141	0.0006	0.0006	0.0188
TOTAL VOCs	0.0373	0.0782	0.0084	0.0006	0.1273
SVOCs by Method OLM04.2 (µg/L)					
Phenol	0.0003	0.0015	0.0003	0	0.0021
TAL Metals by Method ILM04.0 (µg/L)					
Arsenic	0.0001	0.0006	0.0001	< 0.0001	0.0008
Iron	0.0036	0.0059	0.0007	0.00262	0.0128
Potassium	4.8842	16.4325	21.6327	6.67992	49.6293
Sodium	0.9705	1.7021	1.6606	0.70222	4.4043

Notes:

VOCs - Volatile Organic Compounds
SVOCs - Semivolatile Organic Compounds
TAL - Target Analyte List

Table 5
Comparisons of Loading to Interim Discharge Limitations
Norampac - Frontier Site, October 2015
Niagara Falls, New York

Outfall Number Effluent Parameter	Discharge Limitations		Units	Minimum monitoring Requirements		Calculated Daily Discharge October 2015 pounds/day Except as noted (Gallons/day)
	Annual Average	Daily Maximum		Measurement Frequency	Sample Type	
MS #1 Flow		3600	gallons/day	2 per year	See E-2	2097
MS #1 Arsenic		0.008	pounds/day	2 per year	See E-3	0.0008
MS#1 Iron		0.24	pounds/day	2 per year	See E-3	0.0128
MS #1 Potassium		400	pounds/day	2 per year	See E-3	49.6293
MS #1 Sodium		40.0	pounds/day	2 per year	See E-3	4.4043
MS #1 T. Phenol		0.05	pounds/day	2 per year	See E-3	0.0021
MS #1 1,1-Dichloroethane		0.13	pounds/day	2 per year	See E-3	0.0034
MS#1 1,2,4-Trichlorobenzene		0.026	pounds/day	2 per year	See E-3	0.0013
MS #1 1,2-Dichlorobenzene		0.26	pounds/day	2 per year	See E-3	0.0210
MS #1 1,3-Dichlorobenzene		0.11	pounds/day	2 per year	See E-3	0.0153
MS#1 1,4-Dichlorobenzene		0.17	pounds/day	2 per year	See E-3	0.0202
MS #1 Acetone		0.026	pounds/day	2 per year	See E-3	0.0017
MS #1 Benzene		0.15	pounds/day	2 per year	See E-3	0.0071
MS #1 Chlorobenzene		0.10	pounds/day	2 per year	See E-3	0.0111
MS #1 Cis-1,2-Dichloroethene		0.060	pounds/day	2 per year	See E-3	0.0077
MS #1 Tetrachloroethene		0.05	pounds/day	2 per year	See E-3	0.0062
MS#1 Toluene		0.03	pounds/day	2 per year	See E-3	0.0017
MS #1 Trichloroethene		0.15	pounds/day	2 per year	See E-3	0.0099
MS #1 Vinyl Chloride		0.012	pounds/day	2 per year	See E-3	0.0019
MS #1 Monochlorotoluene		0.2	pounds/day	2 per year	See E-3	0.0188

Attachment A

NIAGARA FALLS WATER BOARD
WASTEWATER FACILITIES
ENFORCEMENT DIVISION

SELF-MONITORING REPORT
SIGNIFICANT INDUSTRIAL USERS

PERMIT NO. 078 SEMI-ANNUAL JUNE 2015 – NOVEMBER 2015

INDUSTRY NAME: Norampac - Frontier Site

Pursuant to federal pretreatment reporting requirements and the Niagara Falls Water Board Regulations Part 1960, Significant Industrial Users shall submit periodic self-monitoring and compliance reports. Such reports shall be submitted using this form, according to the following schedule:

Quarterly	-	1st Quarter by February 28th
	-	2nd Quarter by May 31st
	-	3rd Quarter by August 31st
	-	4th Quarter by November 30th
Semi-Annual	-	by May 31st and
	-	by November 30th

Each section of this report form shall be filled out for those parameters listed in Section "C" of the company's Wastewater Discharge Permit. The analysis results must be reported in both concentration and mass. In addition, the calculated annual average load (pounds/day) for each pollutant shall also be reported.

The samples shall be collected at the monitoring points identified in the user permit. Identification of those points in this report should be as listed on page two (2) of the User Permit.

SELF-MONITORING REPORT
Significant Industrial Users (SIUs)

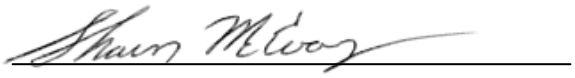
PAGE 2

PART II of the report is the Compliance Monitoring section. The user is obligated to determine if the analysis results indicates compliance. All violations noted should be brought to the Niagara Falls Water Board – Wastewater Facilities attention immediately upon noting and should also be reported in this section. The analysis result should be compared against all applicable federal, state and local standards and limitations. If no violations are noted then **"NO VIOLATIONS"** should appear on the report.

Pursuant to 40 CFR Part 403.12g of the Federal Standards, all violations noted must be followed up by a sample recollect/analysis and the results submitted to the Niagara Falls Water Board within thirty (30) days of first becoming aware of the violation.

Pursuant to 40 CFR Part 403.12g all Periodic Self-Monitoring Reports must be signed by a "responsible company official" certifying the following statement:

> I, certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signed: 

Title: Consultant for Norampac Industries, Inc.

Date: November 24, 2015

PART I

ANALYTICAL RESULTS

SIU PERMIT NAME: **Norampac - Frontier Site**

SIU PERMIT NO.: **078**

SAMPLE LOCATION: **Monitoring Wells in Bedrock A Zone Royal Avenue- West Side**

	RESULTS µg/L	/ µg/L	RESULTS pounds/day	/pounds/day	ANNUAL AVERAGE µg/L	ANNUAL AVERAGE pounds/day
DATE SAMPLED: October 7, 2015						
24-HOUR FLOW IN MGD	0.00069				0.00049	
BENZENE	38		0.0002		45	0.0002
MONOCHLOROBENZENE	785		0.0045		729	0.0036
1,2 – DICHLOROBENZENE	1,165		0.0067		885	0.0046
1,3 – DICHLOROBENZENE	1,795		0.0103		1,519	0.0077
1,4 – DICHLOROBENZENE	1,905		0.0109		1,550	0.0079
1,2,4 - TRICHLOROBENZENE	13		0.0001		16	0.0001
1,1 - DICHLOROETHANE	56		0.0003		54	0.0003
CIS – 1,2 - DICHLOROETHYLENE	44		0.0003		52	0.0003
ACETONE	13		0.0001		23	0.0001
TETRACHLOROETHYLENE	5.4		0.0000		7.3	0.0000
TOLUENE	14		0.0001		16	0.0001
TRICHLOROETHYLENE	17		0.0001		21	0.0001
VINYL CHLORIDE	30		0.0002		37	0.0002
MONOCHLOROTOLUENES	615		0.0035		537	0.0027
TOTAL PHENOL	47		0.0003		34	0.0002
ARSENIC	16		0.0001		16	0.0001
IRON	634		0.0036		582	0.0029
POTASSIUM	849,750		4.8842		816,125	4.009
SODIUM	168,850		0.9705		160,125	0.788

PART I

ANALYTICAL RESULTS

SIU PERMIT NAME: **Norampac - Frontier Site**

SIU PERMIT NO.: **078**

SAMPLE LOCATION: **Monitoring Wells in Bedrock A Zone - Royal Avenue East Side**

	RESULTS µg/L	/ µg/L	RESULTS pounds/day	/pounds/day	ANNUAL AVERAGE µg/L	ANNUAL AVERAGE pounds/day
DATE SAMPLED: October 7-8, 2015						
24-HOUR FLOW IN MGD	0.00058				0.00070	
BENZENE	1,015		0.0050		1,015	0.0060
MONOCHLOROBENZENE	1,190		0.0058		1,182	0.0069
1,2 - DICHLOROBENZENE	2,710		0.0133		2,774	0.0163
1,3 - DICHLOROBENZENE	880		0.0043		830	0.0048
1,4 - DICHLOROBENZENE	1,765		0.0087		1,720	0.0100
1,2,4 - TRICHLOROBENZENE	220		0.0011		198	0.0012
1,1 - DICHLOROETHANE	613		0.0030		740	0.0044
CIS – 1,2 - DICHLOROETHYLENE	650		0.0032		1,053	0.0040
ACETONE	330		0.0016		673	0.0015
TETRACHLOROETHYLENE	1,255		0.0062		1,355	0.0080
TOLUENE	292		0.0014		322	0.0019
TRICHLOROETHYLENE	2,005		0.0098		2,705	0.0164
VINYL CHLORIDE	137		0.0007		105	0.0006
MONOCHLOROTOLUENES	2,881		0.0007		2,768	0.0093
TOTAL PHENOL	309		0.00141		326	0.0037
ARSENIC	113		0.0006		99	0.0006
IRON	1,199		0.0059		1,494	0.009
POTASSIUM	3,350,000		16.433		3,842,500	22.86
SODIUM	347,000		1.702		358,500	2.101

PART I

ANALYTICAL RESULTS

SIU PERMIT NAME: **Norampac - Frontier Site**

SIU PERMIT NO.: **078**

SAMPLE LOCATION: **Monitoring Wells in Bedrock A-Zone 47th Street**

	RESULTS µg/L	/ µg/L	RESULTS pounds/day	/pounds/day	ANNUAL AVERAGE µg/L	ANNUAL AVERAGE pounds/day
DATE SAMPLED: October 8, 2015						
24-HOUR FLOW IN MGD	0.00054				0.00064	
BENZENE	430		0.0019		280	0.0014
MONOCHLOROBENZENE	180		0.0009		115	0.0006
1,2 - DICHLOROBENZENE	220		0.0010		148	0.0008
1,3 - DICHLOROBENZENE	160		0.0007		110	0.0006
1,4 - DICHLOROBENZENE	130		0.0006		103	0.0005
1,2,4 - TRICHLOROBENZENE	0.0		0.0000		0.0	0.0000
CIS – 1,2 - DICHLOROETHYLENE	340		0.0015		220	0.0011
ACETONE	0.0		0.0000		0.0	0.0000
TETRACHLOROETHYLENE	0.0		0.0000		0	0.0000
TOLUENE	34		0.0002		24	0.0002
TRICHLOROETHYLENE	0.0		0.0000		0	0.0000
VINYL CHLORIDE	220		0.0010		140	0.0007
MONOCHLOROTOLUENES	131		0.0006		66	0.0003
TOTAL PHENOL	73		0.0003		67	0.0004
ARSENIC	28		0.0001		26	0.0001
IRON	148		0.0007		247	0.0014
POTASSIUM	4,820,000		21.63		5,705,000	31.16
SODIUM	370,000		1.661		392,500	2.112
1,1-DICHLOROETHANE	25		0.0001		13	0.0001

PART I

ANALYTICAL RESULTS

SIU PERMIT NAME: **Norampac - Frontier Site**

SIU PERMIT NO.: **078**

SAMPLE LOCATION: **Monitoring Wells in Bedrock B Zone (South)**

	RESULTS µg/L	/ µg/L	RESULTS pounds/day	/pounds/day	ANNUAL AVERAGE µg/L	ANNUAL AVERAGE pounds/day
DATE SAMPLED: October 7-8, 2015						
24-HOUR FLOW IN MGD	0.000000[(1)]				0.000000	
BENZENE	7.8		0.0000		11	0.0000
MONOCHLOROBENZENE	83		0.0000		68	0.0000
1,2 – DICHLOROBENZENE	28		0.0000		27	0.0000
1,3 - DICHLOROBENZENE	54		0.0000		52	0.0000
1,4 - DICHLOROBENZENE	60		0.0000		57	0.0000
1,2,4 - TRICHLOROBENZENE	0.0		0.0000		0.0	0.0000
1,1 - DICHLOROETHANE	31		0.0000		31	0.0000
CIS – 1,2 - DICHLOROETHYLENE	18		0.0000		53	0.0000
ACETONE	0.0		0.0000		0.0	0.0000
TETRACHLOROETHYLENE	9.7		0.0000		7.5	0.0000
TOLUENE	0.0		0.0000		3.5	0.0000
TRICHLOROETHYLENE	21		0.0000		20	0.0000
VINYL CHLORIDE	8.1		0.0000		45	0.0000
MONOCHLOROTOLUENES	79		0.0000		65	0.0000
TOTAL PHENOL	10		0.0000		16	0.0000
						0.0000
ARSENIC	22		0.0000		22	0.0000
IRON	232		0.0000		300	0.0000
POTASSIUM	2,606,766		0.0000		2,884,833	0.0000
SODIUM	282,900		0.0000		296,100	0.0000

[(1)] No discharge to south for the time period June 2015 through November 2015.

PART I

ANALYTICAL RESULTS

SIU PERMIT NAME: **Norampac - Frontier Site**

SIU PERMIT NO.: **078**

SAMPLE LOCATION: **Monitoring Wells in Bedrock B Zone (East)**

	RESULTS µg/L	/ µg/L	RESULTS pounds/day	/pounds/day	ANNUAL AVERAGE µg/L	ANNUAL AVERAGE pounds/day
DATE SAMPLED: October 7, 2015						
24-HOUR FLOW IN MGD	0.00028				0.00033	
BENZENE	5.6		<0.0001		11	< 0.0001
MONOCHLOROBENZENE	16		<0.0001		27	0.0001
1,2 - DICHLOROBENZENE	11		<0.0001		8	<0.0001
1,3 - DICHLOROBENZENE	19		<0.0001		19	<0.0001
1,4 - DICHLOROBENZENE	20		<0.0001		26	<0.0001
1,2,4 - TRICHLOROBENZENE	0.0		0.0		0.0	0.0
1,1 - DICHLOROETHANE	14		<0.0001		17	<0.0001
CIS – 1,2 - DICHLOROETHYLENE	6.3		<0.0001		52	0.0002
ACETONE	0.0		0.0		0.0	0.0
TETRACHLOROETHYLENE	5.4		<0.0001		2.7	<0.0001
TOLUENE	0.0		0.0		2.7	<0.0001
TRICHLOROETHYLENE	6.1		<0.0001		4.9	<0.0001
VINYL CHLORIDE	0.0		0.0		10	<0.0001
MONOCHLOROTOLUENES	241		0.0006		249	0.0007
TOTAL PHENOL	0.0		0.0		8	<0.0001
ARSENIC	17		<0.0001		17	<0.0001
IRON	1,115		0.0026		1,873	0.0053
POTASSIUM	2,839,500		6.680		3,188,150	8.725
SODIUM	298,500		0.702		337,750	0.9250

PART I

ANALYTICAL RESULTS

SIU PERMIT NAME: **Norampac - Frontier Site**

SIU PERMIT NO.: **078**

SAMPLE LOCATION: **Total Sum of Bedrock A and B Zones**

	RESULTS µg/L	/ µg/L	RESULTS pounds/day	/pounds/day	ANNUAL AVERAGE µg/L	ANNUAL AVERAGE pounds/day
DATE SAMPLED: October 7-8, 2015						
24-HOUR FLOW IN MGD	0.002097				0.002246	
BENZENE			0.0071			0.0075
MONOCHLOROBENZENE			0.0111			0.0111
1,2 - DICHLOROBENZENE			0.0210			0.0216
1,3 - DICHLOROBENZENE			0.0153			0.0130
1,4 - DICHLOROBENZENE			0.0202			0.0183
1,2,4 - TRICHLOROBENZENE			0.0013			0.0013
1,1 - DICHLOROETHANE			0.0034			0.0047
CIS – 1,2 - DICHLOROETHYLENE			0.0077			0.0068
ACETONE			0.0017			0.0016
TETRACHLOROETHYLENE			0.0062			0.0080
TOLUENE			0.0017			0.0022
TRICHLOROETHYLENE			0.0099			0.0165
VINYL CHLORIDE			0.0019			0.0015
MONOCHLOROTOLUENES			0.0188			0.0197
TOTAL PHENOL			0.0021			0.0025
ARSENIC			0.0008			0.0008
IRON			0.0128			0.0186
POTASSIUM			49.6293			124.509
SODIUM			4.4043			5.6102

PART II

COMPLIANCE MONITORING

SIU NAME: Norampac - Frontier Site

PERMIT NO.: 078

NO VIOLATIONS

VIOLATION PARAMETER	DATE	FLOW [MGD]	SAMPLE POINT LOCATION	ACTUAL* DISCHARGE	PERMIT LIMIT	TYPE** LIMIT VIOLATED

NOTE:

* - Actual discharge – list actual analytical results and appropriate units.

** - Type Limit Violated – List Type:

A.A. = Annual Average

D.M. = Daily Maximum

L.L. = Local Limits (Regulation 1960.5)

ADMIN\WINWORD\PARADISE\SIU\SELF-MONITORING REPORT FORM - BLANK