ARCADIS Design & Consultancy for natural and built assets

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ENVIRONMENT

Subject:
Results of Third Quarter 2018 System Operation and Monitoring, Bethpage Park Groundwater Containment System (BPGWCS), Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York, NYSDEC Site #1-30-003A.

Date:
November 29, 2018

Contact:
Christopher Engler

Phone:
315.409.6579

Email:
christopher.engler@arcadis.com

Our ref:
NY001496.32TM.RPTI4

Dear Jason:

Enclosed is one electronic PDF copy of the third quarter results of the OU3 BPGWCS operation and monitoring, preformed 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) in line with NYSDEC's paper reduction program, hard copies of the report can be provided on request.

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

Sincerely,

Arcadis of New York, Inc.

Christopher D. Engler

Christopher Engler, PE
New York PE-069748

Vice President

Enclosure

Copies:
Edward Hannon, Northrop Grumman Corporation
Donald Hesler, NYSDEC
Steven Karpinski, NYS Dept. of Health
John Lovejoy, Nassau County Dept. of Health
Lorenzo Thantu, USEPA
Carlo San Giovanni, Arcadis
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TABLES

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

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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
2016 Total																																351
2017 Total																																354
1Q 2018																																90
2Q 2018																																81
July 2018	[2]										[3]																					28
Aug 2018												[4]																				30
Sep 2018																																30
3Q 2018																																88
2018 total																																259
TOTAL																																**3231**

Legend:

- Indicates system online the majority or all of the day.
- Indicates system operated with reduced flow rates.
- Indicates system off-line the majority or all of the day.

Abbreviations, Notes, and Units on last page.

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

Notes:

1. Days the system was operational for the majority of the day are counted as one day.

Third Quarter 2018

2. RW-3 pump failed on June 26, 2018 and was replaced on July 5, 2018.
3. System shutdown due to elecrical issues while installing new blower differential pressure switches.
4. System shutdown due to building sump overflow casued by heavy rainfall.

Abbreviations/Units:

1Q	First Quarter
2Q	Second Quarter
3Q	Third Quarter
PLC	Programmable Logic Controller
PSEG	Public Service Enterprise Group
RW	Recovery Well
gpm	gallons per minute

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

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Compound	11/29/17 (µg/L)	02/01/18 (µg/L)	04/04/18 (µg/L)	08/07/18 (µg/L)
Project VOCs				
1,1,1 - Trichloroethane	< 1.0	< 1.0	< 0.50	< 1.0
1,1 - Dichloroethane	< 1.0	< 1.0	< 1.0	< 1.0
1,2 - Dichloroethane	< 1.0	< 1.0	< 1.0	< 1.0
1,1 - Dichloroethene	< 1.0	< 1.0	< 0.50	< 1.0 J
Tetrachloroethene	< 1.0	< 1.0	< 0.50	< 1.0
Trichloroethene	**3.9**	**2.8**	**2.9**	**2.6**
Vinyl Chloride	**4.3**	**3.0**	**6.3**	**2.7**
cis 1,2-Dichloroethene	**6.2**	**6.5**	**7.5**	**5.3**
trans 1,2-Dichloroethene	< 1.0	< 1.0	< 0.50	< 1.0
Benzene	< 0.50	< 0.50	< 0.50	< 0.50
Toluene	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene	< 1.0	< 1.0	< 1.0	< 1.0
m,p-Xylene	< 1.0	< 1.0	< 1.0	< 1.0
Subtotal Project VOCs	**14.4**	**12.3**	**16.7**	**10.6**
Non-Project VOCs				
1,1,2,2-Tetrachloroethane	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloroethane	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloropropane	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Butanone	< 5.0	< 5.0	< 5.0	< 5.0
2-Butanone	< 10	< 10	< 10	< 10
4-Methyl-2-Pentanone	< 5.0	< 5.0	< 5.0	< 5.0
Acetone	< 10	< 10	< 10	< 10
Bromodichloromethane	< 1.0	< 1.0	< 1.0	< 1.0
Bromoform	< 1.0 J	< 1.0	< 1.0	< 1.0
Bromomethane	< 2.0	< 2.0	< 2.0	< 2.0
Carbon Disulfide	< 2.0	< 2.0	< 2.0	< 2.0
Carbon Tetrachloride	< 1.0	< 1.0	< 1.0	< 1.0
Chlorobenzene	< 1.0	< 1.0	< 1.0	< 1.0
Chlorodibromomethane	< 1.0	< 1.0	< 1.0	< 1.0
Chlorodifluoromethane (Freon 22)	< 5.0	< 5.0	< 5.0	< 5.0 J
Chloroethane	< 1.0	< 1.0	< 1.0	< 1.0
Chloroform	**0.65 J**	**0.47 J**	**0.54**	< 1.0
Chloromethane	< 1.0	< 1.0 J	< 1.0	< 1.0 J
cis-1,3-Dichloropropene	< 1.0	< 1.0	< 1.0	< 1.0

Abbreviations, Notes, Qualifers, and Units on last page.

Table 2
Summary of 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	11/29/17 (µg/L)	02/01/18 (µg/L)	04/04/18 (µg/L)	08/07/18 (µg/L)
Non-Project VOCs				
Dichlorodifluoromethane (Freon 12)	< 2.0	< 2.0 J	< 2.0	< 2.0 J
Dichloromethane	< 2.0	< 2.0	< 0.50	< 2.0
Ethylbenzene	< 1.0	< 1.0	< 1.0	< 1.0
Methyl N-Butyl Ketone	< 5.0	< 5.0	< 5.0	< 5.0
Methyl Tert-Butyl Ether	< 1.0	< 1.0	< 1.0	< 1.0
Styrene (Monomer)	< 1.0	< 1.0	< 1.0	< 1.0
trans-1,3-Dichloropropene	< 1.0	< 1.0	< 1.0	< 1.0
Trichlorofluoromethane (Freon 11)	< 2.0	< 2.0 J	< 2.0	< 2.0
Trichlorotrifluoroethane (Freon 113)	< 5.0	< 5.0	< 0.50	< 5.0
1-Chloro-1,1-difluoroethane (Freon 142b)	< 5.0	< 5.0	< 5.0	< 5.0
Subtotal Non-Project VOCs	**0.65**	**0.47**	**0.54**	0
Total VOCs[1]	**15**	**13**	**17**	**11**
1,4-Dioxane[2]	**0.848**	**0.910**	**1.08**	**0.52**
Compound	**11/29/17 (µg/L)**	**02/01/18 (µg/L)**	**04/04/18 (µg/L)**	**08/07/18 (µg/L)**
Inorganics				
Dissolved Cadmium	--	--	--	< 3.0
Total Cadmium	--	--	--	< 3.0
Dissolved Chromium	--	--	--	**10.2**
Total Chromium	--	--	--	**10.5**
Dissolved Iron	**225**	--	--	**108**
Total Iron	**1080**	--	--	**166**
Total Manganese	--	--	--	--
pH[3]	5.7	5.6	5.7	5.8

Abbreviations, Notes, Qualifiers, and Units:

-- Not Analyzed
USEPA United States Environmental Protection Agency
VOC Volatile Organic Compound

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. Samples collected prior to July 11, 2018 were analyzed for 1,4-Dioxane using USEPA Method 522-SIM. Samples collected are analyzed for 1,4-Dioxane using USEPA Method 8270D-SIM-CLLE.
3. Influent pH samples collected and measured in the field by Arcadis personnel on the dates listed using a field calibrated pH/conductivity meter. pH units are standard units.

3.9 Bold value indicates a detection.
< 1.0 Compound not detected at or above the laboratory quantification limit.
J Result is estimated.
µg/L micrograms per liter

Table 3
Summary of Effluent 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	Discharge Limit[1] (µg/L)	01/11/18 (µg/L)	02/01/18 (µg/L)	03/01/18 (µg/L)	04/04/18 (µg/L)	05/11/18 (µg/L)	06/07/18 (µg/L)	07/11/18 (µg/L)	08/07/18 (µg/L)	09/05/18 (µg/L)
Project VOCs										
1,1,1-Trichloroethane	5[2]	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,1-Dichloroethene	5[2]	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Tetrachloroethene	5[2]	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Trichloroethene	5[2]	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Vinyl Chloride	5[2]	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
cis 1,2-Dichloroethene	5[2]	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
trans 1,2-Dichloroethene	5[2]	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Subtotal Project VOCs		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Compound	Discharge Limit[1] (µg/L)	01/11/18 (µg/L)	02/01/18 (µg/L)	03/01/18 (µg/L)	04/04/18 (µg/L)	05/11/18 (µg/L)	06/07/18 (µg/L)	07/11/18 (µg/L)	08/07/18 (µg/L)	09/05/18 (µg/L)
Non-Project VOCs										
Chloroform	5[2]	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Dichloromethane	5[2]	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Trichlorotrifluoroethane (Freon 113)	5[2]	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Subtotal Non-Project VOCs		0	0	0	0	0	0	0	0	0
Total VOCs[3]		0	0	0	0	0	0	0	0	0
Treatment Efficiency[4]		> 99.9%	> 99.9%	> 99.9%	> 99.9%	> 99.9%	> 99.9%	> 99.9%	> 99.9%	> 99.9%

Compound	Discharge Limit[1] (µg/L)	01/11/18 (µg/L)	02/01/18 (µg/L)	03/01/18 (µg/L)	04/04/18 (µg/L)	05/11/18 (µg/L)	06/07/18 (µg/L)	07/11/18 (µg/L)	08/07/18 (µg/L)	09/05/18 (µg/L)
Inorganics										
Dissolved Cadmium	5	--	< 3.0	--	< 3.0	--	--	--	< 3.0	--
Total Cadmium	5	--	< 3.0	--	< 3.0	--	--	--	< 3.0	--
Dissolved Chromium	50	--	< 10	--	< 10	--	--	--	< 10	--
Total Chromium	50	--	< 10	--	< 10	--	--	--	< 10	--
Dissolved Iron	600	**150**	**116**	**181**	**172**	**158**	< 100	**141**	< 100	--
Total Iron	600	**204**	**183**	**229**	**218**	**106**	< 100	**168**	**138 J**	< 100
Total Mercury	250	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	--
Total Manganese	600	--	--	--	--	--	--	--	**50.2**	**46.2**
Nitrate and Nitrite	10,000	**2,800**	**3,200**	**2,800**	**2,800**	**2,800**	**2,900**	**2,500**	**2,800**	**2,900**
Toal Kjeldahl Nitrogen	10,000	< 200	< 200	< 200	< 200	< 200	< 200	< 200	< 200	< 200
Total Nitrogen	10,000	**3,000**	**3,200**	**2,800**	**2,800**	**2,800**	**2,900**	**2,500**	**2,800**	**2,900**
1,4-Dioxane[5]	NE	**0.819**	**0.997**	**1.45**	**0.997**	**0.984**	**0.646**	**0.71**	**0.52**	**0.45**
pH[6]	5.5-8.5	6.8	6.6	6.7	6.6	7.1	7.0	6.5	7.0	6.5

Abbreviations, Notes, Qualifers, and Units on last page.

Table 3
Summary of Effluent 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

Abbreviations, Notes, Qualifiers, and Units:

--	Not Analyzed
NE	Not Established
NYSDEC	New York State Department of Environmental Conservation
SPDES	State Pollutant Discharge Elimination System
USEPA	United States Environmental Protection Agency
VOC	Volatile Organic Compound

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 SPDES Permit Equivalency.
2. As of September 2017, the 10 SPDES VOCs discharge limits are per Site Number 1-30-003A Operable Unit 3 SPDES Permit Equivalency.
3. "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.
4. Treatment efficiency was calculated by dividing the difference between the influent and effluent total VOC concentrations by the influent total VOC concentration.
5. Samples collected prior to July 11, 2018 were analyzed for 1,4-Dioxane using USEPA Method 522-SIM. Samples collected are analyzed for 1,4-Dioxane using USEPA Method 8270D-SIM-CLLE.
6. Effluent pH measured on site using a handheld pH meter. pH units are standard units.

168	Bold value indicates a detection.
< 1.0	Compound not detected above the laboratory quantification limit.
J	Result is estimated.
µg/L	micrograms per liter

Table 4
Influent Vapor 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[1]	11/29/17 (µg/m^3)	02/01/18 (µg/m^3)	04/05/18 (µg/m^3)	08/07/18 (µg/m^3)
Project VOCs				
1,1,1 - Trichloroethane	**0.65**	**0.46**	**0.87**	**0.71**
1,1 - Dichloroethane	**3.6**	**2.8**	**4.9**	**3.8**
1,2 - Dichloroethane	< 0.81	< 0.65	**0.45 J**	< 0.65
1,1 - Dichloroethene	**2.1**	**1.2**	**1.7**	**1.2**
Tetrachloroethene	**5.2**	**2.4**	**3.0**	**2.9**
Trichloroethene	**70.4**	**47**	**73.1**	**53.7**
Vinyl Chloride	**71.8**	**48.6**	**81.8**	**47.8**
cis 1,2-Dichloroethene	**122**	**105**	**137**	**99.5**
trans 1,2-Dichloroethene	< 0.79	**0.28 J**	**0.44 J**	< 0.63
Benzene	**0.32 J**	**0.45 J**	**0.61**	**0.77**
Toluene	**2.4**	**0.94**	**3.6**	**0.64**
o-Xylene	< 0.87	< 0.69	**0.74**	< 0.69
m,p-Xylene	**0.69 J**	**0.48 J**	**1.1**	< 0.69
Subtotal Project VOCs	**279**	**210**	**309**	**211**
Non-Project VOCs				
1,1,2,2-Tetrachloroethane	< 0.69	< 0.55	< 0.55	< 0.55
1,1,2-Trichloroethane	< 0.55	< 0.44	< 0.44	< 0.44
1,2-Dichloropropane	< 0.92	**0.25 J**	**0.45 J**	< 0.74
1,3-Butadiene	< 0.44	< 0.35	< 0.35	< 0.35
2-Butanone	**0.62**	**0.41 J**	**4.7**	**0.86**
4-Methyl-2-Pentanone	< 0.82	< 0.66	< 0.66	< 0.66
Acetone	**7.1**	**4.0**	**22**	**7.6**
Bromodichloromethane	< 0.67	< 0.54	< 0.54	< 0.54
Bromoform	< 0.41	< 0.33	< 0.33	< 0.33
Bromomethane	< 0.78	< 0.62	< 0.62	< 0.62
Carbon Disulfide	< 0.62	< 0.50	**7.5**	< 0.50
Carbon Tetrachloride	< 0.25	**0.47**	**0.62**	**0.59**
Chlorobenzene	< 0.92	< 0.74	< 0.74	< 0.74
Chlorodibromomethane	< 0.85	< 0.68	< 0.68	< 0.68
Chlorodifluoromethane (Freon 22)	**16**	**14**	**14**	**15**
Chloroethane	< 0.53	< 0.42	< 0.42	< 0.42
Chloroform	**13**	**8.8**	**11**	**8.8**
Chloromethane	**1.3**	**1.3**	**1.2**	**1.8**
cis-1,3-Dichloropropene	< 0.91	< 0.73	< 0.73	< 0.73
Dichlorodifluoromethane (Freon 12)	**2.4**	**2.4**	**2.5**	**2.4**
Dichloromethane	< 0.69	**0.97**	< 0.56	**2.8**
Ethylbenzene	< 0.87	**0.37 J**	**1.1**	< 0.69
Methyl N-Butyl Ketone	< 0.82	< 0.65	< 0.65	< 0.65
Methyl Tert-Butyl Ether	**0.35 J**	**0.36 J**	**0.43 J**	< 0.58
Styrene (Monomer)	< 0.85	< 0.68	< 0.68	< 0.68
trans-1,3-Dichloropropene	< 0.91	< 0.73	< 0.73	< 0.73
Trichlorofluoromethane (Freon 11)	**1.9**	**1.7**	**1.9**	**1.7**
Trichlorotrifluoroethane (Freon 113)	**2.1**	**2.0**	**2.1**	**2.3**
1-Chloro-1,1-difluoroethane (Freon 142b)	< 0.82	**0.32 J**	< 0.66	**0.45 J**
Subtotal Non-Project VOCs	**45**	**37**	**70**	**44**
Total VOCs[2]	**324**	**247**	**379**	**255**

Abbreviations, Notes, Qualifiers, and Units 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

Abbreviations, Notes, Qualifiers, and Units:

ELAP	Environmental Laboratory Approval Program
NYSDOH	New York State Department of Health
OM&M	Operation, Maintenance, and Monitoring
USEPA	United States Environmental Protection Agency
VOC	Volatile Organic Compound

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 Bethpage Park Groundwater Containment System OM&M Manual (Arcadis 2016). 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.

53.7	Bold value indicates a detection.
< 1.0	Compound not detected above the laboratory quantification limit.
J	Result is estimated.
$\mu g/m^3$	micrograms per cubic meter

Table 5
Summary of Effluent Vapor 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[1]	12/1/2017 [3] (µg/m^3)	02/01/18 (µg/m^3)	04/05/18 (µg/m^3)	08/07/18 (µg/m^3)
Project VOCs				
1,1,1 - Trichloroethane	< 0.55	< 0.44	**0.60**	**0.50**
1,1 - Dichloroethane	**3.9**	**3.6**	**4.5**	**3.0**
1,2 - Dichloroethane	< 0.81	**0.32 J**	**0.36 J**	< 0.65
1,1 - Dichloroethene	**0.83**	**1.1**	**1.3**	**0.79**
Tetrachloroethene	**0.47**	**0.68**	**1.7**	**1.3**
Trichloroethene	**4.2**	**4.0**	**32**	**16**
Vinyl Chloride	**8.9**	**16**	**51.1**	**14.0**
cis 1,2-Dichloroethene	**31**	**51.9**	**100**	**43.2**
trans 1,2-Dichloroethene	< 0.79	< 0.63	< 0.63	< 0.63
Benzene	**1.6**	**1.5**	**1.1**	**1.7**
Toluene	< 0.75	**0.60**	**5.7**	**5.3**
o-Xylene	< 0.87	< 0.69	**0.34 J**	**0.34 J**
m,p-Xylene	< 0.87	**0.40 J**	**0.69**	**0.56 J**
Subtotal Project VOCs	**51**	**80**	**199**	**87**
Non-Project VOCs				
1,1,2,2-Tetrachloroethane	< 0.69	< 0.55	< 0.55	< 0.55
1,1,2-Trichloroethane	< 0.55	< 0.44	< 0.44	< 0.44
1,2-Dichloropropane	< 0.92	< 0.74	< 0.74	< 0.74
1,3-Butadiene	< 0.44	< 0.35	< 0.35	< 0.35
2-Butanone	**1.1**	**5.0**	**5.6**	**43.1**
4-Methyl-2-Pentanone	< 0.82	< 0.66	< 0.66	< 0.66
Acetone	**43**	**82.7 D**	**23**	**238**
Bromodichloromethane	< 0.67	< 0.54	< 0.54	< 0.54
Bromoform	< 0.41	< 0.33	< 0.33	< 0.33
Bromomethane	< 0.78	< 0.62	< 0.62	< 0.62
Carbon Disulfide	< 0.62	**17**	< 0.50	**0.26 J**
Carbon Tetrachloride	< 0.25	< 0.20	**0.45**	**0.46**
Chlorobenzene	< 0.92	< 0.74	< 0.74	< 0.74
Chlorodibromomethane	< 0.85	< 0.68	< 0.68	< 0.68
Chlorodifluoromethane (Freon 22)	**17**	**15**	< 0.56	**11**
Chloroethane	< 0.53	< 0.42	< 0.42	< 0.42
Chloroform	**20**	**18**	**13**	**9.3**
Chloromethane	**1.2**	**1.8**	**1.1**	**2.3**
cis-1,3-Dichloropropene	< 0.91	< 0.73	< 0.73	< 0.73
Dichlorodifluoromethane (Freon 12)	**2.3**	**2.4**	**2.5**	**2.3**
Dichloromethane	< 0.69	**0.76**	< 0.56	**1.3**
Ethylbenzene	< 0.87	< 0.69	**0.43 J**	< 0.69
Methyl N-Butyl Ketone	< 0.82	< 0.65	< 0.65	< 0.65
Methyl Tert-Butyl Ether	< 0.72	< 0.58	< 0.58	< 0.58
Styrene (Monomer)	< 0.85	< 0.68	< 0.68	< 0.68
trans-1,3-Dichloropropene	< 0.91	< 0.73	< 0.73	< 0.73
Trichlorofluoromethane (Freon 11)	**1.9**	**1.9**	**1.9**	**2.1**
Trichlorotrifluoroethane (Freon 113)	**2.5**	**2.6**	**2.3**	**2.1**
1-Chloro-1,1-difluoroethane (Freon 142b)	< 0.82	**0.36 J**	< 0.66	**0.36 J**
Subtotal Non-Project VOCs	**89**	**148**	**50**	**313**
Total VOCs[2]	**140**	**228**	**250**	**399**

Abbreviations, Notes, Qualifiers, and Units on last page.

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

Abbreviations, Notes, Qualifiers, and Units:

ELAP	Environmental Laboratory Approval Program
NYSDOH	New York State Department of Health
OM&M	Operation, Maintenance, and Monitoring
USEPA	United States Environmental Protection Agency
VOC	Volatile Organic Compound

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 Bethpage Park Groundwater Containment System OM&M Manual (Arcadis 2016). 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. "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.
3. 2017 fourth quarter effluent vapor sample collected two days after the influent vapor sample.

16	Bold value indicates a detection.
< 1.0	Compound not detected above the laboratory quantification limit.
J	Result is estimated.
$\mu g/m^3$	micrograms per cubic meter

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

ARCADIS Design & Consultancy for natural and built assets

Compound[1,2,3]	12/01/17 (ppbv)	02/01/18 (ppbv)	04/05/18 (ppbv)	08/07/18 (ppbv)
Tentatively Identified Compounds				
2-Methyl-1,3-Dioxolane	--	--	--	**5.6 JN**
2-Phenyl-2-propanol	--	--	--	**5.5 JN**
3-Methyl-Furan	--	--	--	**2.6 JN**
Acetophenone	--	--	--	**8.0 JN**
Carbon Dioxide	**290 JNB**	**270 JNB**	--	**210 JNB**
Dimethyl ether	--	--	**290 JNB**	--
Ethanol	--	--	--	**2.6 JN**
Isopropylbenzene	--	--	**19 JN**	**16 JN**
Pentyl-Cyclohexane	**2.4 JN**	--	--	--
trans-2-methyl decalin	**3.0 JN**	--	--	--
Unknown	--	--	--	**1.5 J**
Total VOC TICs	**5.4 JN**	0	**19 J**	**41.8 J**

Abbreviations, Notes, Qualifiers, and Units:

ELAP	Environmental Laboratory Approval Program
NYSDOH	New York State Department of Health
OM&M	Operation, Maintenance, and Monitoring
TIC	Tentatively Identified Compound
USEPA	United States Environmental Protection Agency
VOC	Volatile Organic Compound

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 Bethpage Park Groundwater Containment System OM&M Manual (Arcadis 2016). 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. The ECUs were placed in a parallel configuration on 3/1/2018 to test for performance gain.
3. VSP-5 sample location moved to location parallel ECUs near effluent stack.

210	Bold value indicates a detection.
--	TIC not detected.
B	TIC was detected in the associated field blank.
J	Result is estimated.
N	Indicates presumptive evidence of a compound.
ppbv	parts per billion by volume

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

ARCADIS Design & Consultancy for natural and built assets

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)	(°R)
08/01/17	30.7	77.1	74.6	29.5	212	242	55	50	25	55	10	1,607	4.9	2.5	1.0	1.5	0.0	538
08/16/17	30.3	75.0	75.0	30.8	211	234	55	67	17	54	10	1,549	6.0	2.9	1.0	1.8	0.0	542
09/09/17	29.2	61.2	75.3	29.8	196	226	56	16	18	55	13	1,596	6.0	2.9	1.0	1.7	0.0	540
10/12/17	30.4	74.0	74.4	29.9	209	239	55	69	19	55	15	1,577	6.0	2.9	1.0	1.6	0.0	539
11/29/17	30.8	84.3	62.8	30.2	208	240	54	51	50	54	13	1,571	5.5	2.5	0.5	1.5	0.0	532
12/20/17	31.0	80.5	63.6	30.4	205	237	54	53	46	54	14	1,551	5.5	2.5	0.5	1.5	0.0	532
01/11/18	31.0	78.8	63.6	30.0	203	231	54	53	45	54	20	1,591	5.5	2.5	0.5	1.5	0.0	528
02/01/18	30.9	61.5	69.8	29.5	192	224	54	11	23	55	17	1,563	5.9	2.5	0.5	1.5	0.0	530
03/01/18	30.5	97.0 [6]	60.0	29.4	217 [8]	248	55	7	52	55	19	1,555	0.6 [7]	0.0 [7]	0.2 [7]	0.0 [7]	0.2	532
04/04/18	30.4	88.5	59.7	29.8	208	239	55	6	51	55	23	1,522	0.5	0.0	0.0	0.0	0.0	532
05/11/18	30.1	80.4	76.0	30.3	217	219	54	6	7	54	20	1,888	0.0	0.0	0.0	0.0	0.0	531
06/07/18	30.1	60.0	75.6	30.0	196	201	54	5	6	55	13	1,859	0.0	0.0	0.0	0.0	0.0	535
07/11/18	30.2	95.5	81.5	30.7	238	241	52	6	5	53	15	1,817	0.0	0.0	0.0	0.0	0.0	545
08/07/18	30.7	77.8	80.7	30.7	220	227	53	5	4	54	15	1,827	0.0	0.0	0.0	0.0	0.0	540
09/05/18	30.6	62.7	81.0	30.9	205	208	53	5	4	53	9	1,841	0.0	0.0	0.0	0.0	0.0	542

Abbreviations, Notes, and Units on last page.

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

ARCADIS Design & Consultancy for natural and built assets

Abbreviations, Notes, and Units:

ECU	Emission Control Unit
GAC	Granular Activated Carbon
HMI	Human-Machine Interface
PPZ	Potassium Permanganate-impregnated Zeolite
RW	Remedial Well
SCADA	Supervisory Control and Data Acquisition
Temp	Temperature

1. Operational data collected by Arcadis on days noted. Paramet ers 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 w ell flow rates via the SCADA System.
4. Remedial Well effluent pressure readings measured a t the influent manifold within the treatment system building.
5. Instantaneous values recorded from field-mounted instruments during we ekly site visits.
6. RW-2 flow rate was increased on 2/15/2018 to tes t for performance and life cycle gains.
7. The ECUs were placed in a parallel configuration on 3/1/2018 for performance gain.
8. Combined influent on 3/01/2018 was erroneously reported as 1 20 gpm in the 1Q OMM Report.

gpm	gallons per minute
iwc	inches of water column
psi	pounds per square inch
^{o}R	degrees Rankine
scfm	standard cubic feet per minute

Table 8
Summary of 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

ARCADIS Design & Consultancy for natural and built assets

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
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
2016 Totals	15,826	34,539	39,349	15,826	105,540	<0.01	38	3.2	2.2	44	<0.01	37	1.4	0.20	39	<0.01	1.5	1.7	2.0	5.2	<0.01	0.10	<0.01	<0.01	0.12	<0.01	0.10	<0.01	<0.01	0.11	<0.01	<0.01	<0.01	<0.01	0.014
2017 Totals	16,005	31,600	37,614	15,965	101,184	< 0.01	13	2.2	1.2	17	< 0.01	13	1.1	0.16	14	< 0.01	0.56	1.1	1.1	2.7	< 0.01	0.037	< 0.01	< 0.01	0.046	< 0.01	0.035	< 0.01	< 0.01	0.038	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
January 2018 through March 2018 Totals																																		
01/01/18 - 02/01/18	1,368	3,184	1,951	1,324	7,828	< 0.01	1.5	0.053	0.067	1.6	< 0.01	1.5	0.042	< 0.01	1.5	< 0.01	0.029	0.011	0.058	0.098	< 0.01	0.048	< 0.01	< 0.01	0.052	< 0.01	0.048	< 0.01	< 0.01	0.050	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
02/01/18 - 03/01/18	1,192	2,913	1,207	1,159	6,471	< 0.01	1.4	0.033	0.059	1.5	< 0.01	1.3	0.026	< 0.01	1.3	< 0.01	0.027	<0.01	0.051	0.078	< 0.01	0.049	< 0.01	< 0.01	0.052	< 0.01	0.046	< 0.01	< 0.01	0.048	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
03/01/18 - 04/01/18	1,343	4,300	1,828	1,322	8,794	< 0.01	2.0	0.050	0.067	2.1	< 0.01	2.0	0.040	< 0.01	2.0	< 0.01	0.039	0.010	0.058	0.11	< 0.01	0.065	< 0.01	< 0.01	0.068	< 0.01	0.065	< 0.01	< 0.01	0.066	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Subtotal Jan - Mar 2018 [9]	3,904	10,397	4,986	3,806	23,093	< 0.01	4.9	0.14	0.19	5.2	< 0.01	4.8	0.11	< 0.01	4.9	< 0.01	0.10	0.021	0.17	0.28	< 0.01	0.054	< 0.01	< 0.01	0.058	< 0.01	0.053	< 0.01	< 0.01	0.055	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
April 2018 through June 2018 Totals																																		
04/01/18 - 05/01/18	1,132	3,140	2,376	1,105	7,754	< 0.01	1.5	0.059	0.057	1.6	< 0.01	1.5	0.044	< 0.01	1.5	< 0.01	0.026	0.015	0.052	0.09	< 0.01	0.050	< 0.01	< 0.01	0.054	< 0.01	0.049	< 0.01	< 0.01	0.051	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
05/01/18 - 06/01/18	1,168	2,864	2,910	1,169	8,111	< 0.01	1.4	0.073	0.061	1.5	< 0.01	1.3	0.054	< 0.01	1.4	< 0.01	0.024	0.019	0.055	0.097	< 0.01	0.044	< 0.01	< 0.01	0.048	< 0.01	0.043	< 0.01	< 0.01	0.045	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
06/01/18 - 07/01/18	1,128	2,762	2,233	1,105	7,228	< 0.01	1.3	0.056	0.057	1.4	< 0.01	1.3	0.041	< 0.01	1.3	< 0.01	0.023	0.014	0.052	0.09	< 0.01	0.044	< 0.01	< 0.01	0.048	< 0.01	0.043	< 0.01	< 0.01	0.045	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Subtotal Apr - Jun 2018 [10]	3,429	8,765	7,519	3,379	23,092	< 0.01	4.2	0.19	0.18	4.5	< 0.01	4.1	0.14	< 0.01	4.2	< 0.01	0.073	0.048	0.16	0.28	< 0.01	0.046	< 0.01	< 0.01	0.050	< 0.01	0.045	< 0.01	< 0.01	0.047	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
July 2018 through September 2018 Totals																																		
07/01/18 - 08/01/18	1,264	3,773	2,790	1,257	9,084	< 0.01	0.6	0.083	0.062	0.8	< 0.01	0.6	0.067	< 0.01	0.7	< 0.01	0.024	0.016	0.062	0.10	< 0.01	0.021	< 0.01	< 0.01	0.025	< 0.01	0.020	< 0.01	< 0.01	0.022	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
08/01/18 - 09/01/18	1,299	3,134	3,391	1,321	9,145	< 0.01	0.5	0.10	0.065	0.7	< 0.01	0.5	0.082	< 0.01	0.6	< 0.01	0.020	0.019	0.065	0.10	< 0.01	0.017	< 0.01	< 0.01	0.023	< 0.01	0.017	< 0.01	< 0.01	0.019	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
09/01/18 - 10/01/18	1,306	3,552	3,479	1,302	9,639	< 0.01	0.6	0.10	0.064	0.8	< 0.01	0.6	0.084	< 0.01	0.7	< 0.01	0.022	0.020	0.064	0.11	< 0.01	0.020	< 0.01	< 0.01	0.026	< 0.01	0.019	< 0.01	< 0.01	0.022	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Subtotal July - Sept 2018 [11]	3,869	10,459	9,660	3,880	27,868	< 0.01	1.8	0.29	0.19	2.3	< 0.01	1.7	0.23	< 0.01	1.9	< 0.01	0.065	0.055	0.19	0.31	< 0.01	0.019	< 0.01	< 0.01	0.024	< 0.01	0.019	< 0.01	< 0.01	0.021	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
2018 Totals	11,202	29,621	22,165	11,065	74,053	< 0.01	10.8	0.62	0.56	12.0	< 0.01	10.6	0.48	< 0.01	11.1	< 0.01	0.23	0.12	0.52	0.87	< 0.01	0.040	< 0.01	< 0.01	0.044	< 0.01	0.039	< 0.01	< 0.01	0.041	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Total [12]	143,483	325,561	330,559	142,283	941,886	1.6	1,015	913	256	2,184	1.6	1,004	104	1.9	1,112	< 0.01	10	809	254	1,066	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Abbreviations, Notes, Qualifiers, and Units:

NA Not Applicable
VOC Volatile Organic Compound.

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, 2018 and April 1, 2018.
10. The volume of groundwater recovered and mass recovered calculations represent the operational period between April 1, 2018 and July 1, 2018.
11. The volume of groundwater recovered and mass recovered calculations represent the operational period between July 1, 2018 and October 1, 2018.
12. "Total" refers to the amounts removed by the Operable Unit 3 Bethpage Park Groundwater Containment System.

< Less than

gal Gallons
lbs Pounds
lbs/day Pounds per day

Table 9
Summary of Air Quality Impact Analysis
Bethpage Park Groundwater Containment System
Operable Unit 3 (Former Grumman Settling Ponds)
Bethpage, New York

ARCADIS Design & Consultancy for natural and built assets

Toxic Air Contaminant	VSP-05 Vapor Effluent (µg/m³)	Emission Rate[1]			Scaled Impact - Hourly[2] (µg/m³)	Scaled Impact - Annual[2] (µg/m³)	SGC[3] (µg/m³)	AGC[3] (µg/m³)	% of SGC	% of AGC
	8/7/2018	lb/yr	lb/hr	g/s						
Project VOCs										
1,1,1-Trichloroethane	0.5	0.03	3.39E-06	4.27E-07	1.35E-03	4.12E-05	9,000	5.00E+03	0.0%	0.0%
1,1-Dichloroethane	3	0.18	2.03E-05	2.6E-06	8.1E-03	2.5E-04	--	0.63	--	0.0%
1,2-Dichloroethane	0.79	0.05	5.35E-06	6.74E-07	2.13E-03	6.50E-05	--	3.8E-02	--	0.2%
Benzene	1.7	0.10	1.15E-05	1.5E-06	4.6E-03	1.4E-04	1,300	0.13	0.0%	0.1%
cis-1,2-Dichloroethene	43.2	2.60	2.93E-04	3.7E-05	1.2E-01	3.6E-03	--	63	--	0.0%
Tetrachloroethene	1.3	0.08	8.80E-06	1.1E-06	3.5E-03	1.1E-04	300	4	0.0%	0.0%
Toluene	5.3	0.31	3.59E-05	4.5E-06	1.4E-02	4.4E-04	37,000	5,000	0.0%	0.0%
Trichloroethene	16	0.95	1.08E-04	1.4E-05	4.3E-02	1.3E-03	20	0.20	0.2%	0.7%
Vinyl Chloride	14	0.83	9.48E-05	1.2E-05	3.8E-02	1.2E-03	180,000	0.11	0.0%	1.0%
Xylene-O	0.34 J	0.02	2.30E-06	2.90E-07	9.15E-04	2.8E-05	22,000	100	0.0%	0.0%
Xylenes - M,P	0.56 J	0.03	3.79E-06	4.8E-07	1.5E-03	4.6E-05	22,000	100	0.0%	0.0%
Non-Project VOCs										
1-Chloro-1,1-difluoroethane (Freon 142b)	0.36 J	0.02	2.44E-06	3.07E-07	9.69E-04	3.0E-05	--	50,000	--	0.0%
2-Butanone	43.1	2.60	2.92E-04	3.7E-05	1.2E-01	3.5E-03	13,000	5,000	0.0%	0.0%
Acetone	238	14	1.61E-03	2.0E-04	6.4E-01	2.0E-02	180,000	30,000	0.0%	0.0%
Carbon Disulfide	0.26 J	0.02	1.76E-06	2.2E-07	7.0E-04	2.1E-05	6,200	700	0.0%	0.0%
Carbon Tetrachloride	0.46	0.03	3.12E-06	3.93E-07	1.24E-03	3.79E-05	1900	1.7E-01	0.0%	0.0%
Chlorodifluoromethane (Freon 22)	11	0.65	7.45E-05	9.4E-06	3.0E-02	9.1E-04	--	50,000	--	0.0%
Chloroform	9.3	0.55	6.30E-05	7.9E-06	2.5E-02	7.7E-04	150	15	0.0%	0.0%
Chloromethane	2.3	0.14	1.56E-05	2.0E-06	6.2E-03	1.9E-04	22,000	90	0.0%	0.0%
Dichlorodifluoromethane (Freon 12)	2.3	0.14	1.56E-05	2.0E-06	6.2E-03	1.9E-04	--	12,000	--	0.0%
Dichloromethane	1.3	0.08	8.80E-06	1.1E-06	3.5E-03	1.1E-04	14,000	60	0.0%	0.0%
Trichlorofluoromethane (Freon 11)	2.1	0.12	1.42E-05	1.8E-06	5.7E-03	1.7E-04	9,000	5,000	0.0%	0.0%
Trichlorotrifluoroethane (Freon 113)	2.1	0.12	1.42E-05	1.8E-06	5.7E-03	1.7E-04	960,000	180,000	0.0%	0.0%

Abbreviations, Notes, and Units on last page.

Table 9
Summary of Air Quality Impact Analysis
Bethpage Park Groundwater Containment System
Operable Unit 3 (Former Grumman Settling Ponds)
Bethpage, New York

ARCADIS Design & Consultancy for natural and built assets

Abbreviations, Notes, and Units:

AGC	Annual Guideline Concentration
CAS#	Chemical Abstracts Service Registry Number
DAR-1	Division of Air Resources-1
--	None Specified
NYSDEC	New York State Department of Environmental Conservation
SGC	Short-term Guideline Concentration
VSP	Vapor Sampling Point
J	Result is estimated.

1. Emission rate calculated based on VSP-05 effluent concentration and a daily average exit air flow rate of 1,812 ft^3/min for 8/7/2018.
   1,1,1-Trichloroethane (lb/hr) = TCE [µg/m^3] x Air Flow Rate [ft^3/min] x (1 m^3/35.3147 ft^3) x (60 min/hr) x (0.000001 g/1 µg) x (0.0022 lb/g)
   lb/yr = lb/hr x 8,760 hrs/yr
   g/s = lb/hr x hr/3,600 sec x 453.59 g/lb
2. Ambient impact based on AERMOD modeling using normalized 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 (Brookhaven/Farmingdale) for the years 2011 through 2015. The maximum impact from all the years was used for the calculations.
   Scaled hourly impact (µg/m^3) = AERMOD predicted hourly ambient impact at 1 g/s ([µg/m^3]/[g/s]) x Actual emission rate (g/s)
   Scaled annual impact (µg/m^3) = AERMOD predicted annual ambient impact at 1 g/s ([µg/m^3]/[g/s]) x Actual emission rate (g/s)

AERMOD Normalized Ambient Impact at 1 g/s	
Hourly ([µg/m^3]/[g/s])	Annual ([µg/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.
4. Compounds not detected above the laboratory reporting limit are excluded from the air quality impact analysis summary.

cfm	cubic feet per minute
g/s	grams per second
lb/hr	pounds per hour
lb/yr	pounds per year
µg/m^3	micrograms per cubic meter

Table 10
Concentrations of Volatile Organic Compounds and 1,4-Dioxane
in Groundwater Samples Collected from Monitoring Wells,
Bethpage Park Grondwater Containment System,
OU3 (Former Settling Ponds)
Bethpage, New York

ARCADIS Design & Consultancy for natural and built assets

Compound [1,2,3] (units in µg/L)	Sample Location: Sample Date:	B24MW-2 11/13/2014	B24MW-2 12/28/2015	B24MW-2 12/29/2016	B24MW-2 8/4/2017	*B24MW-2 8/9/2018*	B24MW-3 11/13/2014	B24MW-3 12/28/2015
	NYSDEC SCGs							
1,1,1-Trichloroethane	5	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0
1,1,2,2-Tetrachloroethane	5	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0
1,1,2-Trichloroethane	1	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0
1,1-Dichloroethane	5	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0
1,1-Dichloroethene	5	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0
1,2-Dichloroethane	0.6	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0
1,2-Dichloropropane	1	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0
2-Butanone	NE	< 10	< 10	< 10	< 10	*< 10*	< 10	< 10
2-Hexanone	50	< 5.0	< 5.0	< 5.0	< 5.0	*< 5.0*	< 5.0	< 5.0
4-Methyl-2-Pentanone	50	< 5.0	< 5.0	< 5.0	< 5.0	*< 5.0*	< 5.0	< 5.0
Acetone	NE	< 10	< 10	< 10	< 10	*< 10*	< 10 J	< 10
Benzene	1	< 1.0	< 0.50	< 0.50	< 0.50	*< 0.50*	< 1.0	< 0.50
Bromodichloromethane	50	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0
Bromoform	50	< 4.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 4.0	< 1.0
Bromomethane	5	< 2.0	< 2.0	< 2.0	< 2.0	*< 2.0*	< 2.0	< 2.0
Carbon Disulfide	60	< 2.0	< 2.0	< 2.0	< 2.0	*< 2.0*	< 2.0	< 2.0
Carbon Tetrachloride	5	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0
Chlorobenzene	5	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0
Chlorodifloromethane (Freon 22)	NE	< 5.0	< 5.0	< 5.0	< 5.0	*< 5.0*	< 5.0	< 5.0
Chloroethane	5	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0
Chloroform	7	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	**0.28 J**	**0.30 J**
Chloromethane	5	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0
cis-1,2-Dichloroethene	5	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0
cis-1,3-Dichloropropene	0.4	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0
Chlorodibromomethane	50	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0
Dichlorodifloromethane (Freon 12)	5	< 5.0	< 2.0	< 2.0	< 2.0	*< 2.0*	< 5.0	< 2.0
Ethylbenzene	5	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0
Methyl-Tert-Butylether	5	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0
Methylene Chloride	5	< 2.0	< 2.0	< 2.0	< 2.0	*< 2.0*	< 2.0	< 2.0
Styrene (Monomer)	5	< 5.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 5.0	< 1.0
Tetrachloroethene	5	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0
Tolene	5	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0
trans-1,2-Dichloroethene	5	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0
trans-1,3-Dichloropropene	0.4	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0
Trichloroethene	5	**2.7**	**2.7**	**2.4**	**2.1**	***2.5***	< 1.0	**0.25 J**
Trichlorotrifloroethane (Freon 113)	5	< 5.0	< 5.0	< 5.0	< 5.0	*< 5.0*	< 5.0	< 5.0
Vinyl Chloride	2	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0
o-Xylene	5	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0
m,p-Xylene	5	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0
Total VOCs [4]		**2.7**	**2.7**	**2.4**	**2.1**	***2.5***	**0.28**	**0.55**
Project VOCs [4]		**2.7**	**2.7**	**2.4**	**2.1**	***2.5***	0	**0.25**
1,4-Dioxane		--	**0.185**	**0.417**	**0.348**	***0.16 J***	--	**0.257**

See Notes and Abbreviations on last page

Table 10
Concentrations of Volatile Organic Compounds and 1,4-Dioxane
in Groundwater Samples Collected from Monitoring Wells,
Bethpage Park Grondwater Containment System,
OU3 (Former Settling Ponds)
Bethpage, New York

ARCADIS Design & Consultancy for natural and built assets

Compound [1,2,3] (units in µg/L)	Sample Location: Sample Date:	B24MW-3 1/20/2017	B24MW-3 8/2/2017	*B24MW-3 8/9/2018*	B30MW-1 11/13/2014	B30MW-1 12/31/2015	B30MW-1 1/4/2017	B30MW-1 8/3/2017
	NYSDEC SCGs							
1,1,1-Trichloroethane	5	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2,2-Tetrachloroethane	5	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloroethane	1	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane	5	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethene	5	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane	0.6	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloropropane	1	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0
2-Butanone	NE	< 10	< 10	*< 10*	< 10	< 10	< 10	< 10
2-Hexanone	50	< 5.0	< 5.0	*< 5.0*	< 5.0	< 5.0	< 5.0	< 5.0
4-Methyl-2-Pentanone	50	< 5.0	< 5.0	*< 5.0*	< 5.0	< 5.0	< 5.0	< 5.0
Acetone	NE	< 10	< 10	*< 10*	< 10	< 10	< 10	< 10
Benzene	1	< 0.50	< 0.50	*< 0.50*	< 1.0	< 0.50	< 0.50	< 0.50
Bromodichloromethane	50	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0
Bromoform	50	< 1.0	< 1.0	*< 1.0*	< 4.0	< 1.0	< 1.0	< 1.0
Bromomethane	5	< 2.0	< 2.0	*< 2.0*	< 2.0	< 2.0	< 2.0	< 2.0
Carbon Disulfide	60	< 2.0	< 2.0	*< 2.0*	< 2.0	< 2.0	< 2.0	< 2.0
Carbon Tetrachloride	5	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0
Chlorobenzene	5	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0
Chlorodifloromethane (Freon 22)	NE	< 5.0	< 5.0	*< 5.0*	< 5.0	< 5.0	< 5.0	< 5.0
Chloroethane	5	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0
Chloroform	7	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0
Chloromethane	5	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0
cis-1,2-Dichloroethene	5	< 1.0	**0.59 J**	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0
cis-1,3-Dichloropropene	0.4	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0
Chlorodibromomethane	50	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0
Dichlorodifloromethane (Freon 12)	5	< 2.0	< 2.0	*< 2.0*	< 5.0	< 2.0	< 2.0	< 2.0
Ethylbenzene	5	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0
Methyl-Tert-Butylether	5	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0
Methylene Chloride	5	< 2.0	< 2.0	*< 2.0*	< 2.0	< 2.0	< 2.0	< 2.0
Styrene (Monomer)	5	< 1.0	< 1.0	*< 1.0*	< 5.0	< 1.0	< 1.0	< 1.0
Tetrachloroethene	5	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0
Tolene	5	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0
trans-1,2-Dichloroethene	5	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0
trans-1,3-Dichloropropene	0.4	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0
Trichloroethene	5	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0
Trichlorotrifloroethane (Freon 113)	5	< 5.0	< 5.0	*< 5.0*	< 5.0	< 5.0	< 5.0	< 5.0
Vinyl Chloride	2	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene	5	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0
m,p-Xylene	5	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0
Total VOCs [4]		0	**0.59**	*0*	0	0	0	0
Project VOCs [4]		0	**0.59**	*0*	0	0	0	0
1,4-Dioxane		**0.918**	**0.675**	***0.11 J***	--	< 0.10	< 0.200	< 0.200

See Notes and Abbreviations on last page

Table 10
Concentrations of Volatile Organic Compounds and 1,4-Dioxane
in Groundwater Samples Collected from Monitoring Wells,
Bethpage Park Grondwater Containment System,
OU3 (Former Settling Ponds)
Bethpage, New York

ARCADIS Design & Consultancy for natural and built assets

Compound [1,2,3] (units in µg/L)	Sample Location: Sample Date:	*B30MW-1* *8/9/2018*	BCPMW-4-1 11/17/2014	BCPMW-4-1 10/8/2015	BCPMW-4-1 12/30/2015	BCPMW-4-1 12/28/2016	BCPMW-4-1 7/31/2017	*BCPMW-4-1* *7/24/2018*
	NYSDEC SCGs							
1,1,1-Trichloroethane	5	*< 1.0*	**2.4**	**4.2**	**7.3**	**0.36 J**	< 1.0	*< 1.0*
1,1,2,2-Tetrachloroethane	5	*< 1.0*	< 1.0		< 1.0	< 1.0	< 1.0	*< 1.0*
1,1,2-Trichloroethane	1	*< 1.0*	**0.42 J**	**1.1**	**1.7**	< 1.0	< 1.0	*< 1.0*
1,1-Dichloroethane	5	*< 1.0*	**7.3**	**13.3**	**27.1**	**3.2**	**1.6**	***0.87 J***
1,1-Dichloroethene	5	*< 1.0*	**1.1**	**0.98 J**	**1.7**	**0.42 J**	< 1.0	*< 1.0*
1,2-Dichloroethane	0.6	*< 1.0*	**0.70 J**	**0.97 J**	**1.3**	**0.87 J**	< 1.0	*< 1.0*
1,2-Dichloropropane	1	*< 1.0*	**0.61 J**	**0.95**	**1.5**	< 1.0	< 1.0	*< 1.0*
2-Butanone	NE	*< 10*	< 10	< 10	< 10	< 10	< 10	*< 10*
2-Hexanone	50	*< 5.0*	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	*< 5.0*
4-Methyl-2-Pentanone	50	*< 5.0*	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	*< 5.0*
Acetone	NE	*< 10*	< 10	< 10	< 10	< 10	< 10	*< 10*
Benzene	1	*< 0.50*	< 1.0	< 0.50	< 0.50	< 0.50	< 0.50	*< 0.50*
Bromodichloromethane	50	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*
Bromoform	50	*< 1.0*	< 4.0	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*
Bromomethane	5	*< 2.0*	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	*< 2.0*
Carbon Disulfide	60	*< 2.0*	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	*< 2.0*
Carbon Tetrachloride	5	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*
Chlorobenzene	5	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*
Chlorodifloromethane (Freon 22)	NE	*< 5.0*	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	*< 5.0*
Chloroethane	5	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*
Chloroform	7	*< 1.0*	**0.61 J**	**0.70 J**	**1.1**	**1.4**	**0.76 J**	*< 1.0*
Chloromethane	5	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*
cis-1,2-Dichloroethene	5	*< 1.0*	**207 D**	**156**	**252 D**	**81.4**	**53.5**	***30.7***
cis-1,3-Dichloropropene	0.4	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*
Chlorodibromomethane	50	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*
Dichlorodifloromethane (Freon 12)	5	*< 2.0*	< 5.0	< 2.0	< 2.0	< 2.0	< 2.0	*< 2.0*
Ethylbenzene	5	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*
Methyl-Tert-Butylether	5	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*
Methylene Chloride	5	*< 2.0*	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	*< 2.0*
Styrene (Monomer)	5	*< 1.0*	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*
Tetrachloroethene	5	*< 1.0*	**0.80 J**	**1.1**	**1.1**	**0.50 J**	< 1.0	*< 1.0*
Tolene	5	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*
trans-1,2-Dichloroethene	5	*< 1.0*	**0.59 J**	< 1.0	**0.86 J**	**0.49 J**	< 1.0	*< 1.0*
trans-1,3-Dichloropropene	0.4	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*
Trichloroethene	5	*< 1.0*	**34.7**	**68.1**	**81.5**	**48.2**	**21.9**	***13.5***
Trichlorotrifloroethane (Freon 113)	5	*< 5.0*	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	*< 5.0*
Vinyl Chloride	2	*< 1.0*	**21**	**13**	**197**	**3.3**	< 1.0	*< 1.0*
o-Xylene	5	*< 1.0*	< 1.0	< 1.0	**0.70 J**	< 1.0	< 1.0	*< 1.0*
m,p-Xylene	5	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*
Total VOCs [4]		*0*	**280**	**260**	**570**	**140**	**78**	***45***
Project VOCs [4]		*0*	**280**	**260**	**570**	**140**	**77**	***45***
1,4-Dioxane		*< 0.24*	--	--	**37.7**	**39.3**	**2.64**	***0.68***

See Notes and Abbreviations on last page

Table 10
Concentrations of Volatile Organic Componds and 1,4-Dioxane
in Groundwater Samples Collected from Monitoring Wells,
Bethpage Park Grondwater Containment System,
OU3 (Former Settling Ponds)
Bethpage, New York

ARCADIS Design & Consultancy for natural and built assets

Compound [1,2,3] (units in µg/L)	Sample Location: Sample Date:	BCPMW-4-2 11/18/2014	BCPMW-4-2 10/8/2015	BCPMW-4-2 12/31/2015	BCPMW-4-2 (REP) 12/31/2015	BCPMW-4-2 12/22/2016	BCPMW-4-2 (REP) 12/22/2016	BCPMW-4-2 7/31/2017
	NYSDEC SCGs							
1,1,1-Trichloroethane	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2,2-Tetrachloroethane	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloroethane	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane	5	< 1.0	**0.48 J**	**0.23 J**	**0.24 J**	**0.22 J**	**0.23 J**	**0.25 J**
1,1-Dichloroethene	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane	0.6	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloropropane	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Butanone	NE	< 10	< 10	< 10	< 10	< 10	< 10	< 10
2-Hexanone	50	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
4-Methyl-2-Pentanone	50	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Acetone	NE	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Benzene	1	< 1.0	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bromodichloromethane	50	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromoform	50	< 4.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromomethane	5	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Carbon Disulfide	60	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Carbon Tetrachloride	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chlorobenzene	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chlorodifloromethane (Freon 22)	NE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Chloroethane	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloroform	7	**3.2**	**1.3**	**2.0**	**2.0**	**3.9**	**3.6**	**2.3**
Chloromethane	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
cis-1,2-Dichloroethene	5	**8.6**	**29.7**	**13.3**	**13.2**	**16.9**	**17.4**	**19.9**
cis-1,3-Dichloropropene	0.4	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chlorodibromomethane	50	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dichlorodifloromethane (Freon 12)	5	< 5.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Ethylbenzene	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Methyl-Tert-Butylether	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Methylene Chloride	5	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Styrene (Monomer)	5	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloroethene	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	**0.27 J**	< 1.0
Tolene	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
trans-1,2-Dichloroethene	5	< 1.0	< 1.0	< 1.0	< 1.0	**0.62 J**	**0.58 J**	< 1.0
trans-1,3-Dichloropropene	0.4	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloroethene	5	**9.1**	**25.6**	**16.0**	**16.3**	**18.0**	**18.1**	**17.6**
Trichlorotrifloroethane (Freon 113)	5	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Vinyl Chloride	2	**1.6**	**3.7**	**0.96 J**	**0.92 J**	< 1.0	< 1.0	< 1.0
o-Xylene	5	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
m,p-Xylene	5	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total VOCs [4]		**23**	**61**	**32**	**33**	**40**	**40**	**40**
Project VOCs [4]		**19**	**59**	**30**	**31**	**36**	**37**	**38**
1,4-Dioxane		--	--	**0.858**	**0.982**	**2.34**	**2.40**	**1.35**

See Notes and Abbreviations on last page

Table 10
Concentrations of Volatile Organic Componds and 1,4-Dioxane
in Groundwater Samples Collected from Monitoring Wells,
Bethpage Park Grondwater Containment System,
OU3 (Former Settling Ponds)
Bethpage, New York

ARCADIS Design & Consultancy for natural and built assets

Compound [1,2,3] (units in µg/L)	Sample Location: Sample Date:	*BCPMW-4-2* *7/24/2018*	BCPMW-4-3 11/17/2014	BCPMW-4-3 12/31/2015	BCPMW-4-3 12/22/2016	BCPMW-4-3 8/3/2017	*BCPMW-4-3* *8/8/2018*	BCPMW-6-1 11/11/2014
	NYSDEC SCGs							
1,1,1-Trichloroethane	5	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0
1,1,2,2-Tetrachloroethane	5	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0
1,1,2-Trichloroethane	1	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0
1,1-Dichloroethane	5	***0.87 J***	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0
1,1-Dichloroethene	5	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0
1,2-Dichloroethane	0.6	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0
1,2-Dichloropropane	1	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0
2-Butanone	NE	*< 10*	< 10	< 10	< 10	< 10	*< 10*	< 10
2-Hexanone	50	*< 5.0*	< 5.0	< 5.0	< 5.0	< 5.0	*< 5.0*	< 5.0
4-Methyl-2-Pentanone	50	*< 5.0*	< 5.0	< 5.0	< 5.0	< 5.0	*< 5.0*	< 5.0
Acetone	NE	*< 10*	< 10	< 10	< 10	< 10	*< 10*	< 10
Benzene	1	*< 0.50*	< 1.0	< 0.50	< 0.50	< 0.50	*< 0.50*	< 1.0
Bromodichloromethane	50	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0
Bromoform	50	*< 1.0*	< 4.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 4.0
Bromomethane	5	*< 2.0*	< 2.0	< 2.0	< 2.0	< 2.0	*< 2.0*	< 2.0
Carbon Disulfide	60	*< 2.0*	< 2.0	< 2.0	< 2.0	< 2.0	*< 2.0*	< 2.0
Carbon Tetrachloride	5	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0
Chlorobenzene	5	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0
Chlorodifloromethane (Freon 22)	NE	*< 5.0*	< 5.0	< 5.0 J	< 5.0	< 5.0	*< 5.0*	< 5.0
Chloroethane	5	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0
Chloroform	7	***1.3***	**0.58 J**	< 1.0	**0.52 J**	< 1.0	*< 1.0*	< 1.0
Chloromethane	5	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0
cis-1,2-Dichloroethene	5	***58.1***	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0
cis-1,3-Dichloropropene	0.4	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0
Chlorodibromomethane	50	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0
Dichlorodifloromethane (Freon 12)	5	*< 2.0*	< 5.0	< 2.0	< 2.0	< 2.0	*< 2.0*	< 5.0
Ethylbenzene	5	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0
Methyl-Tert-Butylether	5	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0
Methylene Chloride	5	*< 2.0*	< 2.0	< 2.0	< 2.0	< 2.0	*< 2.0*	< 2.0
Styrene (Monomer)	5	*< 1.0*	< 5.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 5.0
Tetrachloroethene	5	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0
Tolene	5	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0
trans-1,2-Dichloroethene	5	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0
trans-1,3-Dichloropropene	0.4	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0
Trichloroethene	5	***61.5***	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0
Trichlorotrifloroethane (Freon 113)	5	*< 5.0*	< 5.0	< 5.0 J	< 5.0	< 5.0	*< 5.0*	< 5.0
Vinyl Chloride	2	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0
o-Xylene	5	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0
m,p-Xylene	5	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0
Total VOCs [4]		***120***	**0.58**	0	**0.52**	0	*0*	0
Project VOCs [4]		***120***	0	0	0	0	*0*	0
1,4-Dioxane		***2.4***	--	**0.263**	**0.776**	**0.616**	***0.43***	--

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Table 10
Concentrations of Volatile Organic Componds and 1,4-Dioxane
in Groundwater Samples Collected from Monitoring Wells,
Bethpage Park Grondwater Containment System,
OU3 (Former Settling Ponds)
Bethpage, New York

ARCADIS Design & Consultancy for natural and built assets

Compound [1,2,3] (units in µg/L)	Sample Location: Sample Date:	BCPMW-6-1 12/23/2015	BCPMW-6-1 12/27/2016	BCPMW-6-1 8/1/2017	*BCPMW-6-1 8/6/2018*	BCPMW-6-2 11/11/2014	BCPMW-6-2 12/23/2015	BCPMW-6-2 12/27/2016
	NYSDEC SCGs							
1,1,1-Trichloroethane	5	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0
1,1,2,2-Tetrachloroethane	5	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0
1,1,2-Trichloroethane	1	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane	5	< 1.0	< 1.0	< 1.0	*< 1.0*	**0.41 J**	< 1.0	< 1.0
1,1-Dichloroethene	5	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane	0.6	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0
1,2-Dichloropropane	1	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0
2-Butanone	NE	< 10	< 10	< 10	*< 10*	< 10	< 10	< 10
2-Hexanone	50	< 5.0	< 5.0	< 5.0	*< 5.0*	< 5.0	< 5.0	< 5.0
4-Methyl-2-Pentanone	50	< 5.0	< 5.0	< 5.0	*< 5.0*	< 5.0	< 5.0	< 5.0
Acetone	NE	< 10	< 10	< 10	*< 10*	< 10	< 10	< 10
Benzene	1	< 0.50	< 0.50	< 0.50	*< 0.50*	< 1.0	< 0.50	< 0.50
Bromodichloromethane	50	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0
Bromoform	50	< 1.0	< 1.0	< 1.0	*< 1.0*	< 4.0	< 1.0	< 1.0
Bromomethane	5	< 2.0	< 2.0	< 2.0	*< 2.0*	< 2.0	< 2.0	< 2.0
Carbon Disulfide	60	< 2.0	< 2.0	< 2.0	*< 2.0*	< 2.0	< 2.0	< 2.0
Carbon Tetrachloride	5	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0
Chlorobenzene	5	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0
Chlorodifloromethane (Freon 22)	NE	< 5.0	< 5.0	< 5.0	***3.7 J***	< 5.0	< 5.0	< 5.0
Chloroethane	5	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0
Chloroform	7	< 1.0	< 1.0	< 1.0	*< 1.0*	**0.30 J**	< 1.0	< 1.0
Chloromethane	5	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0
cis-1,2-Dichloroethene	5	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0
cis-1,3-Dichloropropene	0.4	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0
Chlorodibromomethane	50	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0
Dichlorodifloromethane (Freon 12)	5	< 2.0	< 2.0	< 2.0	*< 2.0*	< 5.0	< 2.0	< 2.0
Ethylbenzene	5	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0
Methyl-Tert-Butylether	5	< 1.0	< 1.0	< 1.0	*< 1.0*	**0.26 J**	< 1.0	< 1.0
Methylene Chloride	5	< 2.0	< 2.0	< 2.0	*< 2.0*	< 2.0	< 2.0	< 2.0
Styrene (Monomer)	5	< 1.0	< 1.0	< 1.0	*< 1.0*	< 5.0	< 1.0	< 1.0
Tetrachloroethene	5	< 1.0	< 1.0	< 1.0	*< 1.0*	**0.35 J**	< 1.0	< 1.0
Tolene	5	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0
trans-1,2-Dichloroethene	5	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0
trans-1,3-Dichloropropene	0.4	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0
Trichloroethene	5	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0
Trichlorotrifloroethane (Freon 113)	5	< 5.0	< 5.0	< 5.0	*< 5.0*	< 5.0	< 5.0	< 5.0
Vinyl Chloride	2	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0
o-Xylene	5	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0
m,p-Xylene	5	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0
Total VOCs [4]		0	0	0	***3.7***	**1.3**	0	0
Project VOCs [4]		0	0	0	*0*	**0.76**	0	0
1,4-Dioxane		< 0.10	< 0.200	< 0.200	*< 0.24*	--	< 0.10	< 0.200

See Notes and Abbreviations on last page

Table 10
Concentrations of Volatile Organic Compounds and 1,4-Dioxane
in Groundwater Samples Collected from Monitoring Wells,
Bethpage Park Grondwater Containment System,
OU3 (Former Settling Ponds)
Bethpage, New York

ARCADIS Design & Consultancy for natural and built assets

Compound [1,2,3] (units in µg/L)	Sample Location: Sample Date:	BCPMW-6-2 8/2/2017	*BCPMW-6-2 8/6/2018*	BCPMW-7-1 11/18/2014	BCPMW-7-1 12/22/2015	BCPMW-7-1 12/28/2016	BCPMW-7-1 8/1/2017	*BCPMW-7-1 8/3/2018*
	NYSDEC SCGs							
1,1,1-Trichloroethane	5	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*
1,1,2,2-Tetrachloroethane	5	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*
1,1,2-Trichloroethane	1	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*
1,1-Dichloroethane	5	**0.21 J**	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*
1,1-Dichloroethene	5	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*
1,2-Dichloroethane	0.6	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*
1,2-Dichloropropane	1	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*
2-Butanone	NE	< 10	*< 10*	< 10 J	< 10	< 10	< 10	*< 10*
2-Hexanone	50	< 5.0	*< 5.0*	< 5.0 J	< 5.0	< 5.0	< 5.0	*< 5.0*
4-Methyl-2-Pentanone	50	< 5.0	*< 5.0*	< 5.0	< 5.0	< 5.0	< 5.0	*< 5.0*
Acetone	NE	< 10	*< 10*	< 10 J	< 10	< 10	< 10	*< 10*
Benzene	1	< 0.50	*< 0.50*	< 1.0	< 0.50	< 0.50	< 0.50	*< 0.50*
Bromodichloromethane	50	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*
Bromoform	50	< 1.0	*< 1.0*	< 4.0	< 1.0	< 1.0	< 1.0	*< 1.0*
Bromomethane	5	< 2.0	*< 2.0*	< 2.0	< 2.0	< 2.0	< 2.0	*< 2.0*
Carbon Disulfide	60	< 2.0	*< 2.0*	< 2.0	< 2.0	< 2.0	< 2.0	*< 2.0*
Carbon Tetrachloride	5	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*
Chlorobenzene	5	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*
Chlorodifloromethane (Freon 22)	NE	< 5.0	*< 5.0*	< 5.0	< 5.0	< 5.0	< 5.0	*< 5.0*
Chloroethane	5	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*
Chloroform	7	< 1.0	*< 1.0*	**0.25 J**	< 1.0	< 1.0	< 1.0	*< 1.0*
Chloromethane	5	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*
cis-1,2-Dichloroethene	5	< 1.0	***0.97 J***	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*
cis-1,3-Dichloropropene	0.4	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*
Chlorodibromomethane	50	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*
Dichlorodifloromethane (Freon 12)	5	< 2.0	*< 2.0*	< 5.0	< 2.0	< 2.0	< 2.0	*< 2.0*
Ethylbenzene	5	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*
Methyl-Tert-Butylether	5	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*
Methylene Chloride	5	< 2.0	*< 2.0*	< 2.0	< 2.0	< 2.0	< 2.0	*< 2.0*
Styrene (Monomer)	5	< 1.0	*< 1.0*	< 5.0	< 1.0	< 1.0	< 1.0	*< 1.0*
Tetrachloroethene	5	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*
Tolene	5	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*
trans-1,2-Dichloroethene	5	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*
trans-1,3-Dichloropropene	0.4	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*
Trichloroethene	5	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*
Trichlorotrifloroethane (Freon 113)	5	< 5.0	*< 5.0*	< 5.0	< 5.0	< 5.0	< 5.0	*< 5.0*
Vinyl Chloride	2	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*
o-Xylene	5	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*
m,p-Xylene	5	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*
Total VOCs [4]		**0.21**	***0.97***	**0.25**	0	0	0	*0*
Project VOCs [4]		**0.21**	***0.97***	0	0	0	0	*0*
1,4-Dioxane		< 0.100	***0.092 J***	--	< 0.10	< 0.200	< 0.200	--

See Notes and Abbreviations on last page

Table 10
Concentrations of Volatile Organic Compounds and 1,4-Dioxane
in Groundwater Samples Collected from Monitoring Wells,
Bethpage Park Grondwater Containment System,
OU3 (Former Settling Ponds)
Bethpage, New York

ARCADIS Design & Consultancy for natural and built assets

Compound [1,2,3] (units in µg/L)	Sample Location: Sample Date:	*BCPMW-7-1* *8/8/2018*	MW-200-1 11/18/2014	MW-200-1 12/24/2015	MW-200-1 1/17/2017	MW-200-1 8/7/2017	*MW-200-1* *7/30/2018*	MW-201-1 11/20/2014
	NYSDEC SCGs							
1,1,1-Trichloroethane	5	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0
1,1,2,2-Tetrachloroethane	5	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0
1,1,2-Trichloroethane	1	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0
1,1-Dichloroethane	5	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0
1,1-Dichloroethene	5	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0 J*	< 1.0
1,2-Dichloroethane	0.6	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0
1,2-Dichloropropane	1	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0
2-Butanone	NE	*< 10*	< 10	< 10	< 10	< 10	*< 10*	< 10
2-Hexanone	50	*< 5.0*	< 5.0	< 5.0	< 5.0	< 5.0	*< 5.0*	< 5.0
4-Methyl-2-Pentanone	50	*< 5.0*	< 5.0	< 5.0	< 5.0	< 5.0	*< 5.0*	< 5.0
Acetone	NE	*< 10*	< 10	< 10	< 10	< 10	*< 10*	< 10
Benzene	1	*< 0.50*	< 1.0	< 0.50	< 0.50	< 0.50	*< 0.50*	< 1.0
Bromodichloromethane	50	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0
Bromoform	50	*< 1.0*	< 4.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 4.0
Bromomethane	5	*< 2.0*	< 2.0	< 2.0	< 2.0	< 2.0	*< 2.0*	< 2.0
Carbon Disulfide	60	*< 2.0*	< 2.0	< 2.0	< 2.0	< 2.0	*< 2.0 J*	< 2.0
Carbon Tetrachloride	5	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0
Chlorobenzene	5	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0
Chlorodifloromethane (Freon 22)	NE	*< 5.0*	< 5.0	< 5.0	< 5.0	< 5.0	*< 5.0 J*	< 5.0
Chloroethane	5	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0
Chloroform	7	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0
Chloromethane	5	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0
cis-1,2-Dichloroethene	5	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	**3.9**
cis-1,3-Dichloropropene	0.4	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0
Chlorodibromomethane	50	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0
Dichlorodifloromethane (Freon 12)	5	*< 2.0*	< 5.0	< 2.0	< 2.0	< 2.0	*< 2.0*	< 5.0
Ethylbenzene	5	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0
Methyl-Tert-Butylether	5	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0
Methylene Chloride	5	*< 2.0*	< 2.0	< 2.0	< 2.0	< 2.0	*< 2.0*	< 2.0
Styrene (Monomer)	5	*< 1.0*	< 5.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 5.0
Tetrachloroethene	5	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0
Tolene	5	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0
trans-1,2-Dichloroethene	5	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0
trans-1,3-Dichloropropene	0.4	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0
Trichloroethene	5	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	**6.3**
Trichlorotrifloroethane (Freon 113)	5	*< 5.0*	< 5.0	< 5.0	< 5.0	< 5.0	*< 5.0*	< 5.0
Vinyl Chloride	2	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0
o-Xylene	5	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0
m,p-Xylene	5	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0
Total VOCs [4]		*0*	0	0	0	0	*0*	**10**
Project VOCs [4]		*0*	0	0	0	0	*0*	**10**
1,4-Dioxane		*< 0.24*	--	**0.309**	**0.725**	**0.537**	***0.40***	--

See Notes and Abbreviations on last page

Table 10
Concentrations of Volatile Organic Compounds and 1,4-Dioxane
in Groundwater Samples Collected from Monitoring Wells,
Bethpage Park Grondwater Containment System,
OU3 (Former Settling Ponds)
Bethpage, New York

ARCADIS Design & Consultancy for natural and built assets

Compound [1,2,3] (units in µg/L)	Sample Location: Sample Date:	MW-201-1 12/24/2015	MW-201-1 1/18/2017	MW-201-1 8/8/2017	*MW-201-1 8/1/2018*	MW-202-1 11/19/2014	MW-202-1 (REP) 11/19/2014	MW-202-1 12/31/2015
	NYSDEC SCGs							
1,1,1-Trichloroethane	5	< 1.0	< 1.0	< 1.0	*< 1.0*	**0.70 J**	**0.69 J**	< 1.0
1,1,2,2-Tetrachloroethane	5	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0
1,1,2-Trichloroethane	1	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane	5	< 1.0	< 1.0	< 1.0	*< 1.0*	**2.4**	**2.2**	**2.4**
1,1-Dichloroethene	5	< 1.0	< 1.0	< 1.0	*< 1.0*	**1.7**	**1.8**	**1.5**
1,2-Dichloroethane	0.6	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0
1,2-Dichloropropane	1	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0
2-Butanone	NE	< 10	< 10	< 10	*< 10*	< 10	< 10	< 10
2-Hexanone	50	< 5.0	< 5.0	< 5.0	*< 5.0*	< 5.0	< 5.0	< 5.0
4-Methyl-2-Pentanone	50	< 5.0	< 5.0	< 5.0	*< 5.0*	< 5.0	< 5.0	< 5.0
Acetone	NE	< 10	< 10	< 10	*< 10*	< 10	< 10	< 10
Benzene	1	< 1.0	< 0.50	< 0.50	*< 0.50*	< 1.0	< 1.0	< 0.50
Bromodichloromethane	50	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0
Bromoform	50	< 4.0	< 1.0	< 1.0	*< 1.0*	< 4.0	< 4.0	< 1.0
Bromomethane	5	< 2.0	< 2.0	< 2.0	*< 2.0*	< 2.0	< 2.0	< 2.0
Carbon Disulfide	60	< 2.0	< 2.0	< 2.0	*< 2.0*	< 2.0	< 2.0	< 2.0
Carbon Tetrachloride	5	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0
Chlorobenzene	5	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0
Chlorodifloromethane (Freon 22)	NE	< 5.0	< 5.0	< 5.0	*< 5.0*	< 5.0	< 5.0	< 5.0
Chloroethane	5	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0
Chloroform	7	**0.43**	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0
Chloromethane	5	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0
cis-1,2-Dichloroethene	5	**2.0**	**2.0**	**1.5**	***0.87 J***	**1.1**	**1.0**	**1.2**
cis-1,3-Dichloropropene	0.4	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0
Chlorodibromomethane	50	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0
Dichlorodifloromethane (Freon 12)	5	< 5.0	< 2.0	< 2.0	*< 2.0*	< 5.0	< 5.0	< 2.0
Ethylbenzene	5	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0
Methyl-Tert-Butylether	5	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0
Methylene Chloride	5	< 2.0	< 2.0	< 2.0	*< 2.0*	< 2.0	< 2.0	< 2.0
Styrene (Monomer)	5	< 5.0	< 1.0	< 1.0	*< 1.0*	< 5.0	< 5.0	< 1.0
Tetrachloroethene	5	< 1.0	< 1.0	< 1.0	*< 1.0*	**2.3**	**2.4**	**2.5**
Tolene	5	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0
trans-1,2-Dichloroethene	5	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0
trans-1,3-Dichloropropene	0.4	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0
Trichloroethene	5	**2.3**	**1.6**	**1.3**	***0.90 J***	**2.1**	**2.0**	**1.3**
Trichlorotrifloroethane (Freon 113)	5	< 5.0	< 5.0	< 5.0	*< 5.0*	**1.8 J**	**1.8 J**	**1.1 J**
Vinyl Chloride	2	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0
o-Xylene	5	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0
m,p-Xylene	5	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0
Total VOCs [4]		**4.7**	**3.6**	**2.8**	***1.8***	**12**	**12**	**10**
Project VOCs [4]		**4.3**	**3.6**	**2.8**	***1.8***	**10**	**10**	**8.9**
1,4-Dioxane		**0.262**	**0.655**	**0.676**	***0.40***	--	--	**0.404**

See Notes and Abbreviations on last page

Table 10
Concentrations of Volatile Organic Componds and 1,4-Dioxane
in Groundwater Samples Collected from Monitoring Wells,
Bethpage Park Grondwater Containment System,
OU3 (Former Settling Ponds)
Bethpage, New York

ARCADIS Design & Consultancy for natural and built assets

Compound [1,2,3] (units in µg/L)	Sample Location: Sample Date:	MW-202-1 1/19/2017	MW-202-1 8/9/2017	*MW-202-1 7/31/2018*	MW-203-1 11/19/2014	MW-203-1 12/30/2015	MW-203-1 1/20/2017	MW-203-1 8/10/2017
	NYSDEC SCGs							
1,1,1-Trichloroethane	5	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2,2-Tetrachloroethane	5	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloroethane	1	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane	5	**0.66 J**	**0.80 J**	*< 1.0*	**0.60 J**	**0.38 J**	**0.30 J**	**0.34 J**
1,1-Dichloroethene	5	**0.33 J**	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane	0.6	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloropropane	1	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0
2-Butanone	NE	< 10	< 10	*< 10*	< 10	< 10	< 10	< 10
2-Hexanone	50	< 5.0	< 5.0	*< 5.0*	< 5.0	< 5.0	< 5.0	< 5.0
4-Methyl-2-Pentanone	50	< 5.0	< 5.0	*< 5.0*	< 5.0	< 5.0	< 5.0	< 5.0
Acetone	NE	< 10	< 10	*< 10*	< 10	< 10	< 10	< 10
Benzene	1	< 0.50	< 0.50	*< 0.50*	< 1.0	< 0.50	< 0.50	< 0.50
Bromodichloromethane	50	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0
Bromoform	50	< 1.0	< 1.0	*< 1.0*	< 4.0	< 1.0	< 1.0	< 1.0
Bromomethane	5	< 2.0	< 2.0	*< 2.0*	< 2.0	< 2.0	< 2.0	< 2.0
Carbon Disulfide	60	< 2.0	< 2.0	*< 2.0*	< 2.0	< 2.0	< 2.0	< 2.0
Carbon Tetrachloride	5	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0
Chlorobenzene	5	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0
Chlorodifloromethane (Freon 22)	NE	< 5.0	< 5.0	*< 5.0*	< 5.0	**1.9 J**	**2.0 J**	**3.3 J**
Chloroethane	5	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0
Chloroform	7	< 1.0	< 1.0	*< 1.0*	**0.34 J**	**0.32 J**	**0.27 J**	**0.35 J**
Chloromethane	5	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0
cis-1,2-Dichloroethene	5	**0.45 J**	< 1.0	*< 1.0*	**0.39 J**	**0.35 J**	**0.92 J**	**0.55 J**
cis-1,3-Dichloropropene	0.4	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0
Chlorodibromomethane	50	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0
Dichlorodifloromethane (Freon 12)	5	< 2.0	< 2.0	*< 2.0*	< 5.0	< 2.0	< 2.0	< 2.0
Ethylbenzene	5	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0
Methyl-Tert-Butylether	5	< 1.0	< 1.0	*< 1.0*	**1.1**	**0.58 J**	< 1.0	< 1.0
Methylene Chloride	5	< 2.0	< 2.0	*< 2.0*	< 2.0	< 2.0	< 2.0	< 2.0
Styrene (Monomer)	5	< 1.0	< 1.0	*< 1.0*	< 5.0	< 1.0	< 1.0	< 1.0
Tetrachloroethene	5	**1.3**	**1.4**	***1.1***	**1.1**	**1.2**	**0.76 J**	**1.2**
Tolene	5	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0
trans-1,2-Dichloroethene	5	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0
trans-1,3-Dichloropropene	0.4	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0
Trichloroethene	5	**0.68 J**	**0.96 J**	***0.70 J***	**3.2**	**2.5**	**3.9**	**2.9**
Trichlorotrifloroethane (Freon 113)	5	< 5.0	< 5.0	*< 5.0*	< 5.0	**0.56 J**	< 5.0	< 5.0
Vinyl Chloride	2	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene	5	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0
m,p-Xylene	5	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0
Total VOCs [4]		**3.4**	**3.2**	***1.8***	**6.7**	**7.8**	**8.2**	**8.6**
Project VOCs [4]		**3.4**	**3.2**	***1.8***	**5.2**	**4.4**	**5.9**	**5.0**
1,4-Dioxane		**0.396**	**0.518**	***0.30***	--	**0.134**	**0.401**	**0.262**

See Notes and Abbreviations on last page

Table 10
Concentrations of Volatile Organic Compounds and 1,4-Dioxane
in Groundwater Samples Collected from Monitoring Wells,
Bethpage Park Grondwater Containment System,
OU3 (Former Settling Ponds)
Bethpage, New York

ARCADIS Design & Consultancy for natural and built assets

Compound [1,2,3] (units in µg/L)	Sample Location: Sample Date:	*MW-203-1* *8/2/2018*	MW-204-1 12/24/2015	MW-204-1 1/17/2017	MW-204-1 8/7/2017	MW-204-1 (REP) 8/7/2017	*MW-204-1* *7/30/2018*	MW-205-1 12/29/2015
	NYSDEC SCGs							
1,1,1-Trichloroethane	5	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0
1,1,2,2-Tetrachloroethane	5	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0
1,1,2-Trichloroethane	1	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0
1,1-Dichloroethane	5	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0
1,1-Dichloroethene	5	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0 J*	< 1.0
1,2-Dichloroethane	0.6	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0
1,2-Dichloropropane	1	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0
2-Butanone	NE	*< 10*	< 10	< 10	< 10	< 10	*< 10*	< 10
2-Hexanone	50	*< 5.0*	< 5.0	< 5.0	< 5.0	< 5.0	*< 5.0*	< 5.0
4-Methyl-2-Pentanone	50	*< 5.0*	< 5.0	< 5.0	< 5.0	< 5.0	*< 5.0*	**3.0 J**
Acetone	NE	*< 10*	< 10	< 10	< 10	< 10	*< 10*	< 10
Benzene	1	*< 0.50*	< 0.50	< 0.50	< 0.50	< 0.50	*< 0.50*	< 0.50
Bromodichloromethane	50	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0
Bromoform	50	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0
Bromomethane	5	*< 2.0*	< 2.0	< 2.0	< 2.0	< 2.0	*< 2.0*	< 2.0
Carbon Disulfide	60	*< 2.0*	< 2.0	< 2.0	< 2.0	< 2.0	*< 2.0 J*	< 2.0
Carbon Tetrachloride	5	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0
Chlorobenzene	5	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0
Chlorodifloromethane (Freon 22)	NE	*< 5.0*	< 5.0	< 5.0	< 5.0	< 5.0	*< 5.0 J*	< 5.0
Chloroethane	5	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0
Chloroform	7	*< 1.0*	**0.50 J**	**0.24 J**	< 1.0	< 1.0	*< 1.0*	< 1.0
Chloromethane	5	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0
cis-1,2-Dichloroethene	5	*< 1.0*	**2.5**	**3.4**	< 1.0	< 1.0	*< 1.0*	**1.1**
cis-1,3-Dichloropropene	0.4	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0
Chlorodibromomethane	50	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0
Dichlorodifloromethane (Freon 12)	5	*< 2.0*	< 2.0	< 2.0	< 2.0	< 2.0	*< 2.0*	< 2.0
Ethylbenzene	5	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0
Methyl-Tert-Butylether	5	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0
Methylene Chloride	5	*< 2.0*	< 2.0	< 2.0	< 2.0	< 2.0	*< 2.0*	< 2.0
Styrene (Monomer)	5	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0
Tetrachloroethene	5	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0
Tolene	5	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0
trans-1,2-Dichloroethene	5	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0
trans-1,3-Dichloropropene	0.4	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0
Trichloroethene	5	***2.6***	**4.0**	**4.1**	**2.4**	**2.5**	***0.63 J***	**0.76 J**
Trichlorotrifloroethane (Freon 113)	5	*< 5.0*	< 5.0	< 5.0	< 5.0	< 5.0	*< 5.0*	< 5.0
Vinyl Chloride	2	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0
o-Xylene	5	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0
m,p-Xylene	5	*< 1.0*	< 1.0	< 1.0	< 1.0	< 1.0	*< 1.0*	< 1.0
Total VOCs [4]		***2.6***	**7.0**	**7.7**	**2.4**	**2.5**	***0.63***	**4.9**
Project VOCs [4]		***2.6***	**6.5**	**7.5**	**2.4**	**2.5**	***0.63***	**1.9**
1,4-Dioxane		***0.19 J***	< 0.11	**0.350**	**0.306**	**0.319**	***0.25 J***	**0.162**

See Notes and Abbreviations on last page

Table 10
Concentrations of Volatile Organic Componds and 1,4-Dioxane
in Groundwater Samples Collected from Monitoring Wells,
Bethpage Park Grondwater Containment System,
OU3 (Former Settling Ponds)
Bethpage, New York

ARCADIS Design & Consultancy for natural and built assets

Compound [1,2,3] (units in µg/L)	Sample Location: Sample Date:	MW-205-1 1/18/2017	MW-205-1 8/8/2017	*MW-205-1 8/1/2018*	MW-206-1 12/29/2015	MW-206-1 1/19/2017	MW-206-1 8/9/2017	*MW-206-1 7/31/2018*
	NYSDEC SCGs							
1,1,1-Trichloroethane	5	< 1.0	< 1.0	*< 1.0*	< 1.0	**0.27 J**	**0.76 J**	*< 1.0*
1,1,2,2-Tetrachloroethane	5	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0	*< 1.0*
1,1,2-Trichloroethane	1	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0	*< 1.0*
1,1-Dichloroethane	5	< 1.0	< 1.0	*< 1.0*	**0.44 J**	**0.74 J**	**3.0**	***0.96 J***
1,1-Dichloroethene	5	< 1.0	< 1.0	*< 1.0*	< 1.0	**0.27 J**	**1.7**	*< 1.0*
1,2-Dichloroethane	0.6	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0	*< 1.0*
1,2-Dichloropropane	1	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0	*< 1.0*
2-Butanone	NE	< 10	< 10	*< 10*	< 10	< 10	< 10	*< 10*
2-Hexanone	50	< 5.0	< 5.0	*< 5.0*	< 5.0	< 5.0	< 5.0	*< 5.0*
4-Methyl-2-Pentanone	50	< 5.0	< 5.0	*< 5.0*	< 5.0	< 5.0	< 5.0	*< 5.0*
Acetone	NE	< 10	< 10	*< 10*	< 10	< 10	< 10	*< 10*
Benzene	1	< 0.50	< 0.50	*< 0.50*	< 0.50	< 0.50	< 0.50	*< 0.50*
Bromodichloromethane	50	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0	*< 1.0*
Bromoform	50	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0	*< 1.0*
Bromomethane	5	< 2.0	< 2.0	*< 2.0*	< 2.0	< 2.0	< 2.0	*< 2.0*
Carbon Disulfide	60	< 2.0	< 2.0	*< 2.0*	< 2.0	< 2.0	< 2.0	*< 2.0*
Carbon Tetrachloride	5	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0	*< 1.0*
Chlorobenzene	5	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0	*< 1.0*
Chlorodifloromethane (Freon 22)	NE	< 5.0	< 5.0	*< 5.0*	< 5.0	< 5.0	< 5.0	*< 5.0*
Chloroethane	5	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0	*< 1.0*
Chloroform	7	**0.64 J**	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0	*< 1.0*
Chloromethane	5	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0	*< 1.0*
cis-1,2-Dichloroethene	5	**0.39 J**	**0.62 J**	***0.76 J***	**0.32 J**	**0.92 J**	**1.3**	***0.56 J***
cis-1,3-Dichloropropene	0.4	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0	*< 1.0*
Chlorodibromomethane	50	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0	*< 1.0*
Dichlorodifloromethane (Freon 12)	5	< 2.0	< 2.0	*< 2.0*	< 2.0	< 2.0	< 2.0	*< 2.0*
Ethylbenzene	5	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0	*< 1.0*
Methyl-Tert-Butylether	5	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0	*< 1.0*
Methylene Chloride	5	< 2.0	< 2.0	*< 2.0*	< 2.0	< 2.0	< 2.0	*< 2.0*
Styrene (Monomer)	5	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0	*< 1.0*
Tetrachloroethene	5	< 1.0	< 1.0	*< 1.0*	**0.45 J**	**0.56 J**	**2.8**	***1.4***
Tolene	5	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0	*< 1.0*
trans-1,2-Dichloroethene	5	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0	*< 1.0*
trans-1,3-Dichloropropene	0.4	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0	*< 1.0*
Trichloroethene	5	**0.91 J**	**0.41 J**	*< 1.0*	< 1.0	< 1.0	**0.65 J**	***0.79 J***
Trichlorotrifloroethane (Freon 113)	5	< 5.0	< 5.0	*< 5.0*	< 5.0	< 5.0	< 5.0	*< 5.0*
Vinyl Chloride	2	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0	*< 1.0*
o-Xylene	5	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0	*< 1.0*
m,p-Xylene	5	< 1.0	< 1.0	*< 1.0*	< 1.0	< 1.0	< 1.0	*< 1.0*
Total VOCs [4]		**1.9**	**1.0**	***0.76***	**1.2**	**2.8**	**10**	***3.7***
Project VOCs [4]		**1.3**	**1.0**	***0.76***	**1.2**	**2.8**	**10**	***3.7***
1,4-Dioxane		**0.366**	**0.714**	***0.40***	< 0.10	**0.301**	**1.06**	***0.34***

See Notes and Abbreviations on last page

Table 10
Concentrations of Volatile Organic Compounds and 1,4-Dioxane
in Groundwater Samples Collected from Monitoring Wells,
Bethpage Park Grondwater Containment System,
OU3 (Former Settling Ponds)
Bethpage, New York

ARCADIS Design & Consultancy for natural and built assets

Compound [1,2,3] (units in µg/L)	Sample Location: Sample Date:	MW-208-1 12/29/2015	MW-208-1 1/20/2017	MW-208-1 8/10/2017	*MW-208-1 8/2/2018*	*MW-208-1 (REP) 8/2/2018*
	NYSDEC SCGs					
1,1,1-Trichloroethane	5	< 1.0	< 1.0	< 1.0	*< 1.0*	*< 1.0*
1,1,2,2-Tetrachloroethane	5	< 1.0	< 1.0	< 1.0	*< 1.0*	*< 1.0*
1,1,2-Trichloroethane	1	< 1.0	< 1.0	< 1.0	*< 1.0*	*< 1.0*
1,1-Dichloroethane	5	**2.9**	**2.1**	**1.1**	***0.61 J***	*< 1.0*
1,1-Dichloroethene	5	**0.89 J**	**0.70 J**	< 1.0	*< 1.0*	*< 1.0*
1,2-Dichloroethane	0.6	< 1.0	< 1.0	< 1.0	*< 1.0*	*< 1.0*
1,2-Dichloropropane	1	< 1.0	**0.35 J**	< 1.0	*< 1.0*	*< 1.0*
2-Butanone	NE	< 10	< 10	< 10	*< 10*	*< 10*
2-Hexanone	50	< 5.0	< 5.0	< 5.0	*< 5.0*	*< 5.0*
4-Methyl-2-Pentanone	50	< 5.0	< 5.0	< 5.0	*< 5.0*	*< 5.0*
Acetone	NE	< 10	< 10	< 10	*< 10*	*< 10*
Benzene	1	< 0.50	< 0.50	< 0.50	*< 0.50*	*< 0.50*
Bromodichloromethane	50	< 1.0	< 1.0	< 1.0	*< 1.0*	*< 1.0*
Bromoform	50	< 1.0	< 1.0	< 1.0	*< 1.0*	*< 1.0*
Bromomethane	5	< 2.0	< 2.0	< 2.0	*< 2.0*	*< 2.0*
Carbon Disulfide	60	< 2.0	< 2.0	< 2.0	*< 2.0*	*< 2.0*
Carbon Tetrachloride	5	< 1.0	< 1.0	< 1.0	*< 1.0*	*< 1.0*
Chlorobenzene	5	< 1.0	< 1.0	< 1.0	*< 1.0*	*< 1.0*
Chlorodifloromethane (Freon 22)	NE	< 5.0	< 5.0	< 5.0	*< 5.0*	*< 5.0*
Chloroethane	5	< 1.0	< 1.0	< 1.0	*< 1.0*	*< 1.0*
Chloroform	7	**3.1**	**2.8**	**1.4**	***0.75 J***	***0.71 J***
Chloromethane	5	< 1.0	< 1.0	< 1.0	*< 1.0*	*< 1.0*
cis-1,2-Dichloroethene	5	**546 D**	**597**	**268**	***129***	***135***
cis-1,3-Dichloropropene	0.4	< 1.0	< 1.0	< 1.0	*< 1.0*	*< 1.0*
Chlorodibromomethane	50	< 1.0	< 1.0	< 1.0	*< 1.0*	*< 1.0*
Dichlorodifloromethane (Freon 12)	5	< 2.0	< 2.0	< 2.0	*< 2.0*	*< 2.0*
Ethylbenzene	5	< 1.0	< 1.0	< 1.0	*< 1.0*	*< 1.0*
Methyl-Tert-Butylether	5	**0.39 J**	**0.43 J**	< 1.0	*< 1.0*	*< 1.0*
Methylene Chloride	5	< 2.0	< 2.0	< 2.0	*< 2.0*	*< 2.0*
Styrene (Monomer)	5	< 1.0	< 1.0	< 1.0	*< 1.0*	*< 1.0*
Tetrachloroethene	5	< 1.0	< 1.0	< 1.0	*< 1.0*	*< 1.0*
Tolene	5	< 1.0	< 1.0	< 1.0	*< 1.0*	*< 1.0*
trans-1,2-Dichloroethene	5	< 1.0	**0.60 J**	**1.6**	*< 1.0*	*< 1.0*
trans-1,3-Dichloropropene	0.4	< 1.0	< 1.0	< 1.0	*< 1.0*	*< 1.0*
Trichloroethene	5	**17.4**	**10.9**	**12.8**	***11.7***	***11.4***
Trichlorotrifloroethane (Freon 113)	5	< 5.0	< 5.0	< 5.0	*< 5.0*	*< 5.0*
Vinyl Chloride	2	**6.4**	**3.3**	**1.8**	***1.1***	***0.98 J***
o-Xylene	5	< 1.0	< 1.0	< 1.0	*< 1.0*	*< 1.0*
m,p-Xylene	5	< 1.0	< 1.0	< 1.0	*< 1.0*	*< 1.0*
Total VOCs [4]		**580**	**620**	**290**	***140***	***150***
Project VOCs [4]		**570**	**610**	**290**	***140***	***150***
1,4-Dioxane		**0.526**	**1.02**	**0.800**	***0.51***	***0.35***

See Notes and Abbreviations on last page

Table 10
Concentrations of Volatile Organic Componds and 1,4-Dioxane
in Groundwater Samples Collected from Monitoring Wells,
Bethpage Park Grondwater Containment System,
OU3 (Former Settling Ponds)
Bethpage, New York

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Abbreviations, Notes, Qualifiers, and Units

ASP	Analytical Services Protocol
--	Not Analyzed
NE	Not Established
NYSDEC	New York State Department of Environmental Conservation
REP	Field Replicate QA/QC sample
SCGs	Standards, Criteria, and Guidance values
SIM	Selective Ion Monitoring
TCL	Target compound list.
USEPA	United State Environmental Protection Agency
VOC	Volatile Organic Compound

1. All historic data available in previous quarterly reports.
2. Results are validated at 20% frequency, per protocols specified in Sampling and Analysis Plan in the Bethpage Park Groundwater Containment System OM&M Manual (ARCADIS 2016).
3. Samples analyzed for the TCL VOCs using NYSDEC ASP 2005 Method OLM4.3 (prior to November 2014) and per USEPA Method 8260C (after November 2014). Samples analyzed for 1,4-Dioxane using USEPA Method 8270D SIM (prior to 2016), per USEPA Method 522 SIM (2016-2017) and per USEPA Method 8270D SIM (since 2018).
4. "Total VOCs" represents the sum of individual concentrations of the VOCs detected. TVOCs were rounded to two significant figures. "Project VOCs" represents the sum of individual 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.

	Bolded outline indicates an exceedance of an SCG.
< 5	Compound not detected above its laboratory quantification limit.
0.61	Bold value indicates a detection.
italicized indicates most recent data	
D	Constituent identified from secondary dilution
J	Result is estimated
mg/L	Micrograms per liter

Table 11
Concentrations of Metals in Groundwater Samples Collected from Monitoring Wells, Bethpage Park Groundwater Containment System, OU 3 (Former Settling Ponds), Bethpage, New York [1,2,3]

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Constitents (units in ug/L)	Sample Location: / Sample Date:	B24MW-2 4/23/2009	*B24MW-2 8/9/2018*	B24MW-3 4/20/2009	*B24MW-3 8/9/2018*	*B30MW-1 8/9/2018*	BCPMW-4-1 11/17/2014	BCPMW-4-1 10/8/2015	BCPMW-4-1 12/30/2015	BCPMW-4-1 12/28/2016	BCPMW-4-1 7/31/2017	*BCPMW-4-1 7/24/2018*
	NYSDEC SCGs											
Cadmim, Total		< 5	*< 6.0*	< 5	*< 3.0*	*< 3.0*	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	*< 3.0*
Cadmim, Dissolved	5	< 5	*< 3.0*	< 5	*< 3.0*	*< 3.0*	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	*< 3.0*
Chromim, Total	50	**40.3**	***153***	**28.2**	***12.5***	*< 10*	**24.7**	**24.9**	**22.7**	< 10	< 10	*< 10*
Chromim, Dissolved	50	< 10	*< 10*	**10.6**	*< 10*	*< 10*	**20.7**	**22.1**	**19.2**	< 10	< 10	*< 10*
Iron (total)	300	--	--	**597**	--	--	--	--	--	--	--	--
Iron (dissolved)	300	--	--	< 100	--	--	--	--	--	--	--	--
Manganese (total)	300	--	--	**16.9**	--	--	--	--	--	--	--	--
Manganese (dissolved)	300	--	--	**13.7**	--	--	--	--	--	--	--	--

Abbreviations, Notes, Qualifiers, and Units on last page

Table 11
Concentrations of Metals in Groundwater Samples Collected from Monitoring Wells, Bethpage Park Groundwater Containment System, OU 3 (Former Settling Ponds), Bethpage, New York [1,2,3]

ARCADIS Design & Consultancy for natural and built assets

Constitents (units in ug/L)	Sample Location: / Sample Date:	BCPMW-4-2 11/18/2014	BCPMW-4-2 10/8/2015	BCPMW-4-2 12/31/2015	BCPMW-4-2 12/22/2016	BCPMW-4-2 (REP) 12/22/2016	BCPMW-4-2 7/31/2017	*BCPMW-4-2 7/24/2018*	BCPMW-4-3 11/17/2014	BCPMW-4-3 10/9/2015	BCPMW-4-3 12/31/2015	BCPMW-4-3 12/22/2016	BCPMW-4-3 8/3/2017	*BCPMW-4-3 8/8/2018*
	NYSDEC SCGs													
Cadmim, Total		< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	*< 3.0*	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	*< 3.0*
Cadmim, Dissolved	5	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	*< 3.0*	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	*< 3.0*
Chromim, Total	50	**4.1 B**	< 10	< 10	**17.3**	**20.5**	< 10	*< 10*	**6.8 B**	< 10	< 10	**11.2**	< 10	*< 10*
Chromim, Dissolved	50	< 10	< 10	< 10	< 10	< 10	< 10	*< 10*	**3.7 B**	< 10	< 10	< 10	< 10	*< 10*
Iron (total)	300	--	--	--	--	--	--	--	--	--	--	--	--	--
Iron (dissolved)	300	--	--	--	--	--	--	--	--	--	--	--	--	--
Manganese (total)	300	--	--	--	--	--	--	--	--	--	--	--	--	--
Manganese (dissolved)	300	--	--	--	--	--	--	--	--	--	--	--	--	--

Abbreviations, Notes, Qualifiers, and Units on last page

Table 11
Concentrations of Metals in Groundwater Samples Collected from Monitoring Wells, Bethpage Park Groundwater Containment System, OU 3 (Former Settling Ponds), Bethpage, New York [1,2,3]

ARCADIS Design & Consultancy for natural and built assets

Constitents (units in ug/L)	Sample Location: Sample Date:	BCPMW-6-1 11/11/2014	BCPMW-6-1 12/23/2015	BCPMW-6-1 12/27/2016	BCPMW-6-1 8/1/2017	*BCPMW-6-1 8/6/2018*	BCPMW-6-2 11/11/2014	BCPMW-6-2 12/23/2015	BCPMW-6-2 12/27/2016	BCPMW-6-2 8/2/2017	*BCPMW-6-2 8/6/2018*
	NYSDEC SCGs										
Cadmim, Total		< 3.0	< 3.0	< 3.0	< 3.0	*< 3.0*	< 3.0	< 3.0	< 3.0	**3.3**	*< 3.0*
Cadmim, Dissolved	5	< 3.0	< 3.0	< 3.0	< 3.0	*< 3.0*	< 3.0	< 3.0	< 3.0	< 3.0	*< 3.0*
Chromim, Total	50	**11.6**	< 10	**223**	< 10	*< 10*	**13.9**	< 10	**13.5**	**87.7**	*< 10*
Chromim, Dissolved	50	< 10 B	< 10	< 10	< 10	*< 10*	< 10 B	< 10	< 10	< 10	*< 10*
Iron (total)	300	--	--	--	--	--	--	--	--	--	--
Iron (dissolved)	300	--	--	--	--	--	--	--	--	--	--
Manganese (total)	300	--	--	--	--	--	--	--	--	--	--
Manganese (dissolved)	300	--	--	--	--	--	--	--	--	--	--

Abbreviations, Notes, Qualifiers, and Units on last page

Table 11
Concentrations of Metals in Groundwater Samples Collected from Monitoring Wells, Bethpage Park Groundwater Containment System, OU 3 (Former Settling Ponds), Bethpage, New York [1,2,3]

ARCADIS Design & Consultancy for natural and built assets

Constitents (units in ug/L)	Sample Location: Sample Date:	BCPMW-7-1 11/18/2014	BCPMW-7-1 12/22/2015	BCPMW-7-1 12/28/2016	BCPMW-7-1 8/1/2017	*BCPMW-7-1 8/3/2018*	*BCPMW-7-1 8/8/2018*	MW-200-1 11/18/2014	MW-200-1 12/24/2015	MW-200-1 1/17/2017	MW-200-1 8/7/2017	*MW-200-1 7/30/2018*
	NYSDEC SCGs											
Cadmim, Total		< 3.0	< 3.0	< 3.0	< 3.0	*< 3.0*	*< 3.0*	< 3.0	< 3.0	< 3.0	< 3.0	*< 3.0*
Cadmim, Dissolved	5	< 3.0	< 3.0	< 3.0	< 3.0	*< 3.0*	*< 3.0*	< 3.0	< 3.0	< 3.0	< 3.0	*< 3.0*
Chromim, Total	50	**5.1 B**	< 10	**66.0**	< 10	*< 10*	*< 10*	**96.7**	**54.2**	< 10	**11.1**	***12.4***
Chromim, Dissolved	50	**0.90 B**	< 10	< 10	< 10	*< 10*	*< 10*	**19**	**29.5**	< 10	< 10	*< 10*
Iron (total)	300	--	--	--	--	--	--	--	--	--	--	--
Iron (dissolved)	300	--	--	--	--	--	--	--	--	--	--	--
Manganese (total)	300	--	--	--	--	--	--	--	--	--	--	--
Manganese (dissolved)	300	--	--	--	--	--	--	--	--	--	--	--

Abbreviations, Notes, Qualifiers, and Units on last page

Table 11
Concentrations of Metals in Groundwater Samples Collected from Monitoring Wells, Bethpage Park Groundwater Containment System, OU 3 (Former Settling Ponds), Bethpage, New York [1,2,3]

ARCADIS Design & Consultancy for natural and built assets

Constitents (units in ug/L)	Sample Location: / Sample Date:	MW-201-1 11/20/2014	MW-201-1 12/30/2015	MW-201-1 1/18/2017	MW-201-1 8/8/2017	*MW-201-1 8/1/2018*	MW-202-1 11/19/2014	MW-202-1(REP) 11/19/2014	MW-202-1 12/31/2015	MW-202-1 1/19/2017	MW-202-1 8/9/2017	*MW-202-1 7/31/2018*
	NYSDEC SCGs											
Cadmim, Total		< 3.0	< 3.0	< 3.0	< 3.0	*< 3.0*	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	*< 3.0*
Cadmim, Dissolved	5	< 3.0	< 3.0	< 3.0	< 3.0	*< 3.0*	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	*< 3.0*
Chromim, Total	50	**6.7 B**	< 10	< 10	**11.7**	*< 10*	**74.3**	**83.8**	**34.9**	< 10	**73.4**	***21.4***
Chromim, Dissolved	50	**1.7 B**	< 10	< 10	< 10	*< 10*	**2.7 B**	**2.3 B**	< 10	< 10	**14.4**	*< 10*
Iron (total)	300	--	--	--	--	–	--	--	--	--	--	–
Iron (dissolved)	300	--	--	--	--	–	--	--	--	--	--	–
Manganese (total)	300	--	--	--	--	–	--	--	--	--	--	–
Manganese (dissolved)	300	--	--	--	--	–	--	--	--	--	--	–

Abbreviations, Notes, Qualifiers, and Units on last page

Table 11
Concentrations of Metals in Groundwater Samples Collected from Monitoring Wells, Bethpage Park Groundwater Containment System, OU 3 (Former Settling Ponds), Bethpage, New York [1,2,3]

ARCADIS Design & Consultancy for natural and built assets

Constitents (units in ug/L)	Sample Location: / Sample Date:	MW-203-1 11/19/2014	MW-203-1 12/20/2015	MW-203-1 1/20/2017	MW-203-1 8/10/2017	*MW-203-1 8/2/2018*	MW-204-1 12/24/2015	MW-204-1 1/17/2017	MW-204-1 8/7/2017	MW-204-1 (REP) 8/7/2017	*MW-204-1 7/30/2018*
	NYSDEC SCGs										
Cadmim, Total		< 3.0	< 3.0	< 3.0	< 3.0	*< 3.0*	< 3.0	< 3.0	< 3.0	< 3.0	*< 3.0*
Cadmim, Dissolved	5	< 3.0	< 3.0	< 3.0	< 3.0	*< 3.0*	< 3.0	< 3.0	< 3.0	< 3.0	*< 3.0*
Chromim, Total	50	**22.9**	**81.6**	< 10	**138**	***22.7***	**85.3**	**57.0**	**175**	**171**	***239***
Chromim, Dissolved	50	**3.3 B**	< 10	< 10	< 10	*< 10*	**38.5**	**31.1**	**87.0**	**85.3**	***89.1***
Iron (total)	300	--	--	--	--	--	--	--	--	--	--
Iron (dissolved)	300	--	--	--	--	--	--	--	--	--	--
Manganese (total)	300	--	--	--	--	--	--	--	--	--	--
Manganese (dissolved)	300	--	--	--	--	--	--	--	--	--	--

Abbreviations, Notes, Qualifiers, and Units on last page

Table 11
Concentrations of Metals in Groundwater Samples Collected from Monitoring Wells, Bethpage Park Groundwater Containment System, OU 3 (Former Settling Ponds), Bethpage, New York [1,2,3]

ARCADIS Design & Consultancy for natural and built assets

Constitents (units in ug/L)	Sample Location: Sample Date:	MW-205-1 12/29/2015	MW-205-1 1/18/2017	MW-205-1 8/8/2017	*MW-205-1 8/1/2018*	MW-206-1 12/29/2015	MW-206-1 1/19/2017	MW-206-1 8/9/2017	*MW-206-1 7/31/2018*	MW-208-1 12/29/2015	MW-208-1 1/20/2017	MW-208-1 8/10/2017	*MW-208-1 8/2/2018*	*MW-208-1 (REP) 8/2/2018*
	NYSDEC SCGs													
Cadmim, Total		< 3.0	< 3.0	< 3.0	*< 3.0*	< 3.0	< 3.0	< 3.0	*< 3.0*	< 3.0	< 3.0	< 3.0	*< 3.0*	*< 3.0*
Cadmim, Dissolved	5	< 3.0	< 3.0	< 3.0	*< 3.0*	< 3.0	< 3.0	< 3.0	*< 3.0*	< 3.0	< 3.0	< 3.0	*< 3.0*	*< 3.0*
Chromim, Total	50	**11.4**	**73.4**	**134**	***88.7***	**12.6**	**162**	**82.0**	***13.6***	< 10	< 10	< 10	*< 10*	*< 10*
Chromim, Dissolved	50	< 10	< 10	< 10	***23.7***	< 10	< 10	**10.7**	*< 10*	< 10	< 10	< 10	*< 10*	*< 10*
Iron (total)	300		--	--	–		--	--	–		--	--	–	–
Iron (dissolved)	300		--	--	–		--	--	–		--	--	–	–
Manganese (total)	300		--	--	–		--	--	–		--	--	–	–
Manganese (dissolved)	300		--	--	–		--	--	–		--	--	–	–

Abbreviations, Notes, Qualifiers, and Units on last page

Table 11
Concentrations of Metals in Groundwater Samples Collected from Monitoring Wells, Bethpage Park Groundwater Containment System, OU 3 (Former Settling Ponds), Bethpage, New York [1,2]

ARCADIS Design & Consultancy for natural and built assets

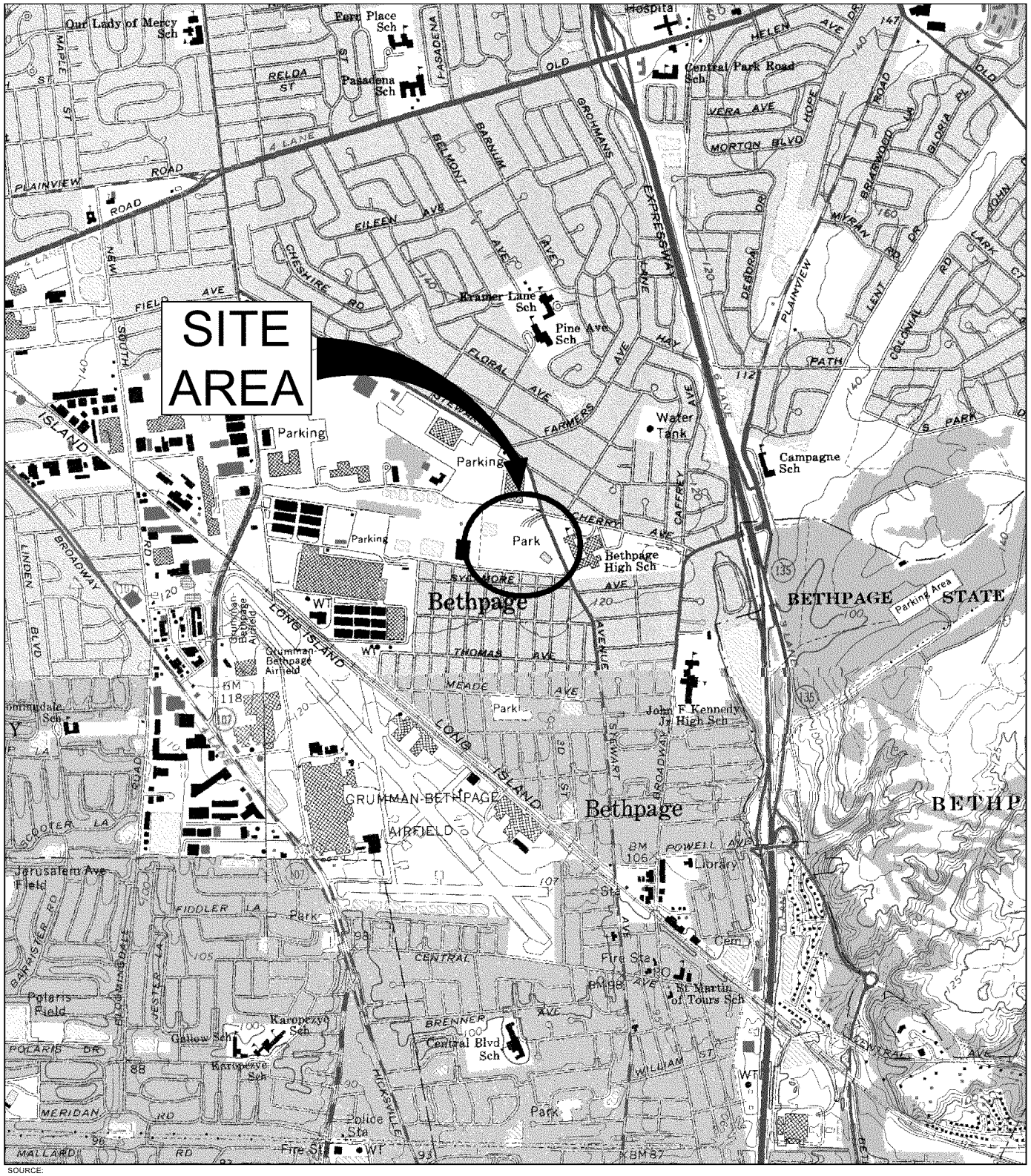
Abbreviations, Notes, Qualifiers, and Units:

--	Not Analyzed
NYSDEC	New York State Department of Environmental Conservation
USEPA	United State Environmental Protection Agency
SCGs	Standards, Criteria, and Guidance values

1. All historic data available in previous quarterly reports.
2. Results are validated at 20% frequency, per protocols specified in Sampling and Analysis Plan in the DRAFT Bethpage Park Groundwater Containment System OM&M Manual (ARCADIS 2016).
3. Samples analyzed for metals using USEPA Method 6010.

	Indicates an exceedance of an SCG
239	Bold indicates a detection
< 5	Compound not detected above its laboratory quantification limit
italicized indicates most recent data	
B	Compound detected in associated blank sample
J	Result is estimated
ug/L	Micrograms per liter

FIGURES



SOURCE:
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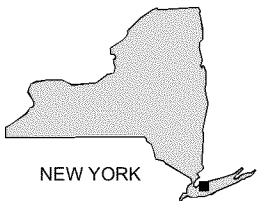
HICKSVILLE QUADRANGLE, HICKSVILLE, N.Y., 1967, PHOTOREVISED 1979, HUNTINGTON, N.Y., 1967, PHOTOREVISED 1979



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*
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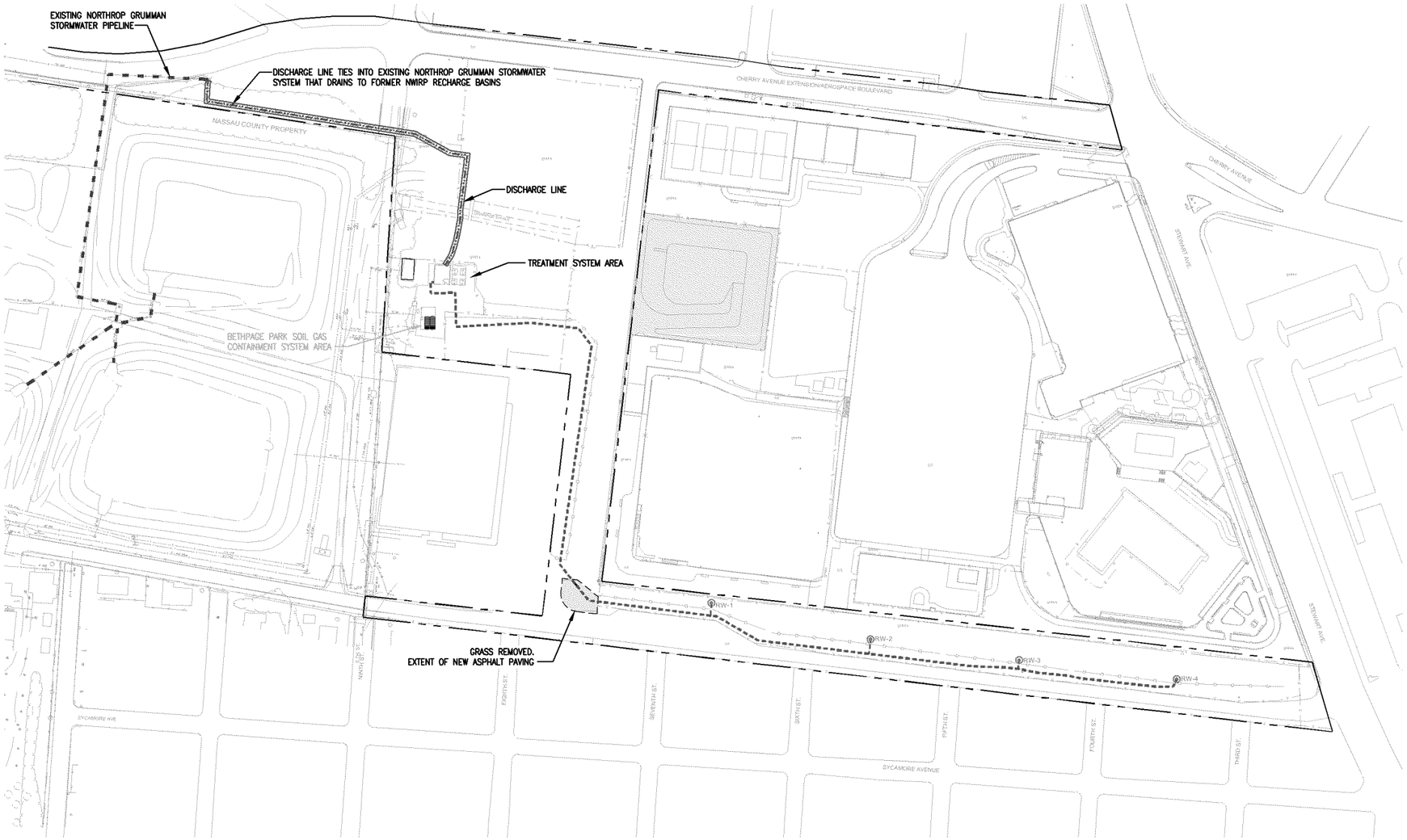
FREEPORT.TIF
HICKSVILLE.TIF
HUNTINGTON.TIF



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

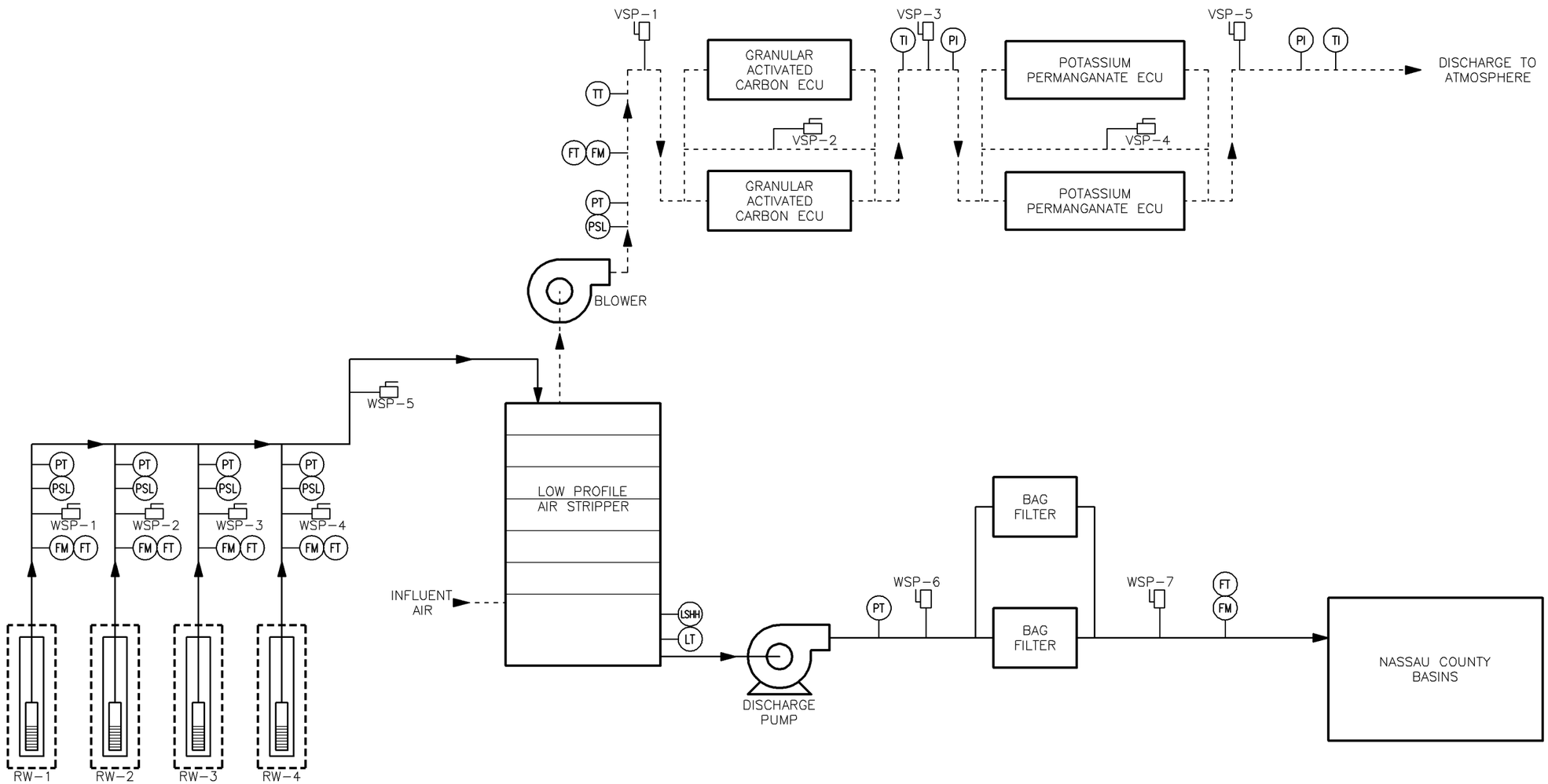
BETHPAGE PARK GROUNDWATER CONTAINMENT SYSTEM
OPERABLE UNIT 3
(FORMER GRUMMAN SETTLING PONDS)
BETHPAGE, NEW YORK

SITE AND GROUNDWATER CONTAINMENT SYSTEM

ARCADIS Design & Consultancy for natural and built assets

FIGURE **2**

CITY:SYRACUSE-NY DIV/GROUP:ENV DB:A.SANCHEZ LD:AS PIC:(Opt) PM:(Reqd) TM:(Opt) LYR:(Opt)ON=*;OFF=*REF*
C:\Users\alsanche2\OneDrive - ARCADIS\BIM 360 Docs\NORTHROP GRUMMAN\OMM4NY1496B01.DWG LAYOUT: 2 SAVED: 8/16/2018 1:24 PM ACADVER: 21.0S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: ---- PLOTTED: 8/16/2018 1:24 PM BY: SANCHEZ, ADRIAN
XREFS: X-1496X00 IMAGES: X-ONSITE-BASE SITE PROJECTNAME: ----



LEGEND:

	PROCESS WATER
	PROCESS AIR
FM	INSTRUMENT
	SAMPLE PORT
	FLOW DIRECTION
FM	FLOW METER
FT	FLOW RATE TRANSMITTER
PSL	PRESSURE VACUUM 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

CITY:SYRACUSE-NY DIV/GROUP:ENV DB:A.SANCHEZ LD:AS PIC:(Opt) PM:(Reqd) TM:(Opt) LYR:(Opt)ON=*;OFF=*REF*
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XREFS: IMAGES: PROJECTNAME: ----
X1496X00

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'

APPROXIMATE 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:SYRACUSE-NY DIV/GROUP:ENV DB:A.SANCHEZ LD:ALS PIC:(Opt) PM:(Reqd) TM:(Opt) LYR:(Opt)ON=*;OFF=*REF*
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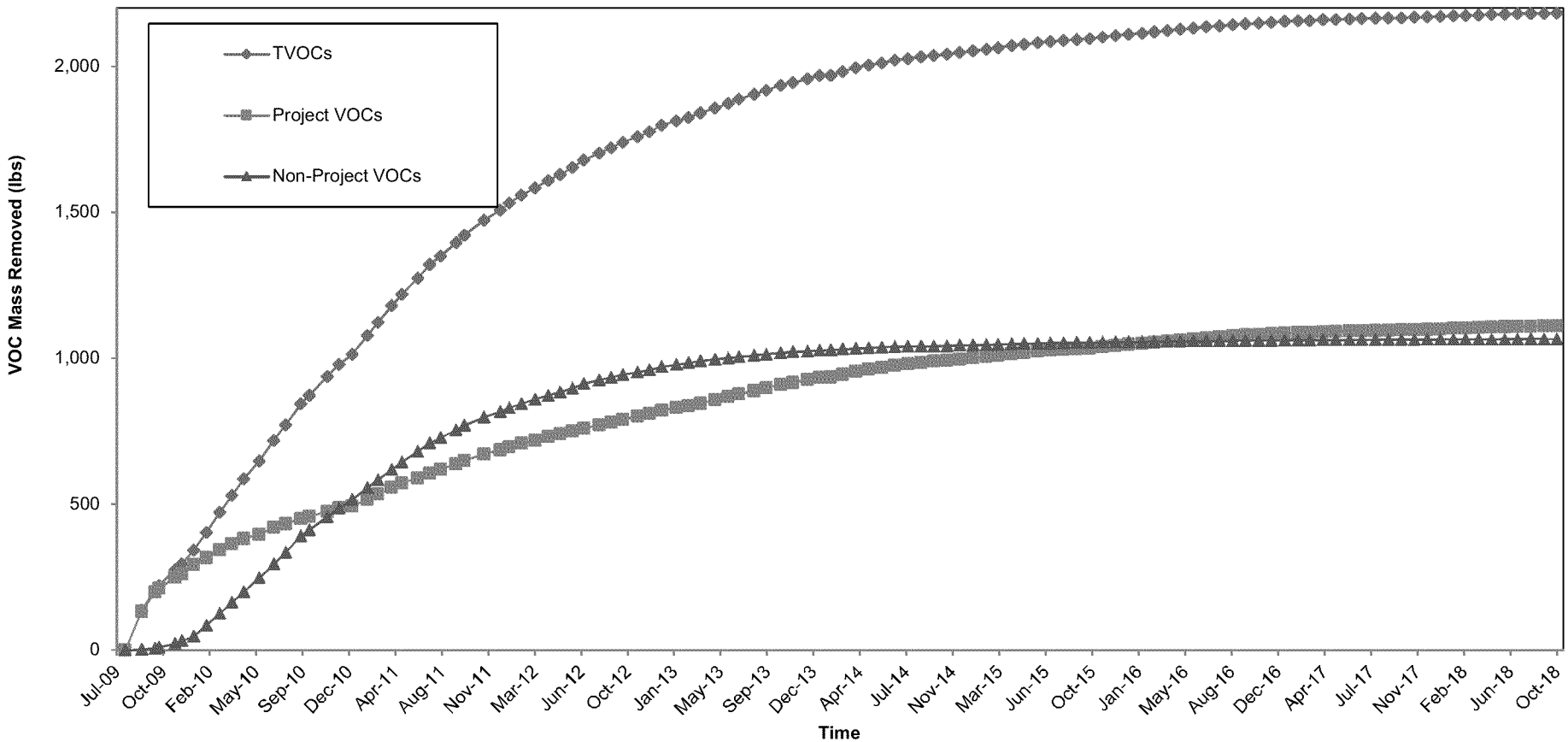
XBDR-CL
X:\1486Xsp



Abbreviations, Notes, and Units:

VOC = Volatile Organic Compound
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.

lbs = pounds

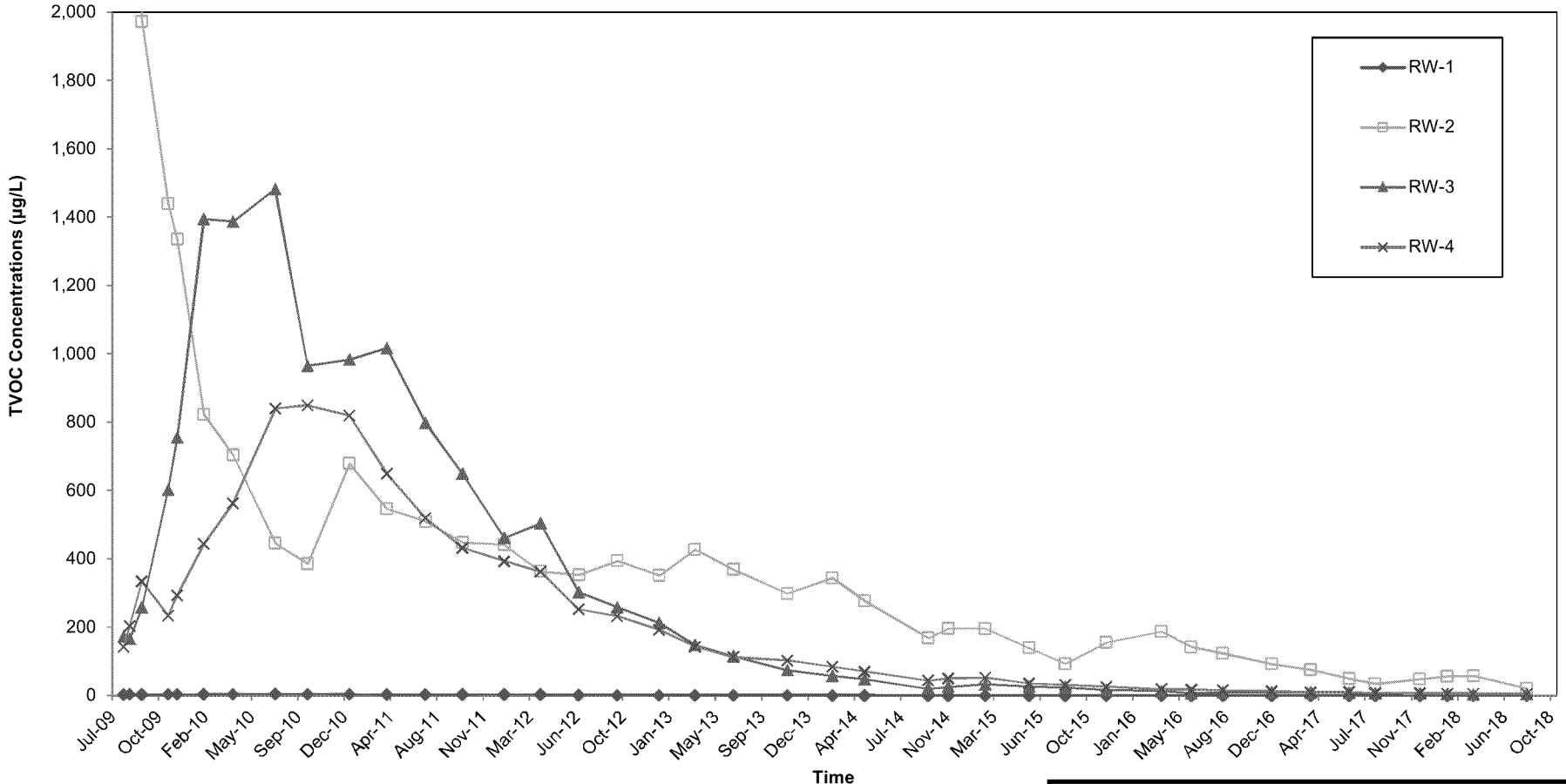
BETHPAGE PARK GROUNDWATER CONTAINMENT SYSTEM
OPERABLE UNIT 3
(FORMER GRUMMAN SETTLING PONDS)
BETHPAGE, NEW YORK

CUMULATIVE TOTAL, PROJECT, AND NON-PROJECT VOC MASS REMOVED

ARCADIS

FIGURE
5

G:\APROJECT\Northrop Grumman Bethpage\OU3.2 Groundwater Contain ment System\11 Draft R eports-Presentations\Reports\2018 Q3\Tables\Q3_Table 2-8Figure 5 TVOC Mass Graph



Abbreviations, Notes, and Units:

VOC = Volatile Organic Compound
TVOCs = Total VOCs detected

1. Results prior to September 10, 2009 are not shown to improve figure clarity. The TVOC concentrations are greater than 2,000 µg/L. See previous reports for full data set.

µg/L = micrograms per liter

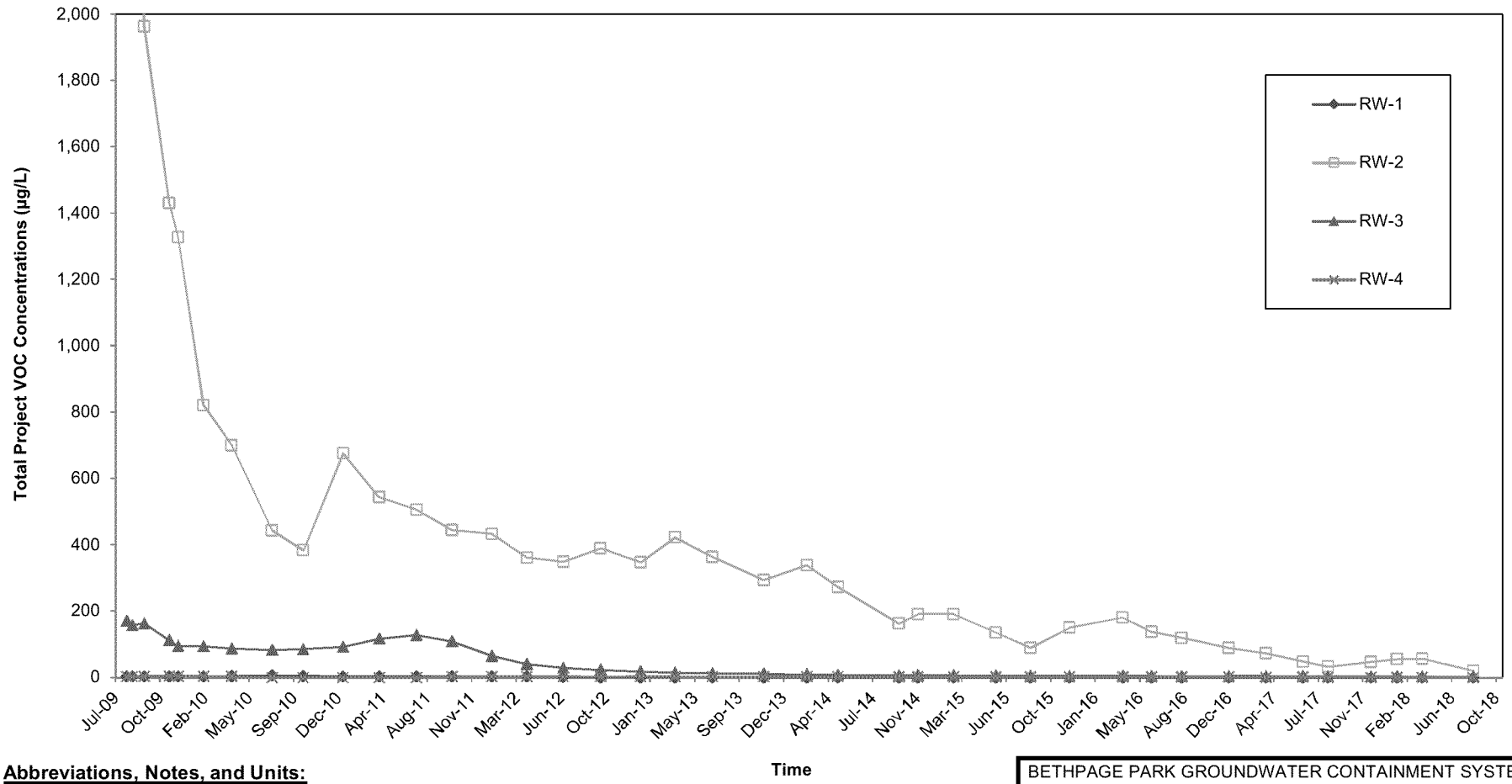
BETHPAGE PARK GROUNDWATER CONTAINMENT SYSTEM
OPERABLE UNIT 3
(FORMER GRUMMAN SETTLING PONDS)
BETHPAGE, NEW YORK

REMEDIAL WELL TOTAL VOC CONCENTRATIONS

ARCADIS

FIGURE
6A

G:\APROJECT\Northrop Grumman Bethpage\OU3.2 Groundwater Containment System\11 Draft Reports-Presentations\Reports\2018 Q3\Tables\Q3_Table 2-8Figure 6A RW Total VOC



Abbreviations, Notes, and Units:

VOC = Volatile Organic Compound
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.

1. Results prior to September 10, 2009 are not shown to improve figure clarity. Total Project VOC concentrations are greater than 2,000 µg/L. See previous reports for full data set.

µg/L = micrograms per liter

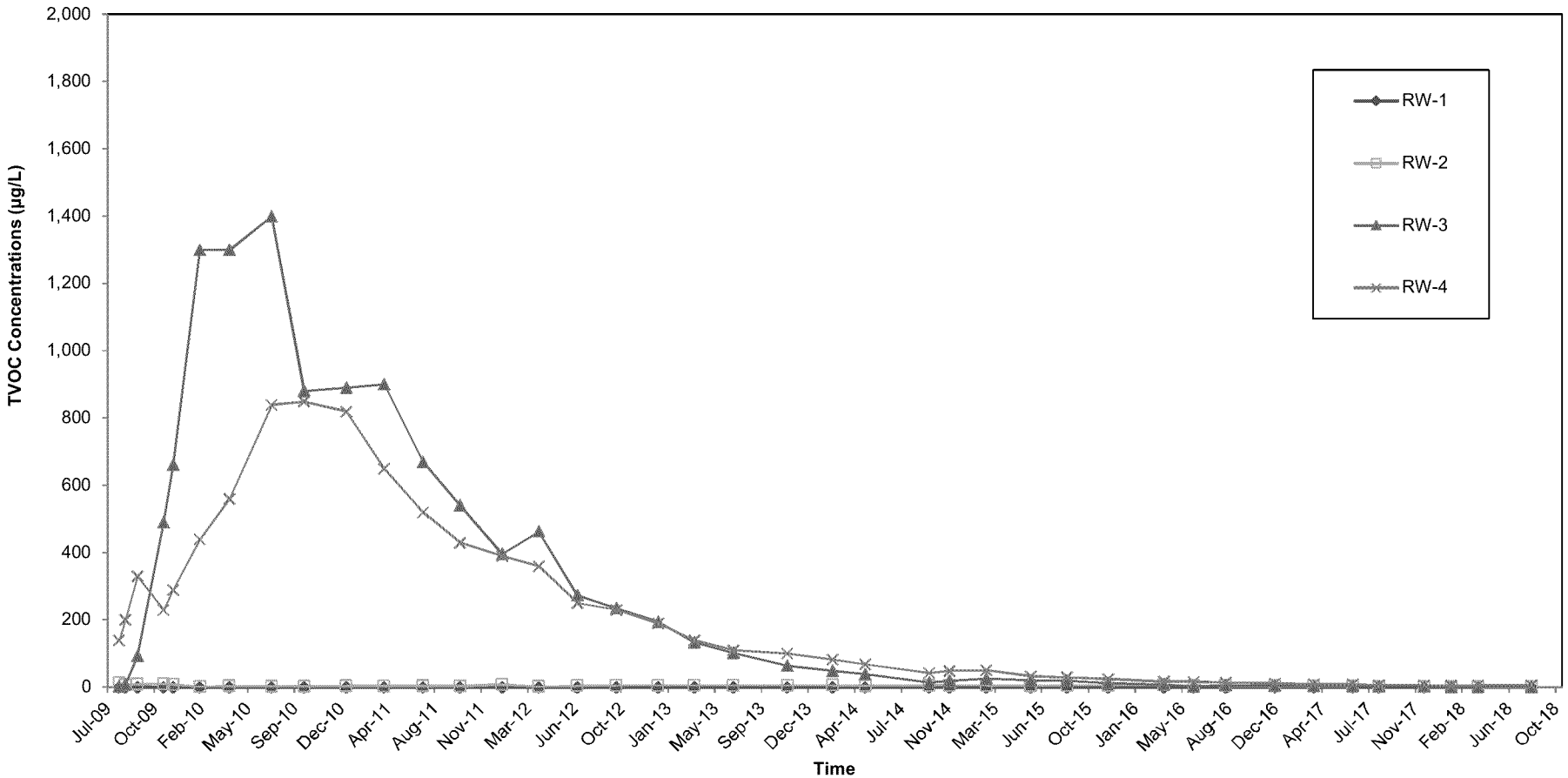
BETHPAGE PARK GROUNDWATER CONTAINMENT SYSTEM
OPERABLE UNIT 3
(FORMER GRUMMAN SETTLING PONDS)
BETHPAGE, NEW YORK

REMEDIAL WELL PROJECT VOC CONCENTRATIONS

ARCADIS

FIGURE
6B

G:\APROJECT\Northrop Grumman Bethpage\OU3.2 Groundwater Containment System\11 Draft Reports-Presentations\Reports\2018 Q3\Tables\Q3_Table 2-8Figure 6B RW Project VOC



Abbreviations, Notes, and Units:

VOC = Volatile Organic Compound
TVOCs = Total VOCs detected.

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

µg/L = micrograms per liter

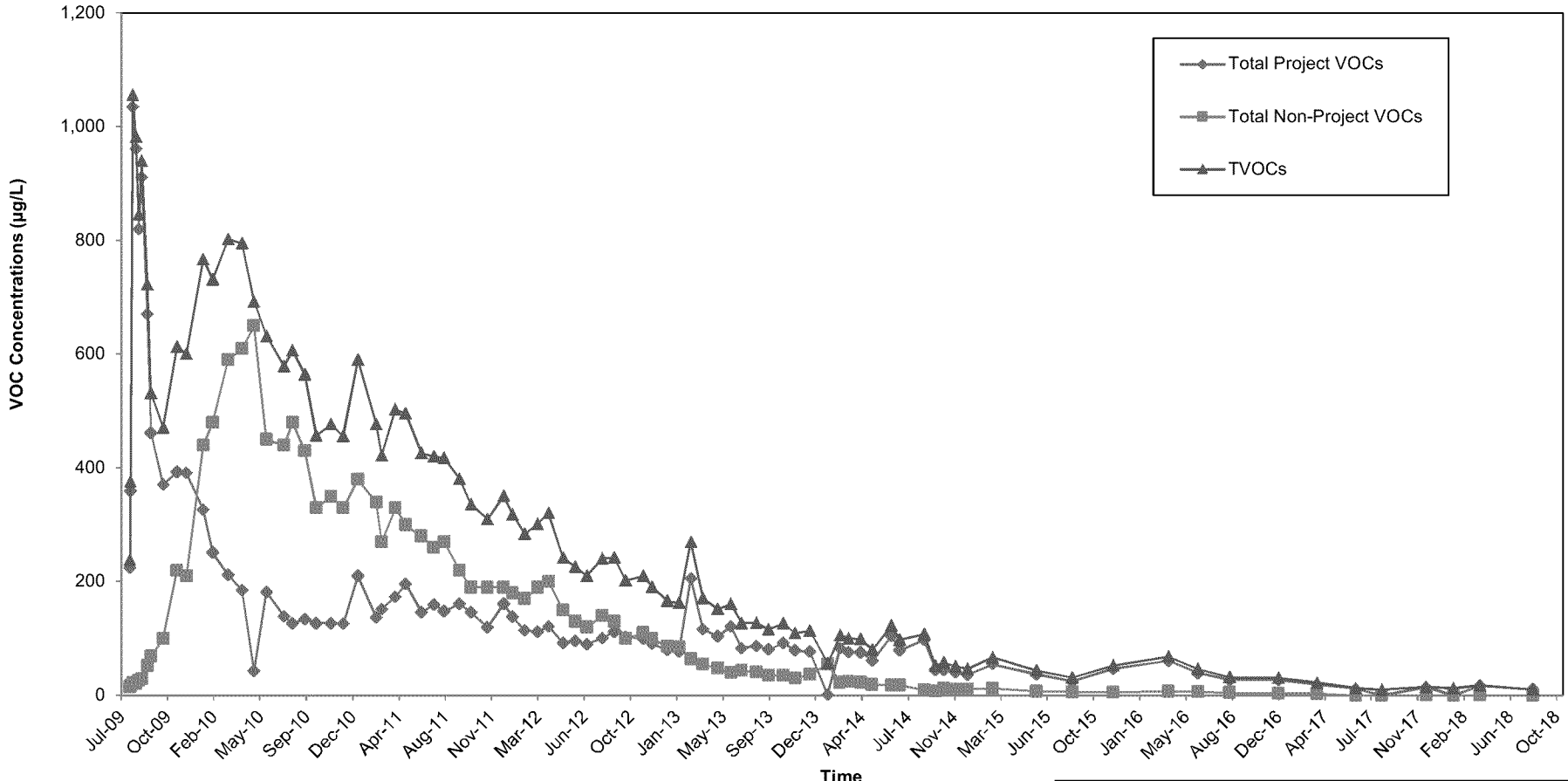
BETHPAGE PARK GROUNDWATER CONTAINMENT SYSTEM
OPERABLE UNIT 3
(FORMER GRUMMAN SETTLING PONDS)
BETHPAGE, NEW YORK

REMEDIAL WELL NON-PROJECT VOC CONCENTRATIONS

ARCADIS

FIGURE
6C

G:\APROJECT\Northrop Grumman Bethpage\OU3.2 Groundwater Containment System\11 Draft Reports-Presentations\Reports\2018 Q3\Tables\Q3_Table 2-8Figure 6C RW Non-Proj VOC



Abbreviations, Notes, and Units:

VOC = Volatile Organic Compound
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.

µg/L = micrograms per liter

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

INFLUENT TOTAL, PROJECT AND NON-PROJECT VOC CONCENTRATIONS

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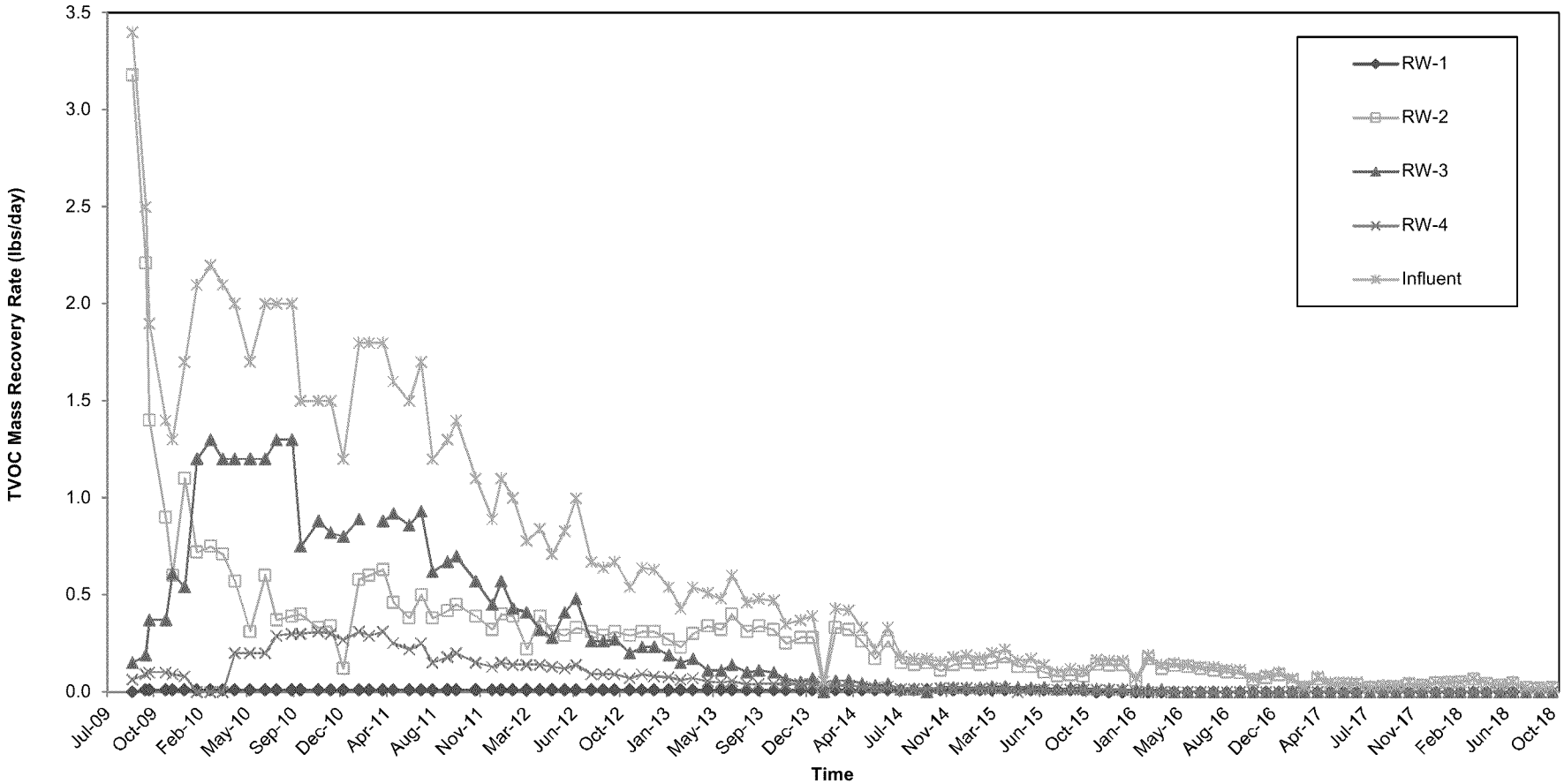
FIGURE
7

G:\APROJECT\Northrop Grumman Bethpage\OU3.2 Groundwater Containment System\11 Draft Reports-Presentations\Reports\2018 Q3\Tables\Q3_Table 2-8Figure 7 Comb. Inf. VOC Conc.



Abbreviation, Notes, and Units:

VOC = Volatile Organic Compound
TVOCs = Total VOCs detected

lbs/day = pounds per day

BETHPAGE PARK GROUNDWATER CONTAINMENT SYSTEM
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TOTAL VOC MASS RECOVERY RATES

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FIGURE
8A

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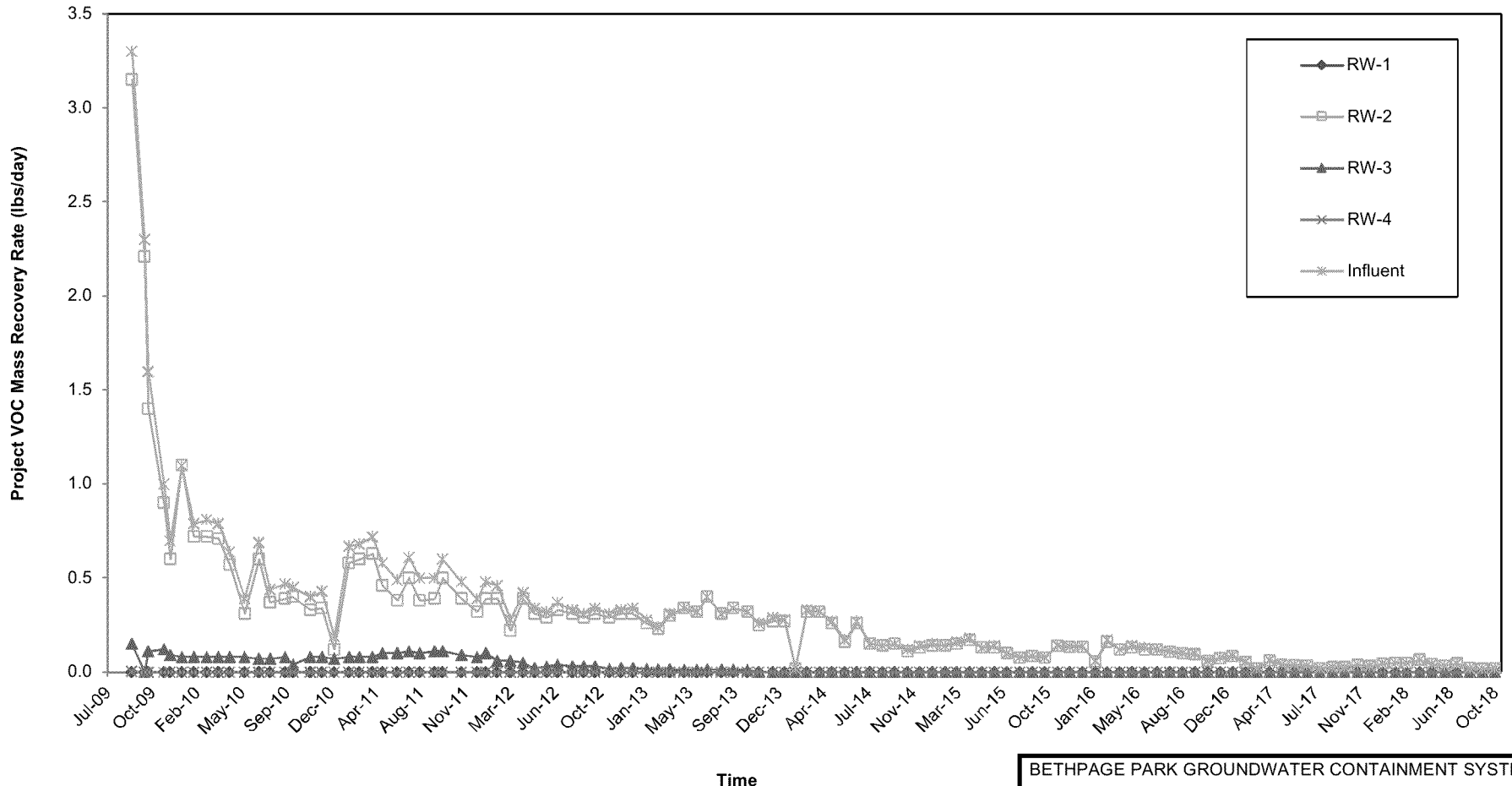

Abbreviations, Notes, and Units:

VOC = Volatile Organic Compound

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

lbs/day = pounds per day

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PROJECT VOC MASS RECOVERY RATES

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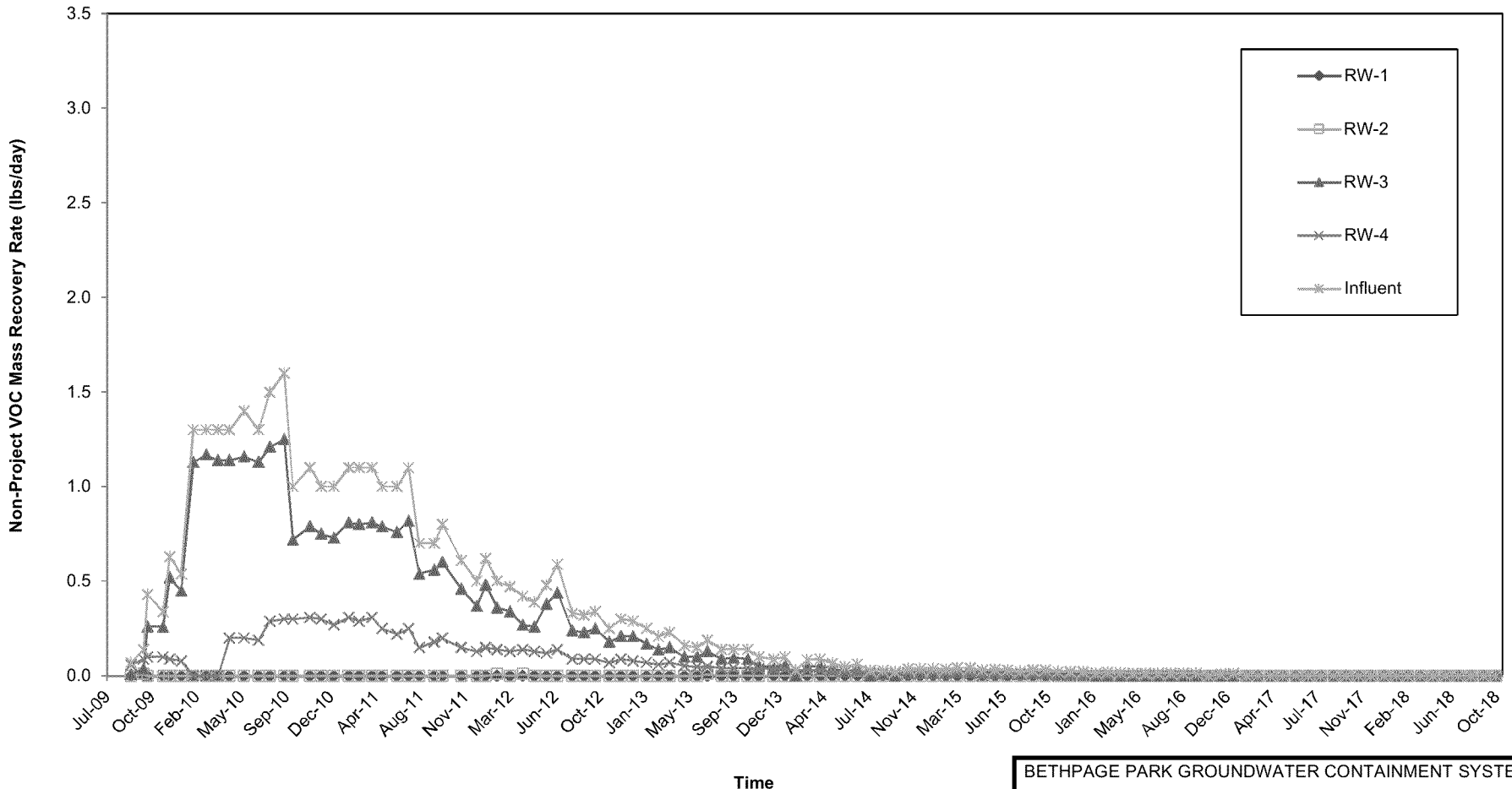
FIGURE
8B

G:\APROJECT\Northrop Grumman Bethpage\OU3.2 Groundwater Containment System\11 Draft Reports-Presentations\Reports\2018 Q3\Tables\Q3_Table 2-8Figure 8B VOC Recovery Rates



Abbreviations, Notes, and Units:

VOC = Volatile Organic Compound

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

lbs/day = pounds per day

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NON-PROJECT VOC MASS RECOVERY RATES

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FIGURE
8C

G:\APROJECT\Northrop Grumman Bethpage\OU3.2 Groundwater Containment System\11 Draft Reports-Presentations\Reports\2018 Q3\Tables\Q3_Table 2-8Figure 8C VOC Recovery Rates