Mr. Steven Scharf, P.E.
New York State Department of Environmental Conservation
Remedial Action, Bureau A
Division of Environmental Remediation
625 Broadway
Albany, NY 12233-7015

Arcadis of New York, Inc.
Two Huntington Quadrangle
Suite 1S10
Melville
New York 11747
Tel 631 249 7600
Fax 631 249 7610
www.arcadis.com

ENVIRONMENT

Subject:
Results of Third Quarter 2016 System Operation and Monitoring, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York, NYSDEC Site #1-30-003A.

Date:
November 23, 2016

Contact:
David E. Stern

Phone:
631.391.5284

Email:
David E. Stern@arcadis.com

Our ref:
NY001496.1416.RPTI4

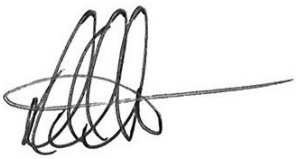
Dear Steve:

Enclosed are the results of Operable Unit 3 Bethpage Park Groundwater Containment System (OU3 BPGWCS) operation and monitoring, performed in accordance with the NYSDEC-approved OU3 Groundwater IRM OM&M Manual (ARCADIS 2009) and the NYSDEC-approved Sampling and Analysis Plan (SAP; ARCADIS 2009). As we have transitioned to electronic submittals (via PDF) as part of ongoing sustainability and cost savings efforts, hard copies of the report can be provided on request.

If you have any questions, please do not hesitate to contact us.

Sincerely,

Arcadis of New York, Inc.



David E. Stern

Senior Hydrogeologist

Enclosure

Copies:
Steven Karpinski, NYS Dept. of Health
Joseph DeFranco, Nassau County Dept. of Health
Robert Alvey, USEPA Region 2
Carol Stein, USEPA Region 2
Fred Weber, Northrop Grumman Corporation
Edward Hannon, Northrop Grumman Corporation, w/o enclosure
Repository
File

TABLES

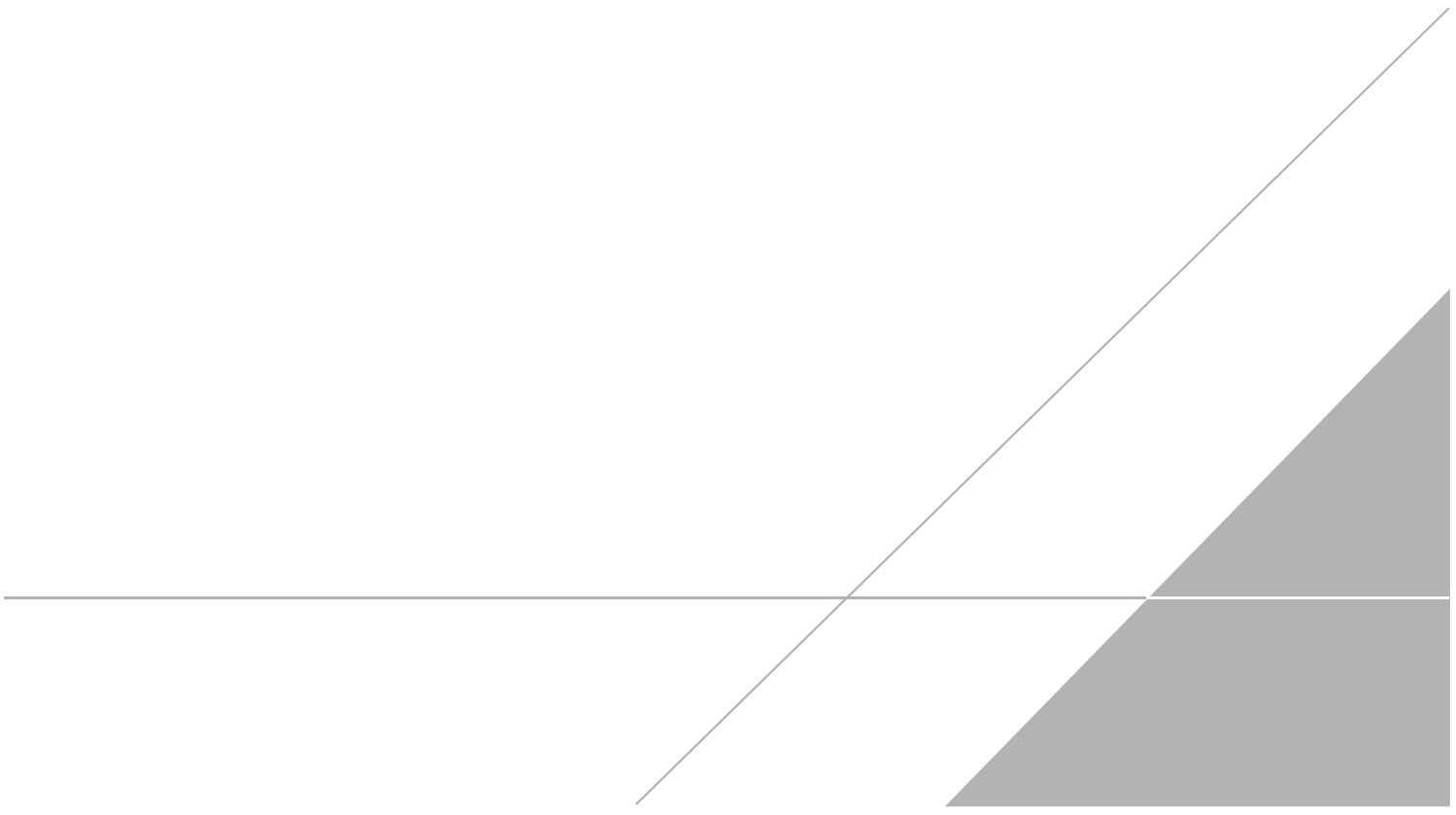


Table 1
Operational Summary, Bethpage Park
Groundwater Containment System, Operable Unit 3
(Former Grumman Settling Ponds), Bethpage, New York

ARCADIS Design & Consultancy for natural and built assets

MONTH	DAY																													Days Operational (1)
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
2009 Total																																160
2010 Total																																352
2011 Total																																351
2012 Total																																353
2013 Total																																354
2014 Total																																349
2015 Total																																348
Jan-16		b				(3)										(4)				b							(5)b					31
Feb-16	#b								b				(6)b		b					(7)	b					b			#			29
Mar-16	b	b							b					b						(8)bb	bb		(9)			(10)			b			31
1Q 2016																																91
Apr-16	####/*/** (11)		b		b	(12)						b					b	#				b					(13)b					30
May-16		b				b				(14)	(15)	bb	b				b	#			b				b		b				b	29
Jun-16	b				b				b	#/###/*/**				b				b		(16)		(17)b						b	(18)	b		30
2Q 2016																																89
Jul-16		(19)b			(20)b				b				b	#				b				b	(21)			b						30
Aug-16	b					b				(22)	b				b					b			####/*/**	b					b			31
Sep-16					b						(23)	bb	b	#	b			b			b	(24)	(25)b						b			30
3Q 2016																																91
2016 Total																																271
TOTAL																																**2,538**

Legend:

	Indicates system online for at least the majority of the day.
	Indicates system operated with reduced flow rates.
	Indicates system off-line for at least the majority of the day.
##	Indicates water compliance samples were collected.
#	Indicates water performance samples were collected.
**	Indicates vapor compliance samples were collected.
*	Indicates vapor performance samples were collected.
b	Indicates filter bag unit changed over.
K	Indicates PPZ change-out.
C	Indicates carbon change-out.

Acronyms\Key:

1Q	first quarter
ECU	emission control unit
VPGAC	vapor phase granular activated carbon
PPZ	potassium permanganate-impregnated zeolite
RW	recovery well

Table 1
Operational Summary, Bethpage Park
Groundwater Containment System, Operable Unit 3
(Former Grumman Settling Ponds), Bethpage, New York

ARCADIS Design & Consultancy for natural and built assets

Notes:

(1) Days in which the system was operational for the majority of the day are counted as one day.
(2) Spent bag filters are stored in DOT certified 55-gallon drums and disposed of by a subcontractor as non-hazardous waste.

First Quarter 2016

(3) The system shut down at 7:32 pm on January 6, 2016 due to a motor overload condition at RW-2. After an attempt to restart by resetting the breaker at RW-2, the system was left offline. The alarm was cleared and the system was restarted at 8:40 am on January 7, 2016, however RW-2 was left offline. The system was offline for approximately 13 hours.
(4) The system shut down at 9:09 pm on January 16, 2016 due to a motor overload condition at RW-3. The breaker at RW-3 was reset, the alarm was cleared, and the system was restarted at 11:18 am on January 17, 2016. The system was offline for approximately 14 hours.
(5) The system was shut down at 9:00 am on January 27, 2016 to install a new pump and motor in RW-2. The system was restarted at 3:50 pm the same day and was offline for approximately 7 hours. RW-2 was offline for a total of 21 days.
(6) The system shut down at 6:40 pm on February 13, 2016 due to overvoltage from the power supply. The system was restarted at 7:10 am on February 14, 2016 following voltage normalization and was offline for approximately 12.5 hours.
(7) The system shut down at 9:50 am on February 20, 2016 due to overvoltage from the power supply. The system was restarted at 11:50 am on the same day following voltage normalization and was offline for approximately 2 hours.
(8) The system shut down at 4:33 pm on March 20, 2016 due to a bag filter differential high pressure alarm resulting from multiple bag filter changes. The alarm was cleared, both of the bag filters changed and the system restarted at 10:12 am on March 21, 2016. The system was offline for approximately 18 hours.
(9) The system shut down at 7:11 am on March 23, 2016 due to a low flow alarm at the RW-2 influent manifold. The alarm was cleared and the system was restarted at 8:08 am on the same day, however RW-2 was left offline. The system was offline for approximately 1 hour.
(10) The system shut down at 4:00 am on March 26, 2016 due to a low pressure alarm at the RW-2 influent manifold. The system was restarted at 10:45 am the same day, and was offline for approximately 7 hours.
(11) First quarter air and water sampling was completed on April 1, 2016 due to downtime associated with RW-2 in March.

Second Quarter 2016

(12) The system was shut down at 7:15 am on April 6, 2016 for flow control verification. The system was restarted at 11:20 am on the same day and was offline for approximately 4 hours.
(13) The system was shut down at 8:30 am on April 27, 2016 for calibration activities. The system was restarted at 10:46 am on the same day and was offline for approximately 2 hours.
(14) The system shut down at 3:47 pm on May 10, 2016 due to a low pressure alarm at the RW-2 influent manifold. The alarm was cleared and the system was restarted at 4:45 pm on the same day, however RW-2 was left offline. The system was offline for approximately 1 hour.
(15) The system was shut down at 11:25 am on May 11, 2016 to replace the pumps in RW-2 and RW-3. When the new pump was installed in RW-2, an issue was noted with the newly installed pump. New pumps were ordered and installed in RW-2 and RW-3 on May 12, 2016. The system was restarted at 12:00 pm on May 12, 2016. The system was offline for approximately 13 hours. RW-2 was offline for approximately 44 hours.
(16) The system shut down at 12:59 pm on June 20, 2016 due to a low flow alarm at the RW-2 influent manifold. The alarm was cleared and the system was restarted at 4:30 pm on the same day. The system was offline for approximately 3.5 hours.
(17) The system shut down at 4:15 pm on June 22, 2016 due to an air stripper high pressure alarm. The alarm was cleared and the system was restarted at 5:20 pm on the same day. The system was offline for approximately 1 hour.
(18) RW-2 was shut down at 9:00 am on June 29, 2016 to install a new pump in RW-2. RW-2 was restarted at 1:15 pm on the same day and was offline for approximately 3 hours.

Third Quarter 2016

(19) The system shut down at 8:33 pm on July 2, 2016 due to overvoltage from the power supply. The alarm was cleared and the system was restarted at 9:30 pm on the same day. The system was offline for approximately 1 hour.

(20) The system shut down at 10:27 am on July 5, 2016 due to a building high sump level alarm. The sump was emptied, the alarm was cleared and the system was restarted at 11:15 am on the same day. The system was offline for approximately 1 hour.

(21) The system shut down at 1:13 pm on July 23, 2016 due to an air stripper high pressure alarm from a faulty pressure switch. The switch was replaced, the alarm was cleared and the system was restarted at 8:57 am on July 25, 2016. The system was offline for approximately 44 hours.

(22) The system shut down at 2:05 pm on August 10, 2016 due to an air stripper high pressure alarm. The alarm was cleared and the system was restarted at 2:30 pm on the same day. The system was offline for approximately 0.5 hours.

(23) The system shut down at 7:30 pm on September 11, 2016 due to an air stripper low influent flow alarm. The system was restarted without RW-2 around 9:30 am on September 12, 2016. The system was offline for approximately 14 hours. A new pump was installed in RW-2 on September 12, 2016 and was brought online at 12:30 pm on the same day. RW-2 was offline for approximately 17 hours.

(24) The system shut down at 9:50 am on September 22, 2016 due to an air stripper high pressure alarm. The alarm was reset and the system was restarted at 12:30 pm on the same day. The system was offline for approximately 2 hours.

(25) The system shut down at 1:44 pm on September 23, 2016 due to an air stripper high pressure alarm. The alarm was reset and the system was restarted at 5:59 pm on the same day. The system was offline for approximately 4.25 hours.

Table 2
Influent Water Sample Analytical Results,
Bethpage Park Groundwater Containment System,
Operable Unit 3 (Former Grumman Settling Ponds),
Bethpage, New York.

ARCADIS Design & Consultancy for natural and built assets

Compound	11/30/15 (µg/L)	4/1/2016 [3] (µg/L)	06/10/16 (µg/L)	08/23/16 (µg/L)
Project VOCs				
1,1,1 - Trichloroethane	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1 - Dichloroethane	**0.36 J**	**0.55 J**	**0.39 J**	< 1.0 U
1,2 - Dichloroethane	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1 - Dichloroethene	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Tetrachloroethene	< 1.0 U	< 1.0 U	**0.30 J**	**0.25 J**
Trichloroethene	**3.9**	**3.7**	**4.0**	**3.3**
Vinyl Chloride	**15**	**29**	**16**	**11**
cis 1,2-Dichloroethene	**19**	**18**	**12**	**8.0**
trans 1,2-Dichloroethene	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Benzene	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
Toluene	**7.6**	**9.1**	**6.1**	**4.5**
Xylene-O	**0.27 J**	**0.52 J**	**0.31 J**	**0.22 J**
Xylenes - M,P	**0.55 J**	**0.66 J**	**0.54 J**	< 1.0 U
Subtotal Project VOCs	**47**	**61**	**40**	**27**

Compound	11/30/15 (µg/L)	4/1/2016 [3] (µg/L)	06/10/16 (µg/L)	08/23/16 (µg/L)
Non-Project VOCs				
1,1,2,2-Tetrachloroethane	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1,2-Trichloroethane	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2-Dichloropropane	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
2-Butanone	< 10 U	< 10 U	< 10 U	< 10 U
4-Methyl-2-Pentanone	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
Acetone	< 10 U	< 10 U	< 10 U	< 10 U
Bromodichloromethane	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Bromoform	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Bromomethane	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
Carbon Disulfide	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
Carbon Tetrachloride	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Chlorobenzene	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Chlorodibromomethane	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Chlorodifluoromethane (Freon 22)	**5.5**	**3.9 J**	**4.2 J**	**3.0 J**
Chloroethane	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Chloroform	**2.7**	**2.4**	**1.8**	**1.5**
Chloromethane	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
cis-1,3-Dichloropropene	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Dichlorodifluoromethane (Freon 12)	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
Dichloromethane	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
Ethylbenzene	**0.59 J**	**0.98 J**	**0.62 J**	**0.38 J**
Methyl N-Butyl Ketone	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
Methyl-Tert-Butylether	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Styrene (Monomer)	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
trans-1,3-Dichloropropene	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Trichlorofluoromethane (Freon 11)	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
Trichlorotrifluoroethane (Freon 113)	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
Subtotal Non-Project VOCs	**8.8**	**7.3**	**6.6**	**4.9**
Total VOCs [1]	**56**	**68**	**46**	**32**
1,4-Dioxane	**0.33**	**0.62**	**0.47**	**0.28**

Notes and abbreviations on last page.

Table 2
Influent Water Sample Analytical Results,
Bethpage Park Groundwater Containment System,
Operable Unit 3 (Former Grumman Settling Ponds),
Bethpage, New York.

Compound	11/30/15 (µg/L)	4/1/2016 [3] (µg/L)	06/10/16 (µg/L)	08/23/16 (µg/L)
Inorganics				
Dissolved Cadmium	< 3.0 U	--	--	--
Total Cadmium	< 3.0 U	--	--	--
Dissolved Chromium	< 10 U	--	--	--
Total Chromium	**12**	--	--	--
Dissolved Iron	**195**	**317**	**220**	**169**
Total Iron	**2,050**	**606**	**328**	**2640**
Total Mercury	--	**--**	**--**	**--**
pH [2]	**5.7**	**5.9**	**5.8**	**5.6**

Notes and Abbreviations:

(1) "Total VOCs" represents the sum of individual concentrations of the compounds detected. The values used in calculations referenced in this report have been rounded to the nearest whole number.

(2) Influent pH samples collected and measured in the field by Arcadis personnel on the dates listed using an Oakton Model 300 pH/conductivity meter. pH units are standard units.

(3) First Quarter samples were collected on April 1, 2016 due to RW-2 downtime in March.

700 Bold value indicates a detection.
-- not analyzed
J Compound detected below its reporting limit; value is estimated.
VOC volatile organic compound
µg/L micrograms per liter
< 5 U Compound not detected above its laboratory quantification limit.

Table 3
Effluent Water Sample Analytical Results,
Bethpage Park Groundwater Containment System,
Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York.

Compound	Discharge Limit [1] (µg/L)	10/13/15 (µg/L)	11/23/15 (µg/L)	12/22/15 (µg/L)	2/1/2016[5] (µg/L)	02/23/16 (µg/L)	4/1/2016[6] (µg/L)	04/18/16 (µg/L)	05/18/16 (µg/L)	06/10/16 (µg/L)	07/14/16 (µg/L)	08/23/16 (µg/L)	09/14/16 (µg/L)
Project VOCs													
1,1,1-Trichloroethane	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1-Dichloroethane	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2-Dichloroethane	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1-Dichloroethene	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Tetrachloroethene	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Trichloroethene	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.30 J**
Vinyl Chloride	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
cis 1,2-Dichloroethene	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
trans 1,2-Dichloroethene	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Benzene	5	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
Toluene	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Xylene-O	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Xylenes - M,P	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Subtotal Project VOCs	**--**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.30**

Notes and abbreviations on last page.

Table 3
Effluent Water Sample Analytical Results,
Bethpage Park Groundwater Containment System,
Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York.

Compound	Discharge Limit [1] (µg/L)	10/13/15 (µg/L)	11/23/15 (µg/L)	12/22/15 (µg/L)	2/1/2016[5] (µg/L)	02/23/16 (µg/L)	4/1/2016[6] (µg/L)	04/18/16 (µg/L)	05/18/16 (µg/L)	06/10/16 (µg/L)	07/14/16 (µg/L)	08/23/16 (µg/L)	09/14/16 (µg/L)
Non-Project VOCs													
1,1,2,2-Tetrachloroethane	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1,2-Trichloroethane	1	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2-Dichloropropane	0.6	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
2-Butanone	50	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U
4-Methyl-2-Pentanone	50	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
Acetone	50	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U
Bromodichloromethane	50	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Bromoform	50	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Bromomethane	5	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
Carbon Disulfide	60	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
Carbon Tetrachloride	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Chlorobenzene	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Chlorodibromomethane	50	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Chlorodifluoromethane (Freon 22)	50	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
Chloroethane	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Chloroform	7	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Chloromethane	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
cis-1,3-Dichloropropene	0.4	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Dichlorodifluoromethane (Freon 12)	5	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
Dichloromethane	5	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
Ethylbenzene	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Methyl N-Butyl Ketone	50	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
Methyl-Tert-Butylether	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Styrene (Monomer)	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
trans-1,3-Dichloropropene	0.4	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Trichlorofluoromethane (Freon 11)	5	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
Trichlorotrifluoroethane (Freon 113)	5	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
Subtotal Non-Project VOCs	**--**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Total VOCs [2]	**--**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.30**
Treatment Efficiency [3]	--	> 99.9%	> 99.9%	> 99.9%	> 99.9%	> 99.9%	> 99.9%	> 99.9%	> 99.9%	> 99.9%	> 99.9%	> 99.9%	99.1%

Notes and abbreviations on last page.

Table 3
Effluent Water Sample Analytical Results,
Bethpage Park Groundwater Containment System,
Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York.

Compound	Discharge Limit [1] (µg/L)	10/13/15 (µg/L)	11/23/15 (µg/L)	12/22/15 (µg/L)	2/1/2016[5] (µg/L)	02/23/16 (µg/L)	4/1/2016[6] (µg/L)	04/18/16 (µg/L)	05/18/16 (µg/L)	06/10/16 (µg/L)	07/14/16 (µg/L)	08/23/16 (µg/L)	09/14/16 (µg/L)
Inorganics													
Dissolved Cadmium	5	--	< 3.0 U	--	--	--	< 3.0 U	--	--	< 3.0 U	--	< 3.0 U	--
Total Cadmium	5	--	< 3.0 U	--	--	--	< 3.0 U	--	--	< 3.0 U	--	< 3.0 U	--
Dissolved Chromium	50	--	< 10 U	--	--	--	< 10 U	--	--	< 10 U	--	< 10 U	--
Total Chromium	50	--	< 10 U	--	--	--	< 10 U	--	--	< 10 U	--	< 10 U	--
Dissolved Iron	600	**235**	**184**	**209**	**156**	**216**	**281**	**195**	**202**	**205**	**199**	**162**	**270**
Total Iron	600	**297**	**275**	**288**	**226**	**262**	**490**	**228**	**229**	**266**	**241**	**208**	**304**
Total Mercury	250	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U
1,4-Dioxane	--	**0.34**	**0.34**	**0.38**	**0.24**	**0.53**	**0.56**	**0.61**	< 0.11 U	**0.53**	**0.41**	**0.40**	**0.60**
pH [4]	5.5 - 8.5	**6.9**	**7.1**	**6.0**	**5.9**	**6.8**	**7.0**	**6.8**	**6.7**	**6.9**	--[7]	**6.4**	**6.6**

Notes and Abbreviations:

(1) Discharge limits per the interim SPDES equivalency program or Division of Water Technical and Operational Guidance Series (TOGS 1.1.1) Quality Standards and Guidance Values and Groundwater Effluent Limitations, if the compound is not part of the interim SPDES equivalency program.

(2) "Total VOCs" represents the sum of individual concentrations of compounds detected. The values used in calculations referenced in this report have been rounded to the nearest whole number.

(3) Treatment efficiency was calculated by dividing the difference between the influent and effluent total VOC concentrations by the influent total VOC concentration.

(4) Effluent pH samples collected and measured in the field by Arcadis personnel on the dates listed using an Oakton Model 300 pH/conductivity meter. pH units are standard units.

(5) Samples representing the month of January were collected on February 1, 2016 due to RW-2 downtime in January.

(6) Samples representing the month of March were collected on April 1, 2016 due to RW-2 downtime in March.

(7) July 2016 pH not recorded due to technician error.

700 Bold value indicates a detection.
J Compound detected below its reporting limit; value is estimated.
SPDES State Pollutant Discharge Elimination System
VOC volatile organic compound
µg/L micrograms per liter
-- not analyzed
< 5 U Compound not detected above its laboratory quantification limit.

Table 4
Influent Vapor Sample Analytical Results,
Bethpage Park Groundwater Containment System,
Operable Unit 3 (Former Grumman Settling Ponds),
Bethpage, New York. [1]

ARCADIS Design & Consultancy for natural and built assets

Compound	11/23/15 (µg/m^3)	4/1/2016 [3] (µg/m^3)	06/10/16 (µg/m^3)	08/23/16 (µg/m^3)
Project VOCs				
1,1,1 - Trichloroethane	**0.82**	**0.87**	**0.71**	**0.60**
1,1 - Dichloroethane	**5.3**	**7.7**	**4.9**	**4.5**
1,2 - Dichloroethane	**0.45 J**	< 0.81 U	**0.45 J**	< 0.81 U
1,1 - Dichloroethene	**2.0**	**2.5**	**1.5**	**1.5**
Tetrachloroethene	**4.5**	**3.2**	**3.5**	**3.1**
Trichloroethene	**55**	**45**	**53**	**47**
Vinyl Chloride	**181 D**	**458**	**184**	**180**
cis 1,2-Dichloroethene	**290 D**	**272**	**165**	**155**
trans 1,2-Dichloroethene	**0.59 J**	**0.67 J**	**0.44 J**	**0.35 J**
Benzene	**0.77**	**1.3**	**1.5**	**0.70**
Toluene	**131**	**139**	**90**	**77**
Xylene-O	**3.2**	**10**	**4.3**	**3.6**
Xylenes - M,P	**7.8**	**14**	**7.8**	**6.1**
Subtotal Project VOCs	**683**	**954**	**517**	**479**

Compound	11/23/15 (µg/m^3)	4/1/2016 [3] (µg/m^3)	06/10/16 (µg/m^3)	08/23/16 (µg/m^3)
Non-Project VOCs				
1,1,2,2-Tetrachloroethane	< 0.69 U	< 0.69 U	< 0.69 U	< 0.69 U
1,1,2-Trichloroethane	< 0.55 U	< 0.55 U	< 0.55 U	< 0.55 U
1,2-Dichloropropane	< 0.92 U	< 0.92 U	**0.60 J**	< 0.92 U
1,3-Butadiene	<0.44 U	<0.44 U	<0.44 U	< 0.44 U
2-Butanone	**2.2**	**2.6**	**0.88**	**1.1**
4-Methyl-2-Pentanone	< 0.82 U	< 0.82 U	< 0.82 U	< 0.82 U
Acetone	**5.0**	**9.3**	< 0.48 U	**7.1**
Bromodichloromethane	< 0.67 U	< 0.67 U	< 0.67 U	< 0.67 U
Bromoform	< 0.41 U	< 0.41 U	< 0.41 U	< 0.41 U
Bromomethane	< 0.78 U	< 0.78 U	< 0.78 U	< 0.78 U
Carbon Disulfide	< 0.62 U	< 0.62 U	< 0.62 U	< 0.62 U
Carbon Tetrachloride	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U
Chlorobenzene	< 0.92 U	< 0.92 U	< 0.92 U	< 0.92 U
Chlorodibromomethane	< 0.85 U	< 0.85 U	< 0.85 U	< 0.85 U
Chlorodifluoromethane (Freon 22)	**48**	**46**	**28**	**35**
Chloroethane	< 0.53 U	< 0.53 U	< 0.53 U	< 0.53 U
Chloroform	**41**	**34**	**22**	**21**
Chloromethane	**1.0**	**1.8**	**1.2**	**1.3**
cis-1,3-Dichloropropene	< 0.91 U	< 0.91 U	< 0.91 U	< 0.91 U
Dichlorodifluoromethane (Freon 12)	**2.4**	**2.8**	**2.3**	**2.7**
Dichloromethane	**0.52 J**	**1.9**	**2.5**	**3.4**
Ethylbenzene	**7.8**	**15**	**9.6**	**6.1**
Methyl N-Butyl Ketone	**0.53 J**	< 0.82 U	< 0.82 U	< 0.82 U
Methyl-Tert-Butylether	**0.76**	**4.0**	< 0.72 U	**0.65 J**
Styrene (Monomer)	< 0.85 U	< 0.85 U	< 0.85 U	< 0.85 U
trans-1,3-Dichloropropene	< 0.91 U	< 0.91 U	< 0.91 U	< 0.91 U
Trichlorofluoromethane (Freon 11)	**1.5**	**1.6**	**1.6**	**2.1**
Trichlorotrifluoroethane (Freon 113)	**2.5**	**2.5**	**2.2**	**2.1**
1-Chloro-1,1-difluoroethane (Freon 142b)	< 0.82 U	< 0.82 U	< 0.82 U	< 0.82 U
Subtotal Non-Project VOCs	**113**	**122**	**71**	**83**
Total VOCs [2]	**796**	**1076**	**588**	**562**

Notes and abbreviations on last page.

Table 4
Influent Vapor Sample Analytical Results,
Bethpage Park Groundwater Containment System,
Operable Unit 3 (Former Grumman Settling Ponds),
Bethpage, New York. [1]

Notes and Abbreviations:

(1) Vapor samples collected by Arcadis on the dates shown and submitted to a NYSDOH ELAP certified laboratory for VOC analyses per Modified USEPA Method TO-15. A VOC analyte list is provided in the Groundwater IRM OM&M Manual (Arcadis 2009). Influent samples were collected at Vapor Sampling Port-1 (VSP-1); refer to Figure 3 of this OM&M Report for the location of VSP-1.

(2) "Total VOCs" represents the sum of individual concentrations of compounds detected. The values used in calculations referenced in this report have been rounded to the nearest whole number.

(3) First Quarter samples were collected on April 1, 2016 due to RW-2 downtime in March.

700	Bold value indicates a detection.
D	Compound identified from secondary dilution.
ELAP	Environmental Laboratory Approval Program
IRM	interim remedial measure
J	Compound detected below its reporting limit; value is estimated.
ND	Analyte not detected at or above its laboratory reporting limit.
NYSDOH	New York State Department of Health
OM&M	operation, maintenance, and monitoring
SPDES	State Pollutant Discharge Elimination System
TIC	tentatively identified compound
USEPA	United States Environmental Protection Agency
VOC	volatile organic compound
$\mu g/m^3$	micrograms per cubic meter
< 5 U	Compound not detected above its laboratory quantification limit.

Table 5
Effluent Vapor Sample Analytical Results,
Bethpage Park Groundwater Containment System,
Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York. [1]

Compound	11/23/15 (µg/m^3)	4/1/2016 [2] (µg/m^3)	06/10/16 (µg/m^3)	08/23/16 (µg/m^3)
Project VOCs				
1,1,1 - Trichloroethane	< 0.55 U	< 0.55 U	< 0.55 U	< 0.55 U
1,1 - Dichloroethane	**2.3**	**7.7**	**4.0**	**6.1**
1,2 - Dichloroethane	< 0.81 U	< 0.81 U	< 0.81 U	< 0.81 U
1,1 - Dichloroethene	**0.79**	**0.83**	**0.48 J**	**0.63 J**
Tetrachloroethene	**1.8**	**0.68**	**2.0**	**0.29**
Trichloroethene	**1.5**	**7.5**	**1.7**	**1.1**
Vinyl Chloride	**4.3**	**3.3**	**2.8**	**3.6**
cis 1,2-Dichloroethene	**2.6**	**11**	**7.1**	**11**
trans 1,2-Dichloroethene	< 0.79 U	< 0.79 U	< 0.79 U	< 0.79 U
Benzene	**29**	**5.8**	**3.1**	**3.2**
Toluene	**15**	**14**	**9.0**	**8.7**
Xylene-O	**1**	**0.69 J**	**0.56 J**	< 0.87 U
Xylenes - M,P	**2.1**	**1.8**	**1.5**	**0.52 J**
Subtotal Project VOCs	**60**	**53**	**32**	**35**

Compound	11/23/15 (µg/m^3)	4/1/2016 [2] (µg/m^3)	06/10/16 (µg/m^3)	08/23/16 (µg/m^3)
Non-Project VOCs				
1,1,2,2-Tetrachloroethane	< 0.69 U	< 0.69 U	< 0.69 U	< 0.69 U
1,1,2-Trichloroethane	< 0.55 U	< 0.55 U	< 0.55 U	< 0.55 U
1,2-Dichloropropane	< 0.92 U	< 0.92 U	< 0.92 U	< 0.92 U
1,3-Butadiene	< 0.44 U	< 0.44 U	< 0.44 U	< 0.44 U
2-Butanone	**40**	**9.1**	**6.2**	**2.5**
4-Methyl-2-Pentanone	< 0.82 U	< 0.82 U	< 0.82 U	< 0.82 U
Acetone	**1060 D**	**87**	**107**	**51**
Bromodichloromethane	< 0.67 U	< 0.67 U	< 0.67 U	< 0.67 U
Bromoform	< 0.41 U	< 0.41 U	< 0.41 U	< 0.41 U
Bromomethane	< 0.78 U	< 0.78 U	< 0.78 U	< 0.78 U
Carbon Disulfide	< 0.62 U	< 0.62 U	< 0.62 U	< 0.62 U
Carbon Tetrachloride	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U
Chlorobenzene	< 0.92 U	< 0.92 U	< 0.92 U	< 0.92 U
Chlorodibromomethane	< 0.85 U	< 0.85 U	< 0.85 U	< 0.85 U
Chlorodifluoromethane (Freon 22)	**52**	**46**	**23**	**40**
Chloroethane	< 0.53 U	< 0.53 U	< 0.53 U	< 0.53 U
Chloroform	**6.8**	**42**	**32**	**40**
Chloromethane	**5.8**	**10**	**2.9**	**6.0**
cis-1,3-Dichloropropene	< 0.91 U	< 0.91 U	< 0.91 U	< 0.91 U
Dichlorodifluoromethane (Freon 12)	**2.6**	**2.8**	**2.6**	**2.6**
Dichloromethane	< 0.69 U	**1.4**	**9.0**	**0.73**
Ethylbenzene	**0.83 J**	**1.4**	**0.56 J**	< 0.87 U
Methyl N-Butyl Ketone	**2.2**	< 0.82 U	< 0.82 U	< 0.82 U
Methyl-Tert-Butylether	< 0.72 U	< 0.72 U	< 0.72 U	< 0.72 U
Styrene (Monomer)	< 0.85 U	< 0.85 U	< 0.85 U	< 0.85 U
trans-1,3-Dichloropropene	< 0.91 U	< 0.91 U	< 0.91 U	< 0.91 U
Trichlorofluoromethane (Freon 11)	**1.9**	**1.9**	**2.9**	**1.7**
Trichlorotrifluoroethane (Freon 113)	< 0.77 U	< 0.77 U	< 0.77 U	**0.74 J**
1-Chloro-1,1-difluoroethane (Freon 142b)	< 0.82 U	< 0.82 U	< 0.82 U	< 0.82 U
Subtotal Non-Project VOCs	**1172**	**201**	**186**	**146**
Total VOCs [3]	**1232**	**255**	**218**	**181**

Notes and abbreviations on last page.

Table 5
Effluent Vapor Sample Analytical Results,
Bethpage Park Groundwater Containment System,
Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York. [(1)]

Notes and Abbreviations:

(1) Vapor samples collected by Arcadis on the dates shown and submitted to a NYSDOH ELAP certified laboratory for VOC analyses per Modified USEPA Method TO-15. A VOC analyte list is provided in the Groundwater IRM OM&M Manual (Arcadis 2009). Effluent samples were collected at Vapor Sampling Port-5 (VSP-5); refer to Figure 3 of this OM&M Report for the location of VSP-5.

(2) First Quarter samples were collected on April 1, 2016 due to RW-2 downtime in March.

(3) "Total VOCs" represents the sum of individual concentrations of all compounds detected. The values used in calculations referenced in this report have been rounded to the nearest whole number.

700	Bold data indicates that the analyte was detected at or above its reporting limit.
< 5 U	Compound not detected above its laboratory quantification limit.
ELAP	Environmental Laboratory Approval Program
J	Compound detected below its reporting limit; value is estimated.
IRM	interim remedial measure
NYSDOH	New York State Department of Health
OM&M	operation, maintenance, and monitoring
USEPA	United States Environmental Protection Agency
VOC	volatile organic compound
$\mu g/m^3$	micrograms per cubic meter

Table 6
Effluent Vapor Tentatively Identified Compounds,
Bethpage Park Groundwater Containment System, Operable Unit 3
(Former Grumman Settling Ponds), Bethpage, New York. [1]

Compound	11/23/15 (ppbv)	4/1/2016 [2] (ppbv)	06/10/16 (ppbv)	08/23/16 (ppbv)
Tentatively Identified Compounds				
2,6-Dimethylundecane	**30 JN**	--	--	--
2-butyl-1,1,3-trimethyl-cyclohexane	**9.9 JN**	--	--	--
2-Methylundecane	**43 JN**	--	--	--
2-Phenyl-2-propanol	--	--	**2.2 JN**	--
3-Methylundecane	**36 JN**	--	--	--
4-Methylundecane	**31 JN**	--	--	--
Acetaldehyde	--	--	**15 JN**	--
Acetophenone	**22 JN**	--	**6.8 JN**	--
alkane	**51 JN**	**6.4 J**	**6.7 J**	**3.1 J**
alkane	**28 JN**	**6.3 J**	**2.0 J**	**2.9 J**
alkane	**24 JN**	**5.4 J**	**1.8 J**	**2.3 J**
alkane	**17 JN**	**4.5 J**	**1.4 J**	**2.1 J**
alkane	**17 JN**	**3.7 J**	--	**1.9 J**
alkane	**16 JN**	**3.3 J**	--	**1.8 J**
alkane	**14 JN**	**3.2 J**	--	**1.4 J**
alkane	--	**3.1 J**	--	--
alkene	**11 JN**	--	--	--
cycloalkane/alkene	--	--	**1.5 J**	**2.6 J**
Ethylene Oxide	--	--	**190 JNB**	--
Methylcyclohexane	--	**3.0 JN**	--	--
Methylcyclopentane	--	**4.9 JN**	--	--
Naphthalene decahydro-methyl	--	--	--	**3.5 J**
Naphthalene decahydro-methyl- isomer	--	**5.5 J**	--	--
N-Undecane	**36 JN**	**4.3 JN**	--	--
Pentane	--	**3.1 JN**	--	--
Pentyl-Cyclohexane	--	**4.7 JN**	--	--
Unknown	**21 JN**	**5.8 J**	**1.9 J**	--
Unknown	**9.4 JN**	**4.5 J**	--	--
Unknown	--	**3.6 J**	--	--
Unknown	--	**2.9 J**	--	--
UNKNOWN VOA ALKENE1	**29 JN**	--	--	--
UNKNOWN VOA ALKENE2	**22 JN**	--	--	--
UNKNOWN VOA ALKENE3	**18 JN**	--	--	--
Total VOC TICs	**485**	**78**	**39**	**22**

Notes and abbreviations on last page.

Table 6
Effluent Vapor Tentatively Identified Compounds,
Bethpage Park Groundwater Containment System, Operable Unit 3
(Former Grumman Settling Ponds), Bethpage, New York. [(1)]

Notes and Abbreviations:

(1) Vapor samples collected by Arcadis on the dates shown and submitted to a NYSDOH ELAP certified laboratory for VOC analyses per Modified USEPA Method TO-15. A VOC analyte list is provided in the DRAFT Groundwater IRM OM&M Manual (Arcadis 2009). Effluent samples were collected at Vapor Sampling Port-5 (VSP-5); refer to Figure 3 of this OM&M Report for the location of VSP-5.

(2) First Quarter samples were collected on April 1, 2016 due to RW-2 downtime in March.

700 Bold data indicates that the analyte was detected at or above its reporting limit.
ELAP Environmental Laboratory Approval Program
J Compound detected below its reporting limit; value is estimated.
B Compound was also detected in the associated field blank.
IRM interim remedial measure
N Indicates presumptive evidence of a compound.
NYSDOH New York State Department of Health
OM&M operation, maintenance, and monitoring
USEPA United States Environmental Protection Agency
VOC volatile organic compound
ppbv parts per billion by volume

Table 7
System Parameters,
Bethpage Park Groundwater Containment System,
Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York.

Date [1]	Water Flow Rates						Water Pressures [2]					Air Flow Rate [2]	Air Pressures [5]					Air Temp. [5]
	Remedial Well [2]				Combined Influent [3]	Effluent [2]	Remedial Well Effluent [4]				Effluent	Effluent	ECU Influents				Effluent	Effluent
	RW-1	RW-2	RW-3	RW-4			RW-1	RW-2	RW-3	RW-4			GAC-501	GAC-502	PPZ-601	PPZ-602		
	(gpm)	(gpm)	(gpm)	(gpm)	(gpm)	(gpm)	(psi)	(psi)	(psi)	(psi)	(psi)	(scfm)	(iwc)	(iwc)	(iwc)	(iwc)	(iwc)	(^{o}R)
10/13/15	29.7	75.1	74.9	29.9	210	212	57	13	30	56	20	1,778	6.5[6]	2.6[6]	0.6[6]	2.0[6]	0.0[6]	540[6]
11/23/15	30.4	78.0	75.2	30.2	214	214	56	12	30	55	14	1,919	6.7	3.0	1.8	1.6	0.0	532
12/22/15	30.4	74.5	75.7	30.6	211	207	56	10	25	55	18	1,912	7.0[7]	3.3[7]	0.5[7]	2.3[7]	0.0[7]	534[7]
02/01/16	30.2	75.6	74.8	30.0	211	214	56	33	24	55	17	1,880	6.9[8]	3.2[8]	2.1[8]	2.5[8]	0.0[8]	535[8]
02/23/16	30.5	74.9	75.7	29.6	211	216	56	32	18	56	11	1,961	6.9[9]	3.2[9]	2.0[9]	2.0[9]	0.0[9]	526[9]
04/01/16	30.8	78.4	75.2	30.0	214	227	56	23	17	55	13	1,891	6.5[10]	3.0[10]	1.0[10]	2.0[10]	0.0[10]	528[10]
04/18/16	30.9	75.8	75.7	29.9	212	216	55	30	14	55	11	1,814	5.8	3.4	0.5	2.0	0.0	532
05/18/16	29.9	75.4	75.7	30.2	211	224	56	22	20	55	12	1,973	6.5[11]	3.4[11]	1.0[11]	2.0[11]	2.0[11]	532[11]
06/10/16	30.2	73.7	75.2	30.3	209	211	56	11	22	54	11	1,827	7.0[12]	3.5[12]	1.0[12]	2.2[12]	0.0[12]	537[12]
07/14/16	30.3	75.1	75.0	30.8	211	222	55	13	25	54	12	1,816	6.9[13]	3.4[13]	1.0[13]	2.0[13]	0.0[13]	538[13]
08/23/16	30.1	62.7	75.3	29.8	198	203	55	6	21	54	12	1,840	6.5[14]	3.2[14]	1.0[14]	2.0[14]	0.0[14]	540[14]
09/14/16	30.7	74.7	75.1	30.8	211	221	54	6	19	53	11	1,738	6.0[15]	3.0[15]	1.0[15]	2.0[15]	0.0[15]	539[15]

Notes and abbreviations on last page.

Table 7
System Parameters,
Bethpage Park Groundwater Containment System,
Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York.

Notes and Abbreviations:

(1) Operational data collected by Arcadis on days noted. Parameters listed were typically recorded during compliance monitoring events. Data in this table correspond to approximately the past year of system operation.
(2) Instantaneous parameters obtained from the SCADA HMI: Water Flow Rate, Water Pressure, Air Flow Rate.
(3) Combined influent water-flow rate is the sum of individual well flow rates via the SCADA System.
(4) Remedial Well effluent pressure readings measured at the influent manifold within the treatment system building.
(5) Instantaneous values from field-mounted instruments
(6) Values collected on October 12, 2015 during the weekly site visit. No values collected on day of sampling.
(7) Values collected on December 23, 2015 during the weekly site visit. No values collected on day of sampling.
(8) Values collected on February 2, 2016 during the weekly site visit. No values collected on day of sampling.
(9) Values collected on February 22, 2016 during the weekly site visit. No values collected on day of sampling.
(10) Values collected on April 5, 2016 during the weekly site visit. No values collected on day of sampling.
(11) Values collected on May 16, 2016 during the weekly site visit. No values collected on day of sampling.
(12) Values collected on June 6, 2016 during the weekly site visit. No values collected on day of sampling.
(13) Values collected on July 11, 2016 during the weekly site visit. No values collected on day of sampling.
(14) Values collected on August 22, 2016 during the weekly site visit. No values collected on day of sampling.
(15) Values collected on September 13, 2016 during the weekly site visit. No values collected on day of sampling.

ECU emission control unit
gpm gallons per minute
HMI human-machine interface
iwc inches of water column
psi pounds per square inch
^{o}R degrees Rankine
SCADA Supervisory Control and Data Acquisition
scfm standard cubic feet per minute
Temp. temperature

Table 8
Groundwater Recovered, VOC Mass Recovered, and VOC Mass Recovery Rates
Bethpage Park Groundwater Containment System, Operable Unit 3
(Former Grumman Settling Ponds) Bethpage, New York.

Operating Period [1]	Volume of Groundwater Recovered (x1,000 gal) [2]					VOC Mass Recovered (lbs) [3]																VOC Mass Recovery Rate (lbs/day) [4]															
						Total VOCs [5]					Project VOCs [6]					Non-Project VOCs [7]					Total VOCs [5]					Project VOCs [6]					Non-Project VOCs [7]				
	RW-1	RW-2	RW-3	RW-4	Total	RW-1	RW-2	RW-3	RW-4	Total	RW-1	RW-2	RW-3	RW-4	Total	RW-1	RW-2	RW-3	RW-4	Total	RW-1	RW-2	RW-3	RW-4	Total	RW-1	RW-2	RW-3	RW-4	Total	RW-1	RW-2	RW-3	RW-4	Total
System Pilot Test, Shakedown and Startup Totals [8]	137	270	251	150	808	NA	NA	NA	NA	1.1	NA	NA	NA	NA	1.0	NA	NA	NA	NA	0.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2009 Totals	6,592	13,838	16,445	6,574	43,449	0.17	275	53	14	342	0.17	273	19	0.20	293	<0.01	0.56	35	13	48	<0.01	1.7	0.33	0.086	2.1	<0.01	1.7	0.12	<0.01	1.8	<0.01	<0.01	0.22	0.080	0.30
2010 Totals	15,726	35,127	38,160	15,689	104,702	0.56	172	412	89	672	0.56	171	28	0.10	200	<0.01	0.17	383	89	469	<0.01	0.46	1.1	0.24	1.8	<0.01	0.46	0.075	<0.01	0.54	<0.01	<0.01	1.0	0.24	1.3
2011 Totals	15,218	36,570	37,682	15,196	104,666	0.36	167	271	78	516	0.36	167	35	0.090	203	<0.01	1.1	236	78	314	<0.01	0.45	0.73	0.21	1.4	<0.01	0.45	0.095	<0.01	0.55	<0.01	<0.01	0.64	0.21	0.85
2012 Totals	15,260	35,178	36,111	15,336	101,885	0.28	114	113	40	267	0.25	113	12	0.39	126	<0.01	1.5	101	40	141	<0.01	0.31	0.31	0.11	0.73	<0.01	0.31	0.032	<0.01	0.35	<0.01	<0.01	0.28	0.11	0.39
2013 Totals	15,968	37,514	36,622	16,036	106,140	0.14	111	41	18	171	0.14	110	4.3	0.36	113	<0.01	1.6	37	18	57	<0.01	0.30	0.11	0.050	0.47	<0.01	0.30	0.012	<0.01	0.31	<0.01	<0.01	0.10	0.049	0.16
2014 Totals	15,690	33,222	31,199	15,691	95,802	0.063	67	9.9	8.1	85	0.063	65	2.0	0.20	67	<0.01	1.5	8.1	7.9	17	<0.01	0.19	0.028	0.023	0.24	<0.01	0.18	<0.01	<0.01	0.19	<0.01	<0.01	0.023	0.022	0.047
2015 Totals	15,859	38,082	34,961	14,755	103,657	0.028	47	7.1	4.5	57	0.021	45	1.5	0.20	45	<0.01	1.7	5.6	4.2	12	<0.01	0.13	0.019	0.012	0.16	<0.01	0.12	<0.01	<0.01	0.12	<0.01	<0.01	0.015	0.012	0.032
January 2016 through March 2016 Totals																																				
01/01/16 - 02/01/16	1,360	1,122	3,202	1,360	7,044	<0.01	1.8	0.34	0.21	2.3	<0.01	1.7	0.13	0.019	1.8	<0.01	0.065	0.21	0.19	0.47	<0.01	0.056	0.011	<0.01	0.074	<0.01	0.055	<0.01	<0.01	0.060	<0.01	<0.01	<0.01	<0.01	0.015
02/01/16 - 03/01/16	1,247	3,118	3,118	1,247	8,730	<0.01	4.9	0.33	0.19	5.4	<0.01	4.7	0.12	0.017	4.8	<0.01	0.18	0.21	0.18	0.57	<0.01	0.17	0.011	<0.01	0.19	<0.01	0.16	<0.01	<0.01	0.17	<0.01	<0.01	<0.01	<0.01	0.020
03/01/16 - 04/01/16	1,348	2,391	3,370	1,348	8,457	<0.01	3.7	0.36	0.21	4.3	<0.01	3.6	0.13	0.018	3.7	<0.01	0.14	0.22	0.19	0.55	<0.01	0.12	0.012	<0.01	0.14	<0.01	0.12	<0.01	<0.01	0.12	<0.01	<0.01	<0.01	<0.01	0.018
Subtotal Jan - Mar 2016 [9]	3,955	6,631	9,690	3,955	24,231	<0.01	10	1.0	0.61	12	<0.01	10	0.38	0.054	10	<0.01	0.39	0.64	0.56	1.6	<0.01	0.11	0.011	<0.01	0.13	<0.01	0.11	<0.01	<0.01	0.11	<0.01	<0.01	<0.01	<0.01	0.018
April 2016 through June 2016 Totals																																				
04/01/16 - 05/01/16	1,368	3,421	3,421	1,368	9,578	<0.01	4.1	0.19	0.20	4.5	<0.01	3.9	0.12	0.016	4.1	<0.01	0.16	0.070	0.19	0.42	<0.01	0.14	<0.01	<0.01	0.15	<0.01	0.13	<0.01	<0.01	0.14	<0.01	<0.01	<0.01	<0.01	0.014
05/01/16 - 06/01/16	1,379	3,361	3,437	1,379	9,556	<0.01	4.0	0.19	0.21	4.4	<0.01	3.8	0.12	0.016	4.0	<0.01	0.15	0.070	0.19	0.41	<0.01	0.13	<0.01	<0.01	0.14	<0.01	0.12	<0.01	<0.01	0.13	<0.01	<0.01	<0.01	<0.01	0.013
06/01/16 - 07/01/16	1,373	3,024	3,431	1,373	9,201	<0.01	3.6	0.19	0.20	4.0	<0.01	3.5	0.12	0.016	3.6	<0.01	0.14	0.070	0.19	0.40	<0.01	0.12	<0.01	<0.01	0.13	<0.01	0.12	<0.01	<0.01	0.12	<0.01	<0.01	<0.01	<0.01	0.013
Subtotal Apr - Jun 2016 [10]	4,120	9,806	10,289	4,120	28,335	<0.01	12	0.60	0.61	13	<0.01	11	0.36	0.048	12	<0.01	0.45	0.21	0.57	1.2	<0.01	0.13	<0.01	<0.01	0.14	<0.01	0.12	<0.01	<0.01	0.13	<0.01	<0.01	<0.01	<0.01	0.013
July 2016 through September 2016 Totals																																				
07/01/16 - 08/01/16	1,343	3,358	3,358	1,343	9,402	<0.01	3.5	0.27	0.18	3.9	<0.01	3.3	0.10	0.017	3.5	<0.01	0.13	0.17	0.16	0.46	<0.01	0.11	<0.01	<0.01	0.13	<0.01	0.11	<0.01	<0.01	0.11	<0.01	<0.01	<0.01	<0.01	0.015
08/01/16 - 09/01/16	1,426	3,066	3,566	1,427	9,485	<0.01	3.2	0.29	0.19	3.6	<0.01	3.0	0.11	0.018	3.2	<0.01	0.12	0.18	0.17	0.47	<0.01	0.10	<0.01	<0.01	0.12	<0.01	0.098	<0.01	<0.01	0.10	<0.01	<0.01	<0.01	<0.01	0.015
09/01/16 - 10/01/16	1,343	2,857	3,358	1,343	8,901	<0.01	2.9	0.27	0.18	3.4	<0.01	2.8	0.10	0.017	3.0	<0.01	0.11	0.17	0.16	0.44	<0.01	0.10	<0.01	<0.01	0.11	<0.01	0.094	<0.01	<0.01	0.10	<0.01	<0.01	<0.01	<0.01	0.015
Subtotal Jul - Sept 2016 [11]	4,112	9,281	10,282	4,113	27,788	<0.01	10	0.83	0.54	11	<0.01	9.2	0.31	0.052	10	<0.01	0.36	0.52	0.48	1.4	<0.01	0.10	<0.01	<0.01	0.12	<0.01	0.10	<0.01	<0.01	0.10	<0.01	<0.01	<0.01	<0.01	0.015
2016 Totals	12,187	25,718	30,261	12,188	80,354	<0.01	32	2.4	1.8	36	<0.01	30	1.1	0.15	32	<0.01	1.2	1.4	1.6	4.2	<0.01	0.34	0.011	<0.01	0.39	<0.01	0.33	<0.01	<0.01	0.34	<0.01	<0.01	<0.01	<0.01	0.046
Total [12]	112,637	255,519	261,692	111,615	741,463	2.0	983	910	253	2,147	2.0	974	102	2.0	1,080	<0.01	9.0	807	252	1,062	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Notes and Abbreviations:

(1) Represents operating period between consecutive monitoring events.

(2) Volume of groundwater recovered is based on individual local well totalized flow readings. Listed value is the difference between totalized flow values recorded between consecutive monitoring events. The total groundwater recovered during a given operating period is the sum of the individual well flow totals. Values shown are rounded to the nearest gallon, but should only be considered accurate to two significant figures to account for error associated with field measurements.

(3) Mass recovered per well was calculated by multiplying the Total VOC concentration from the most recent sampling event by the number of gallons extracted during the reporting period. The total amount recovered during a given operating period is the sum of masses recovered from each of the individual wells. Values less than ten pounds are presented using two significant figures and values greater than ten pounds have been rounded to the nearest whole number; however, these values should only be considered accurate to two significant figures to account for error associated with field measurements and analytical data.

(4) Mass recovery rates were calculated by dividing the total mass recovered for each well and for the system by the number of days in the respective operating period. Values are presented using two significant figures.

(5) "Total VOCs" represents the sum of individual concentrations of the VOCs detected.

(6) "Project VOCs" represents the sum of individual compound concentrations of 1,1,1-trichloroethane; 1,1-dichloroethane; 1,2-dichloroethane; 1,1-dichloroethene; tetrachloroethene; trichloroethelyene; vinyl chloride; cis-1,2-dichloroethene; trans-1,2-dichloroethene; benzene; toluene; and xylenes-o,m, p.

(7) "Non-Project VOCs" represents the difference between Total VOCs and Project VOCs.

(8) Values based on operational data recorded prior to system startup on July 21, 2009.

(9) The volume of groundwater recovered and mass recovered calculations represent the operational period between January 1, 2016 and April 1, 2016.

(10) The volume of groundwater recovered and mass recovered calculations represent the operational period between April 1, 2016 and July 1, 2016.

(11) The volume of groundwater recovered and mass recovered calculations represent the operational period between July 1, 2016 and October 1, 2016.

(12) "Total" refers to the amounts removed by the Operable Unit 3 Bethpage Park Groundwater Containment System.

gal gallons
HMI human-machine interface
lbs pounds
lbs/day pounds per day
-- not applicable

Table 9
Air Quality Impact Analysis
Bethpage Park Groundwater Containment System
Operable Unit 3, Bethpage, New York.

Toxic Air Contaminant	CAS#	VSP-05 Vapor Effluent (ug/m3)	Emission Rate[1]			Scaled Impact - Hourly [2] (ug/m^3)	Scaled Impact - Annual [2] (ug/m^3)	SGC [3] (ug/m^3)	AGC[3] (ug/m^3)	Modeled Impacts < SGC and AGC (Yes/No)
		8/23/2016	lb/yr	lb/hr	g/s					
1,1 - Dichloroethane	00075-34-3	6.1	0.37	4.19E-05	5.30E-06	1.67E-02	5.11E-04	--	6.30E-01	Yes
1,1 - Dichloroethene	00075-35-4	0.63	0.04	4.33E-06	5.47E-07	1.72E-03	5.28E-05	--	200	Yes
Tetrachloroethene	00127-18-4	0.29	0.02	1.99E-06	2.52E-07	7.94E-04	2.43E-05	300	4	Yes
Trichloroethene	00079-01-6	1.1	0.07	7.56E-06	9.55E-07	3.01E-03	9.21E-05	20	2.00E-01	Yes
Vinyl Chloride	00075-01-4	3.6	0.22	2.48E-05	3.13E-06	9.85E-03	3.02E-04	180000	1.1E-01	Yes
cis 1,2-Dichloroethene	00156-59-2	11	0.66	7.56E-05	9.55E-06	3.01E-02	9.21E-04	--	63	Yes
Benzene	00071-43-2	3.2	0.19	2.20E-05	2.78E-06	8.76E-03	2.68E-04	1300	1.30E-01	Yes
Toluene	00108-88-3	8.7	0.52	5.98E-05	7.55E-06	2.38E-02	7.29E-04	37000	5000	Yes
Xylenes - M,P	01330-20-7	0.52	0.03	3.58E-06	4.51E-07	1.42E-03	4.36E-05	22000	100	Yes
2-Butanone	00078-93-3	2.5	0.15	1.72E-05	2.17E-06	6.84E-03	2.09E-04	13000	5000	Yes
Acetone	00067-64-1	51	3.09	3.53E-04	4.45E-05	1.40E-01	4.30E-03	180000	30000	Yes
Chlorodifluoromethane (Freon 22)	00075-45-6	40	2.42	2.76E-04	3.48E-05	1.10E-01	3.36E-03	--	50000	Yes
Chloroform	00067-66-3	40	2.41	2.75E-04	3.47E-05	1.09E-01	3.35E-03	150	14.7	Yes
Chloromethane	00074-87-3	6.0	0.36	4.13E-05	5.21E-06	1.64E-02	5.03E-04	22000	90	Yes
Dichlorodifluoromethane (Freon 12)	00075-71-8	2.6	0.16	1.79E-05	2.26E-06	7.12E-03	2.18E-04	--	12000	Yes
Dichloromethane	00075-09-2	0.73	0.04	5.02E-06	6.34E-07	2.00E-03	6.11E-05	14000	60	Yes
Trichlorofluoromethane (Freon 11)	00075-69-4	1.7	0.10	1.17E-05	1.48E-06	4.65E-03	1.42E-04	9000	5000	Yes
Trichlorotrifluoroethane (Freon 113)	00076-13-1	0.74	0.04	5.09E-06	6.42E-07	2.03E-03	6.20E-05	960000	180000	Yes

Notes

(1) Emission rate calculated based on VSP-01 influent concentration and an exit air flow rate of 1,823 cfm

1,1,1-Trichloroethane (lb/hr) = (0.87 ug/m^3) x (1,823 ft^3/min) x (1 m^3/35 ft^3) x (60 min/hr) x (0.000001 g/1 ug) x (0.0022 lb/g)

lb/yr = lb/hr x 8,760 hrs/yr

g/s = lb/hr x 3,600 sec/hr x 1 lb/453.59 g

(2) Ambient impact based on AERMOD modeling using noramalized rate of 1 g/s is scaled to the actual emission rate of the pollutant. Modeling was performed using the representative meteorological data from the nearest station (Farmingdale) for the years 2011 through 2015. The maximum impact from all the years was used for the calculations.

Scaled hourly impact (ug/m^3) = AERMOD predicted hourly ambient impact at 1 g/s ($[ug/m^3]/[g/s]$) x Actual emission rate (g/s)

Scaled annual impact (ug/m^3) = AERMOD predicted annual ambient impact at 1 g/s ($[ug/m^3]/[g/s]$) x Actual emission rate (g/s)

AERMOD Normalized Ambient Impact at 1 g/s	
Hourly ($[ug/m^3]/[g/s]$)	Annual ($[ug/m^3]/[g/s]$)
3,153.03	96.49

(3) Short-term and annual guideline concentrations specified in the NYSDEC DAR-1 AGC/SGC tables revised August 10, 2016.

Table 10
Concentrations of Volatile Organic Compounds in Groundwater
Samples Collected from Remedial Wells,
Bethpage Park Groundwater Containment System, Operable Unit 3, (Former Grumman Settling Ponds)
Bethpage, New York.

COMPOUND (µg/L)	NYSDEC SCGs	Sample Location: Sample Date:	RW-1 11/23/2015	RW-1 4/1/2016	RW-1 6/10/2016	RW-1 8/23/2016	RW-2 11/23/2015	RW-2 4/1/2016	RW-2 6/10/2016	RW-2 8/23/2016	RW-3 11/23/2015	RW-3 4/1/2016	RW-3 6/10/2016	RW-3 8/23/2016	RW-4 11/23/2015	RW-4 4/1/2016	RW-4 6/10/2016	RW-4 8/23/2016
1,1,1-Trichloroethane	5		< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1,2,2-Tetrachloroethane	5		< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1,2-Trichloroethane	1		< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1-Dichloroethane	5		< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.84 J**	**1.3**	**1.1**	**0.86 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.30 J**	**0.28 J**	**0.30 J**	**0.28 J**
1,1-Dichloroethene	5		< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.35 J**	**0.23 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2-Dichloroethane	0.6		< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2-Dichloropropane	1		< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
2-Butanone	NE		< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U
4-methyl-2-pentanone	50		< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
Acetone	NE		< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U
Benzene	1		< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
Bromodichloromethane	50		< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Bromoform	50		< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Bromomethane	5		< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
Carbon Disulfide	60		< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
Carbon tetrachloride	5		< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Chlorobenzene	5		< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Chlorodibromomethane	50		< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Chlorodifluoromethane (Freon 22)	NE		< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	**7.1**	**4.9 J**	< 5.0 U	**4.0 J**	**25**	**17**	**17**	**14**
Chloroethane	5		< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Chloroform	7		< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**3.1**	**4.2**	**3.2**	**2.9**	**5.2**	**3.1**	**2.5**	**2.1**	**0.28 J**	**0.26 J**	< 1.0 U	**0.28 J**
Chloromethane	5		< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
cis-1,2-dichloroethene	5		< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**59**	**53**	**40**	**35**	**1.8**	**2.2**	**1.8**	**1.5**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
cis-1,3-dichloropropene	0.4		< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Dichlorodifluoromethane (Freon 12)	5		< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
Dichloromethane	5		< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
Ethylbenzene	5		< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**1.9**	**2.8**	**2.3**	**1.7**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Methyl N-Butyl Ketone	50		< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
Methyl tert-Butyl Ether	5		< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Styrene	5		< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Tetrachloroethene	5		< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.25 J**	**0.26 J**	**0.62 J**	**0.64 J**	**0.49 J**	**0.65 J**
Toluene	5		< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**28**	**28**	**22**	**20**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
trans-1,2-dichloroethene	5		< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.44 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
trans-1,3-dichloropropene	0.4		< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Trichloroethylene	5		< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**9.9**	**8.6**	**11**	**11**	**2.2**	**2.6**	**2.2**	**1.9**	**0.61 J**	**0.72 J**	**0.57 J**	**0.59 J**
Trichlorofluoromethane (Freon 11)	5		< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
Trichlorotrifluoroethane (Freon 113)	5		< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
Vinyl Chloride	2		< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**50**	**87**	**59**	**50**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Xylene-o	5		< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.95 J**	**1.5**	**1.1**	**0.93 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Xylenes - m,p	5		< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**1.8**	**1.9**	**1.9**	**1.5**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Total VOCs [2]			**0**	**0**	**0**	**0**	**155**	**187**	**143**	**123**	**16**	**13**	**6.8**	**9.8**	**27**	**19**	**18**	**16**
Project VOCs [3]			**0**	**0**	**0**	**0**	**150**	**180**	**137**	**119**	**4.0**	**4.8**	**4.3**	**3.7**	**1.5**	**1.6**	**1.4**	**1.5**
1,4-Dioxane			**0.21 J**	**0.44**	**0.35**	**0.30**	**0.54**	**1.5**	**1.2**	**1.1**	**0.12 J**	**0.31**	**0.22**	**0.18**	**0.22**	< 0.11 U	< 0.11 U	< 0.10 U

Notes and abbreviations on last page.

Table 10
Concentrations of Volatile Organic Compounds in Groundwater
Samples Collected from Remedial Wells,
Bethpage Park Groundwater Containment System, Operable Unit 3, (Former Grumman Settling Ponds)
Bethpage, New York.

Notes and Abbreviations:

(1) Water samples collected by Arcadis on the dates shown and submitted to a NYSDOH ELAP certified laboratory for VOC analyses per NYSDEC ASP 2005, Method OLM 4.3 (prior to September 1, 2014) and per USEPA Method 8260C (after September 1, 2014). Results validated following protocols specified in Sampling and Analysis Plan in the December 2009 OM&M Manual (ARCADIS 2009). See previous quarterly reports for historical analytical results.

(2) "Total VOCs" represents the sum of individual concentrations of the VOCs detected.

(3) "Project VOCs" represents the sum of individual compound concentrations of 1,1,1-trichloroethane; 1,1-dichloroethane; 1,2-dichloroethane; 1,1-dichloroethene; tetrachloroethene; trichloroethene; vinyl chloride; cis-1,2-dichloroethene; trans-1,2-dichloroethene; benzene; toluene; and xylenes-o,m, and p.

	Indicates an exceedance of an SCG.
700	Bold data indicates a detection.
ASP	analytical services protocol
ELAP	Environmental Laboratory Approval Program
NYSDEC	New York State Department of Environmental Conservation.
NYSDOH	New York State Department of Health
SCGs	standards, criteria, and guidance values
VOC	volatile organic compound
µg/L	micrograms per liter
--	not analyzed
NE	not established
J	Compound detected below its reporting limit; value is estimated.
< 5; <5 U	Compound not detected above its laboratory quantification limit.

Table 11
Water-Level Elevations,
Bethpage Park Groundwater Containment System,
Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York.

Well Identification	Well Casing Elevation (ft msl)	Event Date	Baseline (1) 5/8/2009 (ft msl)	1Q2010 02/04/10 (ft msl)	2Q2010 04/23/10 (ft msl)	3Q2010 08/26/10 (ft msl)	4Q2010 12/10/10 (ft msl)	1Q2011 02/04/11 (ft msl)	2Q2011 05/20/11 (ft msl)	3Q2011 08/09/11 (ft msl)	4Q2011 10/26/11 (ft msl)	1Q2012 01/25/12 (ft msl)	2Q2012 05/02/12 (ft msl)	3Q2012 08/17/12 (ft msl)	4Q2012 10/05/12 (ft msl)	1Q2013 02/13/13 (ft msl)	2Q2013 05/13/13 (ft msl)
Recovery Wells																	
RW-1	125.18		69.75	70.67	74.38	72.52	71.11	70.96	72.13	70.44	72.72	73.15	72.12	71.71	71.21	70.35	70.89
RW-2	124.48		72.27	61.80	64.88	63.44	61.35	67.99	66.31	64.18	65.11	69.05	69.81	65.3	63.7	62.66	63.33
RW-3	122.84		69.40	67.64	71.4	69.44[4]	68.13	67.74	68.88	67.64	69.70	70.75	71.74	74.35[2]	68.06	68.01	68.73
RW-4	121.24		69.25	70.34	74.01	71.92	70.55	67.05	71.36	69.94	72.12	72.7	71.6	70.88	70.66	69.69	70.36
Monitoring Wells																	
B24MW-2	126.96		74.31	74.13	76.16	75.86	75.65	74.96	76.06	74.35	76.00	76.28	75.57	75.76	74.63	74.85	74.32
B24MW-3	127.11		72.63	72.16	75.87	74.10	72.89	72.40	74.04	72.27	74.44	74.63	73.67	73.62	72.69	72.2	72.41
B30MW-1	128.33		73.55	73.00	76.54	74.96	73.86	73.38	74.75	73.25	75.41	75.54	74.66	NM	73.66	73.11	73.28
BCPMW-1	125.73		73.16	72.67	76.26	74.66	73.43	72.94	74.75	72.94	75.05	75.23	74.29	74.22	73.27	NM	73.09
BCPMW-2	126.39		72.55	71.83	75.52	73.69	72.55	72.03	73.64	71.94	74.16	74.33	73.29	73.17	72.39	71.82	72.09
BCPMW-3	124.94		72.46	71.59	75.24	73.40	72.27	71.74	73.25	71.64	73.94	74.05	73.06	72.85	72.14	71.56	71.79
BCPMW-4-1	128.71		72.30	71.28	75	73.08	71.97	71.51	73.03	71.41	73.65	73.73	72.76	72.54	71.84	71.36	71.51
BCPMW-4-2	129.33		72.58	71.54	75.25	73.34	72.26	71.74	73.24	71.69	73.92	74.01	73.01	72.79	72.1	71.6	71.76
BCPMW-4-3	129.20		72.32	71.47	75.17	73.27	72.15	71.74	73.20	71.56	73.85	73.97	72.95	72.72	71.98	71.54	71.68
BCPMW-5-1	129.37		72.79	72.14	75.66	73.94	72.72	72.74	73.81	72.14	74.46	74.77	73.67	73.34	72.62	72.06	72.19
BCPMW-6-1	126.01		72.12	71.26	74.91	72.96	71.91	71.49	72.77	71.45	73.58	73.67	72.66	72.32	71.73	71.12	71.32
BCPMW-6-2	125.16		71.74	70.96	74.64	72.60	71.59	71.17	72.49	71.01	73.26	73.37	72.30	71.97	71.39	70.84	71.01
BCPMW-7-1	124.81		72.00	71.33	74.99	72.99	71.97	71.51	72.78	71.53	73.62	73.71	72.71	72.31	71.77	71.2	71.33
MW-200-1	123.49		72.16	71.37	75.07	73.14	72.08	71.72	72.98	71.52	73.69	73.83	72.76	72.59	71.91	71.34	71.53
MW-201-1	121.69		72.04	71.10	74.84	72.87	71.79	71.33	72.69	71.25	73.48	73.55	72.53	72.28	71.65	71.09	71.28
MW-202-1	119.27		71.90	71.13	74.83	72.82	71.77	71.32	72.66	71.21	73.46	73.57	73.51	72.23	71.6	70.98	71.23
MW-203-1	118.25		71.83	71.10	74.75	72.77	71.75	71.30	72.61	70.20	73.43	73.52	72.49	72.13	71.56	71.02	71.17
MW-204-1[5]	124.95		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-205-1[5]	123.47		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-206-1[5]	120.80		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-207-1a[5]	120.38		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-207-1b[5]	120.48		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-208-1[5]	118.56		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Piezometers																	
PZ-1a	128.82		72.56	71.15	74.87	72.94	71.85	71.33	72.76	71.31	73.54	73.62	72.63	72.42	71.72	71.23	71.39
PZ-1b	128.92		72.47	71.09	74.78	72.88	71.82	71.28	72.70	71.24	73.47	73.55	72.56	72.36	71.64	71.16	71.35
PZ-1c	128.96		72.47	71.48	75.15	73.23	72.13	71.74	73.16	71.56	73.83	73.9	72.90	72.68	71.94	71.46	71.63
PZ-2a	128.36		72.47	71.09	74.82	72.87	71.81	71.34	72.74	71.30	73.45	73.57	72.57	72.32	71.64	71.14	71.32
PZ-2b	128.37		72.43	71.08	74.77	72.86	71.78	71.30	72.68	71.27	73.45	73.55	72.54	72.28	71.61	71.13	71.29
PZ-2c	128.55		72.41	71.40	75.05	73.15	72.05	71.68	73.05	71.52	73.74	73.87	72.82	72.55	71.88	71.38	71.55
PZ-3	124.99		72.52	70.94	74.69	72.71	71.65	70.93	72.55	71.08	73.28	73.4	72.35	72.16	71.44	71.06	71.18
PZ-4	125.31		72.50	71.07	74.81	72.83	71.78	71.45	72.64	71.32	73.42	73.52	72.54	72.32	71.63	71.18	71.33
PZ-5a	129.07		72.50	71.94	75.61	73.79	72.59	72.17	73.70	71.98	74.27	74.39	73.40	73.25	72.45	71.94	72.16
PZ-5b	129.06		72.50	71.84	75.53	73.69	72.51	72.08	73.67	71.88	74.16	74.29	73.29	73.15	72.35	71.85	72.08
PZ-5c[5]	128.84		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PZ-6a	125.67		72.50	71.03	74.73	72.84	71.70	71.24	72.56	71.24	73.37	73.46	72.43	72.13	71.5	70.95	71.17
PZ-6b	125.74		72.50	70.93	74.7	72.65	71.58	71.11	72.46	71.14	73.28	73.37	72.34	72.05	71.43	70.88	71.11
PZ-7a	125.10		72.50	71.32	75.02	73.00	72.00	71.54	72.80	71.58	73.67	73.7	72.72	72.36	71.78	71.2	71.35
PZ-7b	125.06		72.50	71.21	74.85	72.83	71.83	71.37	72.68	71.26	73.45	73.53	72.51	72.13	71.54	71.05	71.16
PZ-8a[5]	127.63		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PZ-8b[5]	127.54		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PZ-8c[5]	127.57		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PZ-9a[5]	125.30		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PZ-10a[5]	125.27		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Notes and abbreviations on last page.

Table 11
Water-Level Elevations,
Bethpage Park Groundwater Containment System,
Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York.

Well Identification	Well Casing Elevation (ft msl)	Event Date	Baseline (1) 5/8/2009 (ft msl)	3Q2013 08/13/13 (ft msl)	4Q2013 11/01/13 (ft msl)	1Q2014 03/07/14 (ft msl)	2Q2014 06/03/14 (ft msl)	3Q2014 08/15/14 (ft msl)	4Q2014 12/23/2014 (ft. msl)	1Q2015 3/13/2015 (ft. msl)	2Q2015 5/28/2015 (ft. msl)	3Q2015 8/20/2015 (ft. msl)	4Q2015 12/17/2015 (ft. msl)	1Q2016 3/3/2016 (ft. msl)	2Q2016 5/27/2016 (ft. msl)	3Q2016 8/29/2016 (ft. msl)
Recovery Wells																
RW-1	125.18		69.75	71.62	69.31	68.08	69.97	69.83	69.40	70.16	70.53	68.69	67.43	67.55	67.23	65.32
RW-2	124.48		72.27	61.35	60.23	58.2	64.45	64.22	61.63	62.27	62.16	61.15	59.08	58.96	59.53	59.38
RW-3	122.84		69.40	72.29	67.11	64.49	66.97	67.09	66.11	67.08	67.43	NM	64.29	64.37	66.52	64.60
RW-4	121.24		69.25	71.19	68.69	67.37	69.39	68.80	68.63	69.39	69.76	68.02	66.78	66.84	70.55	68.54
Monitoring Wells																
B24MW-2	126.96		74.31	73.81	72.88	72.65	73.48	73.93	73.49	74.20	73.80	72.63	NM	71.65	67.78	67.38
B24MW-3	127.11		72.63	73.14	68.24	69.82	71.67	71.77	71.17	NM	NM	NM	69.23	69.39	67.13	65.23
B30MW-1	128.33		73.55	73.97	72.26	70.73	72.61	72.21	72.02	72.79	72.92	71.45	70.05	70.21	67.78	64.83
BCPMW-1	125.73		73.16	73.51	71.66	70.27	72.86	72.40	71.77	72.58	72.56	70.77	NM	67.97	69.71	67.08
BCPMW-2	126.39		72.55	72.66	70.77	69.51	71.41	71.19	70.85	71.59	71.67	71.31	68.88	69.05	67.78	65.60
BCPMW-3	124.94		72.46	72.44	70.57	69.25	71.12	70.78	70.65	71.34	71.48	68.68	68.55	68.69	68.87	66.79
BCPMW-4-1	128.71		72.30	72.27	70.25	68.96	70.91	70.50	70.30	70.80	71.24	69.59	68.31	68.43	64.66	62.79
BCPMW-4-2	129.33		72.58	72.49	70.5	69.21	71.16	70.78	70.51	71.28	71.46	69.84	68.58	68.66	64.30	62.41
BCPMW-4-3	129.2		72.32	72.44	70.41	69.17	71.07	70.75	70.47	71.23	71.40	69.78	68.53	68.61	64.36	62.40
BCPMW-5-1	129.37		72.79	72.87	71.01	69.78	71.56	71.22	70.94	71.79	71.93	70.36	69.07	69.17	64.79	62.80
BCPMW-6-1	126.01		72.12	72.15	70.15	68.79	70.85	70.21	70.07	70.82	71.15	69.99	68.19	68.23	67.27	65.27
BCPMW-6-2	125.16		71.74	71.84	69.83	68.49	70.48	69.94	69.80	70.55	70.82	69.12	67.87	67.96	67.77	65.77
BCPMW-7-1	124.81		72.00	72.26	70.21	68.82	70.86	70.19	70.01	70.86	71.28	69.53	68.30	68.24	68.55	66.51
MW-200-1	123.49		72.16	72.31	70.37	69.06	71.03	70.55	70.29	71.08	71.32	69.71	68.48	68.55	69.92	68.09
MW-201-1	121.69		72.04	72.05	70.08	68.75	70.75	70.07	69.98	70.79	70.75	69.39	67.34	68.24	71.45	69.55
MW-202-1	119.27		71.90	--	70.06	68.75	70.70	70.13	69.97	70.83	71.10	69.43	68.17	68.18	73.89	71.91
MW-203-1	118.25		71.83	72.01	70.01	68.7	70.64	70.03	69.84	70.69	71.07	69.34	67.94	68.15	74.79	72.90
MW-204-1(*)	125.25		--	--	--	--	--	--	--	--	--	--	61.66	68.48	68.46	66.60
MW-205-1(*)	123.87		--	--	--	--	--	--	--	--	--	--	62.81	68.12	69.60	67.73
MW-206-1(*)	121.25		--	--	--	--	--	--	--	--	--	--	63.65	68.20	72.29	70.38
MW-207-1a(*)	121.7		--	--	--	--	--	--	--	--	--	--	65.81	NM(7)	NM(7)	NM(7)
MW-207-1b(*)	121.17		--	--	--	--	--	--	--	--	--	--	66.51	NM(7)	NM(7)	NM(7)
MW-208-1(*)	118.83		--	--	--	--	--	--	--	--	--	--	67.92	68.22	74.31	72.42
Piezometers																
PZ-1a	128.82		72.56	NM(3)	NM(3)	NM(3)	NM(3)	NM(3)	NM(3)	NM(3)	NM(3)	NM(3)	NM(6)	NM(6)	64.18	62.21
PZ-1b	128.92		72.47	72.06	70.34	68.77	70.69	70.27	70.41	70.82	71.07	69.37	68.17	68.21	64.40	62.47
PZ-1c	128.96		72.47	72.39	70.39	69.12	71.01	70.67	70.46	71.16	71.38	69.74	68.46	68.62	64.66	62.63
PZ-2a	128.36		72.47	72.06	70.08	68.73	70.74	70.23	70.03	70.78	71.08	69.40	68.12	68.22	64.85	62.90
PZ-2b	128.37		72.43	72.05	70.08	68.71	70.74	70.23	70.03	70.74	71.02	69.37	68.09	68.20	64.91	62.91
PZ-2c	128.55		72.41	72.34	70.33	69.02	70.93	70.58	70.31	71.04	71.28	69.64	68.29	68.53	64.91	62.93
PZ-3	124.99		72.52	71.92	69.95	68.61	70.60	70.07	70.86	70.72	70.92	69.25	68.02	68.10	68.12	66.20
PZ-4	125.31		72.50	72.05	70.09	68.76	70.70	70.25	70.01	NM(3)	71.07	69.34	68.12	68.18	67.88	66.02
PZ-5a	129.07		72.50	72.84	70.85	69.62	71.47	71.34	70.95	71.67	71.84	70.25	68.99	69.41	64.97	63.01
PZ-5b	129.06		72.50	72.73	70.72	69.51	71.35	71.31	70.86	71.60	71.73	70.14	68.88	69.06	64.82	62.92
PZ-5c(*)	128.84		--	--	--	--	--	--	--	--	--	--	69.19	69.01	65.02	63.08
PZ-6a	125.67		72.50	71.91	69.94	68.53	70.63	69.99	69.83	70.59	70.96	69.26	67.98	68.04	71.66	65.40
PZ-6b	125.74		72.50	71.81	69.86	68.44	70.52	69.93	69.74	70.53	70.84	69.18	67.93	67.98	69.51	65.26
PZ-7a	125.10		72.50	72.26	70.26	68.84	70.90	70.19	70.02	70.89	NM(3)	NM(3)	NM(6)	68.31	68.74	66.27
PZ-7b	125.06		72.50	71.54	70.07	68.68	70.64	70.06	69.94	70.72	71.06	69.36	68.18	68.18	68.08	66.09
PZ-8a(*)	127.63		--	--	--	--	--	--	--	--	--	--	65.31	67.94	65.38	63.44
PZ-8b(*)	127.54		--	--	--	--	--	--	--	--	--	--	65.55	68.06	65.53	63.56
PZ-8c(*)	127.57		--	--	--	--	--	--	--	--	--	--	65.76	68.40	65.77	63.76
PZ-9a(*)	125.82		--	--	--	--	--	--	--	--	--	--	69.49	69.84	69.45	67.47
PZ-10a(*)	125.57		--	--	--	--	--	--	--	--	--	--	68.95	69.58	68.97	66.97

Notes and abbreviations on last page.

Table 11
Water-Level Elevations,
Bethpage Park Groundwater Containment System,
Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York.

Notes and Abbreviations:

(1) Baseline readings were taken prior to system startup, which occurred on July 21, 2009.
(2) Measurement collected is believed to be anomalous.
(3) Well casing is broken and blockage exists at around 2 feet below top of casing.
(4) RW-3 water level measurement collected on September 9, 2010.
(5) Wells installed by ERM in 2015.
(6) Wells recently repaired and to be surveyed.
(7) Well screen is blocked.
ft msl feet relative to mean sea level
NM not measured

FIGURES

SOURCE:
USGS 7.5 MIN. AMITYVILLE QUADRANGLE, AMITYVILLE, N.Y., 1994, FREEPORT QUADRANGLE, FREEPORT, N.Y., 1994,
HICKSVILLE QUADRANGLE, HICKSVILLE, N.Y., 1967, PHOTOREVISED 1979, HUNTINGTON, N.Y., 1967, PHOTOREVISED 1979

0 2000' 4000'

SCALE IN FEET

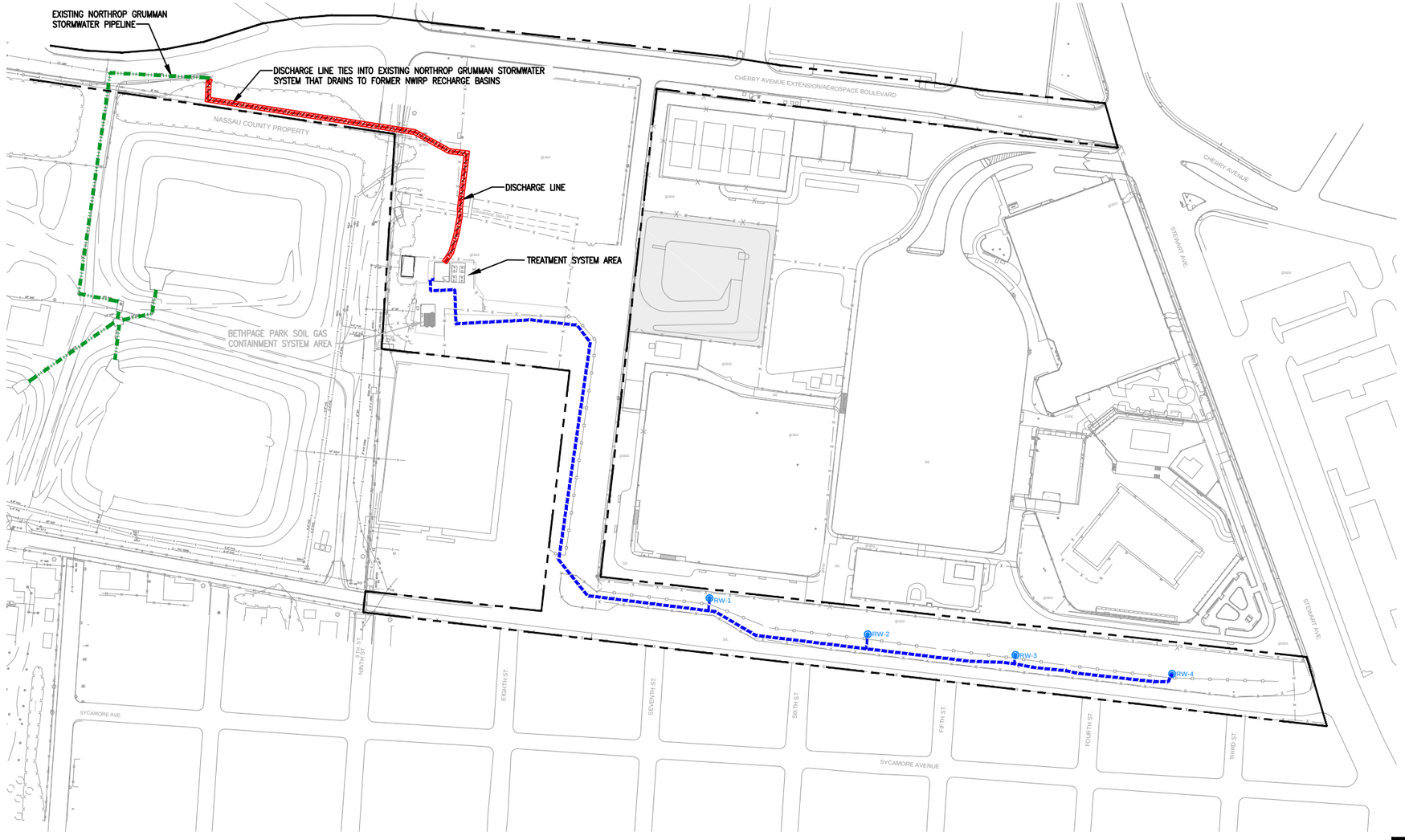
BETHPAGE PARK GROUNDWATER CONTAINMENT SYSTEM
OPERABLE UNIT 3
(FORMER GRUMMAN SETTLING PONDS)
BETHPAGE, NEW YORK

SITE LOCATION

ARCADIS Design & Consultancy for natural and built assets

FIGURE
1

CITY:SYRACUSE-NY DIV/GROUP:ENV DB:A.SANCHEZ LD: PIC:(Opt) PM:(Reqd) TM:(Opt) LYR:(Opt)ON=*;OFF=*REF* PLOTTED: 11/11/2015 4:54 PM BY: STOWELL, GARY
G:\ENVCAD\SYRACUSE\ACT\NY001496\1141\OMM\14\NY1496_B01.dwg LAYOUT: BETHPAGE PARK SAVED: 11/11/2015 4:51 PM ACADVER: 19.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: ----
XREFS: IMAGES: PROJECTNAME: ----
AMITYVILLE.TIF
FREEPORT.TIF
HICKSVILLE.TIF
HUNTINGTON.TIF



LEGEND:

- NORTHROP GRUMMAN PROPERTY LINE
- FENCE
- bit. BITUMINOUS PAVEMENT
- INFLUENT PIPELINE AND ELECTRICAL CONDUITS
- EFFLUENT PIPELINE
- EXISTING NORTHROP GRUMMAN STORMWATER PIPELINE
- RW-4 REMEDIAL WELL
- NWIRP NAVAL WEAPONS INDUSTRIAL RESERVE PLANT (NOW OWNED BY NASSAU COUNTY)

0 200' 400'

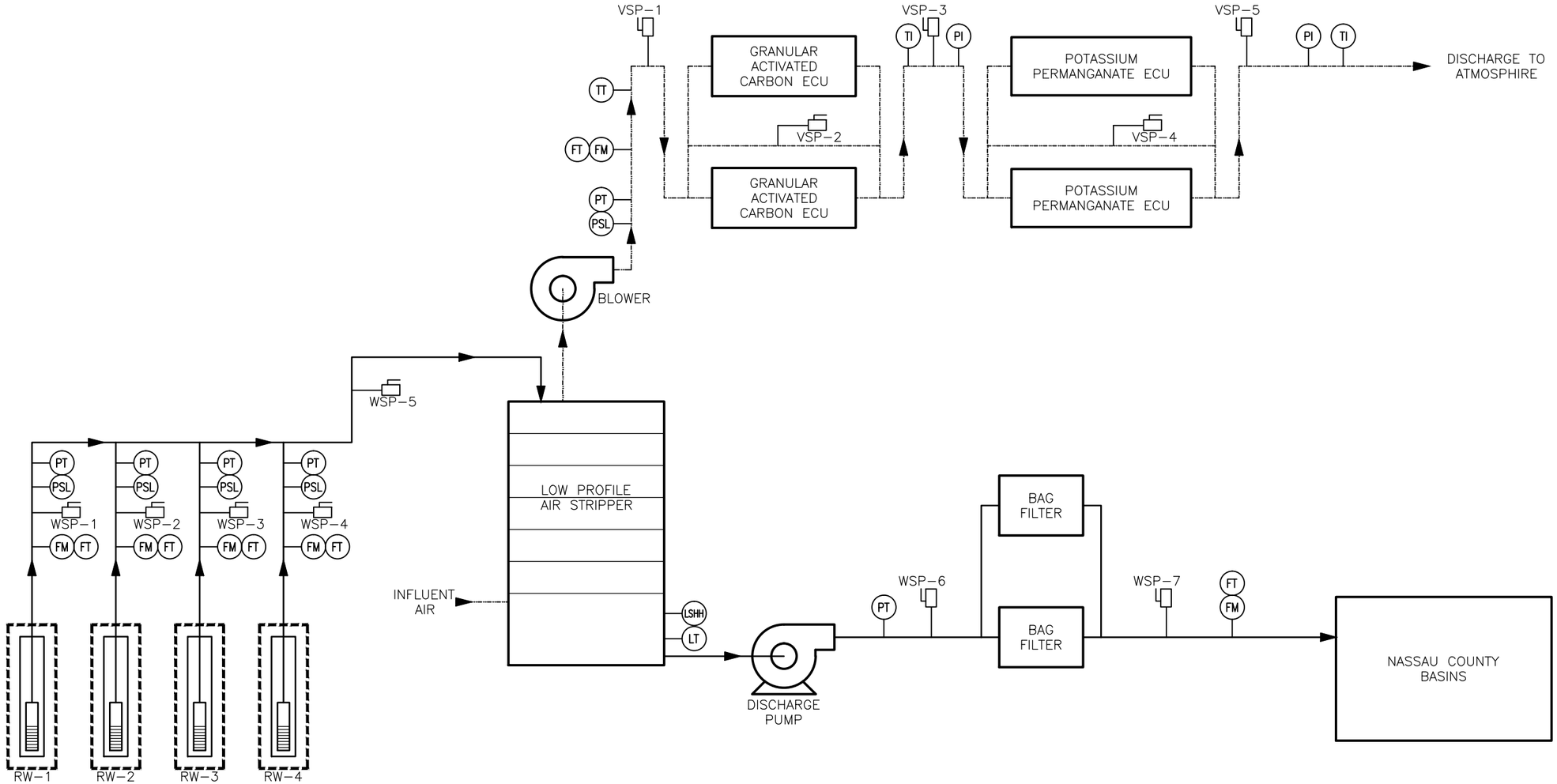
SCALE IN FEET

BETHPAGE PARK GROUNDWATER CONTAINMENT SYSTEM
OPERABLE UNIT 3
(FORMER GRUMMAN SETTLING PONDS)
BETHPAGE, NEW YORK

SITE AND GROUNDWATER CONTAINMENT SYSTEM

ARCADIS Design & Consultancy for natural and built assets

FIGURE 2



LEGEND:

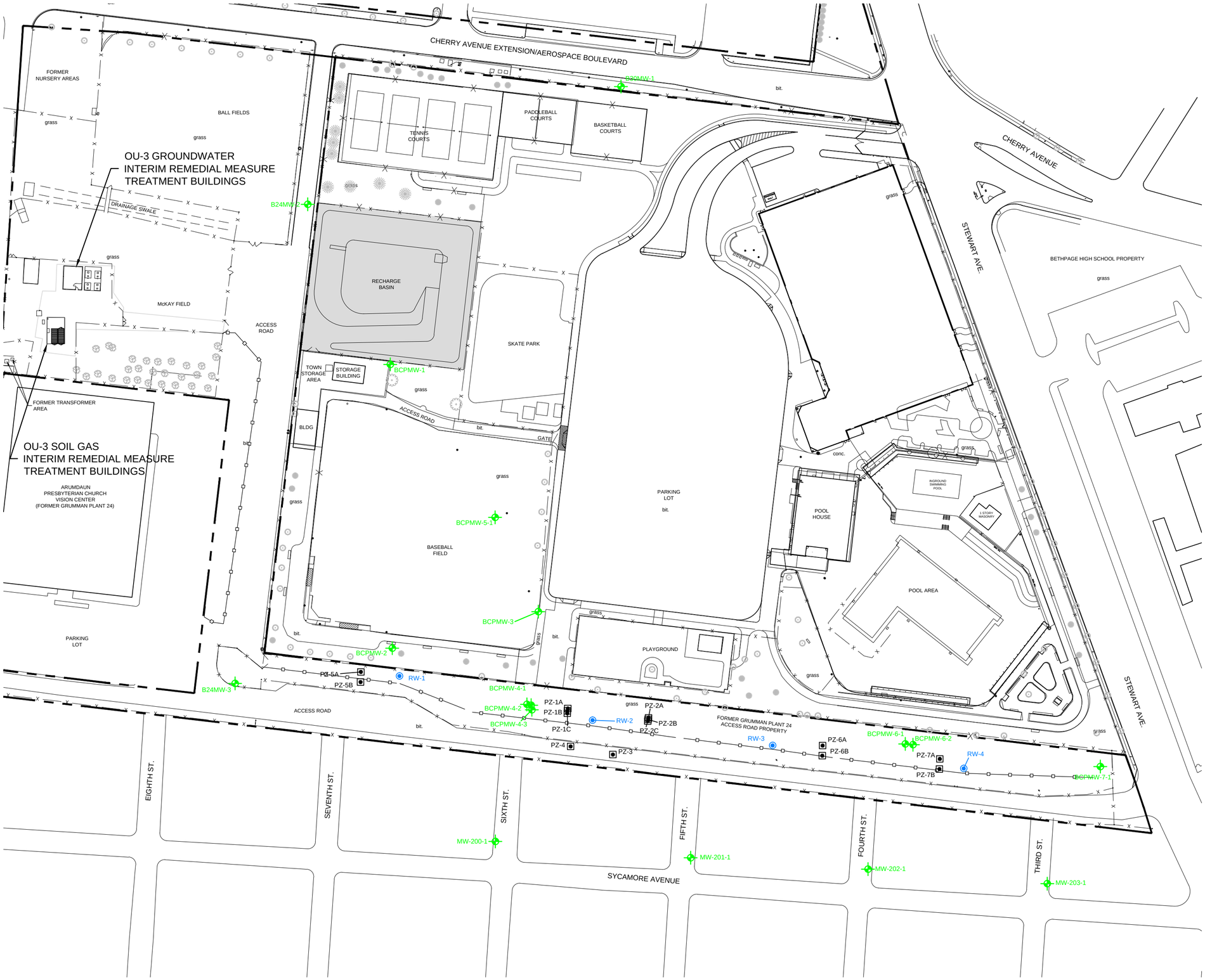
	PROCESS WATER
	PROCESS AIR
FM	INSTRUMENT
	SAMPLE PORT
	FLOW DIRECTION
FM	FLOW METER
FT	FLOW RATE TRANSMITTER
PSL	PRESSURE SWITCH LOW
PT	PRESSURE TRANSMITTER
PI	PRESSURE INDICATOR
LSHH	LEVEL SWITCH HIGH HIGH
LT	LEVEL TRANSMITTER
TT	TEMPERATURE TRANSMITTER
TI	TEMPERATURE INDICATOR
WSP	WATER SAMPLE PORT
VSP	VAPOR SAMPLE PORT
ECU	EMISSION CONTROL UNIT

BETHPAGE PARK GROUNDWATER CONTAINMENT SYSTEM
OPERABLE UNIT 3
(FORMER GRUMMAN SETTLING PONDS)
BETHPAGE, NEW YORK

GROUNDWATER TREATMENT SYSTEM PROCESS SCHEMATIC AND MONITORING LOCATIONS

ARCADIS Design & Consultancy for natural and built assets

FIGURE 3



EXPLANATION:

- NORTHROP GRUMMAN PROPERTY LINE
- FENCE
- BASIN
- bit. BITUMINOUS PAVEMENT
- MW-200-1 MONITORING WELL
- RW-2 REMEDIAL WELL
- PZ-2C PIEZOMETER

NOTES:

1. MONITORING WELLS, REMEDIAL WELLS, AND PIEZOMETERS SURVEYED TO NORTH AMERICAN DATUM (NAD) 83.
2. PARK FEATURES SHOWN WERE PRESENT PRIOR TO TOWN OF OYSTER BAY REDEVELOPMENT IN 2005.

0 100' 200'
SCALE IN FEET

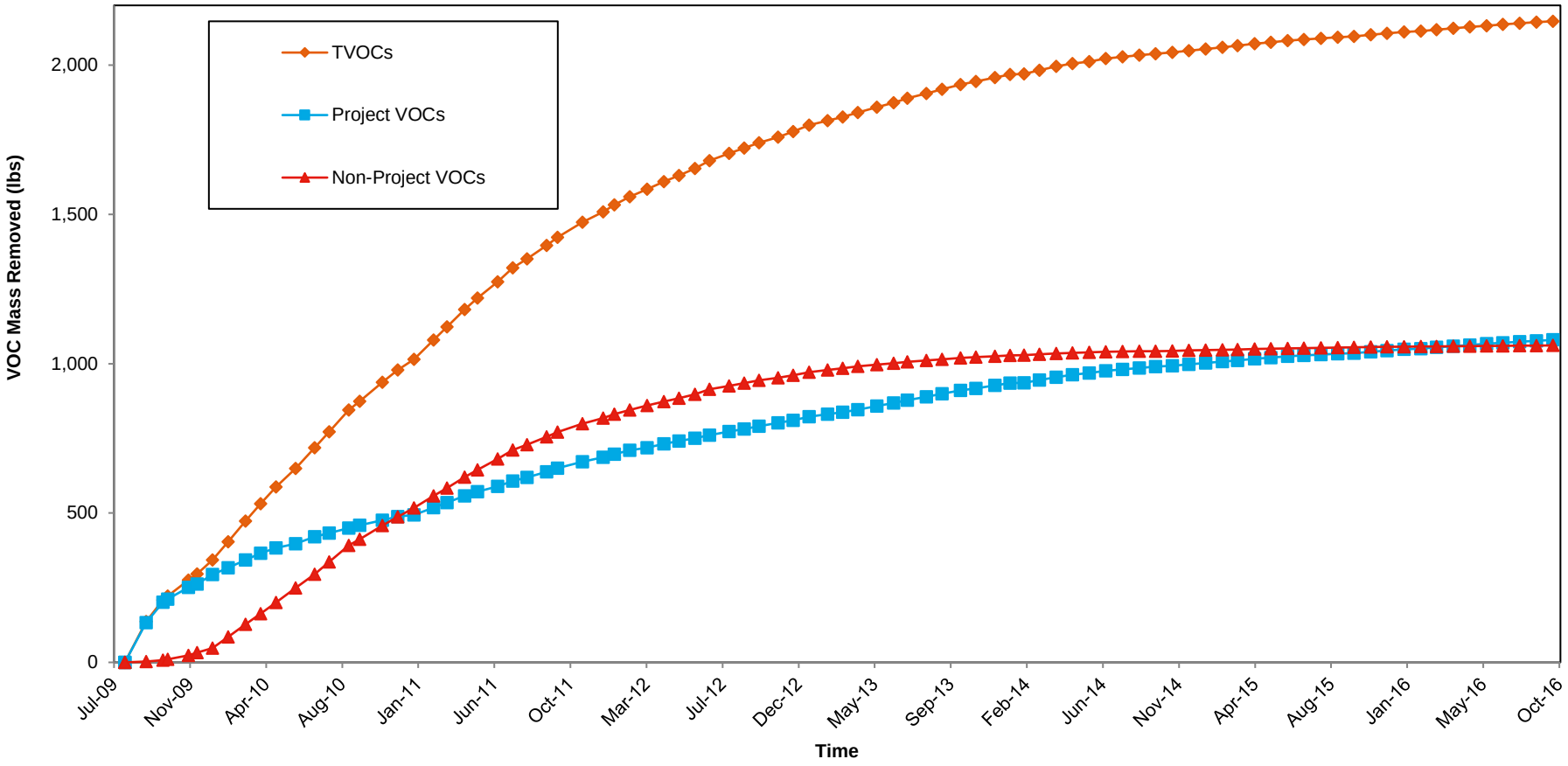
BETHPAGE PARK GROUNDWATER CONTAINMENT SYSTEM
OPERABLE UNIT 3
(FORMER GRUMMAN SETTLING PONDS)
BETHPAGE, NEW YORK

GROUNDWATER MONITORING NETWORK SITE PLAN

ARCADIS Design & Consultancy for natural and built assets

FIGURE 4

CITY:(Req'd) DIV/GROUP:(Req'd) DB:(Req'd) LD:(Opt) PIC:(Opt) PM:(Req'd) TM:(Opt) LYR:(Opt)ON=*;OFF=*REF*
G:\ENVCAD\S*RAC\JSE\ACTNY001498\114\OM\M41498W02.dwg LAYOUT: 4 SAVED: 11/11/2015 4:33 PM ACADVER: 19.1S (LMS TECH) PAGESETUP: PDF PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 11/11/2015 4:54 PM BY: STOWELL, GARY
XREFS: IMAGES: PROJECTNAME: ---
X1498X01



Notes:

VOC = volatile organic compound

lbs = pounds

TVOCs = total VOCs detected

Project VOCs = sum of 1,1,1-trichloroethane; 1,1-dichloroethane; 1,2-dichloroethane; 1,1-dichloroethene; tetrachloroethene; trichloroethene; vinyl chloride; cis-1,2-dichloroethene; trans-1,2-dichloroethene; benzene; toluene; and total xylenes.

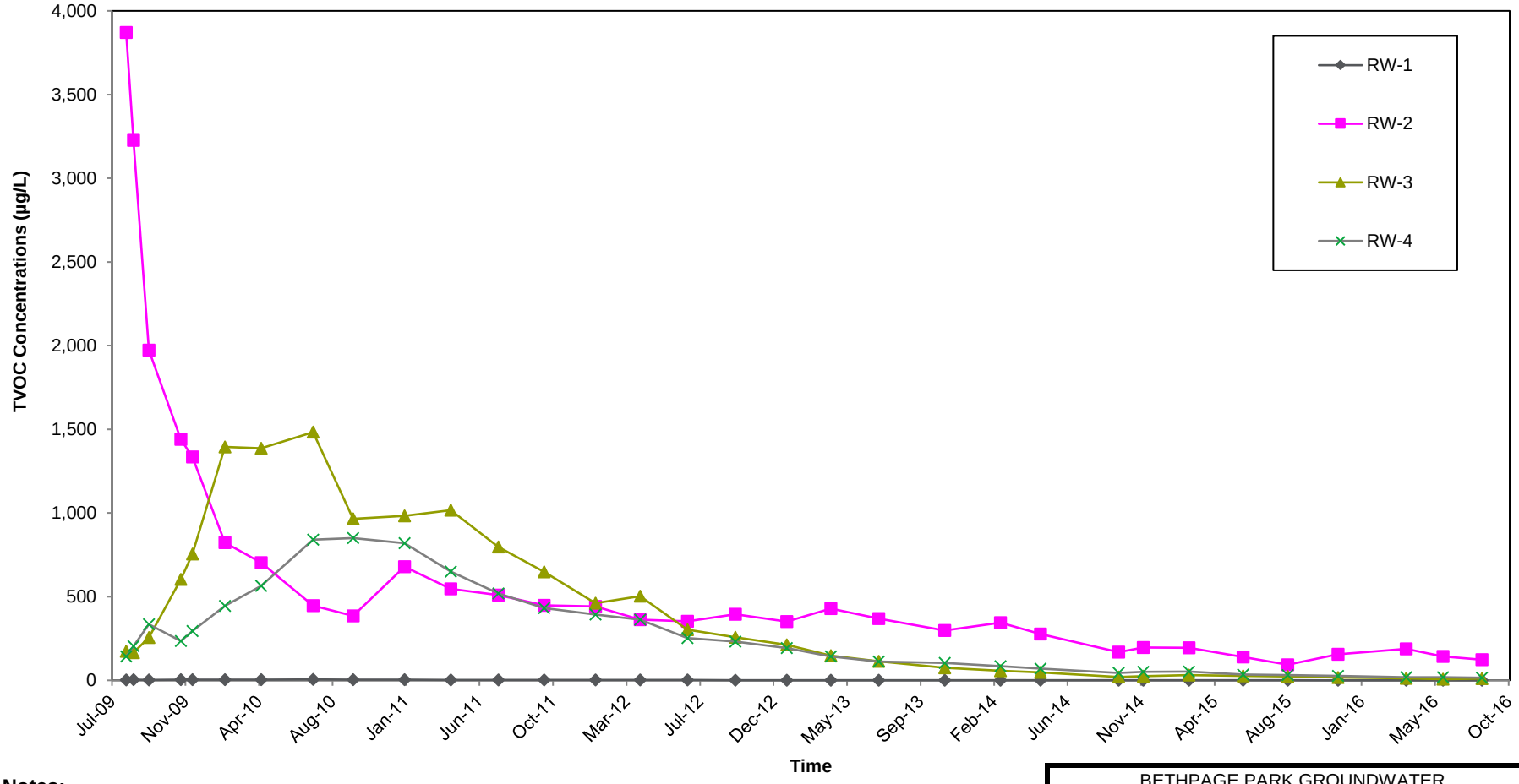
Non-Project VOCs = sum of VOCs that are not Project VOCs.

BETHPAGE PARK GROUNDWATER
CONTAINMENT SYSTEM, OPERABLE UNIT 3
(FORMER GRUMMAN SETTLING PONDS)
BETHPAGE, NEW YORK

CUMULATIVE TOTAL, PROJECT, AND NON-PROJECT VOC MASS REMOVED THROUGH OCTOBER 2016

ARCADIS

FIGURE 5



Notes:

VOC = volatile organic compound

µg/L = micrograms per liter

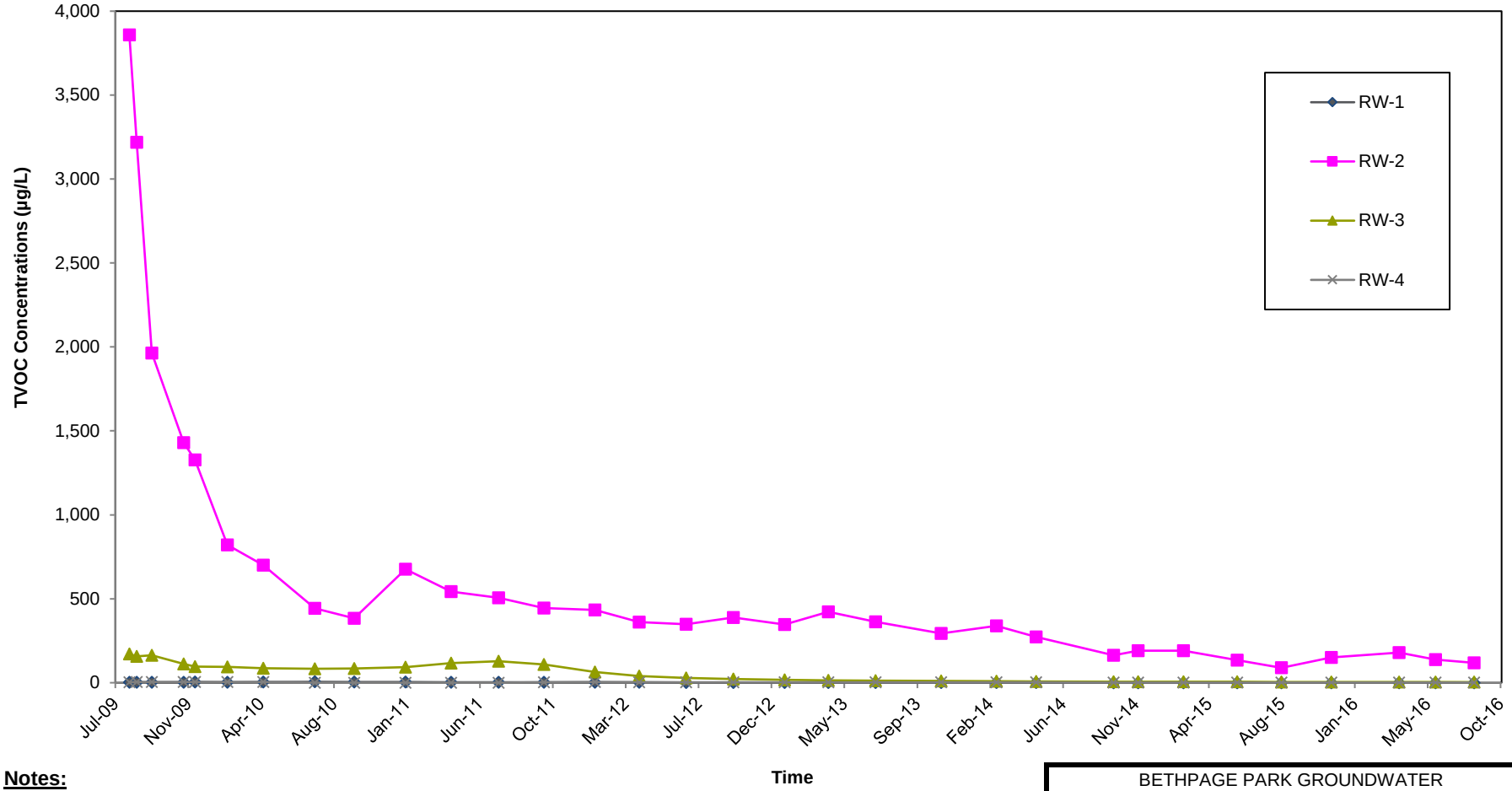
TVOCs = total VOCs detected

BETHPAGE PARK GROUNDWATER
CONTAINMENT SYSTEM, OPERABLE UNIT 3
(FORMER GRUMMAN SETTLING PONDS)
BETHPAGE, NEW YORK

REMEDIAL WELL TVOC CONCENTRATIONS THROUGH OCTOBER 2016

ARCADIS

FIGURE
6A



Notes:

VOC = zolatile organic compound

µg/L = micrograms per liter

TVOCs = total VOCs detected

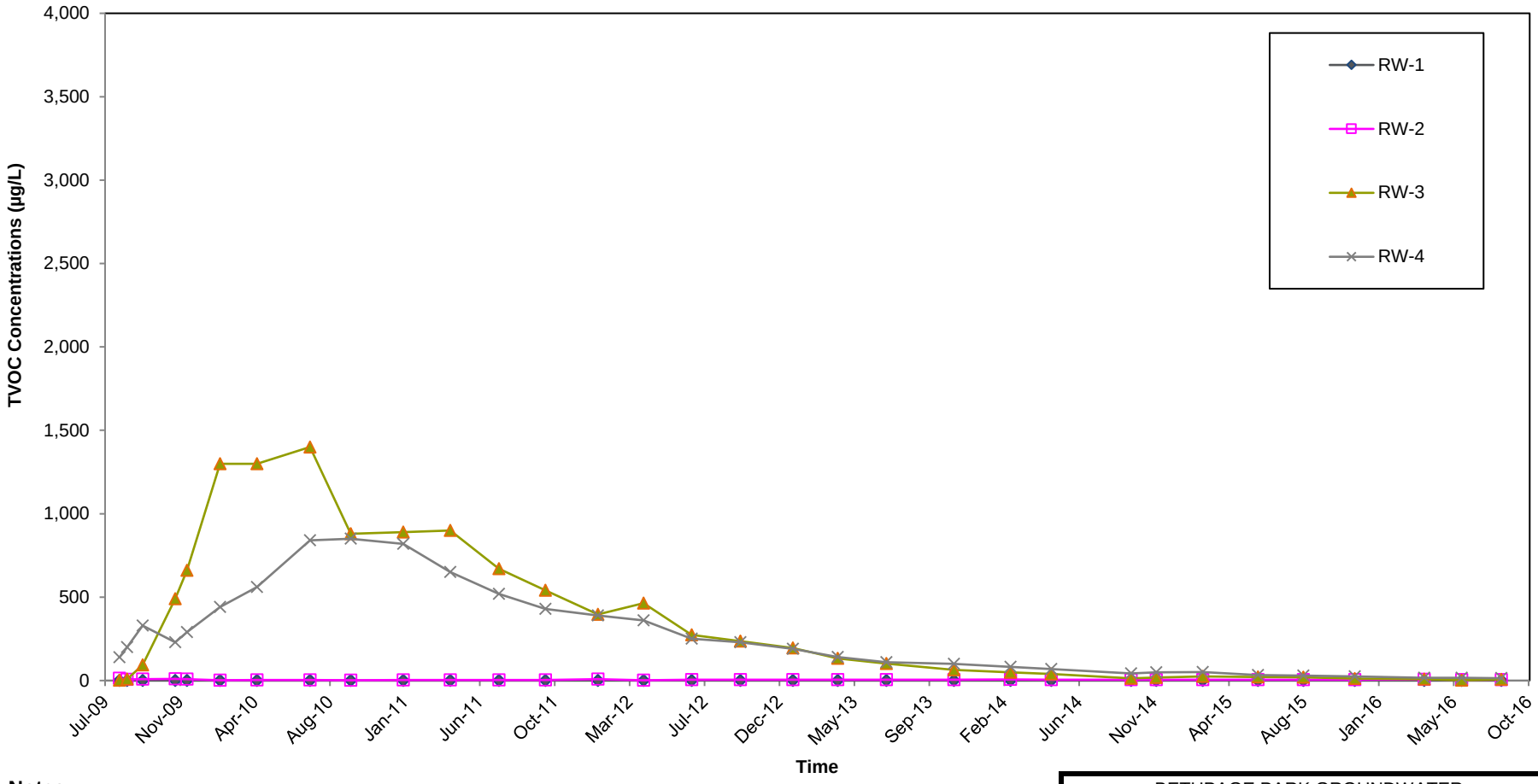
Project VOCs = sum of 1,1,1-trichloroethane; 1,1-dichloroethane; 1,2-dichloroethane; 1,1-dichloroethene; tetrachloroethene; trichloroethene; vinyl chloride; cis-1,2-dichloroethene; trans-1,2-dichloroethene; benzene; toluene and total xylenes.

BETHPAGE PARK GROUNDWATER
CONTAINMENT SYSTEM, OPERABLE UNIT 3
(FORMER GRUMMAN SETTLING PONDS)
BETHPAGE, NEW YORK

REMEDIAL WELL PROJECT VOC CONCENTRATIONS THROUGH OCTOBER 2016

ARCADIS

FIGURE
6B



Notes:

VOC = volatile organic compound

µg/L = micrograms per liter.

TVOCs = total VOCs detected.

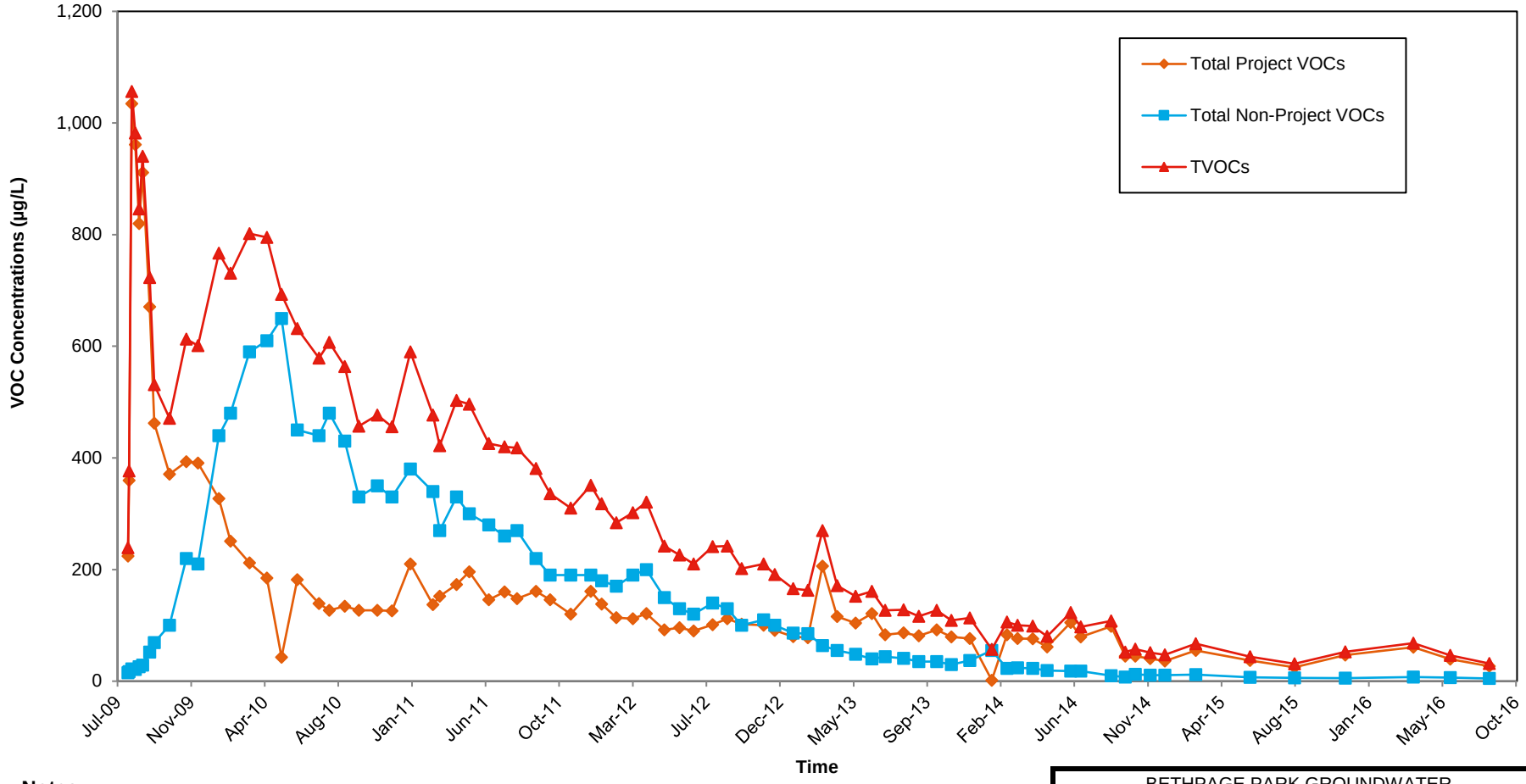
Non-Project VOCs = sum of TVOCs that are not Project VOCs.

BETHPAGE PARK GROUNDWATER
CONTAINMENT SYSTEM, OPERABLE UNIT 3
(FORMER GRUMMAN SETTLING PONDS)
BETHPAGE, NEW YORK

REMEDIAL WELL NON-PROJECT VOC CONCENTRATIONS THROUGH OCTOBER 2016

ARCADIS

FIGURE 6C



Notes:

VOC = volatile organic compound

µg/L = micrograms per liter

TVOCs = total VOCs detected.

Project VOCs = sum of 1,1,1-trichloroethane; 1,1-dichloroethane; 1,2-dichloroethane; 1,1-dichloroethene; tetrachloroethene; trichloroethene; vinyl chloride; cis-1,2-dichloroethene; trans-1,2-dichloroethene; benzene; toluene; and total xylenes.

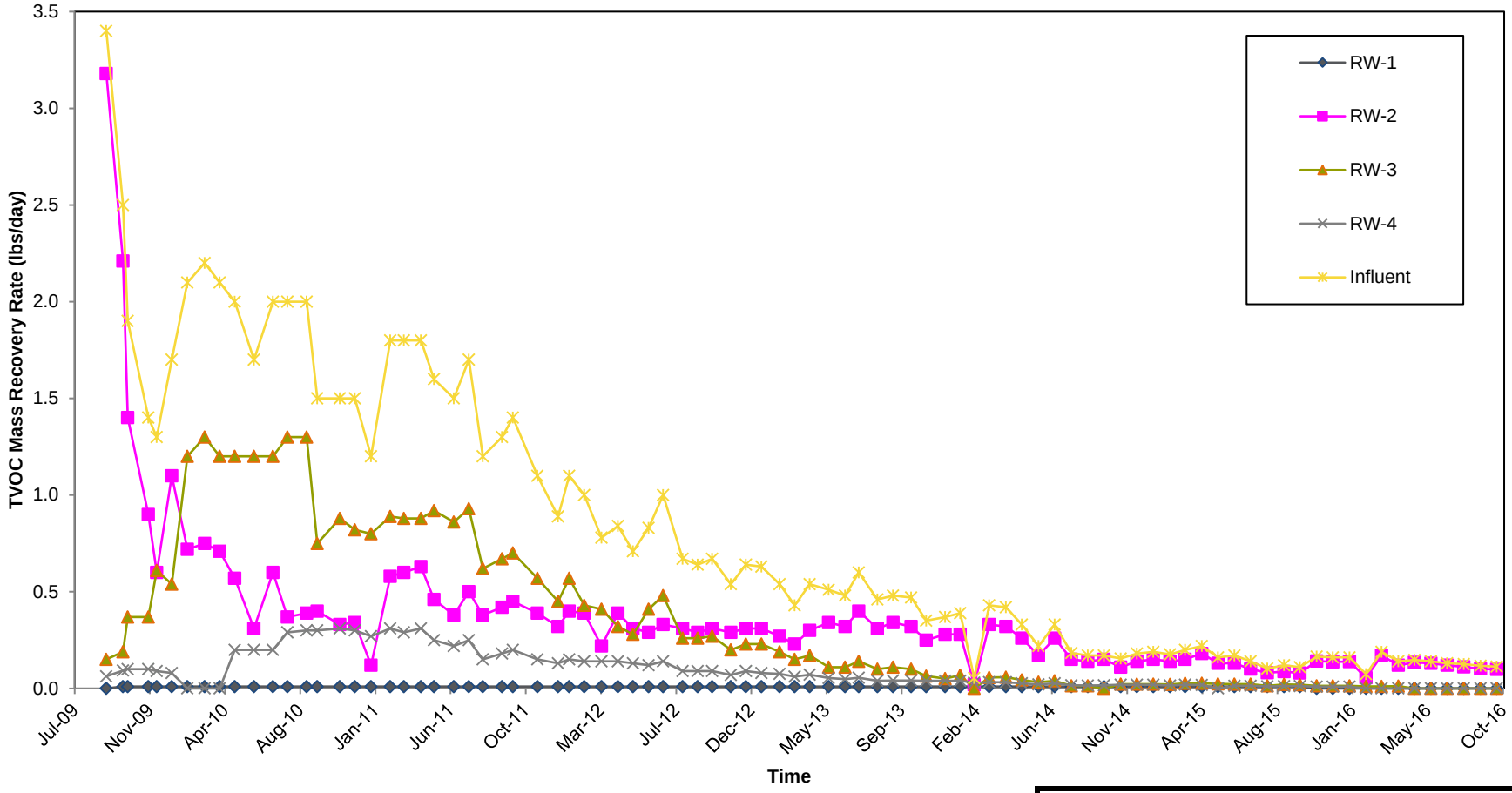
Non-Project VOCs = sum of VOCs that are not Project VOCs.

BETHPAGE PARK GROUNDWATER
CONTAINMENT SYSTEM, OPERABLE UNIT 3
(FORMER GRUMMAN SETTLING PONDS)
BETHPAGE, NEW YORK

INFLUENT TOTAL, PROJECT AND NON-PROJECT VOC CONCENTRATIONS THROUGH OCTOBER 2016

ARCADIS

FIGURE
7



Notes:

VOC = volatile organic compound

lbs/day = pounds per day

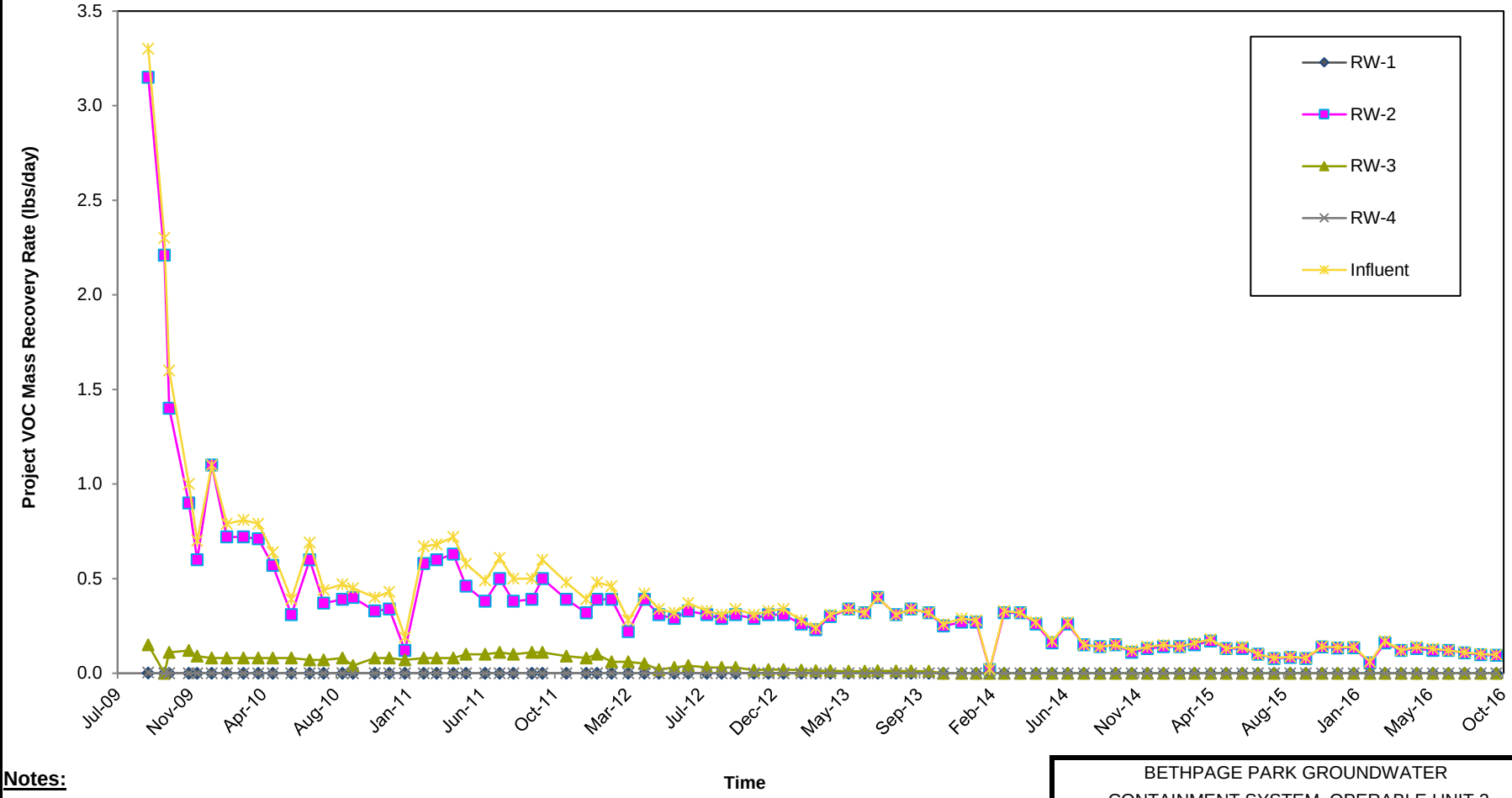
TVOCs = total VOCs detected

BETHPAGE PARK GROUNDWATER
CONTAINMENT SYSTEM, OPERABLE UNIT 3
(FORMER GRUMMAN SETTLING PONDS)
BETHPAGE, NEW YORK

TVOC MASS RECOVERY RATES THROUGH OCTOBER 2016

ARCADIS

FIGURE
8A



Notes:

VOC = volatile organic compound

lbs/day = pounds per day.

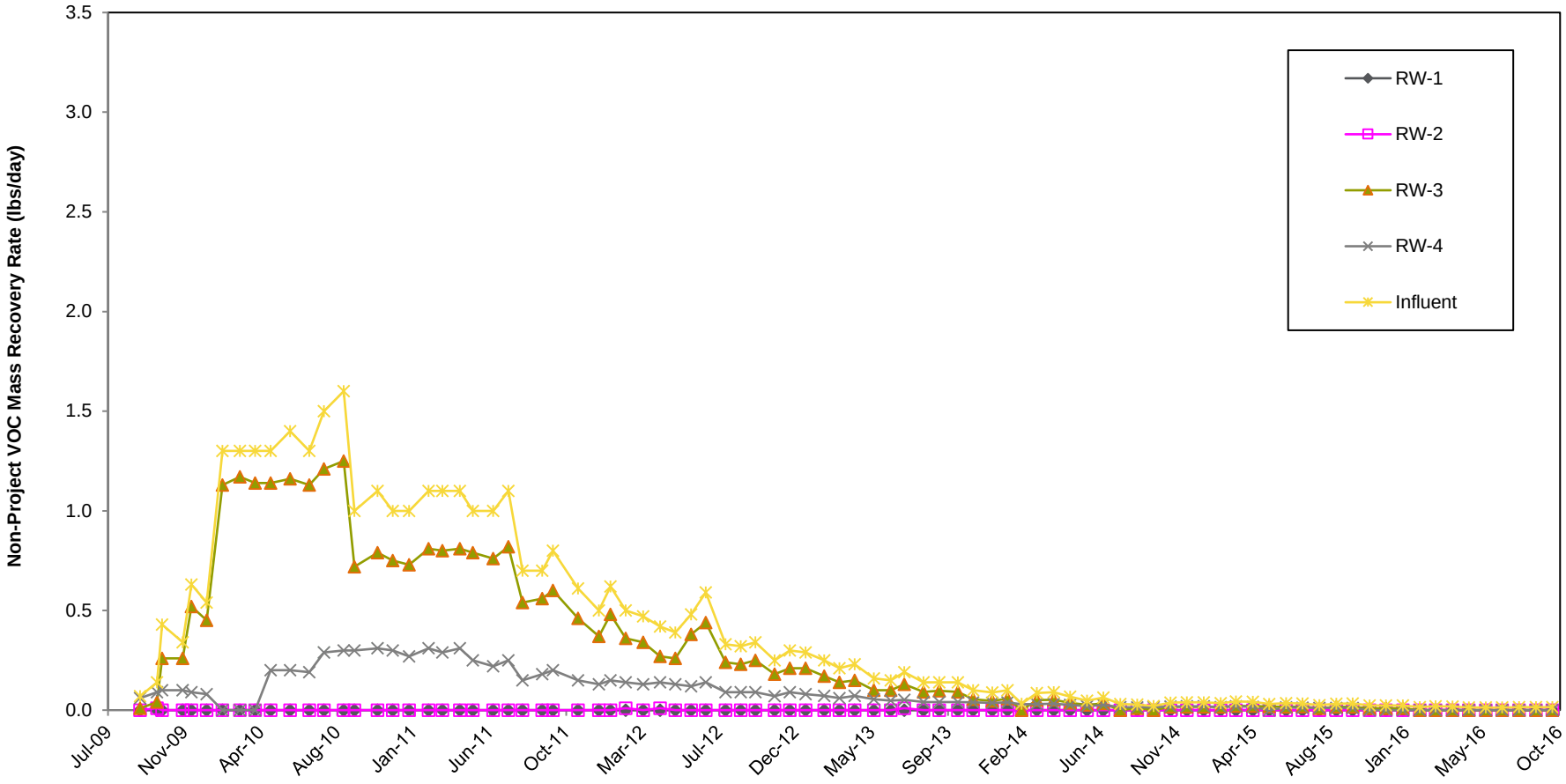
Project VOCs = Sum of 1,1,1-trichloroethane; 1,1-dichloroethane; 1,2-dichloroethane; 1,1-dichloroethene; tetrachloroethene; trichloroethene; vinyl chloride; cis-1,2-dichloroethene; trans-1,2-dichloroethene; benzene; toluene; and total xylenes

BETHPAGE PARK GROUNDWATER
CONTAINMENT SYSTEM, OPERABLE UNIT 3
(FORMER GRUMMAN SETTLING PONDS)
BETHPAGE, NEW YORK

PROJECT VOC MASS RECOVERY RATES THROUGH OCTOBER 2016

ARCADIS

FIGURE
8B



Notes:

VOC = volatile organic compound

lbs/day = pounds per day

Non-Project VOCs = sum of VOCs that are not Project VOCs.

BETHPAGE PARK GROUNDWATER
CONTAINMENT SYSTEM, OPERABLE UNIT 3
(FORMER GRUMMAN SETTLING PONDS)
BETHPAGE, NEW YORK

NON-PROJECT VOC MASS RECOVERY RATES THROUGH OCTOBER 2016

ARCADIS

FIGURE
8C