ARCADIS
Infrastructure · Water · Environment · Buildings

ARCADIS of New York, Inc.
855 Route 146
Suite 210
Clifton Park
New York 12065
Tel 518 250 7300
Fax 518 250 7301

Transmittal Letter

To:
Mr. David Szymanski
New York State Department of Environmental Conservation
270 Michigan Avenue
Buffalo, New York 14203

Copies:
Dave Sordi, Ingersoll Rand
Scarlett Messier, NYSDOH
Moh Mohiuddin, ARCADIS
File

From:
Todd Carignan, Marc Sanford

Date:
July 30, 2013

Subject:
Site Management- Periodic Review Report

ARCADIS Project No.:
AY000219.0019

We are sending you:

☒ **Attached** ☒ **Under Separate Cover Via signed ICEC Certs the Following Items:**

☐ Shop Drawings ☐ Plans ☐ Specifications ☐ Change Order
☐ Prints ☐ Samples ☐ Copy of Letter ☒ Reports
☐ Other:

Copies	Date	Description	Action*
1	7/30/13	Site Management- Periodic Review Report (June 15, 2012 – June 15, 2013), DC Rollforms Site, Jamestown, New York (Site No. 907019)	AS

Action*

☐ A Approved ☐ CR Correct and Resubmit ☐ Resubmit _____ Copies
☐ AN Approved As Noted ☐ F File ☐ Return _____ Copies
☒ AS As Requested ☐ FA For Approval ☐ Review and Comment
☐ Other:

Mailing Method

☐ U.S. Postal Service 1st Class ☐ Courier/Hand Delivery ☐ FedEx Priority Overnight ☐ FedEx 2-Day Delivery
☐ Certified/Registered Mail ☐ United Parcel Service (UPS) ☐ FedEx Standard Overnight ☐ FedEx Economy
☒ Other: Email

Comments: Signed original IC/EC Certification Forms were mailed under seperate cover.

ARCADIS of New York, Inc.
855 Route 146
Suite 210
Clifton Park
New York 12065
Tel 518 250 7300
Fax 518 250 7301
www.arcadis-us.com

Mr. David Szymanski
New York State Department of Environmental Conservation
270 Michigan Avenue
Buffalo, New York 14203

Subject:
Site Management- Periodic Review Report, DC Rollforms Site, Jamestown, New York (Site No. 907019)

ENVIRONMENT

Date:
July 30, 2013

Contact:
Marc W. Sanford
Todd M. Carignan
Phone:
518.250.7300
Email:
marc.sanford@arcadis-us.com
todd.carignan@arcadis-us.com

Our ref:
AY000219.0019

Dear Mr. Szymanski:

On behalf of Ingersoll Rand Company, ARCADIS is submitting this cover letter and accompanying attachments to satisfy the request for the Annual Site Management- Periodic Review Report for DC Rollforms Site, covering the reporting period from June 15, 2012 through June 15, 2013, as requested by NYSDEC in a June 10, 2013 letter to Ingersoll Rand Company.

The following documents have been provided to satisfy the requirements of the Site Management- Periodic Review Report Enclosures 1, 2, and 3:

- NYSDEC Site Management Periodic Review Report Notice, Institutional Controls and Engineering Controls Certification Form;
- Copy of the approved/renewed Jamestown Board of Public Utilities Industrial Wastewater Discharge Permit;
- 2012 Annual Monitoring Report; and
- First Quarter 2013 Remedial Status Report. This report covers the reporting period of January 1, 2013 through March 31, 2013 (submitted previously under separate cover).

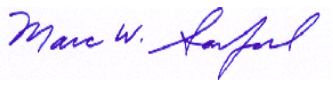
The Second Quarter 2013 Remedial Status Report for Remedial Action covering the reporting period from April 1, 2013 through June 30, 2013 will be submitted under separate cover.

If there are any questions or comments regarding this status report, please do not hesitate to contact us.

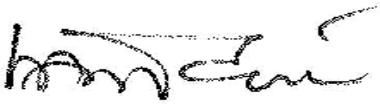
Sincerely,

ARCADIS of New York, Inc.

Todd Carignan
Project Engineer



Marc W. Sanford
Principal Scientist



Moh Mohiuddin, Ph.D., P.E., BCEE
Principal Engineer - Engineer of Record

Attachments:

1. NYSDEC Site Management Periodic Review Report Notice, Institutional Controls and Engineering Controls Certification Form.
2. Jamestown Board of Public Utilities Industrial Wastewater Discharge Permit.
3. 2012 Annual Monitoring Report.

Copies:
Dave Sordi, Ingersoll Rand
Scarlett Messier, NYSDOH
File

ARCADIS

Attachment 1

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. 907019

Site Name D.C. (Dow Craft) Rollforms

Site Address: 583 Allen Street Zip Code: 14701
City/Town: Jamestown
County: Chautauqua
Site Acreage: 2.4

Reporting Period: June 15, 2012 to June 15, 2013

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

Box 2

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

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

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

Signature of Owner, Remedial Party or Designated Representative

Date

SITE NO. 907019 **Box 3**

Description of Institutional Controls

Parcel	Owner	Institutional Control
307-13-2.2	Jamestown Allenco, Inc.	Site Management Plan Landuse Restriction Ground Water Use Restriction Soil Management Plan

Deed Restrictions (7/19/2005) Recorded - 11/29/2005:
1. Property use: Commercial or Industrial
2. Prohibition of use of groundwater.

Site Management Plan:Soils Management Plan and Inspections of Cover System, Rip Rap, Plantings, and Erosion.

Groundwater Collection and Treatment System Operation, Maintenance, and Monitoring.

Box 4

Description of Engineering Controls

Parcel	Engineering Control
307-13-2.2	Groundwater Containment Subsurface Barriers Groundwater Treatment System

Box 5

Periodic Review Report (PRR) Certification Statements

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

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

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

YES	NO
X	☐

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

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

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

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

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

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

YES	NO
X	☐

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

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

Signature of Owner, Remedial Party or Designated Representative

Date

IC CERTIFICATIONS
SITE NO. 915147

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 Marc Sanford (print name) at 855 Route 146, Suite 210, Clifton Park, NY 12065 (print business address),

am certifying as the designated representative (Owner or Remedial Party)
on behalf of Ingersoll Rand

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

Marc W Sanford
Signature of Owner, Remedial Party, or Designated Representative Rendering Certification

7-29-13
Date

IC/EC CERTIFICATIONS

Box 7

Professional Engineer Signature

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

I MOH MOHIUDDIN at ARCADIS OF NEW YORK, P.C.,
print name — print business address

am certifying as a Professional Engineer for the Ingersoll Rand Company/D.C. Rollforms (Owner or Remedial Party)

STATE OF NEW YORK
MOH MOHIUDDIN
074527
LICENSED PROFESSIONAL ENGINEER

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

Stamp (Required for PE)

07/18/2013
Date

ARCADIS

Attachment 2

JAMESTOWN BOARD OF PUBLIC UTILITIES

PO Box 700
Jamestown, NY 14702-0700
Phone (716) 661-1673
Fax (716) 661-1617

ELECTRIC
DISTRICT HEAT
WATER
WASTEWATER
SOLID WASTE

September 21, 2012

Mr. Dave Sordi
PO Box 389
Center Conway, NH 03813

Dear Mr. Sordi:

Please find enclosed a copy of your firm's renewed Industrial Waste Discharge Permit governing the wastewater discharge (s) from your facility to the Jamestown Publicly Owned Treatment Works (POTW). The effective dates of the permit are shown on the first page of the permit. This permit is subject to change should there be any additions and/or deletions made to the industrial pretreatment programs as established by the Environmental Protection Agency.

Please review your permit carefully as it may include changes from your previous permit. Should you have any questions or comments concerning your permit, please do not hesitate to contact this office.

Should you have any questions, please do not hesitate to contact this office.

Sincerely,

Michael V Saar, P.E.
DGM - Water Resources

CITY OF JAMESTOWN
BOARD OF PUBLIC UTILITIES
INDUSTRIAL WASTEWATER DISCHARGE PERMIT

Permit Number: 037 **SIC:** Groundwater Remediation

Date Issued: September 4, 2012 **Expiration Date:** September 3, 2017

Revision Date: N/A

Ingersoll Rand, as a Significant Industrial User (SIU) of the City of Jamestown Publicly Owned Treatment Works (POTW), is hereby issued an industrial wastewater discharge permit for it's ground water remediation site at 583 Allen St., pursuant to Chapter 24A of the Jamestown City Code (Jamestown Sewer Use Ordinance) and also with any applicable provisions of federal or state law(s) or regulations(s). Said permit shall be effective for a period of five (5) years from the date of issuance hereof.

This permit is granted in accordance with the application filed on August 22, 2007 and notice of process modifications submitted on N/A and in conformity with the plans, specifications, semi-annual self-monitoring reports, and other data submitted to the City in support of the above application, all of which are filed with and considered as part of this permit, together with the following named conditions and requirements:

Effective this 4th day of September, 20 12
To expire the 3rd day of September, 20 17

Deputy General Manager - Board of Public Utilities

RIGHT OF ENTRY

The permittee shall allow duly authorized employees or representatives of the City to enter the permittee's premises for the purpose of inspection, observation, measurement, sampling, and testing in accordance with Article VIII of the Jamestown Sewer Use Ordinance.

SAMPLING MANHOLE REQUIREMENTS

If, in the opinion of the General Manager, there are not adequate facilities for the acquisition of representative samples and accurate flow measurements, the General Manager may require that a sampling manhole with flow measuring device be installed by the permittee at his expense. This sampling manhole shall be approved by this office before installation. The permittee shall be responsible for all maintenance of the sampling manhole and calibration of the monitoring equipment.

BOARD OF PUBLIC UTILITES MONITORING

Compliance with the Jamestown Sewer Use Ordinance will be monitored via wastewater discharge monitoring. The City of Jamestown will monitor each SIU a minimum of one time per year. Results will be transmitted to each SIU.

SELF MONITORING

Each SIU must conduct self-monitoring and report results to the City in accordance with applicable federal and local regulations. **Self Monitoring reports are due the 28TH of each month for the operations of the previous month**. Self-monitoring for assessing continued compliance shall be conducted and reported in accordance with federal regulations (40 CFR 403.12(e)). All permit limits set forth in this permit are enforceable effluent limitations.

MONITORING LOCATION #1
NEW SOURCE

PARAMETER	SAMPLE	LOCAL	FEDERAL	FEDERAL
	Monthly	LIMIT	MAX	30 DAY AVE
		MG/L	MG/L	MG/L
FLOW	Report	-	-	-
PH (4 grabs)	X	5.5-10.0	-	-
Oil and Grease (4 Grabs)	X	100	-	-
TSS (comp)	X	350	-	-
Volatile Organics (comp)	X	2.13	-	-
PCB's (comp)	X	Non Detect	-	-

Notes :

1. Samples should be taken as **composites** of at least 4 grab samples collected during a typical production day except for pH and Oil & Grease. Four separate samples must be taken and **individually analyzed for pH and Oil & Grease.**
2. All analysis shall be preformed by a New York State Department of Health Certified Environmental Laboratory.
3. All analysis shall be performed in accordance with the latest edition of the following references:
   a. Standard Methods for the Examination of Water and Wastewater
   b. Method for Chemical Analysis of Water and Wastes, USEPA, technology Transfer, 1983

PROHIBITED DISCHARGES

The following should not be introduced into the City Sewer system:

(1) Pollutants which create a fire or explosion hazard in the POTW, including, but not limited to, wastestreams with a closed cup flashpoint of less than 140 degrees Fahrenheit or 60 degrees Centigrade using the test methods specified in 40 CFR 261.21.
(2) Pollutants which will cause corrosive structural damage to the POTW, but in no case Discharges with pH lower than **5.5** or greater than **10.0**;
(3) Solid or viscous pollutants in amounts which will cause obstruction to the flow in the POTW resulting in Interference;
(4) Any pollutant, including oxygen demanding pollutants (BOD, etc.) released in a Discharge at a flow rate and/or pollutant concentration which will cause Interference with the POTW.
(5) Heat in amounts which will inhibit biological activity in the POTW resulting in Interference, but in no case heat in such quantities that the temperature at the POTW Treatment Plant exceeds 40 deg.C (104 deg.F) unless the Approval Authority, upon request of the POTW, approves alternate temperature limits.
(6) Petroleum oil, non-biodegradable cutting oil, or products of mineral oil origin in amounts that will cause interference or pass through;
(7) Pollutants which result in the presence of toxic gases, vapors, or fumes within the POTW in a quantity that may cause acute worker health and safety problems;
(8) Any trucked or hauled pollutants, except at discharge points designated by the POTW.
(9) The discharge of concentrated solutions without pretreatment is strictly prohibited. Any request to discharge such wastes must be submitted to this office and is subject to the approval of the General Manager on a case by case basis.
10) Any water or waste containing fats, wax, grease, oils, or oil products, whether emulsified or not, in excess of **100 mg/l**.

HAZARDOUS WASTE DISCHARGE NOTIFICATION

For discharges of listed and characteristic hazardous wastes which are not already reported in periodic self-monitoring reports and which exceed 15 kilograms per month, the regulations require that all industrial users notify USEPA, NYSDEC, and the City of Jamestown as to the constituents of these wastes and the anticipated discharge volume of such wastes on both a monthly and an annual basis.

CHANGE IN WASTEWATER DISCHARGE

All discharges authorized herein shall comply with the terms and conditions of this permit. Any industrial facility expansions, production increases, or process modifications which result in new, different, or increased discharges of pollutants must be reported by submission of a new industrial waste disposal questionnaire. This permit may be modified to specify and limit any pollutants not previously limited. The discharge of any pollutant more frequently than or at a level in excess of that specified and authorized by this permit shall constitute a violation of the terms and conditions of this permit.

RECORDKEEPING

The permittee shall retain all records of monitoring activities and results (whether or not required by this permit) for a minimum of 3 years. These records shall be made available for inspection and copying to duly authorized employees or representatives of the City. This period of retention shall be extended during any unresolved litigation.

PERMIT MODIFICATIONS

After sufficient notice to the permittee, this permit may be modified, suspended, or revoked in whole or in part during its term for cause including, but not limited to, the following:

(a) Violation of any terms or conditions of this permit.
(b) A change in any condition that requires either a temporary or permanent reduction or elimination of the authorized discharge.
(c) If an effluent standard is established under any state or federal law for a pollutant which is present in the discharge and such standard or prohibition s more stringent that any limitation for such pollutant in this permit.

PERMIT TRANSFER

Sewer Use Permits are issued to a specific User for a specific operation. A wastewater discharge permit shall not be reassigned or, transferred, or sold to a new owner, new User, different premise, or a new or changed operation without the approval of the City. Any succeeding Owner or User shall also comply with the terms and conditions of the existing permit.

NOTICE OF NON-COMPLIANCE

The permittee shall notify the operator of the Jamestown Wastewater Treatment Plant **immediately,** by telephone (665-3980), so that the operator can take the necessary steps to prevent damage to the wastewater treatment process and equipment in the event the permittee:

(1) Does not comply with or will be unable to comply with any daily maximum effluent limitation specified in this permit.
(2) Discharges or may discharge any wastewater which may cause a slug loading to the Jamestown Wastewater Treatment Plant. This includes wastewater which may cause pass through or interference with wastewater treatment plant operations.
(3) Discharges or may discharge any material or wastewater which is prohibited from discharge as described in the City of Jamestown Local Sewer Use Ordinance or this permit.

These non-complying discharges or possible discharges may be due to:

Breakdown of industrial wastewater pretreatment equipment;
Accidents caused by human error or negligence; or
Other causes, such as acts of nature.

The General Manager shall be notified by telephone within 24 hours, and in writing within five (5) days and said notification shall include the following pertinent information:

(1) A description of the non-complying discharge;
(2) Cause of non-compliance;
(3) Anticipated time the condition of non-compliance is expected to continue, or if such condition has been corrected, the duration of the period of non-compliance;
(4) Steps taken by the permittee to reduce and eliminate the non-complying discharge; and
(5) Steps to be taken by the permittee to prevent reoccurrence of the condition of non-compliance.

The permittee must also repeat sampling for all parameters exceeding discharge limitations and submit the results of the repeat analysis within thirty (30) days of the violation(s).

Nothing in this permit shall be construed to relieve the permittee from the penalties for non-compliance of this permit for any reason subject to Article (IX) (Penalties) of the Jamestown Sewer Ordinance.

SCHEDULE OF COMPLIANCE

The permittee shall comply with the following schedule if the present discharge does not conform to the effluent limitations described within this permit:

a. By _____ the permittee shall have a registered Professional Engineer contact this office.
b. By _____ the permittee shall complete an engineering report and submit it to this office.
c. By_____ the permittee shall complete final plans and specifications for pretreatment facilities and submit them to this office for review and approval.
d. By _____ the permittee shall start construction of its approved pretreatment facilities.
e. By _____ the permittee shall complete construction of the pretreatment facilities.
f. By _____ the permittee shall attain operational levels required to achieve the effluent limits specified within this permit.

CIVIL AND CRIMINAL PENALTIES

A permittee found violating applicable local, state or federal regulations may be subject to administrative penalties, civil action, and/or criminal prosecution. If administrative penalties are warranted, a fine in an amount not exceeding $1000.00 per day per violation may be assessed. If criminal penalties are assessed, a fine in an amount not exceeding $1,000.00 per violation per day may be assessed, imprisonment for not more than 6 months, or both. Any person violating applicable local, state or federal regulations that results in expense, loss or damage to the City and its property shall be liable for all costs.

ARCADIS

Attachment 3

ARCADIS
Infrastructure · Water · Environment · Buildings

Imagine the result

Ingersoll Rand
Inspiring Progress™

2012 Annual Monitoring Report

D.C. Rollforms Site
Jamestown, New York
NYSDEC Site # 907019

July 2013

2012 Annual Monitoring Report

D.C. Rollforms Site,
Jamestown, New York
NYSDEC Site Code 907019

Todd Carignan
Project Engineer

Marc W. Sanford
Principal Scientist

Moh Mohiuddin, Ph.D., P.E., BCEE
Principal Engineer-Engineer of Record
NY PE License #074527

Prepared for:
Ingersoll Rand Company

Prepared by:
ARCADIS of New York, Inc.
855 Route 146
Suite 210
Clifton Park
New York 12065
Tel 518 250 7300
Fax 518 250 7301

Our Ref.:
AY000219.0019

Date:
July 30, 2013

Table of Contents

Tables

Figures

Appendices

Acronyms

AC - air compressor

acfm - actual cubic feet per minute

AGC - Annual Guidance Concentration

AS - air stripper

B - blower

BPU - Board of Public Utilities

CF - cartridge filters

COC - Constituents of Concern

DCE - Dichloroethene

DNAPL - Dense Non-aqueous Phase Liquid

DRO - Diesel Range Organics

FSP - Field Sampling Plan

gpm - gallons per minute

GRO - Gasoline Range Organics

In W.C. - Inches of Water Column

kg - kilograms

LPGOC - Liquid Phase Granular Organically Modified Clay

PLC - Programmable Logic Controller

MW - monitoring well

NAPL - Non-Aqueous Phase Liquid

ND - non-detect

NYSDEC - New York State Department of Environmental Conservation

O&G - Oil and Grease

O&M - Operation and Maintenance

OM&M - Operation, Maintenance and Monitoring

OW - observation well

OWS - oil/water separator

PCBs - polychlorinated Biphenyls

PLC - programmable logic controller

ppbv - parts per billion by volume

POTW - Publicly Owned Treatment Works

SMP - Site Management Plan

SP - sample port

SVE - soil vapor extraction

TCE - Trichloroethene

TP - transfer pump

TPH - Total Petroleum Hydrocarbons

TSS - Total Suspended Solids

µg/L - micrograms per liter

mg/L - milligrams per liter

USEPA - United States Environmental Protection Agency

VC - Vinyl Chloride

VEP - Vacuum Enhanced Pumping

VOCs - Volatile Organic Compounds

VPGAC - vapor phase granular activated carbon

1. Introduction

ARCADIS of New York, Inc. (ARCADIS), on behalf of the Ingersoll Rand Company, has prepared this 2012 Annual Monitoring Report for the former D.C. Rollforms Site (referred to hereafter as the Site) located in Jamestown, Chautauqua County, New York (Figure 1). The work was performed in accordance with the New York State Department of Environmental Conservation (NYSDEC) approved Groundwater Collection and Treatment System Operation, Maintenance, and Monitoring Plan (OM&M Plan; ARCADIS 2008), and Site Management Plan (SMP; ARCADIS 2008). This 2012 Annual Monitoring Report covers the period from January 1, 2012 through December 31, 2012.

The groundwater collection and treatment system (referred to herein as the 'system') consists of a vacuum enhanced pumping (VEP) system for the collection of constituents of concern (COC). The treatment system comprises an oil/water separator, cartridge filters, carbon/clay filters, and an air stripper. The system was designed and constructed to recover and treat chlorinated volatile organic compounds (VOCs), total petroleum hydrocarbons (TPH), and non-aqueous phase liquid (NAPL) present in the subsurface at the Site. The main COCs at the Site are trichloroethene (TCE), cis-1,2-dichloroethene (DCE), and vinyl chloride (VC).

This report summarizes the overall remedial system performance and documents inspections and Site activities related to the SMP. Extracted volumes of groundwater and vapor, contaminant mass removal estimates, and system performance data and evaluation are presented. The report also provides an outlook on the 2013 operating period and any recommendations for modification to the system operation and/or monitoring programs (if necessary) in order to achieve the remedial objectives of the site.

2. Background

2.1 Site Location and Description

The Site is located at 583 Allen Street in Jamestown, Chautauqua County, New York (Figure 1). The Site is approximately 2.38 acres in size, and is a vacant parcel. The vacant parcel is owned by Jamestown Allenco, LLC. and is bounded by Allen Street on the east, the Weber Knapp and Jamestown Urban Renewal Agency properties on the south, and the Chadakoin River on the west and northwest. The adjacent north parcel is owned by Heavy Press and Tool, Inc. This parcel contains a two-story building and

parking lot (Figure 2). The Site is located in a mixed residential and commercial area, which is served by a public water supply and sanitary sewer. The Site was listed in the registry of Inactive Hazardous Waste Disposal Sites in New York State in 1994. The Site is currently classified as Class 2 under the NYSDEC Environmental Site Remediation Database and is in the State Superfund Program. Upon completion of the active remedial activities the Site will be reclassified as a Class 4, which indicates a site that has been properly remediated and will require continued management.

2.2 Summary of Remedial System Components

The remedy implemented for the D.C. Rollforms Site includes the following elements:

- Installation of a steel interlocking sheet-pile wall (i.e., vertical barrier wall) at the top of the riverbank between the Chadakoin River and the Site;
- Vacuum Enhanced Pumping technology utilizing submersible pneumatic pumps and a regenerative blower to remediate NAPL and VOCs in groundwater and soil;
- Groundwater and soil gas treatment system comprised an oil/water separator, solids filtration units, carbon filtration, and air stripping technologies;
- Excavation of the soil between the vertical barrier wall and Chadakoin River;
- Removal of abandoned Site storm water outfalls;
- Riverbank reconstruction/stabilization and restoration including live plantings;
- Covering and reseeding disturbed areas with 12-inches of clean soil;
- The removal of sediment from the Chadakoin River; and
- Fish habitat construction (e.g., wingwall structure) in the Chadakoin River.

The remedial system layout is shown on the site plan in Figure 2. The groundwater collection system is designed to extract groundwater impacted by NAPL and VOCs consisting primarily of TCE, total DCE, and VC. The extracted groundwater is treated via an oil/water separator (OWS), filtration, and air stripping prior to discharge to the

publically owned treatment works (POTW) sanitary sewer under an Industrial Waste Water Discharge permit with the Jamestown Board of Public Utilities (BPU).

2.3 Engineering Controls

As part of the remedy as noted above in Section 2.2, engineering controls implemented and maintained at the D.C. Rollforms Site include:

- Installation of a steel interlocking sheet-pile wall (i.e., vertical barrier wall) at the top of the riverbank between the Chadakoin River and the Site;
- Vacuum Enhanced Pumping technology utilizing submersible pneumatic pumps and a regenerative blower to remediate NAPL and VOCs in groundwater and soil; and
- Groundwater and soil gas treatment system comprised an oil/water separator, solids filtration units, carbon filtration, and air stripping technologies.

2.4 Institutional Controls

Institutional controls have been implemented as part of the Remedial Action. The Declaration of Covenants and Restrictions dated June 2005 by Jamestown Allenco addresses prohibitions on the property. The prohibitions set forth in the declaration are summarized as follows:

- The property is prohibited from ever being used for purposes other than commercial or industrial;

- The use of groundwater underlying the property is prohibited without rendering it safe for drinking water or industrial/commercial purposes; and

- The owner of the property shall continue to not interfere with any institutional and engineering controls the NYSDEC required Ingersoll Rand to put into place and maintain.

The covenants and restrictions run with the land and are binding upon all future owners of the property.

3. System Operation Overview

The general layout (e.g., wells, piping, and treatment building) of the remedial system is shown on Figure 2. The remedial system includes fourteen (14) vacuum enhanced pumping wells (VEP-1 through VEP-14).

3.1 Liquid Phase

Groundwater and NAPL from the VEP wells is extracted by total fluids pneumatic pumps conveyed via below grade in individual 1-inch diameter piping to an onsite treatment building. The groundwater and NAPL is then pumped into a common manifold piped inside the treatment building. The groundwater and NAPL is then conveyed into the OWS (OWS-200) for removal of NAPL. As noted in previous reports, recovery wells VEP-11, VEP-13, and VEP-14 are piped directly to the OWS. A sequestering agent (Aries 2925) is injected into the process stream on the inlet side of the OWS to prevent iron and manganese-related fouling downstream in the system (e.g., OWS, process piping, cartridge filters and air stripper).

Once the groundwater is pre-treated by OWS-200, the water flows by gravity to a storage tank (ST-300). The water is then transferred in batch mode by transfer pump TP-300 through cartridge filters (CF-400 and CF-401) for the removal of residual suspended solids. Following the cartridge filters the treatment process is equipped with a 400-pound (lb) liquid phase granular organically modified clay (LPGOC) filter vessel (ACF-400) for the treatment and removal of residual emulsified NAPL in the liquid phase process stream. As noted in previous reports, the LPGOC vessel has been bypassed since shortly after startup due to the efficiency of the OWS. However, if warranted, the LPGOC treatment process will be brought back online.

Following filtration through the cartridge filters, groundwater is pumped through a low-profile air stripper (AS-700) for the removal of dissolved phase organic compounds. Influent water enters at the top of the air stripper and flows downward by gravity through four aeration trays. A countercurrent of air is blown up through $^{3}/_{16}$-in.-diameter holes in the aeration trays to create bubbles in the water, generating a large mass-transfer surface area from which the VOCs are volatilized. VOCs are stripped from the water and discharged to the atmosphere through an 8-inch diameter stack. The treated water flows into a sump at the bottom of the air stripper and is then discharged via transfer pump TP-700 from the air stripper to local Jamestown BPU sanitary sewer manhole 3T6 located on Allen Street, through a 2-inch force main pipe located below grade (Figure 2).

3.2 Vapor Phase

Soil gas is extracted from each VEP well via vacuum generated by a regenerative blower (B-900). The soil gas is conveyed from each well by 2-inch diameter piping which is then tied into a common header located below grade. Upon entering the treatment building the soil gas passes through a liquid knockout tank (KT-900) which is designed to remove/collect any groundwater or condensate that may be extracted from the subsurface. Following treatment through the knockout tank the soil gas passes through a heat exchanger (HX-500) in order to reduce the temperature of the soil gas stream discharged by the blower, thus maintaining the temperature of the soil gas stream within the acceptable temperature limits of the vapor phase granular activated carbon (VPGAC). The recovered soil gas is treated via two (2) 2,000-lb VPGAC vessels (ASC-501 and ASC-502) arranged in series. The VPGAC is used to remove VOCs from the soil gas stream prior to being discharged to the atmosphere.

3.3 Controls and Monitoring

The system is designed to allow monitoring of the operational status of critical systems on a continual basis during operation and is equipped with a programmable logic controller (PLC). System motors (e.g., air compressor, blowers, etc.) and sensors (e.g., transmitters, switches, etc.) are interlocked with the PLC. Each of the major pieces of equipment and/or sensors are programmed via the PLC to automatically shutdown the system in the event the system malfunctions or a component failure occurs. An automated system shutdown prevents the discharge of untreated groundwater or soil vapor and also protects the health and safety of system operators, should they be onsite during a system failure. Additionally, the PLC is programmed with several non-critical alarm interlocks which notify system operators that routine maintenance needs to be completed (e.g., sequestering agent drum replacement, cartridge filter change-out, etc.) or if the system is shutdown. The process and instrumentation diagrams and equipment layout record drawings are included in Appendix A.

3.4 Riverbank and Cover System Inspections

As outlined in the SMP, the following remedial design elements were constructed at the Site.

- Soil cover of 12 inches in areas disturbed during construction;

- Riverbank reconstruction including stabilization/erosion controls;
- Wingwall structure; and
- Riverbank plantings.

Each of these areas is inspected in accordance with the schedule below:

Frequency	Responsible Person	Actions
Quarterly	Project Engineer	Inspections
Annual	Professional Engineer	Certification

The cover system, riverbank, and wingwall structure were inspected for erosion, sloughing, settlement or other indication of loss of integrity. The riverbank plantings were observed for any signs of distress or lack of growth. The results of the riverbank, site cover, and well inspections are summarized Section 6.2.

3.5 Monitoring Well Inspections

Recovery well and monitoring well integrity surveys are conducted quarterly to observe the surface conditions around each well, the condition of the concrete surface seal and presence of a secure locking cap and/or bolt down road box. Periodically, the depth to bottom in all the wells is measured and compared to the original constructed well depth.

4. System Operation and Maintenance

The remedial system was operated from January to December during the 2012 reporting period with only brief periods of shutdown due to scheduled operation and maintenance (O&M) and/or alarm conditions, as well as repairs and non-routine maintenance activities as discussed in Section 4.2. Monthly O&M site visits consisted of system inspection, recording of operating parameters, influent and effluent system sampling, and investigation/troubleshooting of any alarm conditions. System alarm verification was performed remotely via desktop software. The O&M data generated during each monthly visit are summarized in quarterly progress reports as required by the Consent Order. O&M related to each of the major system components (collection system, liquid and vapor treatment) are discussed below.

4.1 Collection and Treatment System O&M

The following O&M tasks were performed monthly on the remedial system (pneumatic pumps, air compressor, regenerative blower, transfer pump, and related equipment).

4.1.1 Liquid Phase Treatment

The following OM&M tasks were performed monthly, or as needed, with regards to the liquid phase extraction and treatment portion of the system:

- Inspection of all pipes and fittings for potential leaks;
- Checking air compressor (AC-600) coolant oil level and temperature to assure proper operation;
- Inspection of pneumatic pumps (VEP-1 through VEP-14) for proper operation and repair/cleaning, as needed;
- Inspection and cleaning of air stripper (AS-700) as needed;
- Inspection of flow meter (FQI-700) to assure proper operation;
- Monitor and record the system field gauge readings to determine if the system is operating within the designed operational ranges;
- Check and record pressure readings at inlet and outlet of cartridge filters (CF-400 and 401) to assure proper operation;
- Change-out cartidge filters (CF-400 and 401), as needed;
- Record total volume of groundwater recovered and average recovery flow rates;
- Maintain sequestering agent dosing rate and change-out drum as needed;
- Collect system influent liquid phase samples and submit for laboratory analysis of site-specific COCs. These results are summarized in Section 5.3; and

- Collect system effluent liquid phase samples and submit for laboratory analysis as per the Industrial Wastewater Discharge permit, as set forth by the Jamestown BPU. These results are summarized in Section 5.4.

4.1.2 Vapor Phase Treatment

The following OM&M tasks were performed monthly, or as needed, with regards to the vapor extraction and treatment portion of the system.

- Inspection of all pipes and fittings for potential leaks;
- Recording of the blower outlet temperature (TI-901 and TI-902);
- Record extracted air flow rate (FIT-501);
- Check and record pressure readings at inlet and outlet of the heat exchanger and vapor phase activated carbon vessels (ASC-501 and ASC-502) to assure proper operation;
- Monitor the regenerative blower (B-900) for proper operation pressures and temperatures;
- Influent vapor samples are collected and submitted for laboratory analysis of site-specific COCs. These results are summarized in Section 5.5; and
- Effluent vapor samples are collected and submitted for laboratory analysis in order to monitor the system VOC emissions. The VOC emissions are compared to the allowable annual mass flow per the NYSDEC effluent air standards set forth in the Division of Air Resources (DAR-1) Guidance. These results are summarized in Section 5.5.

4.1.3 Recovery Well Inspections

The following O&M tasks were performed quarterly or as needed with regards to the system recovery wells.

- Record applied vacuum readings at individual extraction wells;
- Record induced vacuum readings at select monitoring wells;

- Observe pump operation (pump cycle-counter readings) at each recovery well and record cycle-counter total; and

- Recovery well integrity surveys are conducted to observe the surface conditions around each well, the condition of the concrete surface seal and presence of a secure bolt down road box.

4.1.4 Recordkeeping and Reporting

Monitoring data were recorded on OM&M checklists and submitted as part of the quarterly progress reports to the NYSDEC. As noted, influent and effluent liquid and vapor samples were submitted monthly for laboratory analysis. The analytical results are used to evaluate system performance and to estimate the contaminant mass removal.

4.2 Non-Routine O&M

During the 2012 reporting period, the following system non-routine O&M activities were performed:

- September 11, 2012 – Cleaned iron and manganese deposits from the air stripper trays and demister pad, and replaced the tray and door gaskets;

- September 11, 2012 – Performed scheduled maintenance on the air compressor, including oil and filter change and air filter cleaning;

- November 27, 2012 – Replaced a blown air stripper blower motor fuse; and

- December 11, 2012 – Cleaned the liquid phase effluent discharge line (i.e., force main) piping between air stripper AS-700 and the cleanout located between the treatment system building and Allen Street by removing iron and manganese mineral deposits.

No system process modifications were made during the 2012 reporting period.

5. System Performance Monitoring

The operational data collected during the monthly inspections of the system operation are summarized in the following sections. Monthly system O&M logs have been

provided with the quarterly Remedial Status Reports, and system liquid phase influent and vapor phase sample results have been submitted to NYSDEC's EIMS Administrator in the required EQuIS Electronic Data Deliverable (EDD) format. System liquid phase effluent analytical results have been provided with the Industrial Wastewater Discharge Monitoring Reports submitted on a monthly basis to the Jamestown BPU.

5.1 Objectives of Monitoring

During operation of the system, various data were collected and analyzed to evaluate the overall performance and effectiveness of the system. This performance monitoring is intended to achieve the following objectives:

- Evaluate total dissolved and vapor phase VOC and TPH, as well as NAPL recovered during the operational period;
- Evaluate performance of the remedial system;
- Determine if any modifications to the system are required to enhance the system performance; and
- Ultimately determine when remedial milestones or endpoints have been achieved.

The performance monitoring results for 2012 are summarized below.

5.2 System Operational Data

The system operational data for 2012 is summarized in Table 1. These data include the average and cumulative recovered groundwater and soil vapor flows, average applied vacuums to the recovery well network, and recovery well statuses.

5.2.1 Groundwater Recovery/Extracted Liquid Flowrate

During2012, the groundwater collection system was operated with each VEP well online with the exception of temporary recovery well configuration changes and/or shutdowns associated with routine O&M activities, as well as non-routine O&M activities discussed in Section 4.2. .

It should be noted that recovery wells which were online but were in need of routine repairs and cleaning are identified as being online in Table 1.

Total extracted groundwater flow readings were collected from the totalizing flowmeter (FQI-700). The average monthly system groundwater extraction flow rates are included in Table 1. A cumulative total of 10,231,600 gallons of groundwater has been recovered by the system from startup (January 2008) through December10, 2012 (Table 2). The total flow recovered in 2012 was 2,033,937 gallons. The 2012 total flow corresponds to an average recovery rate of approximately 4.0 gallons per minute (gpm).

5.2.2 Vapor Recovery/Extracted Vapor Flowrate

The vapor phase extraction system was operational during the 2012 period with the exception of isolated shutdowns and/or temporary recovery well configuration changes due to routine O&M activities, as well as non-routine O&M activities discussed in Section 4.2. .

Extracted vapor flow rate readings were collected from the flowmeter (FIT-501) located in the vapor treatment system exhaust post the VPGAC vessel ASC-502 (i.e., post-blower/fresh air dilution valve) and ranged from 1 to 250 actual cubic feet per minute (acfm) during the operational months for the vapor phase extraction system during the 2012 reporting period (Table 1). These flow ranges correspond to an average recovery rate of approximately 230 acfm over the operational period for the vapor phase extraction system during 2012.

5.2.3 Applied and Induced Vacuum

The applied vacuum at the system knockout tank generated by regenerative blower B-900 generally ranged from 44 to 78 inches of water column (in.W.C.). The applied vacuum to the VEP wellheads was adjusted based on several factors which included observed vacuum at the wellhead, induced vacuum at select monitoring points, and seasonal groundwater elevations. The average monthly VEP applied wellhead vacuums are included in Table 1.

Induced vacuum measurements were recorded at select monitoring wells ESI-1, ESI-2, ESI-3, ESI-4R, PW-1, VEPOW-1, VEPOW-2, OW-5, OW-6, OW-7, MW-10R, and MW-4S. Induced vacuums ranged from 0.077 in.W.C. (MW-10R) to 1.5 in.W.C. (PW-1).

5.3 System Influent Liquid Phase Analytical Results

As outlined above, system influent groundwater samples were collected on a monthly basis. The samples were collected from sample port SP-115 (OWS-200 influent chamber). The samples were submitted for laboratory analysis of United States Environmental Protection Agency (USEPA) Method 624 for VOCs, USEPA Method 8015B for TPH gasoline range organics/diesel range organics (GRO/DRO), and USEPA Method 608 for PCBs (polychlorinated biphenyls). All samples were submitted to Accutest Laboratories in Marlborough, Massachusetts.

The influent sample concentrations were used to estimate total mass removal from the subsurface and to evaluate the relative changes in this mass removal rate over time. The mass removal estimate is generated using the monthly influent sample analytical data and the extracted groundwater flow totals. The liquid phase monthly influent concentrations of TCE, total DCE, VC, TPH GRO/DRO, and PCBs in groundwater are provided in Table 3 and are illustrated graphically on Figure 3.

Monthly influent system samples are collected from a single combined system influent sample port located on the influent side of the oil/water separator. Recovery well statuses during influent liquid phase sampling events have been included in Table 3.

Liquid phase influent concentrations during 2012 ranged from non-detect (ND) to 103 micrograms per liter (μg/L) for TCE, 20 to 250 μg/L for total DCE, and 3 to 1,110 μg/L for VC. Influent concentrations of TPH GRO and DRO ranged from non-detect to 0.231 mg/L and from 0.516 to 20.1 μg/L, respectively. It should be noted that the VOC and TPH concentrations detected in monthly system liquid samples are expected to vary based on what recovery wells are online during the sampling event, and cycling during the time of sample collection.

5.4 System Effluent Treated Liquid Phase Analytical Results

Pursuant to the effluent standards set by the Jamestown BPU Industrial Wastewater Discharge Permit (Permit No. 037), sampling consists of the monthly collection of four grab samples over an 8-hour period during a typical operational day. These samples are analyzed for VOCs using USEPA Method 624, oil and grease (O&G) using USEPA Method 1664A, total suspended solids (TSS) using USEPA Method 2540D, and PCBs using USEPA Method 608. All samples were submitted to Accutest Laboratories in Marlborough, Massachusetts. Prior to final discharge to local sanitary sewer manhole

3T6, the system effluent sample is collected from sample port SP-702 located post air stripper (AS-700).

During 2012, the effluent discharge monitoring parameters were non-detect, estimated, and/or reported at quantities below the permitted effluent limits. The effluent sample results are provided in Table 4.

5.5 System Vapor Influent Sampling & Analytical Results

Influent vapor samples were collected on a monthly basis during the operational period for the soil vapor extraction portion of the system, and submitted for laboratory analysis of VOCs and TPH GRO by Method AM 4.02 to Microseeps, Inc. in Pittsburgh, Pennsylvania. As with the extracted groundwater sampling, the purpose of the influent vapor sampling is to estimate the total VOC and TPH GRO mass removal from the subsurface, and to evaluate the relative changes in vapor phase mass removal rate over time as a result of the system operation. The mass removal estimate is generated using the influent sample analytical data and the vapor flow rate recorded at the time of sampling.

The monthly influent vapor concentrations of TCE, total DCE, VC, and TPH GRO are presented in Table 5, and are illustrated graphically on Figure 4. The three predominant compounds detected in the influent vapor samples have been TCE, total DCE, and TPH GRO. TCE was detected in all of the influent vapor samples with concentrations ranging from 14 to 200 parts per billion by volume (ppbv). Influent vapor concentrations of total DCE ranged from 22 to 1,800 ppbv. Influent VC was below the method detection limit for each monthly influent vapor sampling event. Influent TPH GRO vapor samples ranged from non-detect to 1,700 ppbv.

5.6 System Vapor Effluent Sampling & Analytical Results

The purpose of the effluent sample collection is to ensure that the permit equivalent standards/guidance values are met as an air permit is not required for the Site. During 2012, regulatory guidance values were not exceeded. The monthly effluent vapor concentrations of TCE, total DCE, VC, and TPH GRO are presented in Table 5. A summary of effluent vapor concentrations as compared to guidance values is provided in Table 7.

5.7 Groundwater Monitoring

Groundwater monitoring activities were conducted on a quarterly basis in March, May, October, and December2012. Groundwater monitoring consisted of the collection of groundwater samples from monitoring wells and the measurement of water levels in monitoring wells to evaluate the hydraulic influence of the system.

Sampling included the following thirteen (13) monitoring wells during 2012 to evaluate VOC concentration trends during remediation:

- MW-8S, MW-12 and MW-13 (adjacent to VEP-2);
- MW-9 (adjacent to VEP-13);
- MW-10R (adjacent to VEP-12);
- MW-14 (adjacent to VEP-1 and VEP-2);
- ESI-1 (adjacent to VEP-8);
- ESI-2 (adjacent to VEP-6);
- ESI-4R (adjacent to VEP-14);
- ESI-6 (adjacent to VEP-1);
- OW-5 and OW-6 (adjacent to VEP-3 and VEP-4); and
- ESI-7 (adjacent to VEP-5).

Collection of groundwater samples was performed in accordance with the Field Sampling Plan (FSP) and consisted of purging three volumes of water from each well or purging until the well was dry. Samples were then collected using low flow sampling techniques where feasible, and select wells were sampled using disposable bailers due to lack of water. It should be noted that all groundwater sampling was conducted with the VEP system offline (i.e., static conditions). All samples were submitted to Accutest Laboratories in Marlborough, Massachusetts for analysis of VOCs using USEPA Method 8260. Groundwater analytical results are discussed in Section 6.3.2.

6. System Evaluation

The following sections summarize the remedial system performance monitoring data from January 1, 2012 through December 31, 2012.

6.1 Mass Recovery

The estimated total mass recovered was calculated using the system influent dissolved and vapor phase analytical sampling results with the corresponding extraction flow rates (summarized in Section 5.2.1) and the NAPL volumes collected.

6.1.1 Non-Aqueous Phase Liquid

During the 2012 reporting period, approximately 12.5 gallons of dense non-aqueous phase liquid (DNAPL) was recovered by the collection and treatment system in the oil/water separator (OWS-200). .

6.1.2 Dissolved Phase

Influent groundwater laboratory analytical data were used to estimate dissolved phase VOC and TPH GRO/DRO mass recovery rates. As shown in Table 2, influent VOC and TPH GRO/DRO levels and groundwater recovery rates were used to calculate the overall mass of VOCs recovered in the dissolved phase. As indicated in Table 2, a total estimated mass of approximately40 kilograms (kg) of VOCs and TPH GRO/DRO were recovered in the dissolved phase during the 2012 reporting period. The breakdown of total mass removed during the 2012 reporting period is summarized as follows; TCE, 0.22 kg; total DCE, 1.4 kg; VC, 1.4 kg; TPH/GRO, 0.43 kg; and TPH/DRO, 36 kg.

As the data presented in Table 2 indicate, total dissolved phase mass recovery rate estimates ranged from 19 to 252 grams per day, which corresponds to an average recovery rate of 113 grams per day. The fluctuation in dissolved phase mass recovery rate is related to variability in influent mass concentrations in the extracted groundwater due to VEP well configurations, extraction rate, and precipitation recharge to the groundwater system. The cumulative dissolved phase mass recovery of VOCs and TPH [GRO & DRO] is shown on Figure 5.

6.1.3 Vapor Phase

Influent vapor sampling results, molecular weights, and total vapor extraction flow rates were utilized to estimate the vapor phase VOC and TPH/GRO mass recovery rate for the reporting period. As the data presented in Table 6 indicate, the vapor phase mass recovery rate ranged from 0 to 60 grams per day during the operational period for the vapor extraction system. As mentioned in the discussion of dissolved phase mass recovery rates, the fluctuation in vapor phase mass recovery rate is related to the VEP well configuration and groundwater elevations. As Table 6 shows, a total estimated mass of 7.0 kilograms of VOCs and TPH/GRO were removed in the vapor phase during2012, corresponding to an average vapor phase mass recovery rate of 19 grams per day over the entire reporting period. The breakdown of total mass removed during the reporting period is summarized as follows: TCE, 1.1 kg; total DCE, 1.5 kg; and TPH/GRO, 4.4 kg. The cumulative vapor phase mass recovered for VOCs and TPH [GRO] is shown on Figure 6.

The VOC concentrations emitted following vapor phase treatment were used to calculate the estimated actual annual impact by following procedures described in the NYSDEC DAR-1 guidance document. Neither the Short-Term Guidance Concentration (SGC) or Annual Guidance Concentration (AGC) values provided by NYSDEC DAR-1 were exceeded for the site-specific compounds. A summary of effluent vapor concentrations as compared to guidance values is provided in Table 7.

6.2 Site Cover and Riverbank Inspections

During the 2012 reporting period the Site cover material and riverbank were inspected and recorded on inspection checklists (Appendix B) on a quarterly basis for the following:

- Riverbank rip-rap stone condition;
- Wingwall deflector condition and operation;
- Riverbank live planting conditions; and
- Site cover and erosion.

6.2.1 Site Cover

No erosion of the Site cover was observed during the reporting period and the wingwall deflector appeared to be operating as intended.

6.2.2 Riverbank Inspections

Live willow stakes planted (2007) within the riprap (*i.e*., rocked) portions of the bank and the live dogwood and elderberry stakes planted (2007) at the top of the riverbank along the Chadakoin River were observed to be significantly damaged by local fauna, most notably beaver during the 2011-2012 reporting period. ARCADIS prepared and implemented the NYSDEC approved *Riverbank Plantings Corrective Action Plan* (ARCADIS 2012) on November 12 and 30, 2013. The following sections summarize the corrective actions.

Replanting Efforts:

Willow shrubs of 1 to 2-gallon container stock were planted within the rocked portion of the bank at previous live willow stake planting locations where plants no longer existed. The shrubs consisted of 26 Black Willow and 26 Pussy Willows. Planting locations were placed as close to the river in order to get the plant roots closer to the water table. The shrubs were planted by temporarily removing rip rap rock to access underlying soils for shrub planting and then replacing the rock around the plant after planting. Willow shrubs were a minimum of 3-feet in length were inserted a minimum of 0.5-feet into the bank soil below the rock. The willow shrubs were planted along the 260-feet of bank, with an approximately spacing of 5 to 10-feet between plantings.

Dogwood and elderberry shrubs were planted along the top of the bank (*i.e*., above the rocked portion of the bank). The shrubs consisted of 19 Red Osier Dogwoods, 10 Silky Dogwoods, and 10 Elderberry shrubs. These shrubs were 1 to 2-gallon container stock of at least 18-inches in height. Shrubs were planted in groups of 3 of the same species, with at least 2-ft between individual plants. Plant groupings were spaced up to 20-feet apart over the 260-feet of riverbank to create a more natural appearance.

Protection of Existing and New Plantings:

After planting physical protection was installed around the existing live plants as well as the new plants planted during the replanting efforts described below. The protection consisted of chicken wire caging, supported by at least three wooden or metal stakes

per grouping. Stakes were approximately 5-feet in length, and the wire cages extend from the ground to a height of at least 2-feet.

Post Planting Inspections:

The success of the replanting effort was evaluated during the 2012 and 2013 monitoring periods. The new riverbank plantings were inspected weekly for the first two months and then monthly following installation to monitor the area for wildlife damage. During the first two weekly monitoring events following the installation of the new plantings damage to several of the newly planted willow shrubs were observed, most notably from beavers. Repairs and improvements were made on December 10, 2012 to the protective fencing. Additionally, a commercially available beaver repellent was sprayed around each willow planting. Upon implementing these additional measures the beaver activity along the riverbank portion of the site has ceased. As of June 2013, the new plantings have shown sustained growth. The success of the riverbank plantings will continue to be monitored on a monthly basis.

6.3 Groundwater Monitoring Results

The results of the groundwater monitoring program during 2012 are summarized in the following sections. The groundwater monitoring program was performed in accordance with the Groundwater Collection and Treatment System OM&M Plan (ARCADIS 2008) unless otherwise noted. Groundwater sampling was conducted with the system temporarily taken offline.

6.3.1 Groundwater Elevation Data

Water level data collected from the Site monitoring wells for 2012 are summarized in Table 8. The groundwater elevations reflect the position of the water table within the fill material layer at the Site. Groundwater elevations for the March, May and December monitoring events reflect non-pumping conditions with the VEP system temporarily offline, while the October data show the water levels under pumping conditions. Overall, the water level data indicated that the system influences water levels in the vicinity of the VEP recovery wells, with drawdown typically in the range consistent with design estimates of 2 to 6 feet in adjacent monitoring wells.

Water levels in Site wells will continue to be collected on a quarterly basis during the groundwater monitoring program, and periodically to check hydraulic influence of the VEP wells.

6.3.2 Laboratory Analytical Results

During the 2012 reporting period, groundwater samples were collected from thirteen (13) monitoring wells to monitor groundwater quality and evaluate the performance of the system. A summary of the 2012 groundwater monitoring analytical results, along with historical data, is shown in Table 9. The past four years of analytical results for VOCs for those monitoring wells sampled during 2012 are shown on Figure 7.

The following selected observations were made with respect to the groundwater analytical data during2012:

- Consistent with the historical results for the Site, the primary VOCs detected in groundwater are TCE, total DCE and VC, with the majority of the VOC mass within the southern end of the Site near recovery wells VEP-1 and VEP-2.

- VOC concentrations at monitoring wells MW-8S, MW-13 and MW-14 fluctuated within ranges established since the recovery system startup, which include MW-14 VOC concentrations being approximately an order of magnitude less than before the system startup in 2008. Total DCE and VC at MW-8S and MW-12 have been higher when groundwater levels are seasonably lower (i.e., during the May and October 2012 groundwater monitoring events).

- Historical (post-system startup) high concentrations of total DCE (2,685 ug/L) and VC (3,860 ug/L) at monitoring well MW-12 were observed during the May 2012 sampling event.

- While VOC concentrations at monitoring wells OW-5 and OW-6 have shown fluctuation that is attributable to recovery well operation and seasonal groundwater levels, both have shown an overall downward trend in TCE, total DCE and VC over the past three years. Concentrations of TCE were less than 1 µg/L for both of the groundwater sampling events.

- VOC concentrations at replacement wells ESI-4R and MW-10R generally remained within ranges established since installation in 2010, with the exception of total DCE (2,070 µg/L) and VC (825 µg/L) at ESI-4R in March 2012.

- Concentrations of TCE, total DCE and VC at monitoring well ESI-2 which is located adjacent to the Chadakoin River and upgradient from the vertical barrier wall, continues to remain below the laboratory detection limits and the NYSDEC groundwater standards since starting up the remedial system. Monitoring well ESI-1, located just north of well ESI-2, TCE, total DCE, and VC concentrations were below laboratory detection limits for the first quarter sampling event. However, the concentration of total DCE and VC at ESI-1 increased slightly to 10.9 µg/L and 11.8 µg/L, respectively during the third quarter sampling event.

- The 2012 groundwater sampling event showed VOC concentrations at well ESI-7 were consistent with other post-system startup concentrations. Results for the October sampling event, which was the second of two sampling events for well ESI-7 in 2012, were near or below the laboratory detection limits.

- Consistent with the historical Site results since the startup of the remedial system, TCE, total DCE, and VC are below or near laboratory detection levels in groundwater at the northwest corner of the Site in well MW-9 near the Chadakoin River.

7. Conclusions

The following sections summarize the system operation during the 2012 reporting period and also the operational goals for 2013.

7.1 System Performance Summary

Data from the 2012 reporting period indicate that the VEP system has been effective at recovering dissolved and vapor phase VOC mass and NAPL from the subsurface at the Site.

The performance effectiveness of the remedial system is summarized through the following metrics:

- A sustained average groundwater extraction rate of 4.0 gpm from the VEP well network was observed during the reporting period;

- An average soil vapor extraction rate of 223 acfm from the VEP well network was observed during the reporting period;

- The groundwater elevation data indicate that the VEP well network is effective at dewatering the fill material in the vicinity of the recover wells thus making more adsorbed phase mass available via vacuum extraction through in-situ stripping and bio-venting processes;

- Induced vacuums were measured at select monitoring wells which indicate pneumatic conductivity in the subsurface thus promoting lateral air flows in the sub-surface, and further indicating that lighter fraction petroleum compounds (e.g., VOCs and TPH GRO) can be stripped from the vadose soil and groundwater surface to address residual sheens. Additionally, the induced air flows in the subsurface enhances any aerobic microbial degradation (i.e., bioventing) of the remaining residual, heavier fraction petroleum compounds (e.g. TPH DRO) that are remaining in the subsurface soil and groundwater;

- Field measurements of the system influent soil gas stream were recorded with an photoionization detector (PID), the measurements ranged from 1,000 to 8,000 ppbv indicating that SVE is successfully removing VOCs from the subsurface environment;

- Approximately 12.5 gallons of DNAPL were recovered by the remedial system during the 2012 reporting period. Since starting the system in January 2008, an estimated cumulative total of 321.5 gallons of DNAPL have been recovered;

- An estimated total mass of 40 kg and 7.0 kg were recovered in the dissolved and vapor phase in 2012, respectively. Since starting the system (January 2008) an estimated cumulative total mass of 366.1 kg and 167.6 kg have been recovered in the dissolved and vapor phases, respectively (Table 10);

- VOC concentrations in monitoring wells ESI-1 and ESI-6 continue to remain below NYSDEC groundwater standards; and

- Groundwater quality changes in the area of monitoring wells MW-8S, MW-12, MW-13, and MW-14 continue to fluctuate in response to the operation of the remedial system, however, VOC concentrations in monitoring well MW-14 remain below pre-system concentrations.

As part of the annual certification under the Site Management and OM&M Plans the Site engineering controls have been maintained and remain in place functioning as

designed with the exception of noted shutdowns due to non-routine system maintenance. The engineering controls include the following:

- Soil cover and vegetative growth across the Site in previously disturbed areas;
- Riverbank and stabilization erosion controls;
- Wingwall deflector;
- Vertical hydraulic barrier wall;
- Groundwater recovery and soil vapor extraction via VEP (i.e., recovery) wells; and
- Remedial system operation and maintenance.

7.2 Goals for 2013 System Operation

System operation and performance monitoring will continue to focus on optimizing mass removal rates through the operation of VEP well network, evaluating individual recovery well mass removal rates, and continued operation and maintenance of the remedial system process equipment and components.

The goals for system operational activities during 2013, as well as activities already conducted in the first several months of 2013, are as follows:

- Conduct water level measurements at all monitoring wells to monitor hydraulic influence of the system. Water level measurements are generally collected during quarterly groundwater sampling events and periodically as deemed appropriate. Water level measurements have been collected during the first and second quarter groundwater monitoring events completed in March and May 2012, respectively.
- Continue to collect groundwater samples on a quarterly basis from selected monitoring wells MW-10R, MW-12, MW-13, MW-14, and OW-6. The first and second quarterly groundwater sampling events w were conducted in March and June 2013, respectively.

- Continue to collect groundwater samples on a semi-annual basis from select monitoring wells ESI-1, ESI-2, ESI-4R, ESI- 6, MW-8S, MW-9, and OW-5. The first semi-annual groundwater sampling event was conducted in March 2013.

- Continue to monitor the treatment system for mass removal efficiency and VOC breakthrough based on field screening and/or laboratory analysis of samples collected from the system influent and effluent sample points.

- Collect monthly system effluent samples as required by the Jamestown BPU Industrial Wastewater Discharge Permit.

- Submitted the Industrial Wastewater Discharge Permit renewal application to the Jamestown BPU July 2012.

- Continue operation of the system while performing the required liquid/vapor flow and vacuum adjustments at each of the recovery wells to optimize system performance and efficiency, and maximize contaminant mass removal rates.

- Continue NAPL recovery efforts.

- Monitor COC concentrations in the system vapor phase exhaust and compare to the NYSDEC DAR-1 Annual Guidance Concentration Air Modeling Analysis to ensure that the estimated actual annual mass emitted does not exceed the allowable annual mass flow, as per NYSDEC DAR -1.

- Monitor treatment system mechanical and electrical components remotely via the PLC.

- Continue to collect monthly influent samples to track mass removal in the vapor and liquid phases.

- Perform O&M activities (e.g., liquid phase cartridge filter change-outs, pneumatic pump cleaning as needed, sequestering agent drum replacement, air stripper cleaning, air compressor/blower maintenance per OM&M plan).

- Monitor operation of the system and adjusted vacuum and pumping rates to recovery wells, as necessary, to optimize groundwater and vapor extraction rates.

8. References

ARCADIS 2008, Engineering Construction Completion Report, D.C. Rollforms, Ingersoll Rand Site, Jamestown, New York, Site Code 907019, December 7, 2008.

ARCADIS 2008, Site Management Plan, D.C. Rollforms, Ingersoll Rand Site, Jamestown, New York, Site Code 907019, December 6, 2008.

ARCADIS 2008, Groundwater Collection and Treatment System Operation, Maintenance, and Monitoring Plan, D.C. Rollforms, Ingersoll Rand Site, Jamestown, New York, Site Code 907019, December 2, 2008.

ARCADIS 2012, 2011 Annual Monitoring Report, DC Rollforms Site, Jamestown, New York (Site No. 907019), July 13, 2012.

ARCADIS 2012, First Quarter 2012 Remedial Status Report, DC Rollforms Site, Jamestown, New York (Site No. 907019), June 12, 2012.

ARCADIS 2012, Second Quarter 2012 Remedial Status Report, DC Rollforms Site, Jamestown, New York (Site No. 907019), September 10, 2012.

ARCADIS 2012, Third Quarter 2012 Remedial Status Report, DC Rollforms Site, Jamestown, New York (Site No. 907019), December 5, 2012.

ARCADIS 2013, Fourth Quarter 2012 Remedial Status Report, DC Rollforms Site, Jamestown, New York (Site No. 907019), February 6, 2013.

ARCADIS 2013, First Quarter 2013 Remedial Status Report, DC Rollforms Site, Jamestown, New York (Site No. 907019), April 26, 2013.

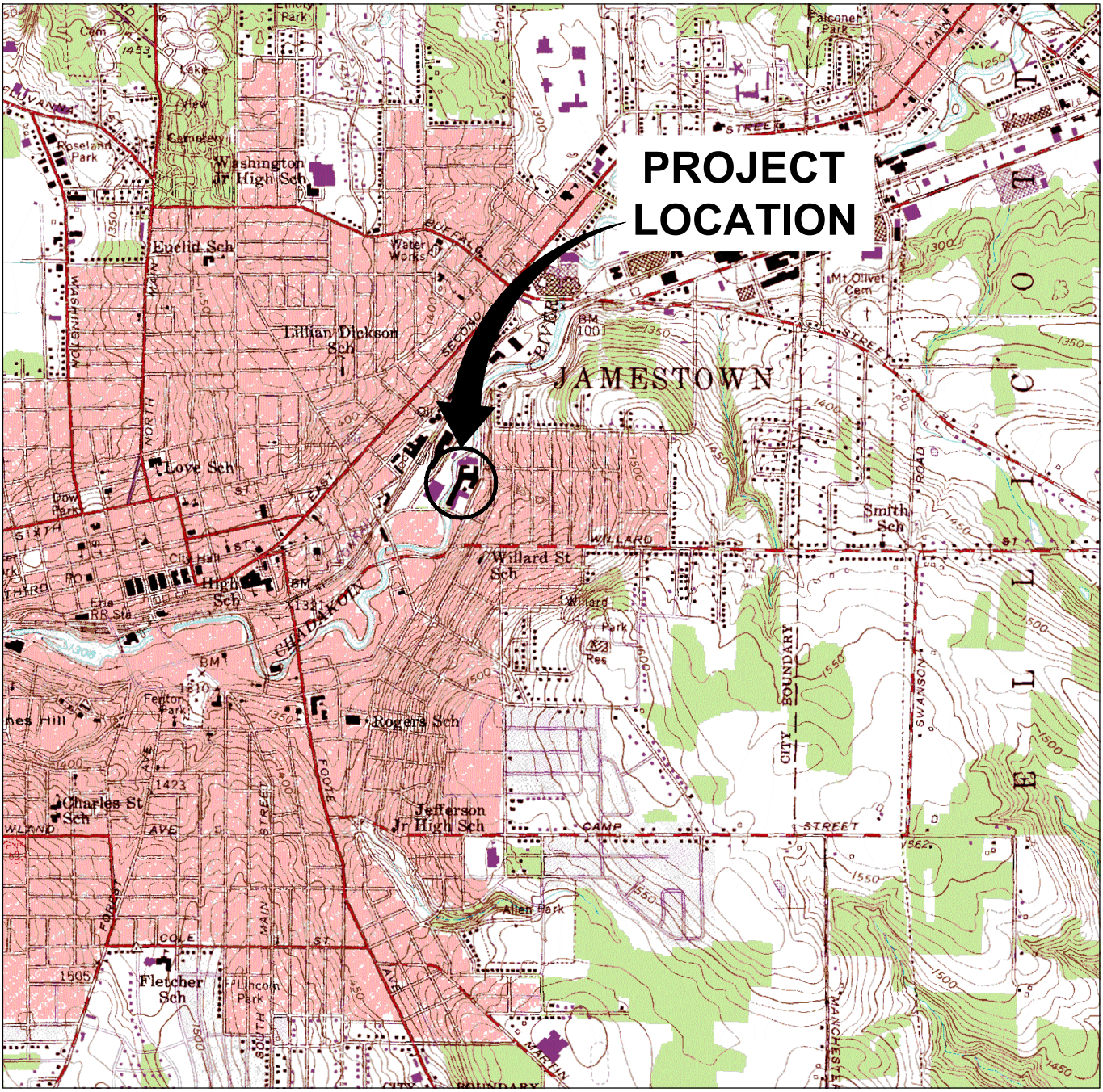
ARCADIS G&M, 2006. 100% Remedial Design Report, D.C. Rollforms, Ingersoll Rand Site, Jamestown, New York, Site Code 907019, August 6, 2006.

Administration Order on Consent Index #B9-0446-94-01A, D.C. Rollforms site, Site #907019, Ingersoll Rand Company, Jamestown, New York, September 21, 2004.

Record of Decision, D.C. (Dow Craft) Rollforms Inactive Hazardous Waste Site, Jamestown, Chautauqua County, New York, Site No. 9-07-019, March 31, 2003.

ARCADIS

Figures



REFERENCE: U.S. GEOLOGICAL SURVEY, 7.5 X 15 MINUTE QUADRANGLE., JAMESTOWN, NEW YORK, ALLEN STREET, 1954.

0 2000' 4000'

GRAPHIC SCALE

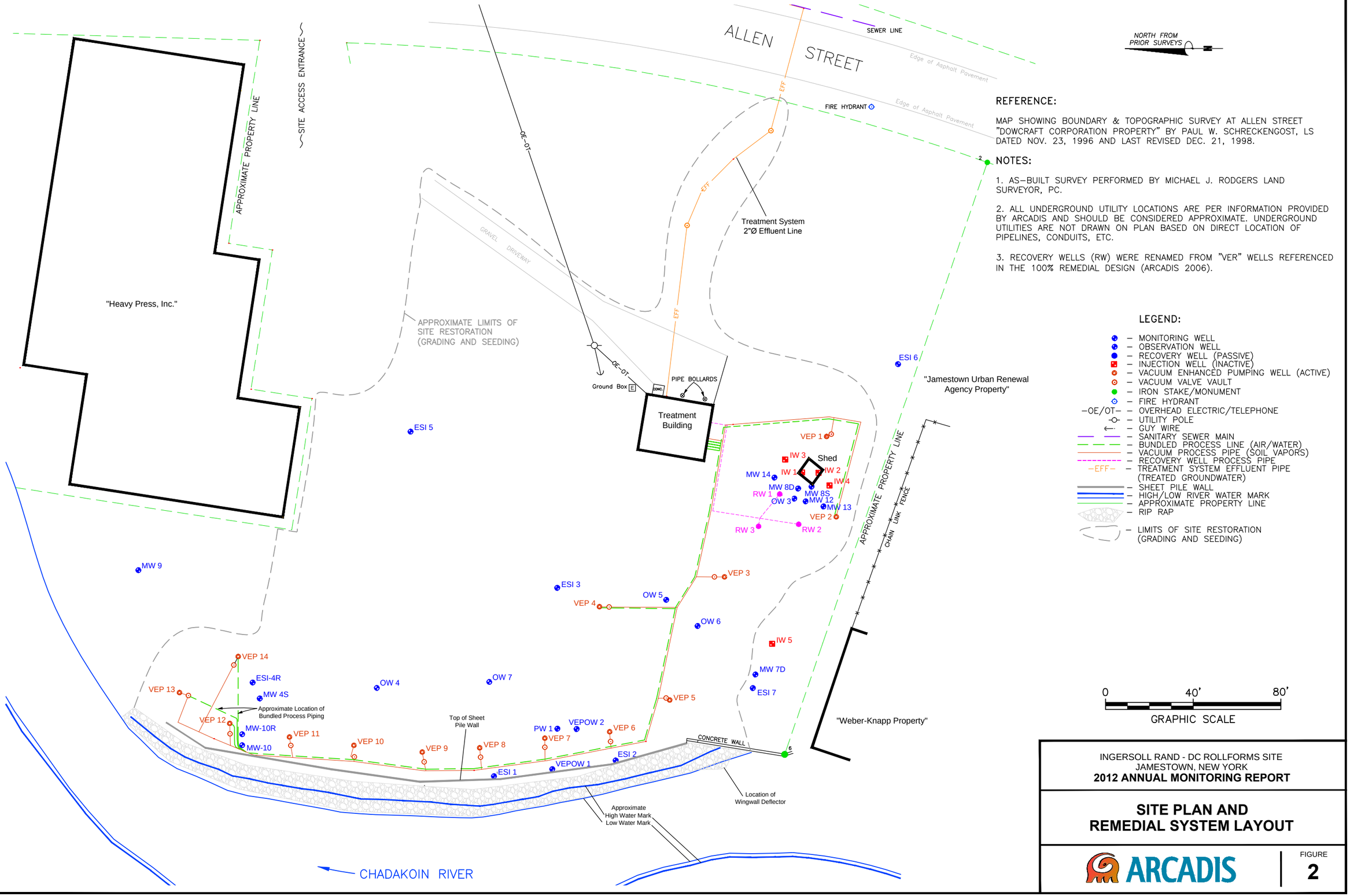
INGERSOLL RAND - DC ROLLFORMS SITE
JAMESTOWN, NEW YORK
2012 ANNUAL MONITORING REPORT

SITE LOCATION

ARCADIS

FIGURE 1

CITY: Syracuse DIV/GROUP: EnvCADD DB: P. LISTER, A.Schilling PM: M.Sanford TM: T.Carignan LYR: ON=*; OFF=REF
G:\ENVCAD\SYRACUSE\ACTIVITY\00219\0017\00004\DWG\00219B01.dwg LAYOUT: 1 SAVED: 6/21/2012 9:55 AM ACADVER: 18.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 3/14/2013 3:05 PM BY: SCHILLING, ADAM
XREFS: IMAGES: PROJECTNAME: ----
00219X01.tif



NORTH FROM PRIOR SURVEYS

REFERENCE:

MAP SHOWING BOUNDARY & TOPOGRAPHIC SURVEY AT ALLEN STREET "DOWCRAFT CORPORATION PROPERTY" BY PAUL W. SCHRECKENGOST, LS DATED NOV. 23, 1996 AND LAST REVISED DEC. 21, 1998.

NOTES:

1. AS-BUILT SURVEY PERFORMED BY MICHAEL J. RODGERS LAND SURVEYOR, PC.

2. ALL UNDERGROUND UTILITY LOCATIONS ARE PER INFORMATION PROVIDED BY ARCADIS AND SHOULD BE CONSIDERED APPROXIMATE. UNDERGROUND UTILITIES ARE NOT DRAWN ON PLAN BASED ON DIRECT LOCATION OF PIPELINES, CONDUITS, ETC.

3. RECOVERY WELLS (RW) WERE RENAMED FROM "VER" WELLS REFERENCED IN THE 100% REMEDIAL DESIGN (ARCADIS 2006).

LEGEND:

- – MONITORING WELL
- – OBSERVATION WELL
- – RECOVERY WELL (PASSIVE)
- – INJECTION WELL (INACTIVE)
- – VACUUM ENHANCED PUMPING WELL (ACTIVE)
- – VACUUM VALVE VAULT
- – IRON STAKE/MONUMENT
- – FIRE HYDRANT
- –OE/OT– – OVERHEAD ELECTRIC/TELEPHONE
- – UTILITY POLE
- – GUY WIRE
- – SANITARY SEWER MAIN
- – BUNDLED PROCESS LINE (AIR/WATER)
- – VACUUM PROCESS PIPE (SOIL VAPORS)
- – RECOVERY WELL PROCESS PIPE
- –EFF– – TREATMENT SYSTEM EFFLUENT PIPE (TREATED GROUNDWATER)
- – SHEET PILE WALL
- – HIGH/LOW RIVER WATER MARK
- – APPROXIMATE PROPERTY LINE
- – RIP RAP
- – LIMITS OF SITE RESTORATION (GRADING AND SEEDING)

0 40' 80'

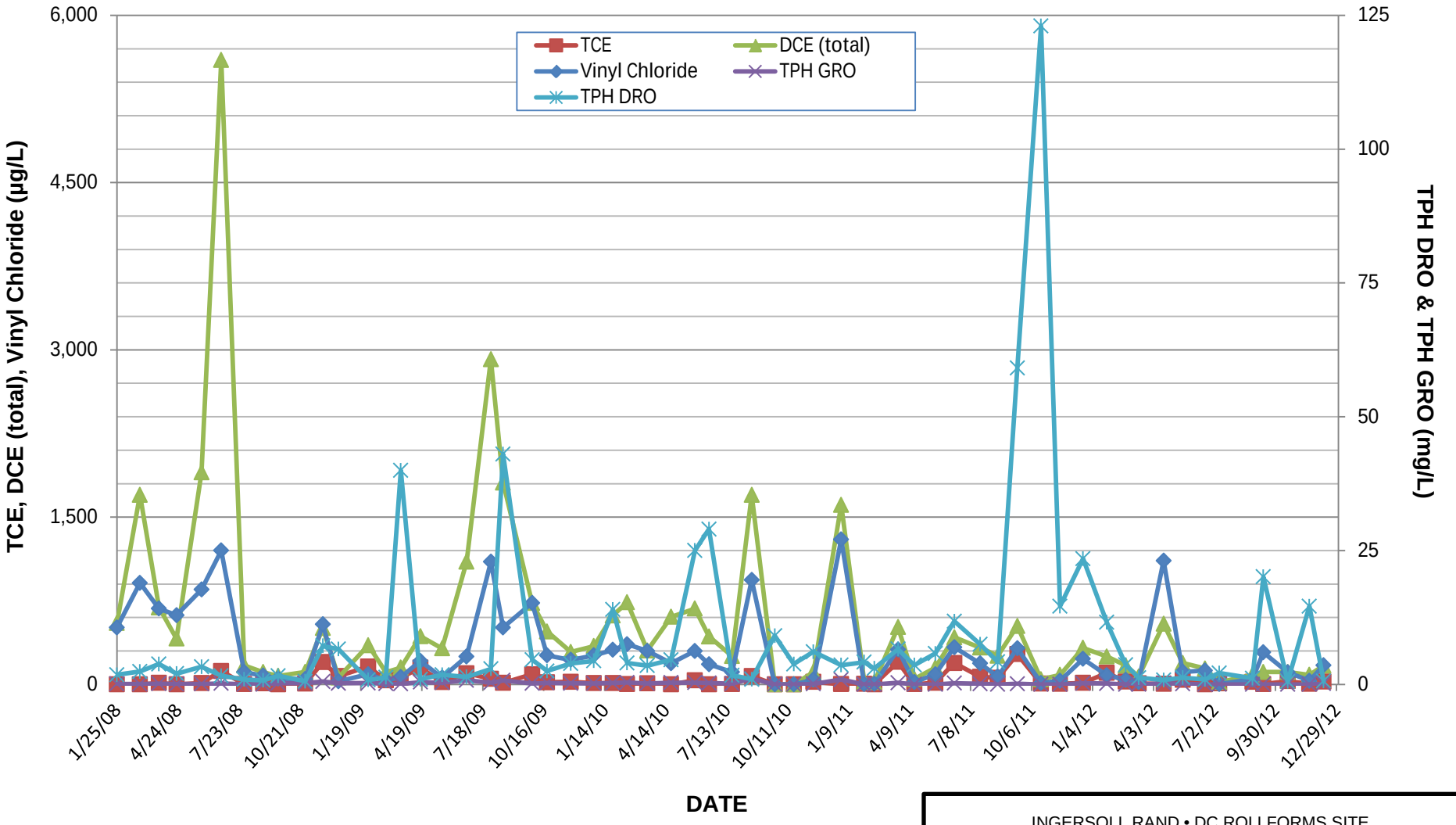
GRAPHIC SCALE

INGERSOLL RAND - DC ROLLFORMS SITE
JAMESTOWN, NEW YORK
2012 ANNUAL MONITORING REPORT

SITE PLAN AND REMEDIAL SYSTEM LAYOUT

ARCADIS

FIGURE
2



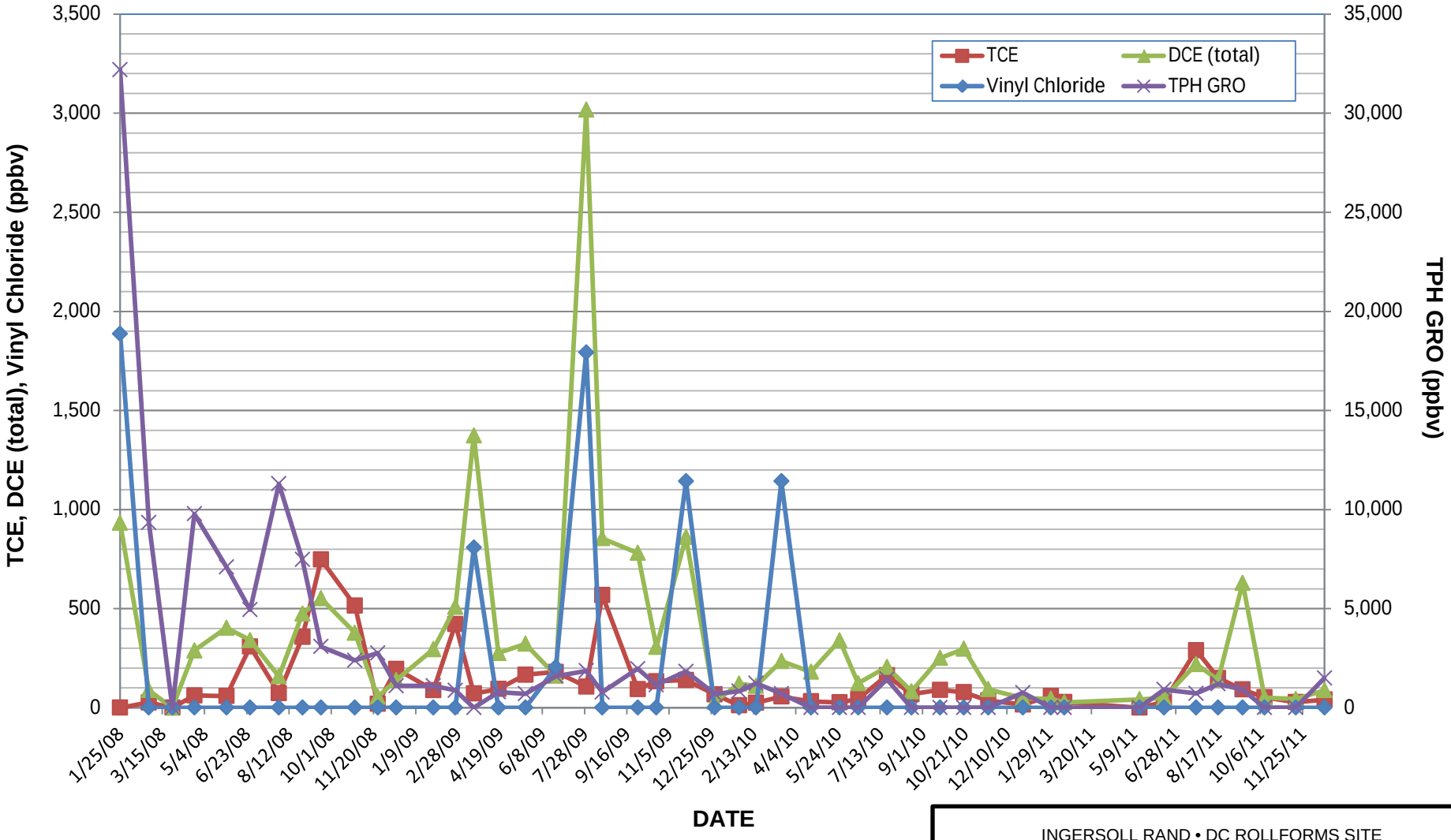
Abbreviations:
DCE – Dichloroethene
DRO – Diesel Range Organics
GRO – Gasoline Range Organics
mg/L – milligrams per liter
TCE – Trichloroethene
TPH – Total Petroleum Hydrocarbons
µg/L – micrograms per liter

INGERSOLL RAND • DC ROLLFORMS SITE
JAMESTOWN, NEW YORK
2012 ANNUAL MONITORING REPORT

System Influent Dissolved Phase Concentrations

ARCADIS

FIGURE
3



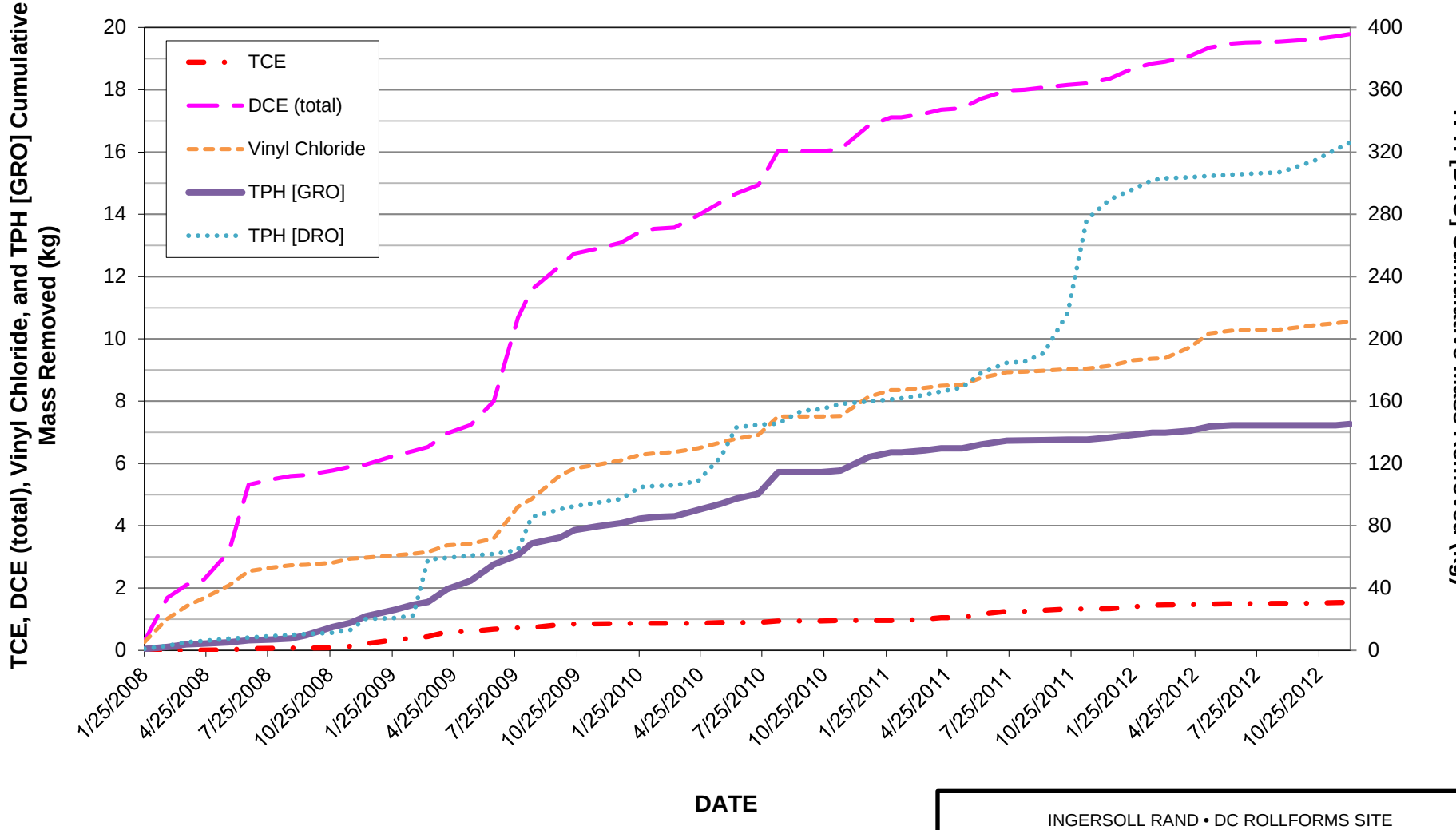
Abbreviations:
DCE – Dichloroethene
GRO – Gasoline Range Organics
ppbv – parts per billion by volume
TCE – Trichloroethene
TPH – Total Petroleum Hydrocarbons

INGERSOLL RAND • DC ROLLFORMS SITE
JAMESTOWN, NEW YORK
2012 ANNUAL MONITORING REPORT

System Influent Vapor Phase Concentrations

ARCADIS

FIGURE
4



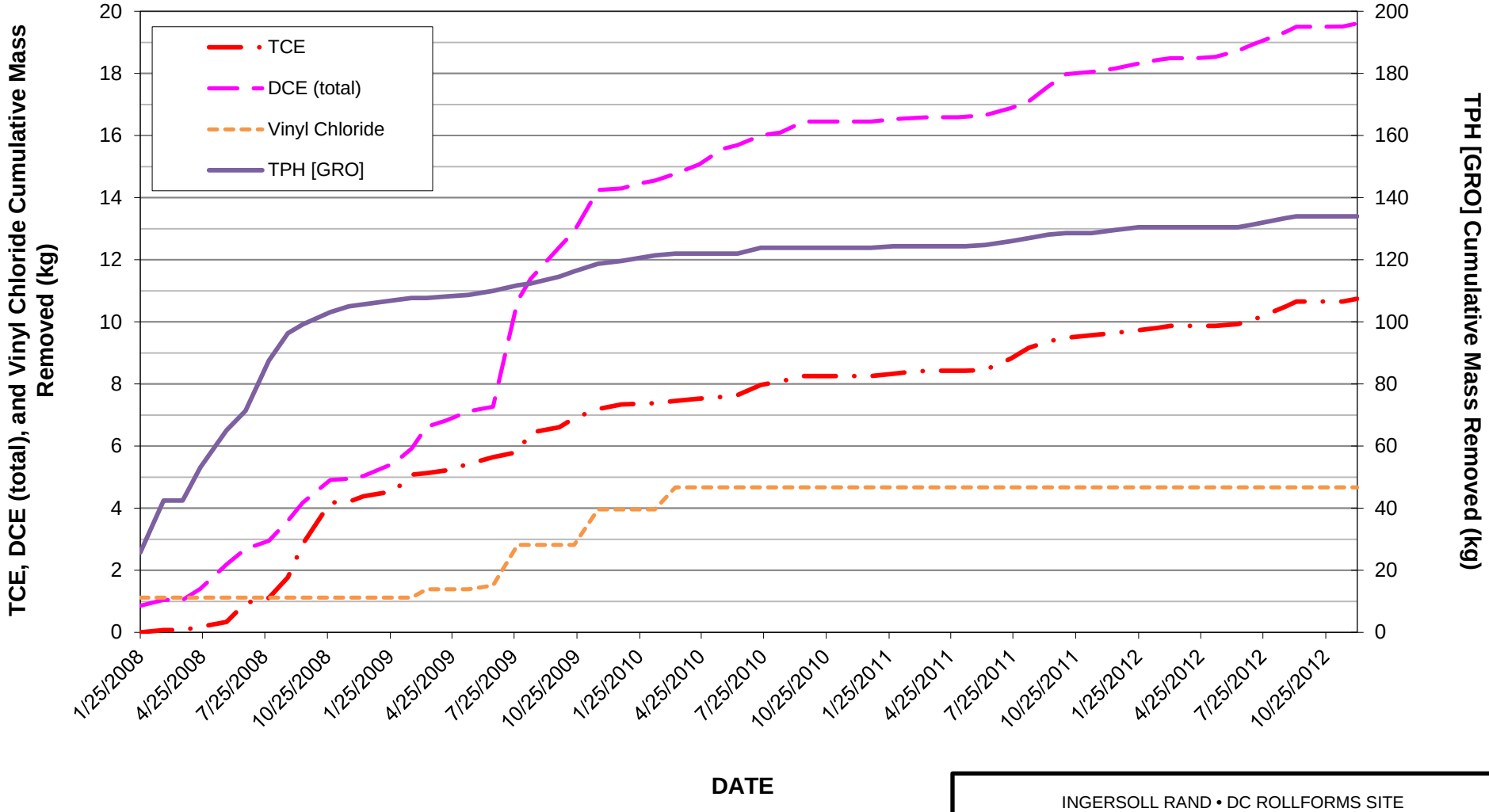
Abbreviations:
DCE – Dichloroethene
DRO – Diesel Range Organics
GRO – Gasoline Range Organics
kg - kilograms
TCE – Trichloroethene
TPH – Total Petroleum Hydrocarbons

INGERSOLL RAND • DC ROLLFORMS SITE
JAMESTOWN, NEW YORK
2012 ANNUAL MONITORING REPORT

Cumulative Dissolved Phase VOC and TPH [GRO & DRO] Mass Recovery

ARCADIS

FIGURE
5



Abbreviations:
DCE – Dichloroethene
GRO – Gasoline Range Organics
kg - kilograms
TCE – Trichloroethene
TPH – Total Petroleum Hydrocarbons

INGERSOLL RAND • DC ROLLFORMS SITE
JAMESTOWN, NEW YORK
2012 ANNUAL MONITORING REPORT

Cumulative Vapor Phase VOC and TPH [GRO] Mass Recovery

ARCADIS

FIGURE
6

ESI-6	Mar 2008	Mar 2011	Jun 2011	Oct 2011	Dec 2011	Mar 2012	Oct 2012
Parameter (µg/L)							
Trichloroethene	< 5	1.1	< 1	< 1	< 1	< 1	< 1
Dichloroethene (Tot)	1.6 J	2.5	< 1	< 1	1.5	< 1	< 1
Vinyl Chloride	3.6 J	< 1	< 1	< 1	< 1	< 1	< 1

MW-13	Mar 2008	Mar 2011	Jun 2011	Oct 2011	Dec 2011	Mar 2012	May 2012	Oct 2012	Dec 2012
Parameter (µg/L)									
Trichloroethene	1.7 J	5.8	5.7	85	79	37	495	< 1	72
Dichloroethene (Tot)	1,009 DJ	363	325	1,538 D	916 D	392	3,116	2,010	316
Vinyl Chloride	340	612	377	1,310 D	494 D	243	682	3,100	15

MW-8S	Mar 2008	Mar 2011	Jun 2011	Oct 2011	Dec 2011	Mar 2012	Oct 2012
Parameter (µg/L)							
Trichloroethene	150 D	25	10	12	16	30	< 1
Dichloroethene (Tot)	758 DJ	145	3,902 D	2,744 D	158	400	809
Vinyl Chloride	60 DJ	3	334 D	115 D	< 1	24	1,270

MW-12	Mar 2008	Mar 2011	Jun 2011	Oct 2011	Dec 2011	Mar 2012	May 2012	Oct 2012	Dec 2012
Parameter (µg/L)									
Trichloroethene	44	127	194	1,750 D	828 D	188	5,870	< 1	692
Dichloroethene (Tot)	1,808 DJ	620	3,843 D	1,942 D	2,032 D	1,580	9,958.0	2,685	1,244
Vinyl Chloride	400	9.4	364 D	15	25	25	106	3,860	5.8

MW-14	Mar 2008	Mar 2011	Jun 2011	Oct 2011	Dec 2011	Mar 2012	May 2012	Oct 2012	Dec 2012
Parameter (µg/L)									
Trichloroethene	1.7 J	66	< 1	3.4	3.1	< 1	< 1	< 1	2.9
Dichloroethene (Tot)	1,009 DJ	1,809	1,419 D	2,230 D	1,282 D	3,401	568	25	1,829
Vinyl Chloride	340	451	544	476 D	353	1,260	209	65	194

OW-6	Mar 2008	Mar 2011	Jun 2011	Oct 2011	Dec 2011	Mar 2012	May 2012	Oct 2012	Dec 2012
Parameter (µg/L)									
Trichloroethene	42	3.6	15	2.7	610 D	298	67	9.6	14
Dichloroethene (Tot)	343 DJ	6.1	249	12	362 D	314	414	94	86
Vinyl Chloride	76	< 1	17	< 1	< 1	4.3	58	100	58

OW-5	Mar 2008	Mar 2011	Jun 2011	Oct 2011	Dec 2011	Mar 2012	Oct 2012
Parameter (µg/L)							
Trichloroethene	< 5	< 1	1	< 1	< 1	< 1	< 1
Dichloroethene (Tot)	< 5	< 1	2,558 D	187	< 1	1,208	2,554
Vinyl Chloride	< 5	< 1	1,650	137 D	< 1	1,030	4,060

MW-10R	Jun 2010	Mar 2011	Jun 2011	Oct 2011	Dec 2011	Mar 2012	May 2012	Oct 2012	Dec 2012
Parameter (µg/L)									
Trichloroethene	3.9	76	9.3	86	11	17	13	< 1	1.1
Dichloroethene (Tot)	12	17	273	143	31	111	157	1.7	41
Vinyl Chloride	< 2	< 1	1.8	< 1	< 1	< 1	< 1	< 1	< 1

ESI-4R	Oct 2010	Mar 2011	Jun 2011	Oct 2011	Dec 2011	Mar 2012
Parameter (µg/L)						
Trichloroethene	150	134	15	4.2	2.5	3.5
Dichloroethene (Tot)	186	410	1,165 D	391	480 D	2,070
Vinyl Chloride	38	52	248 D	102	101	825

MW-9	Mar 2008	Mar 2011	Jun 2011	Oct 2011	Dec 2011	Mar 2012	Oct 2012
Parameter (µg/L)							
Trichloroethene	3.4 J	4	9	8.6	6.7	4.4	3.4
Dichloroethene (Tot)	6.9 J	4.2	< 1	< 1	< 1	1.4	3.0
Vinyl Chloride	3.6 J	1.5	< 1	< 1	< 1	< 1	4.4

ESI-2	Mar 2008	Mar 2011	Jun 2011	Oct 2011	Dec 2011	Mar 2012	Oct 2012
Parameter (µg/L)							
Trichloroethene	< 25	< 1	4.1	< 1	< 1	< 1	< 1
Dichloroethene (Tot)	< 25	< 1	< 1	< 1	< 1	< 1	< 1
Vinyl Chloride	< 25	< 1	1.1	< 1	< 1	< 1	< 1

ESI-1	Mar 2008	Mar 2011	Jun 2011	Oct 2011	Dec 2011	Mar 2012	Oct 2012
Parameter (µg/L)							
Trichloroethene	< 50	< 1	< 1	< 1	< 1	< 1	< 1
Dichloroethene (Tot)	< 50	< 1	< 1	< 1	< 1	< 1	11
Vinyl Chloride	< 50	< 1	< 1	< 1	< 1	< 1	12

ESI-7	Mar 2008	Mar 2011	Jun 2011	Oct 2011	Dec 2011	Mar 2012	Oct 2012
Parameter (µg/L)							
Trichloroethene	2.2 J	44	< 1	< 1	1.2	8.5	< 1
Dichloroethene (Tot)	20	168	1.3	1.2	9.1	10	2.1
Vinyl Chloride	2.4 J	6.8	1.6	< 1	< 1	1.5	4.4

SITE ACCESS ENTRANCE

APPROXIMATE PROPERTY LINE

STREET

Edge of Asphalt Pavement

Edge of Asphalt Pavement

Heavy Press, Inc.

"Jamestown Urban Renewal Agency Property"

"Weber-Knapp Property"

Treatment Building

Shed

PIPE BOLLARDS

Ground Box E

OE-OT

EFF

APPROXIMATE PROPERTY LINE

CHAIN LINK FENCE

WALL

Approximate Location of Bundled Process Piping

CHADAKOIN RIVER

MW-9 MW-10 MW-10R MW-4S ESI-4R MW-14 MW-8D MW-8S MW-12 MW-13 MW-1 OW-3 RW-1 RW-2 RW-3 OW-4 OW-5 OW-6 OW-7 ESI-1 ESI-2 ESI-3 ESI-6 ESI-7 VEPOW 1 VEP 1 VEP 2 VEP 3 VEP 4 VEP 8 VEP 9 VEP 10 VEP 11 VEP 12 VEP 13 VEP 14 IW 1 IW 2 IW 3 IW 4 IW 5 MW-7D

REFERENCE:

MAP SHOWING BOUNDARY & TOPOGRAPHIC SURVEY AT ALLEN STREET "DOWCRAFT CORPORATION PROPERTY" BY PAUL W. SCHRECKENGOST, LS DATED NOV. 23, 1996 AND LAST REVISED DEC. 21, 1998.

NOTES:

1. AS-BUILT SURVEY PERFORMED BY MICHAEL J. RODGERS LAND SURVEYOR, PC.
2. ALL UNDERGROUND UTILITY LOCATIONS ARE PER INFORMATION PROVIDED BY ARCADIS AND SHOULD BE CONSIDERED APPROXIMATE. UNDERGROUND UTILITIES ARE NOT DRAWN ON PLAN BASED ON DIRECT LOCATION OF PIPELINES, CONDUITS, ETC.
3. RECOVERY WELLS (RW) WERE RENAMED FROM "VER" WELLS REFERENCED IN THE 100% REMEDIAL DESIGN (ARCADIS 2006).
4. ALL CONCENTRATIONS DETECTED IN GROUNDWATER REPORTED IN MICROGRAMS PER LITER (µg/L), EQUIVALENT TO PARTS PER BILLION (ppb).
5. SAMPLES ANALYZED USING USEPA METHOD 8260.
6. DICHLOROETHENE (TOTAL) INCLUDES THE SUM OF 1,1-DICHLOROETHENE, cis-1,2-DICHLOROETHENE, AND trans-1,2-DICHLOROETHENE.
7. ESI-4R WAS INSTALLED AS A REPLACEMENT TO ESI-4 IN THE FIRST QUARTER 2010. MW-10R WAS INSTALLED AS A REPLACEMENT TO MW-10 IN THE FIRST QUARTER 2010. MW-10 WAS NOT SAMPLED DUE TO DAMAGE TO THE WELL CASING.

LEGEND:

NORTH FROM PRIOR SURVEYS

- MONITORING WELL
- OBSERVATION WELL
- RECOVERY WELL (PASSIVE)
- INJECTION WELL (INACTIVE)
- VACUUM ENHANCED PUMPING WELL (ACTIVE)
- VACUUM VALVE VAULT
- IRON STAKE/MONUMENT
- FIRE HYDRANT
- −OE/OT− OVERHEAD ELECTRIC/TELEPHONE
- UTILITY POLE
- GUY WIRE
- SANITARY SEWER MAIN
- BUNDLED PROCESS LINE (AIR/WATER)
- VACUUM PROCESS PIPE (SOIL VAPORS)
- RECOVERY WELL PROCESS PIPE
- −EFF− TREATMENT SYSTEM EFFLUENT PIPE (TREATED GROUNDWATER)
- SHEET PILE WALL
- HIGH/LOW RIVER WATER MARK
- APPROXIMATE PROPERTY LINE
- RIP RAP
- LIMITS OF SITE RESTORATION (GRADING AND SEEDING)

ND – NOT DETECTED
NS – NOT SAMPLED
D – DILUTED SAMPLE
J – ESTIMATED VALUE
< – CONCENTRATION WAS LESS THAN THE LABORATORY DETECTION LIMIT

MONITORING WELL ID

OW-6	DEC
Analyte (µg/L)	2010
Dichloroethene (total)	180
Trichloroethene	190 D
Vinyl Chloride	1.4

DATE OF GROUNDWATER SAMPLE EVENT

GROUNDWATER CONSTITUENT

CONCENTRATION OF GROUNDWATER CONSTITUENT

0 40' 80'

GRAPHIC SCALE

INGERSOLL RAND - DC ROLLFORMS SITE
JAMESTOWN, NEW YORK
2012 ANNUAL MONITORING REPORT

GROUNDWATER MONITORING ANALYTICAL RESULTS

ARCADIS

FIGURE 7

CITY: SYRACUSE, NY DIV/GROUP: ENV/CADD DB: P.LISTER, R.BASSETT, P.LISTER PM: M.SANFORD TM: T.CARIGNAN TR: C.DAVERN LYR: ON=*; OFF=REF. (FRZ)
G:\ENV\CAD\SYRACUSE\ACTIVITY\00219\0017\000041DWG\00219C01.dwg LAYOUT: 7 SAVED: 7/15/2013 3:24 PM ACADVER: 18.1S (LMS TECH) PAGESETUP: --- PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 7/15/2013 3:24 PM BY: SCHILLING, ADAM
XREFS: 00219X02 00219X00 IMAGES: PROJECT:

ARCADIS

Tables

ARCADIS

Table 1. System Operational Data for 2012, DC Rollforms Site, Jamestown, New York.

System Parameters			Date										
			1/25/12	2/22/12	3/12/12	4/18/12	5/16/12	6/18/12	7/9/12	8/27/12	9/12/12	10/18/12	11/19/12	12/10/12
SVE Blower Applied Vacuum (in. W.C.)			45	44	44	49	48	58	47	48	46	51	80	78
Vapor Extraction Flowrate (acfm)			250	247	249	231	220	208	225	226	232	235	186	167
Monthly System Flow (gallons)			306,651	196,724	126,643	166,190	189,690	203,349	100,522	151,516	54,828	133,485	258,359	145,980
Monthly System Influent (gpm)			6.3	4.9	2.5	3.4	6.3	4.9	3.3	3.9	1.4	2.6	5.6	4.8
Recovery Well Statuses[1]														
Vacuum Enhanced Pumping (VEP) Wells	**VEP-1**	Liquid Phase On (Y/N)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
		Vapor Phase On (Y/N)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	VEP-2	Liquid Phase On (Y/N)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
		Vapor Phase On (Y/N)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	VEP-3	Liquid Phase On (Y/N)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
		Vapor Phase On (Y/N)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	VEP-4	Liquid Phase On (Y/N)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
		Vapor Phase On (Y/N)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	VEP-5	Liquid Phase On (Y/N)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
		Vapor Phase On (Y/N)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	VEP-6	Liquid Phase On (Y/N)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
		Vapor Phase On (Y/N)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	VEP-7	Liquid Phase On (Y/N)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
		Vapor Phase On (Y/N)	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	Y
	VEP-8	Liquid Phase On (Y/N)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
		Vapor Phase On (Y/N)	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	Y
	VEP-9	Liquid Phase On (Y/N)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
		Vapor Phase On (Y/N)	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	Y
	VEP-10	Liquid Phase On (Y/N)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
		Vapor Phase On (Y/N)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	VEP-11	Liquid Phase On (Y/N)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
		Vapor Phase On (Y/N)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	VEP-12	Liquid Phase On (Y/N)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
		Vapor Phase On (Y/N)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	VEP-13	Liquid Phase On (Y/N)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
		Vapor Phase On (Y/N)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	VEP-14	Liquid Phase On (Y/N)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
		Vapor Phase On (Y/N)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

Notes:

1. Recovery wells for which total fluids pneumatic pumps were online but observed to be in need of routine cleaning and/or repairs and therefore not recovering groundwater are considered to have liquid phases on in this table. Recovery well statuses do not necessarily reflect the recovery well configuration for the corresponding monthly influent sampling events.
2. Vapor phases offline for recovery well's VEP-7 through VEP-9 from 11/1/12 through 11/14/12 because of excessively high groundwater influent flowrates due to Hurricane Sandy.

Definitions:

"--" - not applicable
acfm - actual cubic feet per minute
gpm - gallons per minute
in.W.C. - Inches of Water Column
N - No
SVE - Soil Vapor Extraction
VEP - Vacuum Enhanced Pumping
Y - Yes

ARCADIS

Table 2. Cumulative Dissolved Phase VOC and TPH Mass Recovery for 2012, DC Rollforms Site, Jamestown, New York.

Date	VOC and TPH [GRO & DRO] Mass Removed																		
	Influent VOC and TPH [GRO & DRO] Concentrations					Total[1] Cumulative Flow (gallons)	Total Flow Per Reporting Period (L)	Estimated Mass Removed Per [3] Reporting Period (kg)					Estimated Cumulative Mass Removed (kg)					Estimated 2012 Cumulative Mass Removal (kg)	Cumulative Days Operating	Estimated Mass Removal Rate Per Reporting Period (kg/day)
	TCE (µg/L)	DCE[2] (total) (µg/L)	VC (µg/L)	TPH [GRO] (mg/L)	TPH [DRO] (mg/L)			TCE	DCE[2] (total)	VC	TPH [GRO]	TPH [DRO]	TCE	DCE[2] (total)	VC	TPH [GRO]	TPH [DRO]			
1/25/12	103	250	82.3	0.158	11.6	8,504,314	1,160,800	0.068	0.335	0.181	0.092	6.746	0.068	0.335	0.181	0.092	6.746	7.421	35	0.212
2/22/12	25.9	169	41.8	ND	3.65	8,701,038	744,681	0.048	0.156	0.046	0.059	5.678	0.116	0.491	0.227	0.151	12.424	13.409	63	0.214
3/12/12	9.3	69.7	21.6	ND	1.24	8,827,681	479,396	0.008	0.057	0.015	0.000	1.172	0.124	0.548	0.242	0.151	13.597	14.662	82	0.066
4/18/12	4.2	543	1110	0.231	0.821	8,993,871	629,097	0.004	0.193	0.356	0.073	0.648	0.128	0.741	0.598	0.223	14.245	15.936	119	0.034
5/16/12	40	192	112	0.113	1.27	9,183,561	718,054	0.016	0.264	0.439	0.124	0.751	0.144	1.005	1.037	0.347	14.996	17.528	147	0.057
6/18/12	ND	142	125	ND	0.904	9,386,910	769,759	0.015	0.129	0.091	0.043	0.837	0.160	1.133	1.128	0.390	15.832	18.644	180	0.034
7/9/12	9.3	20	3	ND	2.13	9,487,432	380,517	0.002	0.031	0.024	0.000	0.577	0.162	1.164	1.152	0.390	16.410	19.278	201	0.030
8/27/12	23.2	85	46	ND	1.14	9,638,948	573,550	0.009	0.030	0.014	0.000	0.938	0.171	1.195	1.166	0.390	17.347	20.269	250	0.020
9/12/12	3	111	287	ND	20.1	9,693,776	207,546	0.003	0.020	0.035	0.000	2.204	0.174	1.215	1.201	0.390	19.551	22.531	266	0.141
10/18/12	29	111	109	ND	0.516	9,827,261	505,295	0.008	0.056	0.100	0.000	5.209	0.181	1.271	1.301	0.390	24.760	27.904	302	0.149
11/19/12	6	85.4	32.2	ND	14.6	10,085,620	977,995	0.017	0.096	0.069	0.000	7.392	0.198	1.367	1.370	0.390	32.152	35.477	334	0.237
12/10/12	24.9	169	170	0.145	0.614	10,231,600	552,594	0.009	0.070	0.056	0.040	4.204	0.207	1.437	1.426	0.430	36.355	39.856	355	0.208
			2012 Total Flow (gal)			2,033,937									2012 Cumulative Mass Recovery Rate (kg/day)					0.112
			2012 Avg. Flow (gpm)			4.0														

Notes:

1. Total cumulative flow is estimated based on the system flowmeter FQI-700.
2. DCE (total) is the sum of 1,1-Dichloroethene, cis-1,2-Dichloroethene, and trans-1,2-Dichloroethene.
3. Estimated mass removed per reporting period is calculated from influent mass concentration and volume of groundwater recovered. Influent mass concentrations used for calculations are the average of the concentrations from the previous and current monthly events.

Definitions:

DCE - Dichloroethene
DRO - Diesel Range Organics
GRO - Gasoline Range Organics
kg - kilograms
L - Liters
mg/L - milligrams per liter
ND - Non-detect
TCE - Trichloroethene
TPH - Total Petroleum Hydrocarbons
µg/L - micrograms per liter
VC - Vinyl Chloride
VOC - Volatile Organic Compounds
gal - gallons
gpm - gallons per minute

ARCADIS

Table 3. TCE, DCE (total), VC, TPH, and PCBs in System Influent Water Samples in 2012, DC Rollforms Site, Jamestown, New York.

Date	VOCs (µg/L)[1]			TPH (mg/L)[1]		PCB (µg/L)[1]	VEP Wells Online During Monthly System Influent Sampling Event
	TCE	DCE (total)[2]	VC	GRO	DRO		
1/25/2012	103	250	82.3	0.158	11.6	ND	VEP-1 through VEP-14
2/22/2012	25.9	169	41.8	ND	3.65	ND	VEP-1 through VEP-14
3/12/2012	9.3	69.7	21.6	ND	1.24	ND	VEP-1 through VEP-14
4/18/2012	4.2	543	1110	0.231	0.821	ND	VEP-1 through VEP-14
5/16/2012	40	192	112	0.113	1.27	ND	VEP-1 through VEP-14
6/18/2012	ND	142	125	ND	0.904	ND	VEP-1 through VEP-14
7/9/2012	9.3	20	3	ND	2.13	ND	VEP-1 through VEP-14
8/27/2012	23.2	85	46	ND	1.14	ND	VEP-1 through VEP-14
9/12/2012	3	111	287	ND	20.1	ND	VEP-1 through VEP-14
10/18/2012	29	111	109	ND	0.516	ND	VEP-1 through VEP-14
11/19/2012	6	85.4	32.2	ND	14.6	ND	VEP-1 through VEP-14
12/10/2012	24.9	169	170	0.145	0.614	ND	VEP-1 through VEP-14

Notes:

1. Samples analyzed for VOCs using US EPA Method 624. Samples analyzed for TPH [GRO] and TPH[DRO] using US EPA Method 8015 B. Samples analyzed for PCB using US EPA Method 608.
2. DCE (total) includes the sum of 1,1-Dichloroethene, cis-1,2-Dichloroethene, and trans-1,2-Dichloroethene.

Definitions:

D - Identifies an analysis that used a secondary dilution factor
DCE - Dichloroethene
DRO - Diesel Range Organics
E - Sample concentration exceeded calibration range
GRO - Gasoline Range Organics
mg/L - milligrams per liter
ND - Non-Detect
NS - Not Sampled for
PCB - Polychlorinated Biphenyls
TCE - Trichloroethene
TPH - Total Petroleum Hydrocarbons
µg/L - micrograms per liter
VC - Vinyl Chloride
VOCs - Volatile Organic Compounds

ARCADIS

Table 4. TCE, DCE (total), VC, PCBs, TSS, Oil & Grease, and pH in System Effluent Water Samples in 2012, DC Rollforms Site, Jamestown, New York.

Date	Analyte[1]								
	VOCs			PCB (µg/L)	TSS (mg/L)	Oil & Grease (mg/L)		pH (s.u.)	
	TCE (µg/L)	DCE (total)[2] (µg/L)	VC (µg/L)						
	Local Discharge Limit								
	2,130 µg/L (Total VOCs)			ND	350	100		5.5 - 10	
1/25/2012	ND	ND	ND	ND	ND	ND	ND	8.0	8.0
						ND	ND	7.9	8.1
2/22/2012	ND	ND	ND	ND	ND	ND	ND	8.2	8.2
						ND	ND	8.3	8.2
3/12/2012	ND	ND	ND	ND	ND	ND	ND	8.0	8.2
						ND	ND	8.2	8.2
4/18/2012	ND	ND	ND	ND	7.0	ND	ND	7.5	8.1
						ND	ND	8.0	8.2
5/16/2012	ND	ND	ND	ND	ND	ND	ND	7.7	7.8
						ND	ND	8.1	8.2
6/18/2012	ND	ND	ND	ND	ND	ND	ND	7.4	8.0
						ND	ND	8.2	8.2
7/9/2012	ND	ND	ND	ND	ND	ND	ND	8.0	7.8
						ND	ND	8.2	8.2
8/27/2012	ND	ND	ND	ND	ND	ND	ND	7.9	8.3
						ND	ND	8.4	8.4
9/12/2012	ND	ND	ND	ND	ND	ND	ND	7.7	8.1
						ND	ND	8.2	7.9
10/18/2012	ND	ND	ND	ND	ND	ND	ND	7.6	7.9
						ND	ND	8.0	8.1
11/19/2012	ND	ND	ND	ND	ND	ND	ND	7.6	8.0
						ND	ND	8.0	8.1
12/10/2012	ND	ND	ND	ND	ND	ND	ND	8.0	8.1
						ND	ND	8.0	8.2

Notes:

1. System effluent water samples collected via sample port SP-702 located after the air stripper. Samples analyzed for TCE, DCE (total), VC, PCB, and TSS consisted of four effluent samples collected during a typical operating day that were composited at the laboratory. Samples analyzed for Oil & Grease and pH were not composited. Samples analyzed for TCE, DCE (total), and VC using US EPA Method 624. Samples analyzed for PCB using US EPA Method 608. Samples analyzed for TSS using US EPA Method 160.2. Samples analyzed for Oil & Grease using US EPA Method 1664. pH measured in field.
2. DCE (total) includes the sum of 1,1-Dichloroethene, cis-1,2-Dichloroethene, and trans-1,2-Dichloroethene.

Definitions:

"--" - Indicates data not available
DCE - Dichloroethene
mg/L - milligrams per liter
ND - Non-detect
PCB - Polychlorinated Biphenyls
s.u. - standard units
TCE - Trichloroethene
TSS - Total Suspended Solids
µg/L - micrograms per liter
VC - Vinyl Chloride

ARCADIS

Table 5. TCE, DCE (total), VC and TPH in System Influent and Effluent Vapor Samples in 2012,
DC Rollforms Site, Jamestown, New York

Date	Sample Location	Analyte (ppbv)[1]				VEP Wells Online During Monthly System Influent Sampling Event
		TCE	DCE (total)[2]	VC	TPH [GRO]	
1/25/2012	Influent	56	140	ND	ND	VEP-1 through VEP-14
	Effluent	ND	72	ND	ND	
2/22/2012	Influent	37	58	ND	ND	VEP-1 through VEP-14
	Effluent	ND	78	ND	ND	
3/12/2012	Influent	14	22	ND	ND	VEP-2 through VEP-14
	Effluent	ND	170	ND	ND	
4/18/2012	Influent	62	1800	ND	1100	VEP-1 through VEP-14
	Effluent	ND	120	ND	ND	
5/16/2012	Influent	71	120	ND	730	VEP-1 through VEP-14
	Effluent	ND	220	ND	790	
6/18/2012	Influent	88	280	ND	ND	VEP-1 through VEP-14
	Effluent	ND	360	ND	ND	
7/9/2012	Influent	160	230	ND	1200	VEP-1 through VEP-14
	Effluent	ND	250	ND	1100	
8/27/2012	Influent	200	230	ND	1500	VEP-1 through VEP-14
	Effluent	ND	260	ND	1700	
9/12/2012	Influent	200	330	ND	710	VEP-1 through VEP-14
	Effluent	ND	200	ND	ND	
10/18/2012	Influent	160	680	ND	ND	VEP-1 through VEP-14
	Effluent	ND	200	ND	ND	
11/19/2012	Influent	190	250	ND	ND	VEP-1 through VEP-6 & VEP-10 through VEP 14
	Effluent	ND	170	ND	ND	
12/10/2012	Influent	41	120	ND	ND	VEP-1 through VEP-14
	Effluent	ND	200	ND	ND	

Notes:

1. Influent vapor sample collected via sample port SP-900 located before the liquid knockout tank. Effluent vapor sample collected via sample port SP-503 located after VPGAC vessel ASC-502. Samples analyzed using Microseeps, Inc. Method AM 4.02.
2. DCE (total) includes the sum of 1,1-Dichloroethene, cis-1,2-Dichloroethene, and trans-1,2-Dichloroethene.

Definitions:

DCE - Dichloroethene
GRO - Gasoline Range Organics
J - Indicates an estimated value
ND - Non-detect
NS - Not Sampled
ppbv - parts per billion by volume
SVE - Soil Vapor Extraction
TCE - Trichloroethene
TPH - Total Petroleum Hydrocarbons
VC - Vinyl Chloride

ARCADIS

Table 6. Cumulative Vapor Phase VOC and TPH Mass Recovery for 2012, DC Rollforms Site, Jamestown, New York.

Date	VOC and TPH [GRO] Mass Recovered																					
	Influent VOC and TPH [GRO] Concentrations (ppmv)				Influent VOC and TPH [GRO] Concentrations (µg/L)				Vapor Extraction Flow Rate (acfm)[5]	Reporting Period			Mass of Component Recovered[2] Per Reporting Period (kg)				Cumulative Mass Recovered (kg)				Estimated[2] 2012 Cumulative Mass Recovery (kg)	Cumulative Days Operating	Estimated[2] Mass Recovery Rate Per Reporting Period (kg/day)
										Period Duration		Volume Of[1] Air Treated (L)											
	TCE	DCE[3] (total)	VC	TPH [GRO]	TCE	DCE[3] (total)	VC	TPH[4] [GRO]		(days)	(min)		TCE	DCE[3] (total)	VC	TPH [GRO]	TCE	DCE[3] (total)	VC	TPH [GRO]			
1/25/12	0.056	0.14	ND	ND	0.302	0.556	ND	ND	250	35	50400	356,791,680	0.093	0.162	0.000	0.921	0.093	0.162	0.000	0.921	1.175	35	0.034
2/22/12	0.037	0.058	ND	ND	0.199	0.230	ND	ND	247	28	40320	282,008,144	0.071	0.111	0.000	0.000	0.164	0.273	0.000	0.921	1.357	63	0.006
3/12/12	0.014	0.022	ND	ND	0.075	0.087	ND	ND	249	34	48960	345,211,241	0.047	0.055	0.000	0.000	0.211	0.327	0.000	0.921	1.459	97	0.003
4/18/12	0.062	1.8	ND	1.1	0.334	7.151	ND	3.784	231	45	64800	423,868,516	0.000	0.000	0.000	0.000	0.211	0.327	0.000	0.921	1.459	142	0.000
5/16/12	0.071	0.12	ND	0.73	0.382	0.477	ND	2.511	220	10	14400	89,707,622	0.034	0.043	0.000	0.225	0.246	0.370	0.000	1.146	1.761	152	0.030
6/18/12	0.088	0.28	ND	ND	0.474	1.112	ND	ND	208	29	41760	245,961,990	0.105	0.195	0.000	0.309	0.351	0.566	0.000	1.455	2.371	181	0.021
7/9/12	0.16	0.23	ND	1.2	0.862	0.914	ND	4.128	225	21	30240	192,667,507	0.129	0.195	0.000	0.398	0.479	0.761	0.000	1.852	3.093	202	0.034
8/27/12	0.2	0.23	ND	1.5	1.077	0.914	ND	5.160	226	49	70560	451,555,550	0.438	0.413	0.000	2.097	0.917	1.173	0.000	3.949	6.040	251	0.060
9/12/12	0.2	0.33	ND	0.71	1.077	1.311	ND	2.442	232	16	23040	151,361,225	0.163	0.168	0.000	0.575	1.080	1.342	0.000	4.525	6.947	267	0.057
10/18/12	0.16	0.68	ND	ND	0.862	2.702	ND	ND	235	36	51840	344,966,584	0.334	0.692	0.000	0.421	1.415	2.034	0.000	4.946	8.394	303	0.040
11/19/12	0.19	0.25	ND	ND	1.023	0.993	ND	ND	186	32	46080	242,699,895	0.229	0.448	0.000	0.000	1.643	2.482	0.000	4.946	9.071	335	0.021
12/10/12	0.041	0.12	ND	ND	0.221	0.477	ND	ND	167	21	30240	143,002,105	0.089	0.105	0.000	0.000	1.732	2.587	0.000	4.946	9.266	356	0.009
																				2012 Cumulative Mass Recovery Rate (kg/day)			0.026

Notes:

1. Volumes of air treated are estimated values.
2. Estimated mass recovery rate calculated from monthly influent mass concentration and estimated vapor extraction rate. Influent concentrations used are averages of those from the previous and current monthly events.
3. DCE (total) is the sum of 1,1-Dichloroethene, cis-1,2-Dichloroethene, and trans-1,2-Dichloroethene.
4. Conversion of TPH[GRO] from ppmv to µg/L assumes molecular weight approximately equal to hexane, temperature of 25ºC, and pressure of 1 atmosphere.

Definitions:

acfm - actual cubic feet per minute
DCE - Dichloroethene
GRO - Gasoline Range Organics
kg - kilograms
L - Liters
min - minutes
ND - Non-detect
NS - Not Sampled
ppmv - parts per million by volume
TCE - Trichloroethene
TPH - Total petroleum hydrocarbons
µg/L - micrograms per liter
VC - Vinyl Chloride
VOC - Volatile Organic Compounds

ARCADIS

Table 7. Summary of Effluent VOC Concentrations vs. Guidance Concentrations in 2012, DC Rollforms Site, Jamestown, New York.

Volatile Organic Compound	AGC[(1)] (µg/m^3)	SGC[(1)] (µg/m^3)	Maximum Effluent Concentration (ppmv)	Maximum Effluent Concentration (µg/m^3)	Maximum [(2)] Emission Rate (lb/day)	Actual Annual Impact (µg/m^3)[(3)]	Actual Annual Impact Percentage of AGC (%)
Trichloroethene	0.5	14,000	ND	ND	NA	NA	NA
1,1-Dichloroethene	70	-	ND	ND	NA	NA	NA
cis-1,2-Dichloroethene	63	-	0.36	1,430	0.032	0.083	0.13
trans-1,2-Dichloroethene	63	-	ND	ND	NA	NA	NA
Vinyl Chloride	0.11	180,000	ND	ND	NA	NA	NA

Notes:

1. AGC and SGC values obtained from NYSDEC DAR-1 AGC/SGC Tables, dated 9/10/07.
2. Maximum emission rate calculated using the maximum concentrations for each volatile organic compound detected in 2012 system effluent samples and the maximum effluent flow rate (250 acfm) recorded for any one month during the entire 2012 reporting period.
3. Actual annual impact calculated by following procedures described in NYSDEC DAR-1 Guidelines for the Control of Toxic Ambient Air Contaminants (NYSDEC 1991). Note effective stack height of 20 feet.

Definitions:

"-" - indicates no guideline as been established
AGC - Annual Guideline Concentration
lb/day - pounds per day
NA - Not Applicable
ND - Non-Detect
ppmv - parts per million by volume
SGC - Short-term Guideline Concentration
µg/m^3 - micrograms per cubic meter

ARCADIS

Table 8. Summary of Groundwater Elevation Data, DC Rollforms Site, Jamestown, New York.

Well ID	Measuring Point Elevation (ft amsl) [1]	Non-pumping Conditions 3/12/2012		Operational Conditions 5/23/2012		Non-pumping Conditions 10/1/2012		Non-pumping Conditions 12/5/2012	
		Depth to Water [2]	Water-Level Elevation [3]	Depth to Water [2]	Water-Level Elevation [3]	Depth to Water [2]	Water-Level Elevation [3]	Depth to Water [2]	Water-Level Elevation [3]
ESI-1	1296.37	8.41	1287.96	12.36	1284.01	12.68	1283.69	11.02	1285.35
ESI-2	1295.08	11.12	1283.96	12.01	1283.07	12.04	1283.04	11.80	1283.28
ESI-3[4]	1295.75	6.55	1289.20	8.02	1287.73	10.88	1284.87	6.19	1289.56
ESI-4R	1294.96	13.13	1281.83	12.25	1282.71	12.06	1282.90	DRY	NA
ESI-5	1293.08	4.83	1288.25	9.14	1283.94	7.62	1285.46	5.48	1287.60
ESI-6	1295.24	5.97	1289.27	7.51	1287.73	10.21	1285.03	7.68	1287.56
ESI-7	1295.12	10.64	1284.48	10.89	1284.23	11.10	1284.02	10.55	1284.57
MW-4S	1295.75	12.28	1283.47	14.26	1281.49	13.80	1281.95	13.48	1282.27
MW-7D	1295.37	9.11	1286.26	10.13	1285.24	10.79	1284.58	9.59	1285.78
MW-8S	1295.21	6.60	1288.61	8.60	1286.61	10.49	1284.72	6.97	1288.24
MW-8D	1295.48	5.99	1289.49	6.45	1289.03	7.05	1288.43	5.92	1289.56
MW-9	1291.95	6.32	1285.63	7.40	1284.55	6.97	1284.98	5.55	1286.40
MW-10R	1295.11	9.09	1286.02	12.54	1282.57	13.24	1281.87	13.12	1281.99
MW-12	1294.91	6.12	1288.79	7.54	1287.37	10.03	1284.88	6.54	1288.37
MW-13	1294.20	5.83	1288.37	7.40	1286.80	9.43	1284.77	6.91	1287.29
MW-14	1294.59	5.60	1288.99	7.01	1287.58	9.54	1285.05	6.48	1288.11
OW-1	1292.59	7.90	1284.69	7.90	1284.69	7.91	1284.68	DRY	NA
OW-2	1293.96	13.08	1280.88	13.95	1280.01	13.89	1280.07	13.70	1280.26
OW-3	1292.01	4.12	1287.89	5.02	1286.99	6.90	1285.11	5.25	1286.76
OW-4	NS	10.23	NA	11.41	NA	11.85	NA	10.60	NA
OW-5	1295.59	11.19	1284.40	11.96	1283.63	12.03	1283.56	11.42	1284.17
OW-6	1295.67	10.82	1284.85	11.49	1284.18	11.84	1283.83	10.88	1284.79
OW-7	NS	10.83	NA	11.45	NA	11.57	NA	11.24	NA
IW-1	1295.32	7.22	1288.10	8.55	1286.77	10.60	1284.72	8.57	1286.75
IW-2	1295.32	6.27	1289.05	8.46	1286.86	10.03	1285.29	6.44	1288.88
IW-3	1294.93	5.99	1288.94	7.93	1287.00	10.01	1284.92	7.76	1287.17
IW-4	1294.90	6.48	1288.42	8.44	1286.46	9.81	1285.09	8.17	1286.73
IW-5	1294.81	7.76	1287.05	8.63	1286.18	9.74	1285.07	8.11	1286.70
RW-1	1292.06	4.03	1288.03	8.26	1283.80	7.40	1284.66	5.54	1286.52
RW-2	1292.52	5.37	1287.15	6.45	1286.07	7.99	1284.53	6.31	1286.21
RW-3	1292.46	5.36	1287.10	6.32	1286.14	7.99	1284.47	6.43	1286.03
PW-1	1296.93	12.34	1284.59	13.19	1283.74	13.06	1283.87	12.93	1284.00

Notes:

1. Wells ESI-1, ESI-2, ESI-4R, ESI-5, ESI-6, OW-1, OW-2, MW-9, and MW-10R: water level elevations have been estimated based on field measurements following well casing repairs made in June 2008 and 2010.
2. Depths to water are presented as feet below the measuring point.
3. Water level elevations are presented as feet above mean sea level.
4. Well ESI-3: depth to top of LNAPL 5.01 ft (3/22/11). Oil absorbent sock used for LNAPL recovery for remainder of 2011.

Definitions:

NA - Not Applicable
NS - Not Surveyed

ARCADIS

Table 9. Summary of TCE, DCE, and VC in Groundwater Samples, DC Rollforms Site, Jamestown, New York.

Monitoring Well	Date	Analyte (µg/L)[1]		
		TCE	DCE (total)[2]	VC
MW-8S	December 1998	< 5	8,500	1,100
	January 1999	< 5	9,300	2,100
	February 1999	3,000	2,500	< 10
	March 1999	120	1,406	330
	April 1999	130	4,416	480
	May 1999	320	2,110 J	62 J
	July 1999	35 J	1,600	290
	September 1999	96 J	7,100	1,600
	January 2000	9	50	72
	July 2000	< 5	1,107 J	820
	December 2001	85	11 J	1 J
	March 2002	6	51 J	18
	July 2002	< 5	4.6 J	5 J
	October 2002	< 20	410	130
	December 2002	3 J	37 J	23
	August 2003	9	8.8	3
	December 2003	< 5	50 J	49
	June 2004	< 5	9.6 J	35
	November 2004	< 20	400	93
	July 2005	< 20	320	180
	March 2008	150 D	758 DJ	60 DJ
	June 2008	< 100	3,100 D	910
	September 2008	46 J	6,029 DJ	1,800
	December 2008	26	69 J	1.5
	March 2009	23	92	< 1
	June 2009	42	3,000	350
	September 2009	57	7,800 D	870
	December 2009	67	4,400	270
	March 2010	< 25	4,700	580
	June 2010	< 25	5,400 D	690
	October 2010	58	1,811	57
	December 2010	14	66	< 1
	March 2011	25	145	3
	June 2011	10	3,902 D	334 D
	October 2011	12	2,744 D	115 D
	December 2011	16	158	< 1
	March 2012	29.5	400	24.2
	October 2012	< 1	809	1,270
MW-9	March 2008	3.4 J	6.9 J	3.6 J
	June 2008	10	< 5	< 5
	September 2008	9.8 J	2.2 J	< 25
	December 2008	6.8	0.52 J	< 1
	March 2009	4.8	2.7	1.4
	June 2009	7.2	< 1	< 1
	September 2009	11	< 1	< 1
	December 2009	4.1	< 1	< 1
	March 2010	2.1	2.7	1.9
	June 2010	5.3	< 1	< 1
	October 2010	8.4	< 1	< 1
	December 2010	4.7	< 1	< 1
	March 2011	4	4.2	1.5
	June 2011	9	< 1	< 1
	October 2011	8.6	< 1	< 1
	December 2011	6.7	< 1	< 1
	March 2012	4.4	1.4	< 1
	October 2012	3.4	3.0	4.4
MW-10R[4]	June 2010	3.9	12	< 2
	October 2010	56	260	< 2
	December 2010	22	9.4	< 1
	March 2011	76	17	< 1
	June 2011	9.3	273	1.8
	October 2011	86	143	< 1
	December 2011	11	31	< 1
	March 2012	17	111	< 1
	May 2012	13.2	157	< 1
	October 2012	< 1	1.7	< 1
	December 2012	1.1	41.0	< 1
MW-12	December 1998	81	524 J	260
	January 1999	60	460	120
	February 1999	4,400 B	9,800	< 10
	March 1999	66 J	4,516	380
	April 1999	510	9,200	710 J
	May 1999	300	7,438 J	360 J
	July 1999	6	29 J	83
	September 1999	56	1,000	120
	January 2000	12 J	1,100	920
	July 2000	< 5	< 5	< 10
	December 2001	< 5	15 J	< 10
	March 2002	7	172 J	120
	July 2002	< 5	35	24
	October 2002	10	48 J	37
	December 2002	64	301 J	130
	August 2003	42	40	100
	December 2003	22	140	220
	June 2004	< 5	11	26
	November 2004	32	140	140
	July 2005	0.76	51	86
	March 2008	44	1,808 DJ	400
	June 2008	< 100	1,900	470
	September 2008	< 50	810	410
	December 2008	1,600 D	1,808 D	30
	March 2009	540	760	14
	June 2009	280	2,300	140
	September 2009	< 20	5,800 D	230
	December 2009	470	3,500	59
	March 2010	510	3,800	140
	June 2010	110	4,800	440
	October 2010	36	970	310
	December 2010	230	1,200	< 10
	March 2011	127	620	9.4
	June 2011	194	3,843 D	364 D
	October 2011	1,750 D	1,942 D	15
	December 2011	828 D	2,032 D	25
	March 2012	188	1,580	25.3
	May 2012	5,870	9,958	106
	October 2012	< 1	2,685	3,860
	December 2012	692	1,244	5.8

Monitoring Well	Date	Analyte (µg/L)[1]		
		TCE	DCE (total)[2]	VC
MW-13	July 2000	< 5	6	4 J
	December 2001	24	< 5	< 5
	July 2002	0.9 J	< 5	< 5
	October 2002	< 5	< 5	< 5
	December 2002	51	3 J	< 5
	August 2003	3	< 5	< 5
	December 2003	< 5	< 5	< 5
	June 2004	< 5	< 5	< 5
	November 2004	< 5	< 5	< 5
	July 2005	< 5	< 5	< 5
	March 2008	2.7 J	48 J	24
	June 2008	6.7	1,306 DJ	85
	September 2008	< 100	1,700 D	890
	December 2008	61	523 DJ	200 D
	March 2009	41	1,700	630
	June 2009	< 50	6,200	1,700
	September 2009	< 25	2,600	170
	December 2009	< 5	900	400
	March 2010	< 5	510	170
	June 2010	< 5	1,400 D	530
	October 2010	< 10	5,157 D	4,500 D
	December 2010	< 25	4,500 D	4,300
	March 2011	5.8	363	612
	June 2011	5.7	325	377
	October 2011	85	1,538 D	1,310 D
	December 2011	79	916 D	494 D
	March 2012	36.7	392	243
	May 2012	495	3,116	682
	October 2012	< 1	2,554	3,100
	December 2012	72.2	316	14.5
MW-14	July 2000	13 J	4,700	1,400
	December 2001	< 5	3,000	610
	March 2002	< 5	6,600	1,100
	July 2002	NA	14,000	3,800
	October 2002	< 500	8,400	2,000
	December 2002	< 250	6,816 J	1,400
	August 2003	< 1,200	20,000	1,900
	December 2003	< 500	16,000	2,200
	June 2004	< 1,000	19,000	2,500
	December 2004	< 500	16,000	2,300
	March 2008	1.7 J	1,009 DJ	340
	June 2008	< 100	1,800	550
	September 2008	< 100	1,814 J	3,900 D
	December 2008	3.7	975 DJ	390 D
	March 2009	< 5	620	150
	June 2009	< 10	1,100	450
	September 2009	< 2.5	190	300
	December 2009	< 2.5	710 D	310
	March 2010	< 5	1,307 D	510
	June 2010	< 2	220	280
	October 2010	< 1	85	170
	December 2010	3.4	1,607 D	390 D
	March 2011	66	1,809	451
	June 2011	< 1	1,419 D	544
	October 2011	3.4	2,230 D	476 D
	December 2011	3.1	1,282 D	353
	March 2012	< 1	3,401	1260
	May 2012	< 1	568	209
	October 2012	< 1	24.9	65.0
	December 2012	2.9	1,829	194
ESI-1	July 2002	< 100	210	2,300
	October 2002	< 20	21	460
	August 2003	< 20	16	420
	December 2003	< 5	1 J	1 J
	June 2004	< 500	92 J	1,300
	December 2004	< 5	< 5	< 5
	July 2005	< 50	70	1,200
	March 2008	< 50	< 50	< 50
	June 2008	< 50	< 50	< 50
	September 2008	< 50	< 50	< 50
	December 2008	< 1	< 1	< 1
	March 2009	< 1	< 1	< 1
	June 2009	< 1	< 1	< 1
	September 2009	< 1	3.2	< 1
	December 2009	< 1	< 1	< 1
	March 2010	< 1	3.6	< 1
	June 2010	< 1	< 1	< 1
	October 2010	< 1	< 1	< 1
	December 2010	< 1	< 1	< 1
	March 2011	< 1	< 1	< 1
	June 2011	< 1	< 1	< 1
	October 2011	< 1	< 1	< 1
	December 2011	< 1	< 1	< 1
	March 2012	< 1	< 1	< 1
	October 2012	< 1	10.9	11.8
ESI-2	July 2002	< 20	21	390
	October 2002	< 10	< 10	52
	August 2003	< 5	< 5	36
	December 2003	< 20	230	500
	June 2004	< 5	5 J	190
	December 2004	< 5	< 5	12
	July 2005	< 5	< 5	75
	March 2008	< 25	< 25	< 25
	December 2008	< 1	< 1	< 1
	March 2009	< 1	< 1	< 1
	March 2010	< 1	< 1	< 1
	June 2010	< 1	< 1	< 1
	October 2010	< 1	< 1	< 1
	December 2010	< 1	< 1	< 1
	March 2011	< 1	< 1	< 1
	June 2011	4.1	< 1	1.1
	October 2011	< 1	< 1	< 1
	December 2011	< 1	< 1	< 1
	March 2012	< 1	< 1	< 1
	October 2012	< 1	< 1	< 1
ESI-4R[3]	October 2010	150	186	38
	December 2010	12	410	39
	March 2011	134	410	52
	June 2011	15	1,165 D	248 D
	October 2011	4.2	391	102
	December 2011	2.5	480 D	101
	March 2012	3.5	2,070	825

Monitoring Well	Date	Analyte (µg/L)[1]		
		TCE	DCE (total)[2]	VC
ESI-6	December 1998	2 J	19	13
	January 1999	< 5	30	34
	February 1999	360	22	< 10
	March 1999	390	82	50
	April 1999	520	75	45 J
	May 1999	280	39	42
	July 1999	120	12	11
	September 1999	610	8 J	< 10
	January 2000	130	46	24
	July 2000	< 5	< 5	< 10
	December 2001	3	14	5
	March 2002	< 5	49	26
	July 2002	1 J	4 J	2 J
	October 2002	< 5	1 J	< 5
	December 2002	< 5	14	9
	August 2003	< 5	2	< 5
	December 2003	4 J	67	23
	June 2004	< 5	6	12
	November 2004	< 5	43	11
	July 2005	< 5	14	6
	March 2008	< 5	1.6 J	3.6 J
	June 2008	< 5	< 5	1.5 J
	September 2008	< 5	2.6 J	3.2 J
	December 2008	< 1	2.2	1.1
	March 2009	9.1	6.8	2.4
	June 2009	1.4	1.1	< 1
	September 2009	< 1	< 1	< 1
	December 2009	< 1	2.1	< 1
	March 2010	< 1	< 1	< 1
	June 2010	< 1	< 1	< 1
	October 2010	< 1	< 1	< 1
	December 2010	< 1	1.6	< 1
	March 2011	1.1	2.5	< 1
	June 2011	< 1	< 1	< 1
	October 2011	< 1	< 1	< 1
	December 2011	< 1	1.5	< 1
	March 2012	< 1	< 1	< 1
	October 2012	< 1	< 1	< 1
ESI-7	December 1998	320	8	< 10
	January 1999	< 5	3	< 10
	February 1999	16	19	< 10
	March 1999	100	40	2 J
	April 1999	180	37	4 J
	May 1999	77	83 J	88
	July 1999	89	2.5 J	4 J
	September 1999	190	4 J	< 10
	January 2000	33	49.7 J	3 J
	July 2000	4 J	14	< 10
	December 2001	7	17 J	2 J
	March 2002	65	261 J	2 J
	July 2002	9	204 J	33
	October 2002	1 J	7	2 J
	December 2002	24	83 J	1 J
	August 2003	10	93	5
	December 2003	13	171 J	4 J
	July 2004	< 5	17 J	11
	November 2004	10	66	< 5
	July 2005	< 5	19	18
	March 2008	2.2 J	20	2.4 J
	June 2008	< 5	< 5	< 5
	September 2008	< 5	1.1 J	0.55 J
	December 2008	0.79 J	3.2	< 1
	March 2009	7.9	5.7	< 1
	June 2009	< 1	< 1	< 1
	September 2009	< 1	1.4	< 1
	December 2009	< 1	1.8	1.4
	March 2010	1.1	5.6	3.2
	June 2010	< 1	1.1	1.2
	October 2010	< 1	2.6	1.2
	December 2010	7.3	13	< 1
	March 2011	44	168	6.8
	June 2011	< 1	1.3	1.6
	October 2011	< 1	1.2	< 1
	December 2011	1.2	9.1	< 1
	March 2012	8.5	10.1	1.5
	October 2012	< 1	2.1	4.4
OW-5	March 2008	< 5	< 5	< 5
	June 2008	< 5	6,656 DJ	11,000 D
	September 2008	< 25	7,213 DJ	11,000 D
	December 2008	< 1	< 1	< 1
	March 2009	< 1	< 1	< 1
	June 2009	< 5	930	780
	September 2009	< 5	3,200 D	5,400 D
	December 2009	< 1	130	130
	March 2010	< 1	1,709 D	1,400 D
	June 2010	< 10	5,100 D	4,200 D
	October 2010	< 2	46	110
	December 2010	< 1	< 1	< 1
	March 2011	< 1	< 1	< 1
	June 2011	1	2,558 D	1,650
	October 2011	< 1	187	137 D
	December 2011	< 1	< 1	< 1
	March 2012	< 1	1,208	1,030
	October 2012	< 1	2,554	4,060
OW-6	March 2008	42	343 DJ	76
	June 2008	11 J	100	310
	September 2008	14 J	130	330
	December 2008	230 D	98 D	0.8 J
	March 2009	480	210	< 2.5
	June 2009	94	290	40
	September 2009	35	300	120
	December 2009	200	640 D	9.8
	March 2010	59	606	150
	June 2010	20	420	120
	October 2010	32	223	220
	December 2010	190 D	180	1.4
	March 2011	3.6	6.1	< 1
	June 2011	15	249	17
	October 2011	2.7	11.7	< 1
	December 2011	610 D	362 D	< 1
	March 2012	298	314	4.3
	May 2012	66.8	414	57.5
	October 2012	9.6	93.6	100
	December 2012	13.8	85.5	57.6

Notes:

1. Samples analyzed using US EPA Method 8260.
2. DCE (total) includes the sum of 1,1-Dichloroethene, cis-1,2-Dichloroethene, and trans-1,2-Dichloroethene.
3. ESI-4R was installed as a replacement to ESI-4 in the First Quarter 2010.
4. MW-10R was installed as a replacement to MW-10 in the First Quarter 2010.

Definitions:

< - Indicates the sample concentration was less than the laboratory detection limit
D - Identifies an analysis that used a secondary dilution factor
DCE - Dichloroethene
J - Indicates an estimated value
TCE - Trichloroethene
µg/L - Micrograms per liter
VC - Vinyl Chloride

ARCADIS

Table 10. Annual Mass Recovery, DC Rollforms Site, Jamestown, New York.

Year	Estimated Annual Mass Recovery[1]		
	Dissolved Phase (kg)	Vapor Phase (kg)	DNAPL (gallons)[2]
2008	30.4	116.2	117
2009	90.7	27.5	135
2010	72.0	8.1	39
2011	133.2	8.8	18
2012	39.9	9.3	12.5
Total	**366.1**	**169.9**	**321.5**

Notes:

1. Estimated cumulative mass recovery includes mass recovered since the system was brought online at the beginning of 2008.
2. Total volume of DNAPL recovered is based on volumes removed and containerized from oil/water separator (OWS-200) during the reporting period.

Definitions:

DNAPL - Dense Non-Aqueous Phase Liquid
kg - kilograms

ARCADIS

Appendix A

Record Drawings

ABBREVIATIONS

AS	AIR STRIPPER
B	BLOWER
BV	BALL VALVE
CS	CARBON STEEL
CV	CHECK VALVE
FAL	FLOW ALARM LOW
FL	FAULT LIGHT
FIT	FLOW TOTALIZER INDICATOR
FT	FLOW TRANSMITTER
G	GREEN LIGHT
GAC	GRANULAR ACTIVATED CARBON
GALV	GALVANIZED
GPM	GALLONS PER MINUTE
HDPE	HIGH DENSITY POLYETHYLENE
HP	HORSE POWER
HOA	HAND-OFF-AUTO
HZ	HERTZ
HC	HOSE CONNECTION
HS	HAND SWITCH
LAHH	LEVEL ALARM HIGH HIGH
LALL	LEVEL ALARM LOW LOW
LSH	LEVEL SENSOR HIGH
LSHH	LEVEL SENSOR HIGH HIGH
LSL	LEVEL SENSOR LOW
M	MOTOR
PAHH	PRESSURE ALARM HIGH HIGH
PAH	PRESSURE ALARM HIGH
PAL	PRESSURE ALARM LIGHT LOW
PI	PRESSURE INDICATOR
PRV	PRESSURE RELIEF VALVE
PSL	PRESSURE SWITCH LOW
PSH	PRESSURE SWITCH HIGH
PT	PRESSURE TRANSMITTER
PVC	POLYVINYL CHLORIDE
QD	QUICK DISCONNECT
R	RED LIGHT
SCH	SCHEDULE
SG	SIGHT GAUGE
SP	SAMPLE PORT
SV	SOLENOID VALVE
SDR	STANDARD DIMENSION RATIO
TAH	TEMPERATURE ALARM HIGH
TI	TEMPERATURE INDICATOR
TP	TRANSFER PUMP
TYP	TYPICAL
UN	UNION
VI	VACUUM INDICATOR
V	VOLT
YL	INDICATING LIGHT

INSTRUMENT SYMBOLS

- INLINE INSTRUMENT
- ISOLATED INSTRUMENT CONNECTED TO PROCESS LINE
- FIELD MOUNTED INSTRUMENT CONNECTED TO PROCESS LINE
- INTERLOCKED TO SCADA
- PRIMARY PANEL MOUNTED
- RUN/ALARM INDICATOR LIGHT
- SCADA (SUPERVISORY CONTROL AND DATA ACQUISITION)

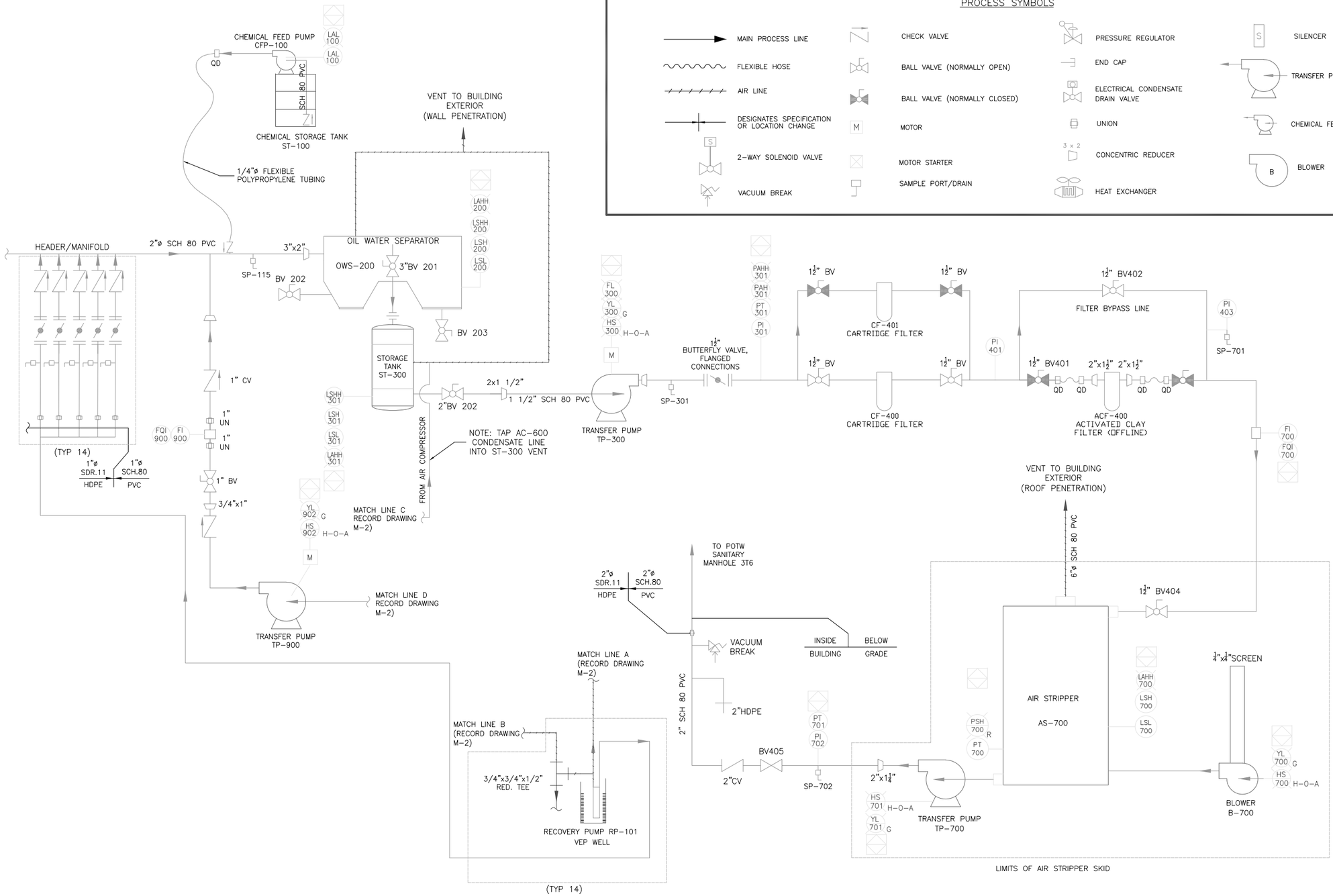
PIPE IDENTIFICATION

LINE SIZE — PIPING SPECIFICATION (SEE PROCESS ABBREVIATIONS)

2"ø SCH. 80 PVC → DIRECTION OF FLOW

PROCESS SYMBOLS

- MAIN PROCESS LINE
- FLEXIBLE HOSE
- AIR LINE
- DESIGNATES SPECIFICATION OR LOCATION CHANGE
- 2-WAY SOLENOID VALVE
- VACUUM BREAK
- CHECK VALVE
- BALL VALVE (NORMALLY OPEN)
- BALL VALVE (NORMALLY CLOSED)
- MOTOR
- MOTOR STARTER
- SAMPLE PORT/DRAIN
- PRESSURE REGULATOR
- END CAP
- ELECTRICAL CONDENSATE DRAIN VALVE
- UNION
- CONCENTRIC REDUCER (3 x 2)
- HEAT EXCHANGER
- SILENCER
- TRANSFER PUMP
- CHEMICAL FEED PUMP
- BLOWER



LIQUID PHASE PROCESS FLOW

DRAWING NOT TO SCALE

No.	Date	Revisions	By	Ckd
5	7.23.12	DISCHARGE PERMIT RENEWAL	TC	MM
4	6.12.08	RECORD DRAWING SUBMITTAL TO NYSDEC	TC	MM
3	5.30.06	100 % REMEDIAL DESIGN SUBMITTAL TO NYSDEC	TC	KL
2	4.17.06	BID SUBMISSION TO CONTRACTORS	TC	KL
1	2.9.06	90% SUBMITTAL TO NYSDEC	TC	KL
0	1.13.06	DRAFT	TC	KL

SCALE(S) AS INDICATED

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING. USE TO VERIFY FIGURE REPRODUCTION SCALE

Professional Engineer's Name: MOH MOHIUDDIN
Professional Engineer's No.: 074527
State: NY | Date Signed: 11/18/08 | Project Mgr.: M.SANFORD
Designed by: T.CARIGNAN | Drawn by: TP/TC/LE | Checked by: C.DAVERN

ARCADIS OF NEW YORK, INC.

INGERSOLL RAND • D.C. ROLLFORMS
JAMESTOWN, NEW YORK

LIQUID PHASE PROCESS & INSTRUMENTATION DIAGRAM, AND GENERAL LEGEND

MECHANICAL

ARCADIS Project No.: AY000219.0014.00006
Date: 11.18.08

ARCADIS OF NEW YORK, INC.
465 NEW KARNER ROAD
FIRST FLOOR
ALBANY, NEW YORK
TEL. 518.452.7826

M-1

ALARMS

Alarm #	Alarm Name	Alarm Description
0	LAHH-901	High High liquid level alarm in SVE knockout tank. Alarm shuts down SVE blower B-900 and heat exchanger HX-500.
1	LAHH-200	High high liquid level in oil/water separator OWS-200. Alarm shuts down air compressor AC-600, chemical feed pump CFP-100, SVE blower B-900, and heat exchanger HX-500. Alarm also relieves pressure to pneumatic pumps in recovery wells.
2	LAHH-301	High high liquid level in storage tank ST-301. Alarm shuts down air compressor AC-600, chemical feed pump CFP-100, SVE blower B-900, and heat exchanger HX-500. Alarm also relieves pressure to pneumatic pumps in recovery wells.
3	LAHH-700	High high liquid level in air stripper sump. Alarm shuts down transfer pump TP-300.
4	PAH-301	High pressure alarm indicating pressure greater than 22 psi for pressure transmitter PT-301. Alarm only sends warning and does not affect system components.
5	PAHH-301	High high pressure alarm indicating pressure greater than 27 psi for pressure transmitter PT-301. Alarm shuts down transfer pump TP-300, air compressor AC-600, and SVE blower B-900. Alarm also disables SVE knockout tank transfer pump TP-900 and relieves pressure to pneumatic pumps in recovery wells.
6	PAH-501	High pressure alarm indicating pressure greater than 35 psi for pressure transmitter PT-501. Alarm only sends warning and does not affect system components.
7	PAHH-501	High high pressure alarm indicating pressure greater than 50 psi for pressure transmitter PT-501. Alarm shuts down SVE blower B-900 and heat exchanger HX-500.
8	PAL-601	Low pressure alarm indicating pressure less than 40 psi for the air compressor AC-600. Alarm shuts down only air compressor AC-600.
9	TP-300 Fault	Transfer pump TP-300 motor fault. Alarm shuts down chemical feed pump CFP-100, SVE blower B-900, heat exchanger HX-500, transfer pump TP-300, and transfer pump TP-900. Alarm also relieves pressure to pneumatic pumps in recovery wells.
10	Power Failure	Power failure alarm. Alarm de-energizes chemical feed pump CFP-100, SVE blower B-900, heat exchanger HX-500, and air compressor AC-600. Alarm also relieves pressure to pneumatic pumps in recovery wells.
11	HX-500 Fault	Heat exchanger motor fault. Alarm shuts down chemical feed pump CFP-100, SVE blower B-900, heat exchanger HX-500, and air compressor AC-600. Alarm also relieves pressure to pneumatic pumps in recovery wells.
12	B-900 Fault	SVE blower B-900 motor fault. Alarm shuts down chemical feed pump CFP-100, SVE blower B-900, and heat exchanger HX-500. Alarm also relieves pressure to pneumatic pumps in recovery wells.
13	TP-900 Fault	Transfer pump TP-900 motor fault. Alarm shuts down transfer pump TP-900, SVE blower B-900, heat exchanger HX-500, and air compressor AC-600.
14	FSL-100	Low flow chemical feed pump alarm. Alarm shuts down only chemical feed pump CFP-100.
15	AC-600 Fault	Air compressor AC-600 motor fault. Alarm shuts down SVE blower B-900 and heat exchanger HX-500.
16	TP-300 Thermal	Transfer pump TP-300 overheat alarm. Alarm shuts down transfer pump TP-300, chemical feed pump CFP-100, SVE blower B-900, and heat exchanger HX-500. Alarm also relieves pressure to pneumatic pumps in recovery wells.
17	B-900 Thermal	SVE blower B-900 overheat alarm. Alarm shuts down chemical feed pump CFP-100, SVE blower B-900, and heat exchanger HX-500. Alarm also relieves pressure to pneumatic pumps in recovery wells.
18	HX-500 Thermal	Heat exchanger HX-500 overheat alarm. Alarm shuts down chemical feed pump CFP-100, SVE blower B-900, and heat exchanger HX-500. Alarm also relieves pressure to pneumatic pumps in recovery wells.
19	PAL-700	Low pressure alarm for air stripper sump. Alarm shuts down transfer pump TP-300, chemical feed pump CFP-100, SVE blower B-900, and heat exchanger HX-500. Alarm also relieves pressure to pneumatic pumps in recovery wells.
20	LSHH-201 Prod.	High high product level in oil/water separator OWS-200. Alarm shuts down chemical feed pump CFP-100, SVE blower B-900, and heat exchanger HX-500. Alarm also relieves pressure to pneumatic pumps in recovery wells.
21	LAH-200	High liquid level in oil/water separator OWS-200. Alarm only sends warning and does not affect system components.
22	PAHH-701	High high pressure alarm indicating pressure greater than 30 psi for pressure transmitter PT-701. Alarm shuts down transfer pump TP-300, chemical feed pump CFP-100, SVE blower B-900, and heat exchanger HX-500. Alarm also relieves pressure to pneumatic pumps in recovery wells.

ALARM LOGIC:

The air compressor, which supplies air to the pneumatic pumps in each VEP recovery well, automatically shuts down in the event of the following alarm conditions for system parameters: high-high level alarm in oil/water separator OWS-200 (LAHH-200), high-high level in storage tank ST-300 (LAHH-301), high-high product level in the oil/water separator oil capturing reservoir (LAHH-201 PROD), low pressure alarm in air compressor AC-600 (PAL-601), high-high level alarm in the air stripper (AS-700) sump (LAHH-700), low pressure alarm in the air stripper (AS-700) sump (PAL-700), high-high pressure alarm after the storage tank transfer pump from pressure transmitter PT-301 (PAHH-301), and a high-high pressure alarm after the discharge pump from PT-701 (PAHH-701). A pair of two-way solenoid valves (SV-1 and SV-2) located between the air compressor and the recovery wells are also interlocked with the above alarms. Upon the occurrence of any of these alarms, one of the solenoid valves closes to shut off the air supply from the compressor, while the other solenoid valve opens to allow the air supply line to the recovery wells to de-pressurize.

The SVE blower (B-900) automatically shuts down in the event of any of the critical alarm conditions listed above for the air compressor and solenoid valves. Given that the vapor extraction pipeline at each VEP well is located above the water recovery pipeline, operation of the SVE blower while the recovery well pumps are not dewatering the wells could result in the unwanted extraction of groundwater by the SVE blower. In addition to the alarm conditions listed above for the air compressor and solenoid valves, the following conditions will result in the automatic shutdown of only the SVE blower: high-high level alarm in SVE knock-out tank KT-900 (LAHH-901) and a high-high pressure alarm directly upstream from the vapor phase granular activated carbon units from pressure transmitter PT-501 (PAHH-501).

In addition to the alarm conditions that will disable components of the remediation system, alarm conditions have been established to provide early warning that a system component may require servicing. The following alarm conditions result in only a notification to operating personnel, and do not cause a system shutdown: a low flow alarm from chemical feed pump CFP-100 (FSL-100), a high pressure alarm from pressure transmitter PT-301 (PAH-301), a high pressure alarm from pressure transmitter PT-501 (PAH-501), a high pressure alarm from pressure transmitter PT-701 (PAH-701), and a high level in oil/water separator OWS-200 (LAH-200).

PROCESS DESCRIPTION:

Groundwater and non-aqueous phase liquid (NAPL) from the vacuum enhanced pumping (VEP) wells is conveyed via underground piping to an on-site treatment building. Prior to reaching the first component of the treatment system (i.e., the oil/water separator OWS-200) a sequestering agent is injected into the process stream. The purpose of the sequestering agent is to prevent iron and manganese related fouling downstream in the system (e.g. process piping, cartridge filters and the air stripper). The groundwater and NAPL is then pumped directly into the oil/water separator (OWS-200) for removal of residual non-emulsified NAPL.

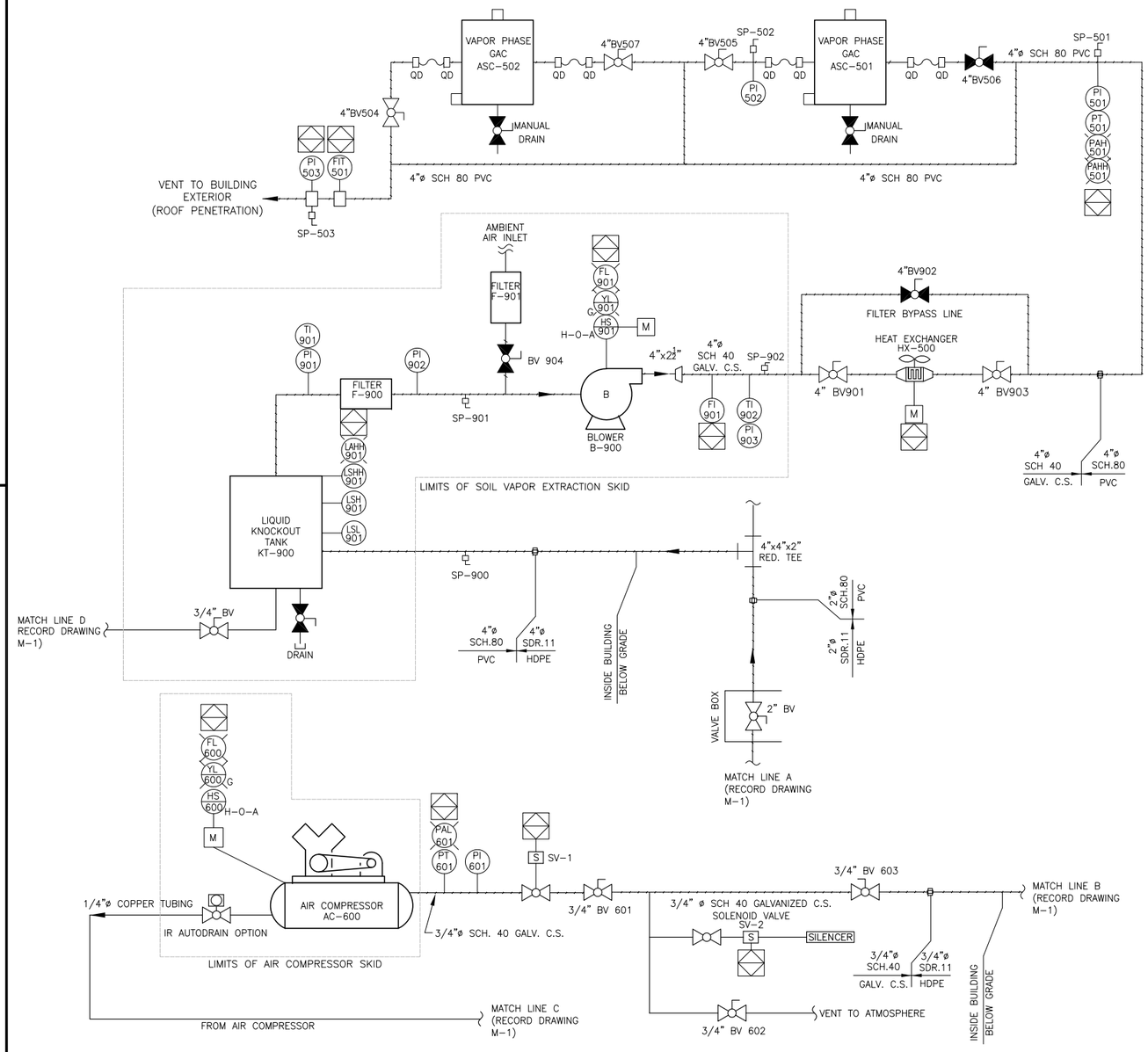
Once the groundwater has passed through the oil/water separator, the water flows by gravity to the storage tank (ST-300). The water is then transferred in batch mode by transfer pump TP-300 through two cartridge filters housings (CF-400 and CF-401) arranged in parallel for removal of residual suspended solids. Following the cartridge filters, groundwater and residual emulsified NAPL is pumped through a liquid phase granular organically modified clay (LPGOC) filter vessel for the removal of emulsified NAPL. Groundwater is pumped through a low-profile air stripper (AS-700) series for the removal of dissolved phase organic compounds. Treated groundwater is then discharged to the local POTW sanitary sewer manhole 3T6 via a single 2-inch standard dimension ratio (SDR) 11 high density polyethylene (HDPE) below grade pipe.

Soil vapors are collected from each VEP well via a regenerative blower (B-900). The recovered soil gas is treated via two (2) vapor-phase granular activated carbon units (VPGAC) arranged in series (ASC-501 and ASC-502).

The system has been designed to monitor the operational status of critical systems on a continual basis during operation. The system is interlocked with sensors and alarms which can temporarily shut down the system in the event the system malfunctions. A system component failure results in a system shutdown to assure that the discharge of untreated groundwater or soil vapor is prevented and also to protect system operators.

GENERAL NOTE:

SEE RECORD DRAWING M-1 FOR GENERAL ABBREVIATIONS, PROCESS SYMBOLS, INSTRUMENT SYMBOLS, AND PIPE IDENTIFICATION,



VAPOR PHASE PROCESS FLOW

DRAWING NOT TO SCALE

SCALE(S) AS INDICATED

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING. USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd
5	11.18.08	RECORD DRAWING	TC	MM
4	6.12.08	DRAFT RECORD DRAWING SUBMITTAL TO NYSDEC	TC	TC
3	5.30.06	100 % REMEDIAL DESIGN SUBMITTAL TO NYSDEC	TC	KL
2	4.17.06	BID SUBMISSION TO CONTRACTORS	TC	KL
1	2.9.06	90% SUBMITTAL TO NYSDEC	TC	KL
0	1.13.06	DRAFT	TC	KL

Professional Engineer's Name: MOH MOHIUDDIN
Professional Engineer's No.: 074527

State	Date Signed	Project Mgr.
NY	11/18/08	M.SANFORD

Designed by	Drawn by	Checked by
T.CARIGNAN	TP/TC/LE	C.DAVERN

ARCADIS OF NEW YORK, INC.

INGERSOLL RAND • D.C. ROLLFORMS
JAMESTOWN, NEW YORK

VAPOR PHASE PROCESS & INSTRUMENTATION DIAGRAM, AND CONTROL LOGIC

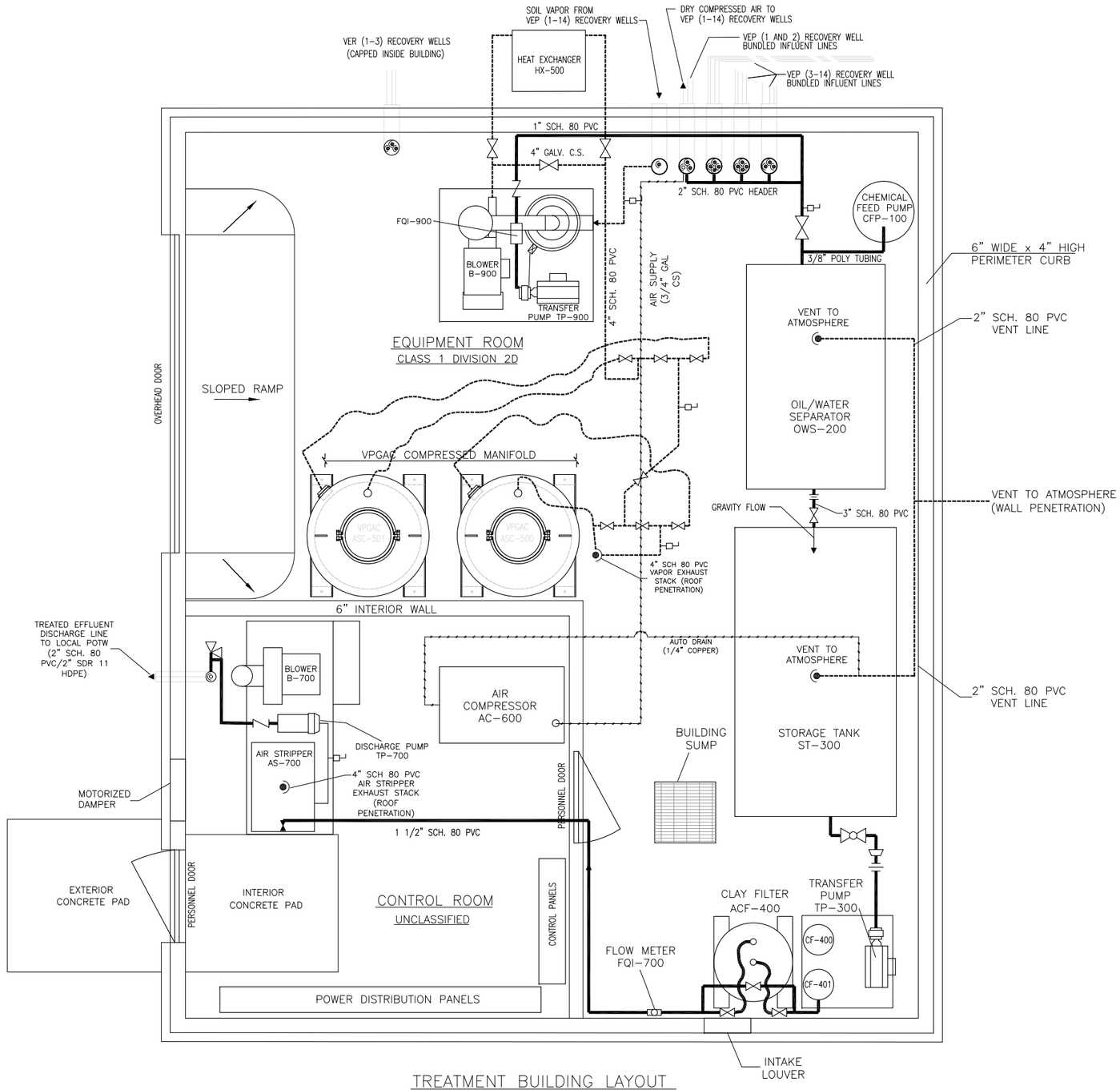
MECHANICAL

ARCADIS Project No. AY000219,0014,00006
Date 11.18.08

ARCADIS OF NEW YORK, INC.
465 NEW KARNER ROAD
FIRST FLOOR
ALBANY, NEW YORK
TEL. 518.452.7826

M-2

CITY:ALBANY DIV/GROUP:SER-1 DB:TP/TC/LE LD:T.CARIGNAN PIC:M.SANFORD PM:M.SANFORD
G:\APROJECTING\ERS\OLDC Rollforms\AY000219.0014 2006\Engineering Construction Completion Report\As-built Construction Drawings



TREATMENT BUILDING LAYOUT

SCALE: 1" = 2'

LEGEND

- WATER PROCESS LINE
- VAPOR PROCESS LINE
- COMPRESSED AIR PROCESS LINE

EQUIPMENT DESCRIPTIONS

FILTRATION UNITS

VAPOR PHASE CARBON UNITS
ASC-500 AND 501
MAKE: US FILTER
MODEL: VSC-2000
SIZE: 2000-LB

STORAGE TANK
ST-300
MAKE: CHEM-TAINER INDUSTRIES, INC.
MODEL: ST-300
TYPE: ROUND HORIZONTAL BULK STORAGE W/ SUMP
SIZE: 1300 GALLONS

ACTIVATED CLAY/CARBON FILTRATION UNIT
ACF-400
MAKE: US FILTER
TYPE: LIQUID PHASE ADSORBER
MODEL: PV-500

OIL/WATER SEPARATOR
OWS-200
MAKE: HYDROFLO
MODEL: EVS-036-SS34P
TYPE: SS, RECTANGULAR CHANNEL
CAPACITY: 70 GPM
MEDIA: COALESCING PVC MEDIA

CARTRIDGE FILTERS
CF-400 AND CF-401
MAKE: HARMSCO
MODEL: HIF-14
FILTER: 20 MICRON CARTRIDGE
CAPACITY: 60 GPM

MISCELLANEOUS

TRANSFER PUMP
TP-300
MAKE: GOULDS
MODEL: G&L SERIES NPE 316SS
TYPE: POSITIVE DISPLACEMENT
CAPACITY: 20 GPM, 75 FT TDH
MOTOR RATINGS: 1 HP, 3ø, 460V, EXP

RECOVERY PUMP
RP-1-14
MAKE: QED
TYPE: PNEUMATIC
MODEL: SPECIAL SHORT AP-4T TOP LOADING
CAPACITY: 4 GPM @ 20 PSI.

CHEMICAL HOLDING TANK
CT-100
CHEMICAL: ARIES 2925 SEQUESTERING AGENT
TYPE: PLASTIC DRUM
SIZE: 55 GALLON

CHEMICAL FEED PUMP
CFP-100
MAKE: LMI
TYPE: ELECTRONIC METERING PUMP
MODEL: P70-1-30
MOTOR RATINGS: 1ø, 120V
CAPACITY: 1.3 GPH (4.9 L/H), 300 PSI
OPTIONS: LMI MICROPACE, MP-100 W/ DIGI-PULSE FLOW MONITOR SERIES FM-200

HEAT EXCHANGER
HX-500
MAKE: XCHANGER, INC.
CAPACITY: 322 SCFM, 150 F IN/80F OUT
MODEL: AA-500 (REF#83360)
MOTOR RATINGS: 3ø, 460V, XP

AIR COMPRESSOR SKID

AIR COMPRESSOR
AC-600
MAKE: INGERSOLL-RAND
MODEL: UP6-10TAS-125
CAPACITY: 80 GALLON, 38 ACFM, 125 PSI
MOTOR RATINGS: 10 HP, 1ø, 120 V
OPTIONS: INTERNAL AIR DRYER

SVE SKID

AIR FILTER
F-900
MAKE: SOLBERG
MODEL: CSL-235P-300
CAPACITY: 300 CFM

AIR FILTER
F-901
MAKE: EM PRODUCTS
MODEL: EMF-2

LIQUID KNOCKOUT TANK
KT-900
MAKE: J.E. GASHO & ASSOC.
MODEL: GX-90
SIZE: 90 GALLON

REGENERATIVE BLOWER
B-900
MAKE: ROTRON
MODEL: EN 858 BD72WL
MOTOR RATINGS: 10 HP, 3ø, 460 V, 60 HZ

TRANSFER PUMP
TP-900
MAKE: OBERDORFER
MODEL: 992R
CAPACITY: 4 GPM
MOTOR RATINGS: 0.5 HP, 3ø, 460 V

AIR STRIPPER SKID

AIR STRIPPER
AS-700
MAKE: QED
MODEL: EZ-4.4SS
TYPE: LOW PROFILE
CAPACITY: 10-25 GPM
MOTOR RATINGS: 3ø, 460 V, 60HZ

TRANSFER PUMP
TP-700
MAKE: GOULDS
MODEL: NPE SERIES 316L
TYPE: POSITIVE DISPLACEMENT
CAPACITY: 30 GPM, 50 FT TDH.
MOTOR RATINGS: 1 HP, 3ø, 460 V

No.	Date	Revisions	By	Ckd
5	11.18.08	RECORD DRAWING	TC	MM
4	6.12.08	DRAFT RECORD DRAWING SUBMITTAL TO NYSDEC	CD	TC
3	5.30.06	100 % REMEDIAL DESIGN SUBMITTAL TO NYSDEC	TC	KL
2	4.17.06	BID SUBMISSION TO CONTRACTORS	TC	KL
1	2.9.06	90% SUBMITTAL TO NYSDEC	TC	KL
0	1.13.06	DRAFT	TC	KL

SCALE(S) AS INDICATED

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING. USE TO VERIFY FIGURE REPRODUCTION SCALE

Professional Engineer's Name: MOH MOHIUDDIN
Professional Engineer's No.: 074527
State: NY | Date Signed: 11/18/08 | Project Mgr.: M.SANFORD
Designed by: T.CARIGNAN | Drawn by: TP/TC/LE | Checked by: C.DAVERN

ARCADIS
ARCADIS OF NEW YORK, INC.

INGERSOLL RAND • D.C. ROLLFORMS
JAMESTOWN, NEW YORK

EQUIPMENT LAYOUT AND DESCRIPTIONS

MECHANICAL

ARCADIS Project No.
AY000219.0014.00006

Date
11.18.08

ARCADIS OF NEW YORK, INC.
465 NEW KARNER ROAD
FIRST FLOOR
ALBANY, NEW YORK
TEL. 518.452.7826

M-3

Appendix B

Site Cover and Riverbank Inspection Checklist

Site Cover and Riverbank Inspection Checklist

DC Rollforms Site, Jamestown, New York

Section 1: General Information

Figure Reference:	Weather:
Date / Time Monitoring Performed: 2/23/12 1100	Cloudy, 30's

Cover material(s)	□ Soil	X Vegetated Topsoil	X Rip Rap Stone

Section II. Observations

Observation	Yes	No	N/A	Provide Comments As Necessary (use additional space below if needed)
Erosion and Sedimentation Controls				
Are erosion and sedimentation (E&S) controls present? If yes:	X			
Are they functioning as intended?	X			
Are they still required (i.e., has a healthy stand of vegetation been established)?			X	
Vegetated Topsoil Isolation Cover				
Are there areas of scour?			X	Winter
Is any geotextile fabric exposed?		X		
Is vegetation effectively covering the intended area? Provide percent growth for seeded areas.			X	NA
Is there any sign of distressed vegetation?			X	NA
Do any areas require seeding?			X	NA
Photograph Numbers (if applicable)				
Rip Rap Stone Cover				
Are there areas of scour?	X			Little
Is any geotextile fabric exposed?	X			
Photograph Numbers (if applicable)				
Wing Wall Deflector				
Are there areas of scour?		X		
Is 30" dia. Rip Rap in place?			X	Water is too high to tell
Photograph Numbers (if applicable)				
Riverbank Plantings				
Are the live stake cuttings thriving?			X	Winter
Photograph Numbers				
Chadakoin River (USGS 03014500, Falconer, NY)				
Discharge, Cubic Feet Per Second?	550 cfs			
Gage Height, Feet?	2.03 ft.			

Other Observations: Describe any other relevant observations noted during this monitoring period.

Performed by: Jeff H / Adam L	Signature:	Date: 2/23/12

Site Cover and Riverbank Inspection Checklist

DC Rollforms Site, Jamestown, New York

Section 1: General Information

Figure Reference:	Weather:
Date / Time Monitoring Performed: 4/18/12 11[00]	PARTLY CLOUDY

Cover material(s)	□ Soil	X Vegetated Topsoil	X Rip Rap Stone

Section II. Observations

Observation	Yes	No	N/A	Provide Comments As Necessary (use additional space below if needed)
Erosion and Sedimentation Controls				
Are erosion and sedimentation (E&S) controls present? If yes:	X			
Are they functioning as intended?	X			
Are they still required (i.e., has a healthy stand of vegetation been established)?	X			
Vegetated Topsoil Isolation Cover				
Are there areas of scour?	X			
Is any geotextile fabric exposed?	X	X		
Is vegetation effectively covering the intended area? Provide percent growth for seeded areas.	X			~75%, OTHERS ARE STRUGGLING/NOT THRIVING
Is there any sign of distressed vegetation?	X	X		VEG. HAVING A HARD TIME IN THE RIP RAP
Do any areas require seeding?		X		NOT AT THIS TIME, BUT POTENTIALLY
Photograph Numbers (if applicable)				
Rip Rap Stone Cover				
Are there areas of scour?		X		
Is any geotextile fabric exposed?	X			
Photograph Numbers (if applicable)				
Wing Wall Deflector				
Are there areas of scour?		X		
Is 30" dia. Rip Rap in place?	X			
Photograph Numbers (if applicable)				
Riverbank Plantings				
Are the live stake cuttings thriving?	X			~50% ARE THRIVING
Photograph Numbers				
Chadakoin River (USGS 03014500, Falconer, NY)				
Discharge, Cubic Feet Per Second?	58			
Gage Height, Feet?	0.54			

Other Observations: Describe any other relevant observations noted during this monitoring period.

WATER LEVEL LOW, NO SIGNS OF SHEEN AT THE WATER LEVEL ALONG THE RIP RAP BASE

Performed by: ADAM LAVELLE	Signature: Adam Lavelle	Date: 4/18/12

Site Cover and Riverbank Inspection Checklist

DC Rollforms Site, Jamestown, New York

Section 1: General Information

Figure Reference:	Weather:
Date / Time Monitoring Performed: 7/9/12 / 1115	SUNNY 78°F

Cover material(s)	□ Soil	X Vegetated Topsoil	X Rip Rap Stone

Section II. Observations

Observation	Yes	No	N/A	Provide Comments As Necessary (use additional space below if needed)
Erosion and Sedimentation Controls				
Are erosion and sedimentation (E&S) controls present? If yes:	X			
Are they functioning as intended?	X			
Are they still required (i.e., has a healthy stand of vegetation been established)?	X			
Vegetated Topsoil Isolation Cover				
Are there areas of scour?	X			MIDDLE OF SITE HAS A BARE SPOT
Is any geotextile fabric exposed?		X		
Is vegetation effectively covering the intended area? Provide percent growth for seeded areas.	Y			~90%
Is there any sign of distressed vegetation?		X		
Do any areas require seeding?		Y		
Photograph Numbers (if applicable)				
Rip Rap Stone Cover				
Are there areas of scour?	Y			
Is any geotextile fabric exposed?	Y			
Photograph Numbers (if applicable)				
Wing Wall Deflector				
Are there areas of scour?		Y		
Is 30" dia. Rip Rap in place?	Y			
Photograph Numbers (if applicable)				
Riverbank Plantings				
Are the live stake cuttings thriving?	X			~70% THRIVING
Photograph Numbers				
Chadakoin River (USGS 03014500, Falconer, NY)				
Discharge, Cubic Feet Per Second?	54.0			
Gage Height, Feet?	0.52			

Other Observations: Describe any other relevant observations noted during this monitoring period.

WATER LEVEL AT NORMAL HEIGHT

Performed by: ADAM LAVELLE	Signature:	Date: 7/9/12

Site Cover and Riverbank Inspection Checklist

DC Rollforms Site, Jamestown, New York

Section 1: General Information

Figure Reference:

Weather: PARTLY CLOUDY

Date / Time Monitoring Performed: 10/16/12 0745

Cover material(s) | □ Soil | X Vegetated Topsoil | X Rip Rap Stone

Section II. Observations

Observation	Yes	No	N/A	Provide Comments As Necessary (use additional space below if needed)
Erosion and Sedimentation Controls				
Are erosion and sedimentation (E&S) controls present? If yes:	X			
Are they functioning as intended?	X			
Are they still required (i.e., has a healthy stand of vegetation been established)?	X			
Vegetated Topsoil Isolation Cover				
Are there areas of scour?	X			MIDDLE OF THE SITE HAS DEAD GRASS/BARE AREA
Is any geotextile fabric exposed?		X		
Is vegetation effectively covering the intended area? Provide percent growth for seeded areas.	X			~ 80%
Is there any sign of distressed vegetation?	X			MIDDLE OF THE SITE
Do any areas require seeding?	X			MIDDLE OF SITE
Photograph Numbers (if applicable)				
Rip Rap Stone Cover				
Are there areas of scour?	X			
Is any geotextile fabric exposed?	X			
Photograph Numbers (if applicable)				
Wing Wall Deflector				
Are there areas of scour?		X		
Is 30" dia. Rip Rap in place?	X			
Photograph Numbers (if applicable)				
Riverbank Plantings				
Are the live stake cuttings thriving?		X		~ 20% THRIVING
Photograph Numbers				
Chadakoin River (USGS 03014500, Falconer, NY)				
Discharge, Cubic Feet Per Second?	75 cfs			
Gage Height, Feet?	0.61 ft			

Other Observations: Describe any other relevant observations noted during this monitoring period.

LIVE STAKE CUTTINGS TO BE PLANTED THIS FALL.

Performed by: ADAM LAVELLE | Signature: Adam Lavelle | Date: 10/16/12

Site Cover and Riverbank Inspection Checklist

DC Rollforms Site, Jamestown, New York

Section 1: General Information

Figure Reference:	Weather:
Date / Time Monitoring Performed: 11/19/12 1320	

Cover material(s)	☐ Soil	X Vegetated Topsoil	X Rip Rap Stone

Section II. Observations

Observation	Yes	No	N/A	Provide Comments As Necessary (use additional space below if needed)
Erosion and Sedimentation Controls				
Are erosion and sedimentation (E&S) controls present? If yes:	X			
Are they functioning as intended?	X			
Are they still required (i.e., has a healthy stand of vegetation been established)?	X			
Vegetated Topsoil Isolation Cover				
Are there areas of scour?	X			
Is any geotextile fabric exposed?		X		
Is vegetation effectively covering the intended area? Provide percent growth for seeded areas.	X			10% - 15% IN THE CENTER OF THE SITE IS BROWN GRASS
Is there any sign of distressed vegetation?	X			SAME AS ABOVE, BEAVER DAMAGE, TREES REMOVED
Do any areas require seeding?		X		
Photograph Numbers (if applicable)				
Rip Rap Stone Cover				
Are there areas of scour?	X			
Is any geotextile fabric exposed?	X			
Photograph Numbers (if applicable)				
Wing Wall Deflector				
Are there areas of scour?		X		
Is 30" dia. Rip Rap in place?	X			
Photograph Numbers (if applicable)				
Riverbank Plantings				
Are the live stake cuttings thriving?				SEE BELOW
Photograph Numbers				
Chadakoin River (USGS 03014500, Falconer, NY)				
Discharge, Cubic Feet Per Second?	395			
Gage Height, Feet?	1.66			

Other Observations: Describe any other relevant observations noted during this monitoring period.

WESTERN BANK OF SITE HAS SIGNIFICANT BEAVER DAMAGE, ~60 - 70% TREES REMOVED.
BLACK WILLOWS EATEN IN RIVERBANK

LIVE STAKES ON THE TOP OF THE RIVER BANK THRIVING. FENCING STILL IN PLACE.

Performed by: ADAM LAVIGNE	Signature: Adam Lavigne	Date: 11/19/12

Site Cover and Riverbank Inspection Checklist

DC Rollforms Site, Jamestown, New York

Section 1: General Information

Figure Reference:	Weather: OVERCAST, RAIN, MID-30°F's
Date / Time Monitoring Performed: 12/10/12 1410	

Cover material(s)	□ Soil	X Vegetated Topsoil	X Rip Rap Stone

Section II. Observations

Observation	Yes	No	N/A	Provide Comments As Necessary (use additional space below if needed)
Erosion and Sedimentation Controls				
Are erosion and sedimentation (E&S) controls present? If yes:	X			
Are they functioning as intended?	X			
Are they still required (i.e., has a healthy stand of vegetation been established)?	X			
Vegetated Topsoil Isolation Cover				
Are there areas of scour?		X		
Is any geotextile fabric exposed?		X		
Is vegetation effectively covering the intended area? Provide percent growth for seeded areas.	X			
Is there any sign of distressed vegetation?	X			MINOR FLOODING, BEAVER DAMAGE
Do any areas require seeding?		X		
Photograph Numbers (if applicable)				
Rip Rap Stone Cover				
Are there areas of scour?	X			
Is any geotextile fabric exposed?	X			
Photograph Numbers (if applicable)				
Wing Wall Deflector				
Are there areas of scour?		X		
Is 30" dia. Rip Rap in place?	X			
Photograph Numbers (if applicable)				
Riverbank Plantings				
Are the live stake cuttings thriving?	X			
Photograph Numbers				
Chadakoin River (USGS 03014500, Falconer, NY)				
Discharge, Cubic Feet Per Second?	420			
Gage Height, Feet?	1.65			

Other Observations: Describe any other relevant observations noted during this monitoring period.

BEAVER APPEARS TO HAVE GOTTEN UNDER SOME OF THE FENCES AND ATE SOME OF THE BLACK WILLOWS. 3-4 GROUPINGS AFFECTED. ONE GROUPING ONLY HAS 3 OUT OF THE 4 WALLS STILL IN TACT.

Performed by: ADAM LAVELLE	Signature:	Date: 12/10/12