NORTHROP GRUMMAN

ISTR Operations Monthly Progress Report

Reporting Period: 8/26/20 through 9/30/20

Operable Unit 3 VOC Source Area Remedy
Former Grumman Settling Ponds
Bethpage, NY
NYSDEC Site No. 130003A

In-Situ Thermal Remediation (ISTR) Operations Monthly Progress Report

NORTHROP GRUMMAN

Prepared per Section 8.2 of the OU3 Remedial Action Work Plan (RAWP) and DER-10, Section 5.7(b):

1. Remedy Progress / Performance Monitoring
2. Ambient Air and Noise Monitoring
3. Vacuum Monitoring – Soil Gas Containment System
4. Significant Activities
5. Schedule / Proposed Modifications
6. Requested RAWP Modifications
7. Data Tables

Remedy Progress / Performance Monitoring

ISTR Operations Summary

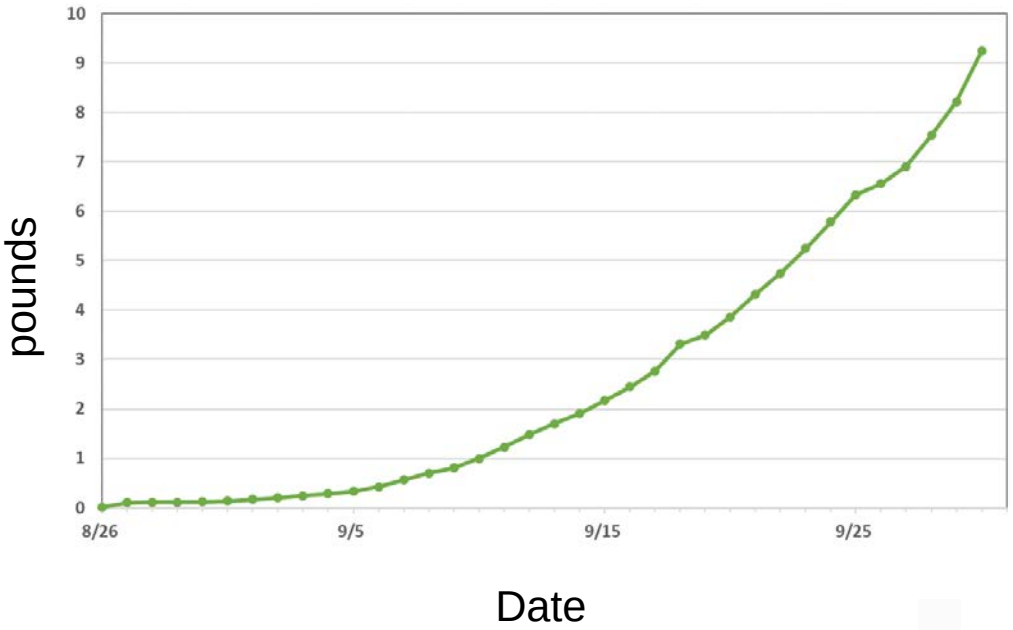
- Air emissions comply with air discharge criteria specified in the RAWP
- No exceedances of NYSDEC Community Air Monitoring Plan (CAMP) action levels
- No ambient air monitoring results above target screening levels
- No impacts of ISTR operations on soil gas containment system
- No liquid effluent discharges this reporting period

Reporting Period: Aug 26, 2020 through Sept 30, 2020

System Startup	8/26/2020
Days of Operation Since Startup	36
Cumulative Mass Removed, lbs	9.2

Remedy Progress / Performance Monitoring

Cumulative TVOC Mass Removed



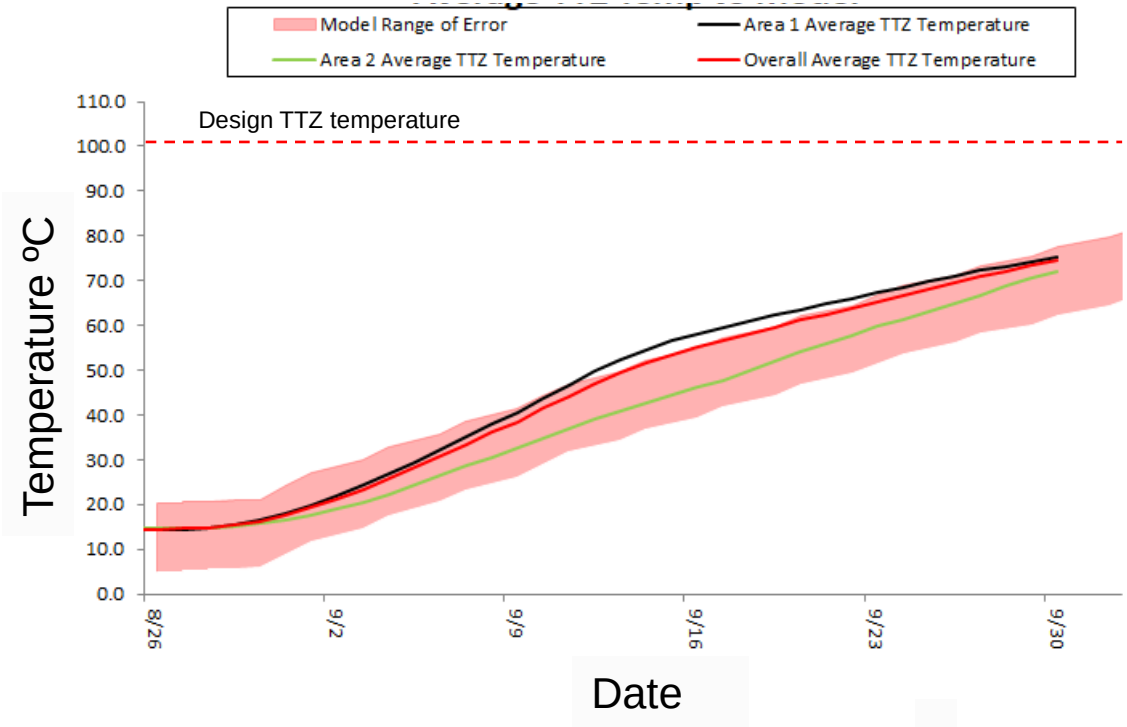
An estimated 9.2 lbs of total volatile organic compounds (TVOCs) removed during this reporting period

Cumulative TVOC mass is the sum of the following:

- Photoionization detector (PID) TVOC vapor mass
- Liquid TVOC mass
- Condensed non-aqueous phase liquid (NAPL) mass

Remedy Progress / Performance Monitoring

Cumulative TVOC Mass Removed

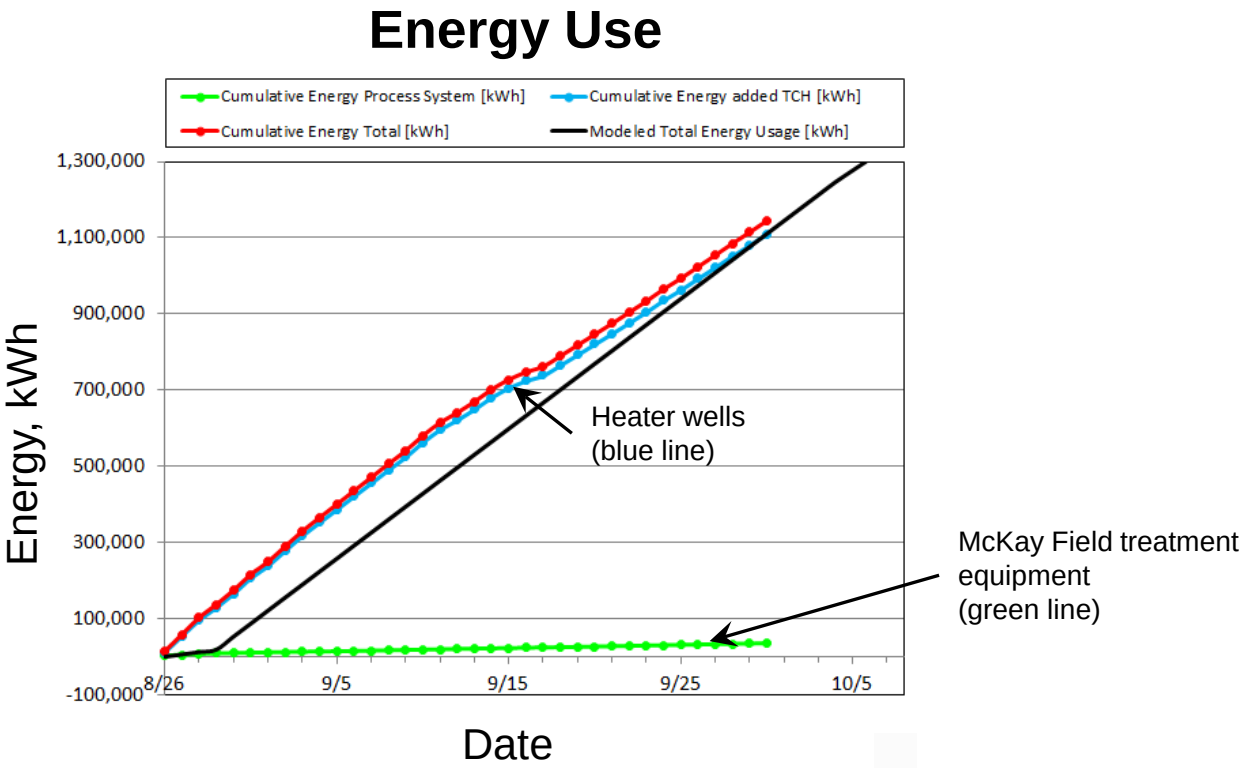


Target treatment zone (TTZ) design temperature is 100ºC

Average temperature at end of reporting period:

- Area 1 = 76ºC
- Area 2 = 72ºC

Remedy Progress / Performance Monitoring



Remedy Progress / Performance Monitoring

Vapor Treatment System

Air emissions meet treatment requirements in the RAWP:

- Greater than 90% removal of trichloroethylene (TCE) and vinyl chloride
- Stack concentrations less than 7.6 mg/m^3 for TCE and 1.9 mg/m^3 for vinyl chloride

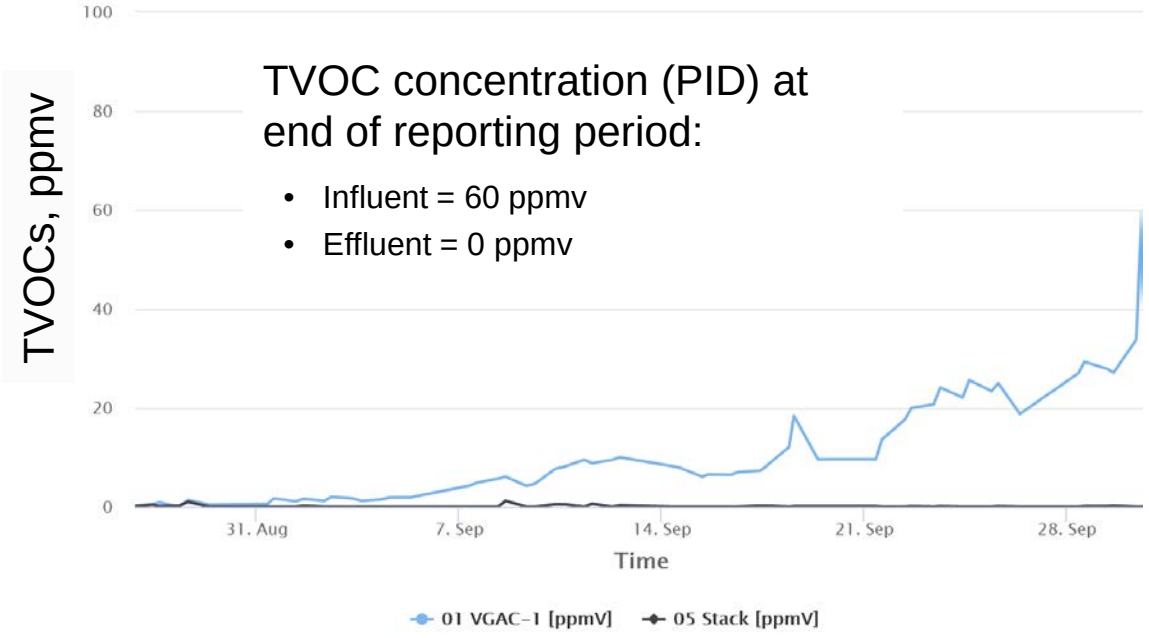
Data validated and meet data quality objectives

System startup analytical results provided in Table 1

Routine operations analytical results provided in Table 2

Remedy Progress / Performance Monitoring

Vapor Treatment System

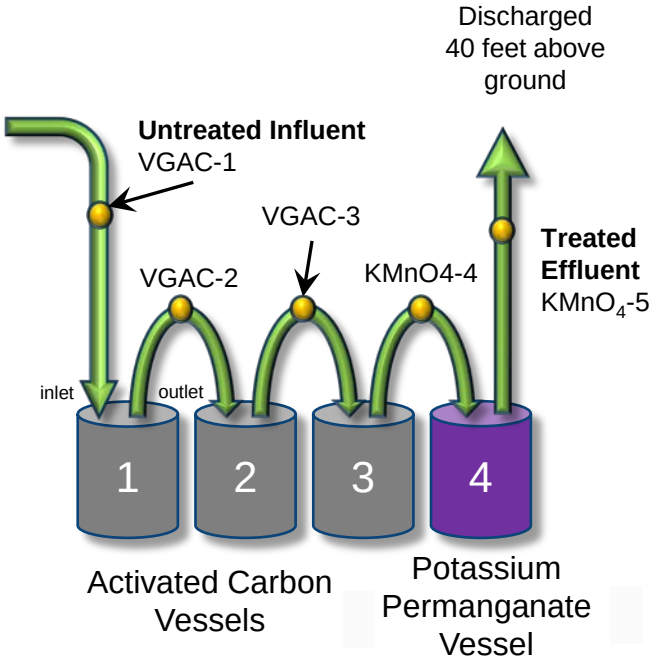


TVOC concentration (PID) at end of reporting period:

- Influent = 60 ppmv
- Effluent = 0 ppmv

Untreated Influent

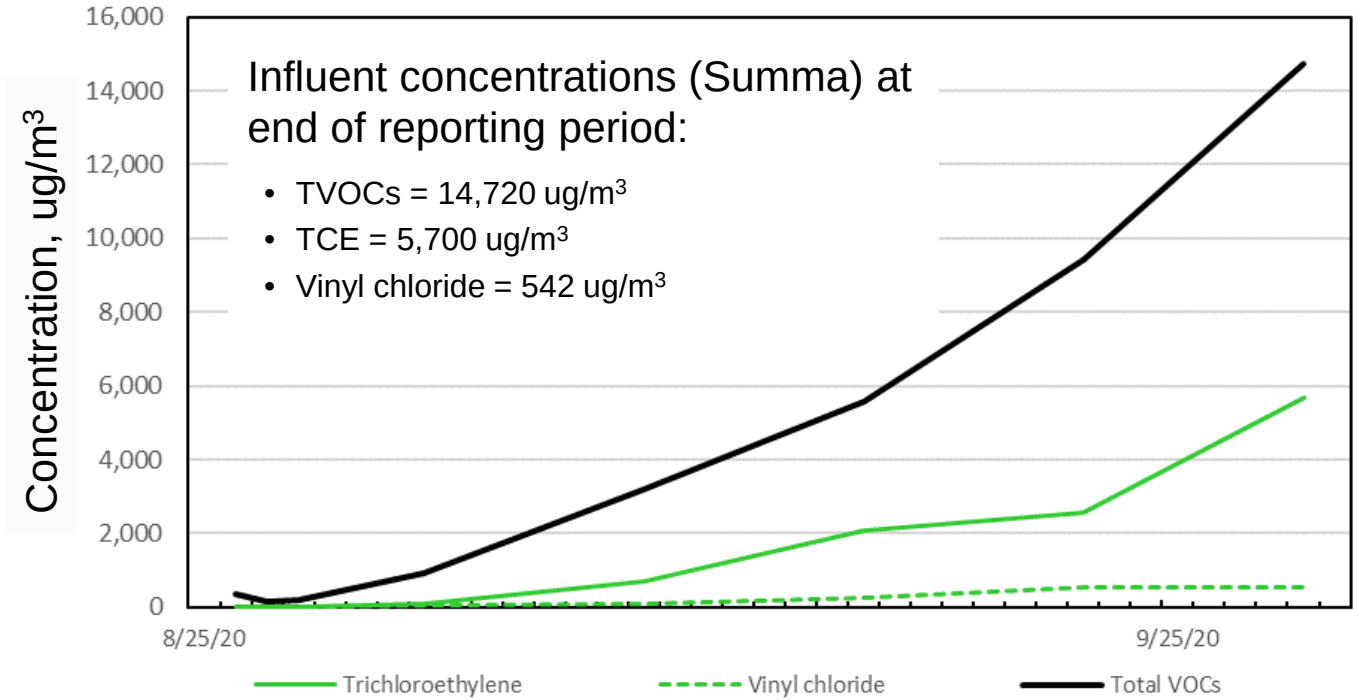
Treated Effluent



Vapor Treatment System Sampling Locations

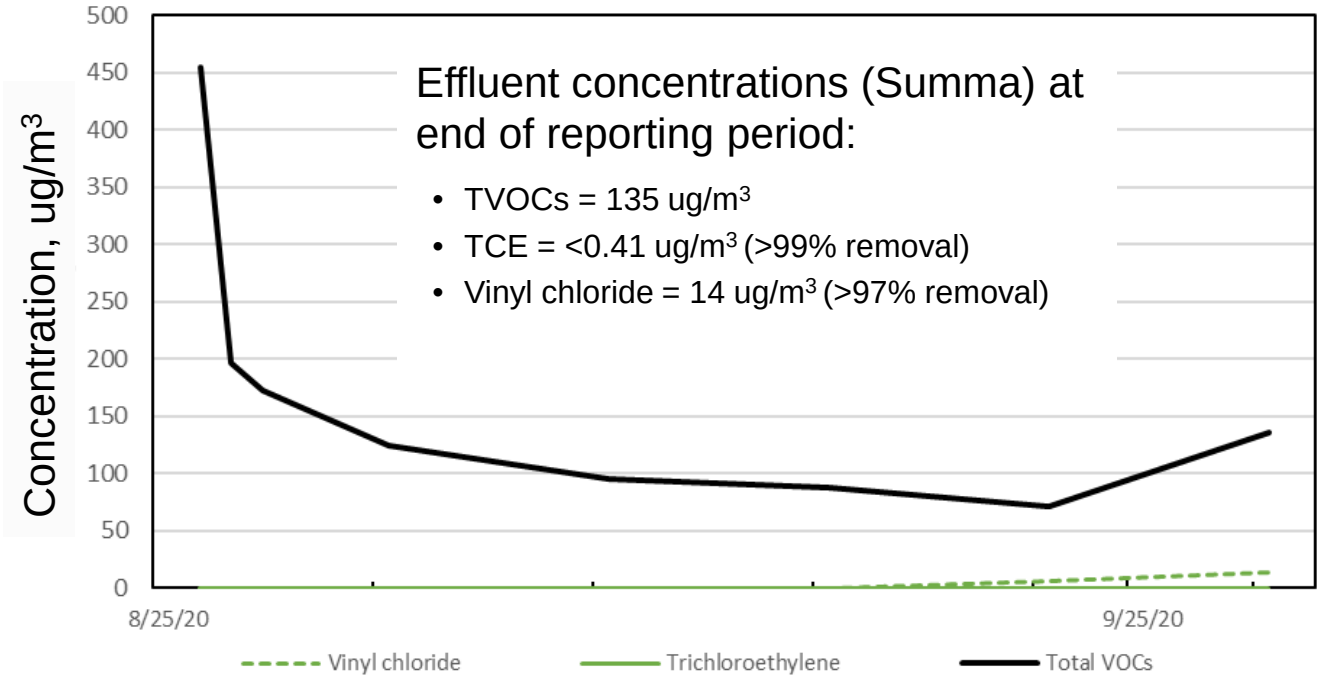
Remedy Progress / Performance Monitoring

Vapor Treatment System Influent



Remedy Progress / Performance Monitoring

Vapor Treatment System Effluent



Remedy Progress / Performance Monitoring

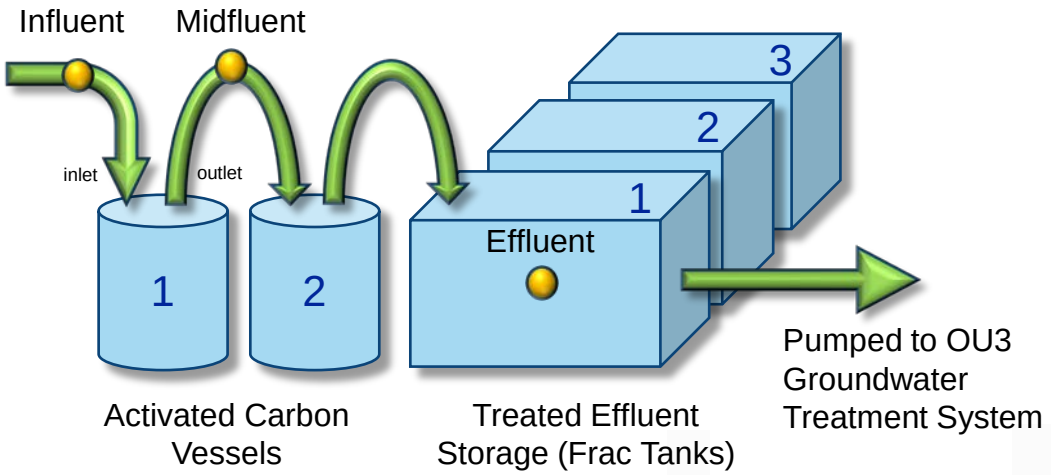
Liquid Treatment System

Frac tank 1 sampled 9/22

Discharge to OU3 groundwater treatment system pending (no discharge this reporting period)

Data validated and meet data quality objectives with one minor exception

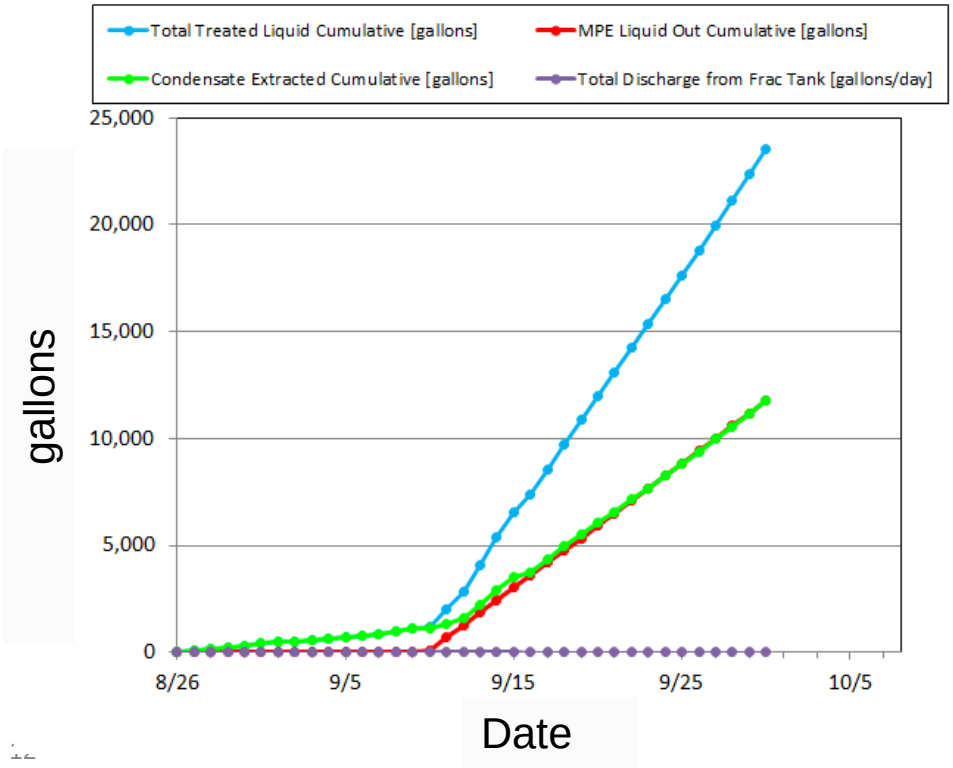
Analytical results provided in Table 3



Liquid Treatment System Sampling Locations

Remedy Progress / Performance Monitoring

Cumulative Liquid Produced



Treated effluent contained in three frac tanks (~18,000 gallons each)

Liquids not discharged to OU3 groundwater treatment system this reporting period

Ambient Air PID Monitoring

PID levels comply with ambient air criteria specified in the RAWP:

- PID readings recorded at ambient air monitoring locations AMP-1 through 4 continuously
- Results emailed daily to the State and Town of Oyster Bay (Monday through Saturday)
- PID monitoring results did not exceed NYSDEC's Community Air Monitoring Plan (CAMP) action level (5 ppm TVOCs for a 15-minute average)

Ambient Air Summa Canister Monitoring

Summa canister levels comply with ambient air criteria specified in the RAWP:

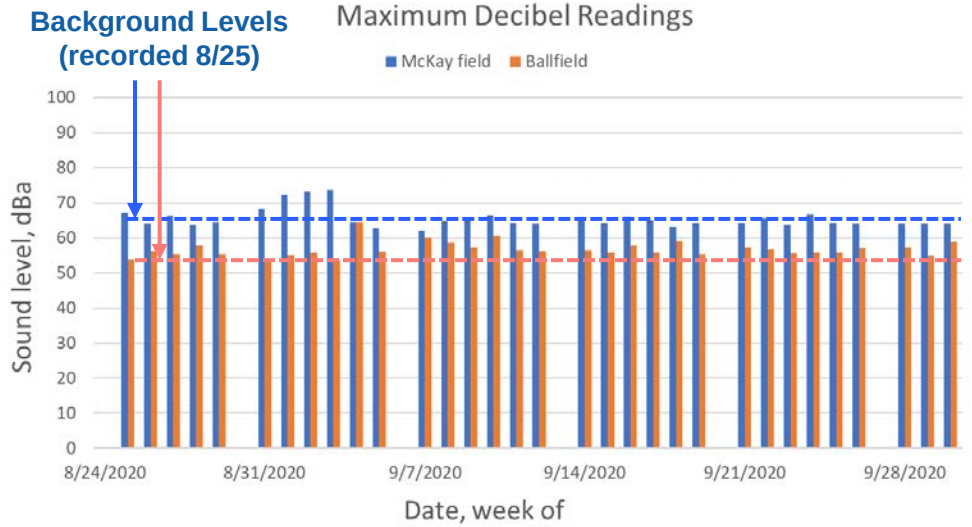
- Summa canister samples collected 8/27, 9/2, 9/8, 9/14, 9/19, 9/25; average sample duration 6 days
- Results emailed to the State and Town of Oyster Bay
- Summa canister results for compounds of interest (COIs) lower than target screening levels in the CAMP
- Summa canister results for Non-COIs also lower than target screening levels calculated using CAMP-specified protocol

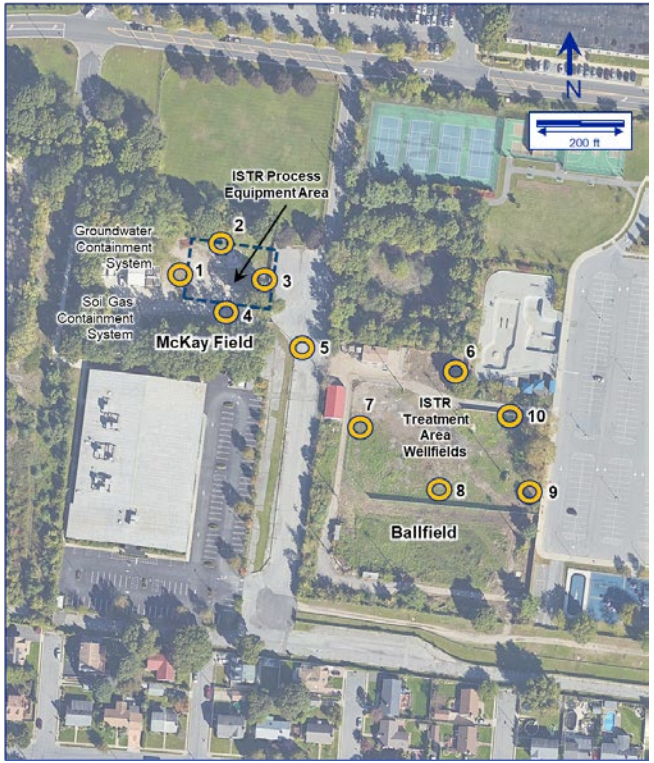
Analytical results provided in Table 4

Noise Monitoring

Sound levels comply with noise criteria in the RAWP:

- Readings measured prior to ISTR startup (background) and twice daily at 10 locations, Monday through Saturday
- All readings <80 dBa action level





Vacuum Monitoring – Soil Gas Containment System

Vacuum measured on 7/29 (background), 9/3, 9/9, 9/16, and 9/24 at 21 compliance monitoring points

Comparison of background vacuums to vacuum readings during ISTR operations indicate ISTR system had no measurable impact on OU3 Soil Gas Containment System

Compliance goal of -0.1 vacuum (inches of water column) met at all compliance monitoring points throughout reporting period

Vacuum results provided in Table 5

Significant Activities

Major equipment repairs and significant downtime

- 9/4: Vacuum blower A offline for 48 hours to perform maintenance. Blower B remained operational.
- 9/8: Vacuum blower B offline for 48 hours to replace variable frequency drive. Blower A remained operational.
- 9/17: Silicon controlled rectifier (SCR) No. 6 offline for 24 hours to repair an electrical short.

Carbon changeouts - None

Potassium permanganate vessel changeouts – None

Planned Significant Activities During Next Two Months

Continue routine system operations, monitoring, and maintenance

Schedule / Proposed Modifications

Activity	RAWP Schedule	Current Status
Remedial System Operation	Q3/20 – Q1/21	On schedule
Post-Treatment Confirmation Sampling	Q1/21	On schedule
Remedy Cool-down	Q1/21-Q2-21	On schedule
Equipment Removal & Site Restoration	Q2/21	On schedule

No significant delays or corrective actions required

No proposed schedule modifications

Requested RAWP Modifications

Discontinue routine noise monitoring; conduct only as-needed

- Noise readings from beginning of operations have been consistent with background levels
- No readings exceeded 80 dBa action level

Data Tables

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Table 1. Vapor Treatment System Air Sampling Results
System Startup - August 2020

Compound (ug/m^3)	Sample ID:	VGAC-1	VGAC-2	VGAC-3	KMNO4-4	KMNO4-5
	Lab Sample ID:	JD12267-1	JD12267-2	JD12267-3	JD12267-4	JD12267-5
	Date Sampled:	8/26/2020	8/26/2020	8/26/2020	8/26/2020	8/26/2020
1,1,1-Trichloroethane		< 0.71	< 0.71	< 0.71	< 0.71	< 0.71
1,1-Dichloroethane		< 0.19	< 0.19	< 0.19	< 0.19	< 0.19
1,1-Dichloroethylene		< 0.27	< 0.27	< 0.27	< 0.27	< 0.27
1,2,4-Trimethylbenzene		**2.0 J**	**9.3**	**11**	**5.4**	**9.3**
1,3,5-Trimethylbenzene		< 0.64	**2.8 J**	**3.2 J**	**1.6 J**	**2.6 J**
1,4-Dioxane*		< 0.76	< 0.76	< 0.76	< 0.76	< 0.76
2,2,4-Trimethylpentane		< 0.41	**2.3 J**	**2.1 J**	< 0.41	< 0.41
2-Hexanone		< 0.61	< 0.61	< 0.61	< 0.61	< 0.61
4-Ethyltoluene		< 0.59	**2.9 J**	**3.4 J**	**1.8 J**	**2.7 J**
Acetone*		**173**	**41.3**	**33.5**	**38.7**	**48.5**
Benzene		< 0.15	**1.3 J**	**2.1 J**	**20**	**2.4 J**
Bromoform		< 1.6	< 1.6	< 1.6	< 1.6	< 1.6
Carbon disulfide		**2.5 J**	< 0.29	< 0.29	< 0.29	< 0.29
Carbon tetrachloride		< 0.59	< 0.59	< 0.59	< 0.59	< 0.59
Chloroethane		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Chloroform		< 0.39	< 0.39	< 0.39	< 0.39	< 0.39
Chloromethane*		**1.2 J**	**1.1 J**	**1.4 J**	**1.7**	**2.1**
cis-1,2-Dichloroethylene		**2.5 J**	< 0.19	< 0.19	< 0.19	< 0.19
Cyclohexane		< 0.30	< 0.30	< 0.30	**5.5**	< 0.30
Dichlorodifluoromethane		**2.7 J**	< 0.33	< 0.33	< 0.33	< 0.33
Ethanol		**15**	**66.5**	**173**	**72.0**	**41.8**
Ethyl acetate		**6.8**	**95.4**	**9.4**	**64.4**	**16**
Ethylbenzene		< 0.26	**4.0**	**4.2**	**2.8 J**	**3.6**
Heptane		< 0.29	**1.9 J**	**2.0 J**	**1.6 J**	< 0.29
Hexane		< 0.15	**2.8 J**	**1.8 J**	**1.8 J**	**1.9 J**
Isopropyl alcohol*		**29.0**	**172**	**160**	**121**	**228**
m,p-Xylene		**5.6**	**15**	**16**	**10**	**16**
m-Dichlorobenzene		< 0.46	**13**	**8.4**	**5.2**	**9.6**
Methyl ethyl ketone		**12**	**5.9**	**5.6**	**10**	**5.6**
Methyl isobutyl ketone		< 0.57	**2.9 J**	**7.8**	**1.8 J**	**4.5**
Methylene chloride*		< 0.20	< 0.20	< 0.20	**1.4 J**	< 0.20
o-Xylene		**2.0 J**	**6.1**	**6.9**	**4.0**	**7.4**
Propylene*		< 0.11	**3.3 J**	**2.6 J**	< 0.11	< 0.11
Styrene		**49.4**	**4.1**	**4.7**	**2.5 J**	**3.2 J**
Tertiary butyl alcohol		**6.1**	**36.1**	**33.3**	**26**	**28**
Tetrachloroethylene		< 0.81	< 0.81	< 0.81	< 0.81	< 0.81
Tetrahydrofuran		< 0.59	< 0.59	< 0.59	< 0.59	< 0.59
Toluene		**41.1**	**26**	**25**	**19**	**18**
trans-1,2-Dichloroethylene		< 0.11	**7.1**	< 0.11	**4.8**	< 0.11
Trichloroethylene		**3.8**	< 0.41	< 0.41	< 0.41	< 0.41
Trichlorofluoromethane		< 0.62	**4.1 J**	**3.1 J**	**3.4 J**	**2.9 J**
Vinyl acetate		< 0.49	< 0.49	< 0.49	< 0.49	< 0.49
Vinyl chloride*		**15**	< 0.23	< 0.23	< 0.23	< 0.23
Xylenes (total)		**7.4**	**21**	**23**	**14**	**23**
TVOCs		**370**	**527**	**521**	**426**	**454**

Footnotes:

ug/mg^3 micrograms per cubic meter

* Compound is poorly adsorbed by activated carbon.

< Compound was not detected at or above the indicated value.

J Detected concentration is less than the quantitation limit.

TVOCs Total volatile organic compounds

Detections are **bolded**.

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Table 1. Vapor Treatment System Air Sampling Results
System Startup - August 2020

Compound (ug/m^3)	Sample ID:	VGAC-1	VGAC-2	VGAC-3	KMNO4-4	KMNO4-5
	Lab Sample ID:	JD12341-1	JD12341-2	JD12341-3	JD12341-5	JD12341-4
	Date Sampled:	8/27/2020	8/27/2020	8/27/2020	8/27/2020	8/27/2020
1,1,1-Trichloroethane		< 0.71	< 0.71	< 0.71	< 0.71	< 0.71
1,1-Dichloroethane		< 0.19	< 0.19	< 0.19	< 0.19	< 0.19
1,1-Dichloroethylene		< 0.27	< 0.27	< 0.27	< 0.27	< 0.27
1,2,4-Trimethylbenzene		< 0.64	< 0.64	< 0.64	< 0.64	< 0.64
1,3,5-Trimethylbenzene		< 0.64	< 0.64	< 0.64	< 0.64	< 0.64
1,4-Dioxane*		< 0.76	< 0.76	< 0.76	< 0.76	< 0.76
2,2,4-Trimethylpentane		< 0.41	< 0.41	< 0.41	< 0.41	< 0.41
2-Hexanone		< 0.61	< 0.61	< 0.61	< 0.61	< 0.61
4-Ethyltoluene		< 0.59	< 0.59	< 0.59	< 0.59	< 0.59
Acetone*		**35.6**	**48.7**	**25.4**	**34.4**	**33.0**
Benzene		**2.1 J**	< 0.15	< 0.15	**134**	**4.2**
Bromoform		< 1.6	< 1.6	< 1.6	< 1.6	< 1.6
Carbon disulfide		< 0.29	< 0.29	< 0.29	< 0.29	< 0.29
Carbon tetrachloride		< 0.59	< 0.59	< 0.59	< 0.59	< 0.59
Chloroethane		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Chloroform		< 0.39	< 0.39	< 0.39	< 0.39	< 0.39
Chloromethane*		**1.3 J**	**1.7**	**1.2 J**	**1.9**	**0.97 J**
cis-1,2-Dichloroethylene		**1.6 J**	< 0.19	< 0.19	< 0.19	< 0.19
Cyclohexane		< 0.30	< 0.30	< 0.30	**1.6 J**	< 0.30
Dichlorodifluoromethane		**2.5 J**	< 0.33	< 0.33	< 0.33	< 0.33
Ethanol		**23.2**	**24.9**	**87.1**	**45.2**	**44.1**
Ethyl acetate		**2.4 J**	**2.6 J**	**12**	**55.1**	**3.5**
Ethylbenzene		< 0.26	< 0.26	**1.7 J**	< 0.26	**2.0 J**
Heptane		**3.6**	< 0.29	< 0.29	< 0.29	**3.8**
Hexane		< 0.15	**1.5 J**	< 0.15	**1.7 J**	< 0.15
Isopropyl alcohol*		**13**	**13**	**14**	**11**	**71.8**
m,p-Xylene		**5.6**	< 0.61	**5.2**	**6.1**	**6.1**
m-Dichlorobenzene		**3.3 J**	< 0.46	< 0.46	**5.5**	**3.2 J**
Methyl ethyl ketone		**8.6**	**1.4 J**	**2.2 J**	**5.9**	**2.8**
Methyl isobutyl ketone		< 0.57	< 0.57	**1.9 J**	< 0.57	< 0.57
Methylene chloride*		< 0.20	**3.1**	< 0.20	**3.2**	< 0.20
o-Xylene		**2.8 J**	< 0.30	**2.6 J**	**2.5 J**	**3.0 J**
Propylene*		< 0.11	< 0.11	< 0.11	< 0.11	< 0.11
Styrene		**4.7**	< 0.32	< 0.32	< 0.32	< 0.32
Tertiary butyl alcohol		< 0.17	**6.1**	**6.7**	**7.0**	**12**
Tetrachloroethylene		< 0.81	< 0.81	< 0.81	< 0.81	< 0.81
Tetrahydrofuran		< 0.59	< 0.59	< 0.59	< 0.59	< 0.59
Toluene		**24**	**6.0**	**2.2 J**	**18**	**5.7**
trans-1,2-Dichloroethylene		< 0.11	< 0.11	**1.6 J**	< 0.11	< 0.11
Trichloroethylene		**1.7**	< 0.41	< 0.41	< 0.41	< 0.41
Trichlorofluoromethane		< 0.62	< 0.62	< 0.62	< 0.62	< 0.62
Vinyl acetate		< 0.49	< 0.49	< 0.49	< 0.49	< 0.49
Vinyl chloride*		**9.7**	< 0.23	< 0.23	< 0.23	< 0.23
Xylenes (total)		**8.3**	< 0.30	**7.4**	**8.7**	**9.1**
TVOCs		**146**	**109**	**163**	**333**	**196**

Footnotes:

ug/mg^3 micrograms per cubic meter

* Compound is poorly adsorbed by activated carbon.

< Compound was not detected at or above the indicated value.

J Detected concentration is less than the quantitation limit.

TVOCs Total volatile organic compounds

Detections are **bolded**.

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Table 1. Vapor Treatment System Air Sampling Results
System Startup - August 2020

Compound (ug/m^3)	Sample ID:	VGAC-1	VGAC-2	VGAC-3	KMNO4-4	KMNO4-5
	Lab Sample ID:	JD12431-1	JD12431-2	JD12431-3	JD12431-4	JD12431-5
	Date Sampled:	8/28/2020	8/28/2020	8/28/2020	8/28/2020	8/28/2020
1,1,1-Trichloroethane		< 0.71	< 0.71	< 0.71	< 0.71	< 0.71
1,1-Dichloroethane		< 0.19	< 0.19	< 0.19	< 0.19	< 0.19
1,1-Dichloroethylene		< 0.27	< 0.27	< 0.27	< 0.27	< 0.27
1,2,4-Trimethylbenzene		< 0.64	**10**	< 0.64	< 0.64	< 0.64
1,3,5-Trimethylbenzene		< 0.64	< 0.64	< 0.64	< 0.64	< 0.64
1,4-Dioxane*		< 0.76	< 0.76	< 0.76	< 0.76	< 0.76
2,2,4-Trimethylpentane		< 0.41	< 0.41	< 0.41	< 0.41	< 0.41
2-Hexanone		< 0.61	< 0.61	< 0.61	< 0.61	**2.5 J**
4-Ethyltoluene		< 0.59	< 0.59	< 0.59	< 0.59	< 0.59
Acetone*		**17**	**23**	**11**	**8.8**	**32.3**
Benzene		**1.7 J**	< 0.15	< 0.15	**1.2 J**	< 0.15
Bromoform		< 1.6	< 1.6	< 1.6	< 1.6	< 1.6
Carbon disulfide		**1.8 J**	< 0.29	< 0.29	< 0.29	< 0.29
Carbon tetrachloride		< 0.59	< 0.59	< 0.59	< 0.59	< 0.59
Chloroethane		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Chloroform		< 0.39	< 0.39	< 0.39	< 0.39	< 0.39
Chloromethane*		< 0.13	< 0.13	< 0.13	**1.0 J**	**1.3 J**
cis-1,2-Dichloroethylene		**2.3 J**	< 0.19	< 0.19	< 0.19	< 0.19
Cyclohexane		< 0.30	< 0.30	< 0.30	< 0.30	< 0.30
Dichlorodifluoromethane		**2.1 J**	< 0.33	< 0.33	< 0.33	< 0.33
Ethanol		**7.3**	**32.2**	**104**	**19.6**	**15**
Ethyl acetate		**4.0**	**62.3**	**20**	**66.9**	**4.0**
Ethylbenzene		< 0.26	**1.9 J**	< 0.26	< 0.26	< 0.26
Heptane		< 0.29	< 0.29	< 0.29	< 0.29	< 0.29
Hexane		< 0.15	**2.0 J**	< 0.15	< 0.15	< 0.15
Isopropyl alcohol*		**5.9**	**62.4**	**5.4**	**2.3**	**71.0**
m,p-Xylene		**6.5**	**6.5**	< 0.61	**3.9**	**6.5**
m-Dichlorobenzene		**5.7**	**17**	< 0.46	**5.1**	**16**
Methyl ethyl ketone		**13**	**2.8**	< 0.50	< 0.50	**7.7**
Methyl isobutyl ketone		< 0.57	**4.5**	< 0.57	**3.6**	**3.0 J**
Methylene chloride*		< 0.20	**6.6**	**3.8**	< 0.20	**3.8**
o-Xylene		**2.3 J**	**3.2 J**	< 0.30	**2.0 J**	**2.4 J**
Propylene*		< 0.11	**16**	**1.4 J**	**2.1 J**	**2.4 J**
Styrene		**72.0**	**2.0 J**	< 0.32	< 0.32	< 0.32
Tertiary butyl alcohol		**2.8**	**19**	< 0.17	**1.6 J**	**3.9**
Tetrachloroethylene		< 0.81	< 0.81	< 0.81	< 0.81	< 0.81
Tetrahydrofuran		< 0.59	< 0.59	< 0.59	< 0.59	< 0.59
Toluene		**38.8**	**5.3**	< 0.22	**1.5 J**	< 0.22
trans-1,2-Dichloroethylene		< 0.11	< 0.11	< 0.11	< 0.11	< 0.11
Trichloroethylene		**3.3**	< 0.41	< 0.41	< 0.41	< 0.41
Trichlorofluoromethane		< 0.62	< 0.62	< 0.62	< 0.62	< 0.62
Vinyl acetate		< 0.49	< 0.49	< 0.49	< 0.49	< 0.49
Vinyl chloride*		**11**	< 0.23	< 0.23	< 0.23	< 0.23
Xylenes (total)		**8.7**	**9.7**	< 0.30	**5.6**	**8.9**
TVOCs		**197**	**277**	**146**	**119**	**172**

Footnotes:

ug/mg^3 micrograms per cubic meter

* Compound is poorly adsorbed by activated carbon.

< Compound was not detected at or above the indicated value.

J Detected concentration is less than the quantitation limit.

TVOCs Total volatile organic compounds

Detections are **bolded**.

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Table 2. Vapor Treatment System Air Sampling Results
Routine Monitoring - September 2020

Compound (ug/m^3)	Sample ID: / Lab Sample ID: / Date Sampled:	VGAC-1 JD12529-1 9/1/2020	VGAC-3 JD12529-2 9/1/2020	KMN04-5 JD12529-3 9/1/2020	Percent Removed
1,1,1-Trichloroethane		< 0.71	< 0.71	< 0.71	
1,1-Dichloroethane		< 0.19	< 0.19	< 0.19	
1,1-Dichloroethylene		< 0.27	< 0.27	< 0.27	
1,2,4-Trimethylbenzene		< 0.64	< 0.64	< 0.64	
1,3,5-Trimethylbenzene		< 0.64	< 0.64	< 0.64	
1,4-Dioxane*		< 0.76	< 0.76	< 0.76	
2,2,4-Trimethylpentane		< 0.41	< 0.41	< 0.41	
2-Hexanone		< 0.61	**2.7** J	< 0.61	
4-Ethyltoluene		< 0.59	< 0.59	< 0.59	
Acetone*		**48.7**	**19**	**11**	
Benzene		**65.5**	< 0.15	< 0.15	
Bromoform		< 1.6	< 1.6	< 1.6	
Carbon disulfide		**3.7**	< 0.29	< 0.29	
Carbon tetrachloride		< 0.59	**2.4** J	< 0.59	
Chloroethane		< 0.50	< 0.50	< 0.50	
Chloroform		< 0.39	**2.0** J	< 0.39	
Chloromethane*		**2.3**	**3.3**	**2.5**	
cis-1,2-Dichloroethylene		**58.7**	< 0.19	< 0.19	
Cyclohexane		< 0.30	< 0.30	< 0.30	
Dichlorodifluoromethane		**2.2** J	**1.6** J	< 0.33	
Ethanol		**27.1**	**22.0**	**33.5**	
Ethyl acetate		**12**	**19**	**38.9**	
Ethylbenzene		**10**	< 0.26	< 0.26	
Heptane		**11**	< 0.29	< 0.29	
Hexane		**8.5**	< 0.15	< 0.15	
Isopropyl alcohol*		**4.9**	**18**	**29.7**	
m,p-Xylene		**25**	**3.0** J	**3.1** J	
m-Dichlorobenzene		**7.2**	**5.0**	**4.5** J	
Methyl ethyl ketone		**12**	**2.7**	< 0.50	
Methyl isobutyl ketone		< 0.57	**3.2** J	< 0.57	
Methylene chloride*		< 0.20	< 0.20	< 0.20	
o-Xylene		**7.8**	< 0.30	< 0.30	
Propylene*		**164**	**22.2**	< 0.11	
Styrene		**33**	< 0.32	< 0.32	
Tertiary butyl alcohol		< 0.17	**3.0**	**1.3** J	
Tetrachloroethylene		**1.8**	**2.0**	< 0.81	
Tetrahydrofuran		< 0.59	< 0.59	< 0.59	
Toluene		**314**	**1.6** J	< 0.22	
trans-1,2-Dichloroethylene		< 0.11	< 0.11	< 0.11	
Trichloroethylene		**83.3**	**0.81** J	< 0.41	100%
Trichlorofluoromethane		< 0.62	< 0.62	< 0.62	
Vinyl acetate		< 0.49	< 0.49	< 0.49	
Vinyl chloride*		**38.3**	< 0.23	< 0.23	100%
Xylenes (total)		**32**	**3.0** J	**3.1** J	
TVOCs		**940**	**134**	**125**	

Footnotes:

ug/mg^3 micrograms per cubic meter

* Compound is poorly adsorbed by activated carbon.

< Compound was not detected at or above the indicated value.

J Detected concentration is less than the quantitation limit.

TVOCs Total volatile organic compounds

Detections are **bolded**.

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Table 2. Vapor Treatment System Air Sampling Results
Routine Monitoring - September 2020

Compound (ug/m^3)	Sample ID:	VGAC-1		VGAC-3		KMN04-5		Percent Removed
	Lab Sample ID:	JD12808-1		JD12808-2		JD12808-3		
	Date Sampled:	9/8/2020		9/8/2020		9/8/2020		
1,1,1-Trichloroethane		< 1.8		< 0.71		< 0.71		
1,1-Dichloroethane		< 0.49		< 0.19		< 0.19		
1,1-Dichloroethylene		**12**		< 0.27		< 0.27		
1,2,4-Trimethylbenzene		**8.4**	J	< 0.64		**0.69**	J	
1,3,5-Trimethylbenzene		< 1.7		< 0.64		< 0.64		
1,4-Dioxane*		< 1.9		< 0.76		< 0.76		
2,2,4-Trimethylpentane		**6.1**	J	< 0.41		< 0.41		
2-Hexanone		< 1.5		< 0.61		< 0.61		
4-Ethyltoluene		< 1.5		< 0.59		< 0.59		
Acetone*		**97.2**		**15**		**13**		
Benzene		**227**		< 0.15		< 0.15		
Bromoform		< 3.8		< 1.6		< 1.6		
Carbon disulfide		**21**		< 0.29		< 0.29		
Carbon tetrachloride		< 1.5		< 0.59		< 0.59		
Chloroethane		< 1.3		< 0.50		< 0.50		
Chloroform		< 0.98		< 0.39		< 0.39		
Chloromethane*		**7.6**		**18**		**13**		
cis-1,2-Dichloroethylene		**460**		< 0.19		< 0.19		
Cyclohexane		**4.5**	J	< 0.30		< 0.30		
Dichlorodifluoromethane		< 0.84		**3.1**	J	< 0.33		
Ethanol		**17**		**36.6**		**6.0**		
Ethyl acetate		**12**		**14**		**8.3**		
Ethylbenzene		**29**		**13**		< 0.26		
Heptane		**41**		< 0.29		< 0.29		
Hexane		**39.8**		< 0.15		< 0.15		
Isopropyl alcohol*		**5.9**		**37.4**		**39.6**		
m,p-Xylene		**89.0**		**37**		**2.0**	J	
m-Dichlorobenzene		**6.0**	J	< 0.46		**4.8**		
Methyl ethyl ketone		**36.3**		< 0.50		**1.8**	J	
Methyl isobutyl ketone		< 1.5		< 0.57		< 0.57		
Methylene chloride*		< 0.52		**14**		**4.5**		
o-Xylene		**33**		**10**		< 0.30		
Propylene*		**558**		**253**		< 0.11		
Styrene		**57.1**		< 0.32		< 0.32		
Tertiary butyl alcohol		< 0.42		< 0.17		**1.3**	J	
Tetrachloroethylene		**9.5**		< 0.81		< 0.81		
Tetrahydrofuran		< 1.5		< 0.59		< 0.59		
Toluene		**588**		< 0.22		< 0.22		
trans-1,2-Dichloroethylene		**11**		< 0.11		< 0.11		
Trichloroethylene		**704**		< 0.41		< 0.41		100%
Trichlorofluoromethane		< 1.6		< 0.62		< 0.62		
Vinyl acetate		< 1.2		< 0.49		< 0.49		
Vinyl chloride*		**109**		**13**		< 0.23		100%
Xylenes (total)		**122**		**47.3**		**2.0**	J	
TVOCs		**3,189**		**464**		**95**		

Footnotes:

ug/mg^3 micrograms per cubic meter

* Compound is poorly adsorbed by activated carbon.

< Compound was not detected at or above the indicated value.

J Detected concentration is less than the quantitation limit.

TVOCs Total volatile organic compounds

Detections are **bolded**.

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Table 2. Vapor Treatment System Air Sampling Results
Routine Monitoring - September 2020

Compound (ug/m^3)	Sample ID:	VGAC-1		VGAC-3		KMN04-5		Percent Removed
	Lab Sample ID:	JD13141-1		JD13141-2		JD13141-3		
	Date Sampled:	9/15/2020		9/15/2020		9/15/2020		
1,1,1-Trichloroethane		**7.1**	J	< 0.71		< 0.71		
1,1-Dichloroethane		**8.5**		< 0.19		< 0.19		
1,1-Dichloroethylene		**26**		< 0.27		< 0.27		
1,2,4-Trimethylbenzene		< 1.6		**7.9**		< 0.64		
1,3,5-Trimethylbenzene		< 1.7		**2.3**	J	< 0.64		
1,4-Dioxane*		**6.1**	J	< 0.76		< 0.76		
2,2,4-Trimethylpentane		**21**		**6.1**		< 0.41		
2-Hexanone		**7.0**	J	**2.2**	J	< 0.61		
4-Ethyltoluene		< 1.5		**4.0**		< 0.59		
Acetone*		**222**		**23**		**15**		
Benzene		**185**		< 0.15		< 0.15		
Bromoform		< 3.8		**69**		< 1.6		
Carbon disulfide		**24**		< 0.29		< 0.29		
Carbon tetrachloride		< 1.5		< 0.59		< 0.59		
Chloroethane		< 1.3		< 0.50		< 0.50		
Chloroform		< 0.98		< 0.39		< 0.39		
Chloromethane*		**3.5**	J	**4.1**		**4.5**		
cis-1,2-Dichloroethylene		**753**		< 0.19		< 0.19		
Cyclohexane		**9.3**		< 0.30		< 0.30		
Dichlorodifluoromethane		< 0.84		**2.2**	J	**2.2**	J	
Ethanol		**30.5**		**22.6**		**23.0**		
Ethyl acetate		**13**		**12**		**12**		
Ethylbenzene		**43**		**3.9**		< 0.26		
Heptane		**81.1**		**3.3**		< 0.29		
Hexane		**57.8**		**1.7**	J	< 0.15		
Isopropyl alcohol*		**5.4**		**4.2**		**16**		
m,p-Xylene		**96.0**		**17**		**2.9**	J	
m-Dichlorobenzene		< 1.1		< 0.46		< 0.46		
Methyl ethyl ketone		**59.6**		**4.7**		**1.7**	J	
Methyl isobutyl ketone		< 1.5		< 0.57		< 0.57		
Methylene chloride*		< 0.52		**5.2**		**1.5**	J	
o-Xylene		**30**		**11**		< 0.30		
Propylene*		**337**		**340**		< 0.11		
Styrene		**4.1**	J	< 0.32		< 0.32		
Tertiary butyl alcohol		< 0.42		**3.9**		**2.4**	J	
Tetrachloroethylene		**8.1**		< 0.81		**3.5**		
Tetrahydrofuran		< 1.5		**1.4**	J	< 0.59		
Toluene		**1,210**		**11**		**3.1**		
trans-1,2-Dichloroethylene		**15**		< 0.11		< 0.11		
Trichloroethylene		**2,060**		< 0.41		< 0.41		100%
Trichlorofluoromethane		< 1.6		< 0.62		< 0.62		
Vinyl acetate		< 1.2		**2.1**	J	< 0.49		
Vinyl chloride*		**274**		**54.2**		< 0.23		100%
Xylenes (total)		**126**		**29**		**2.9**	J	
TVOCs		**5,600**		**620**		**88**		

Footnotes:

ug/mg^3 micrograms per cubic meter

* Compound is poorly adsorbed by activated carbon.

< Compound was not detected at or above the indicated value.

J Detected concentration is less than the quantitation limit.

TVOCs Total volatile organic compounds

Detections are **bolded**.

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Table 2. Vapor Treatment System Air Sampling Results
Routine Monitoring - September 2020

Compound (ug/m^3)	Sample ID: / Lab Sample ID: / Date Sampled:	VGAC-1 JD13486-1 9/22/2020		VGAC-3 JD13486-2 9/22/2020		KMNO4-5 JD13486-3 9/22/2020		Percent Removed
1,1,1-Trichloroethane		**20**	J	< 1.8		< 0.71		
1,1-Dichloroethane		**24**		< 0.49		< 0.19		
1,1-Dichloroethylene		**59.1**		< 0.67		< 0.27		
1,2,4-Trimethylbenzene		< 3.2		< 1.6		< 0.64		
1,3,5-Trimethylbenzene		< 3.3		< 1.7		< 0.64		
1,4-Dioxane*		< 3.6		< 1.9		< 0.76		
2,2,4-Trimethylpentane		**89.7**		< 1.0		< 0.41		
2-Hexanone		< 3.0		< 1.5		< 0.61		
4-Ethyltoluene		< 2.9		< 1.5		< 0.59		
Acetone*		**482**		**14**		**9.5**		
Benzene		**156**		< 0.38		< 0.15		
Bromoform		**385**		< 3.8		< 1.6		
Carbon disulfide		**45.5**		< 0.75		< 0.29		
Carbon tetrachloride		< 3.0		< 1.5		< 0.59		
Chloroethane		< 2.6		< 1.3		< 0.50		
Chloroform		< 2.0		< 0.98		< 0.39		
Chloromethane*		**4.7**	J	**5.6**		**5.8**		
cis-1,2-Dichloroethylene		**2310**		< 0.48		< 0.19		
Cyclohexane		**25**		< 0.76		< 0.30		
Dichlorodifluoromethane		< 1.6		< 0.84		**2.1**	J	
Ethanol		**71.8**		**13**		**11**		
Ethyl acetate		< 2.7		**16**		**24**		
Ethylbenzene		**46.0**		< 0.65		< 0.26		
Heptane		**211**		< 0.74		< 0.29		
Hexane		**57.1**		< 0.39		< 0.15		
Isopropyl alcohol*		**39.6**		< 1.6		**9.1**		
m,p-Xylene		**89.5**		< 1.5		**2.1**	J	
m-Dichlorobenzene		< 2.3		< 1.1		< 0.46		
Methyl ethyl ketone		**125**		< 1.2		< 0.50		
Methyl isobutyl ketone		< 3.0		< 1.5		< 0.57		
Methylene chloride*		< 1.0		< 0.52		< 0.20		
o-Xylene		**28**		< 0.74		< 0.30		
Propylene*		**234**		**400**		< 0.11		
Styrene		< 1.6		< 0.81		< 0.32		
Tertiary butyl alcohol		< 0.85		< 0.42		**1.8**	J	
Tetrachloroethylene		**8.8**		< 2.1		< 0.81		
Tetrahydrofuran		< 2.9		< 1.5		< 0.59		
Toluene		**1,790**		< 0.53		< 0.22		
trans-1,2-Dichloroethylene		**25**		< 0.29		< 0.11		
Trichloroethylene		**2,550**		< 1.0		< 0.41		100%
Trichlorofluoromethane		< 3.1		< 1.6		< 0.62		
Vinyl acetate		< 2.4		< 1.2		< 0.49		
Vinyl chloride*		**539**		**221**		**5.4**		99%
Xylenes (total)		**117**		< 0.74		**2.1**	J	
TVOCs		**9,420**		**670**		**71**		

Footnotes:

ug/mg^3 micrograms per cubic meter

* Compound is poorly adsorbed by activated carbon.

< Compound was not detected at or above the indicated value.

J Detected concentration is less than the quantitation limit.

TVOCs Total volatile organic compounds

Detections are **bolded**.

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Table 2. Vapor Treatment System Air Sampling Results
Routine Monitoring - September 2020

Compound (ug/m^3)	Sample ID: / Lab Sample ID: / Date Sampled:	VGAC-1 JD13848-1 9/29/2020	VGAC-3 JD13848-2 9/29/2020	KMNO4-5 JD13848-3 9/29/2020	Percent Removed
1,1,1-Trichloroethane		**35** J	< 1.5	< 0.71	
1,1-Dichloroethane		**26** J	< 0.38	< 0.19	
1,1-Dichloroethylene		**101**	< 0.52	< 0.27	
1,2,4-Trimethylbenzene		< 6.4	< 1.3	**22**	
1,3,5-Trimethylbenzene		< 6.4	< 1.3	**4.1**	
1,4-Dioxane*		< 7.6	< 1.5	< 0.76	
2,2,4-Trimethylpentane		**134**	< 0.79	**2.7** J	
2-Hexanone		< 6.1	< 1.2	< 0.61	
4-Ethyltoluene		< 5.9	< 1.2	**7.4**	
Acetone*		**615**	**18**	**21**	
Benzene		**110**	< 0.30	< 0.15	
Bromoform		< 16	< 3.1	< 1.6	
Carbon disulfide		**41.4**	< 0.59	< 0.29	
Carbon tetrachloride		< 5.9	< 1.2	< 0.59	
Chloroethane		< 5.0	< 1.0	< 0.50	
Chloroform		< 3.9	< 0.78	< 0.39	
Chloromethane*		< 1.3	**4.7**	**5.6**	
cis-1,2-Dichloroethylene		**2,670**	< 0.37	< 0.19	
Cyclohexane		**36.5**	< 0.62	< 0.30	
Dichlorodifluoromethane		< 3.3	< 0.64	**2.4** J	
Ethanol		**38.1**	**22.8**	**15**	
Ethyl acetate		< 5.4	**4.0** J	**4.0**	
Ethylbenzene		**133**	< 0.52	**3.2** J	
Heptane		**330**	< 0.57	< 0.29	
Hexane		**42.6**	< 0.30	< 0.15	
Isopropyl alcohol*		< 6.4	< 1.3	**8.8**	
m,p-Xylene		**271**	< 1.2	**10**	
m-Dichlorobenzene		< 4.6	< 0.90	< 0.46	
Methyl ethyl ketone		**163**	< 1.0	**2.5**	
Methyl isobutyl ketone		< 5.7	< 1.2	**1.6** J	
Methylene chloride*		< 2.0	< 0.42	< 0.20	
o-Xylene		**74.7**	< 0.61	**4.0**	
Propylene*		**164**	**158**	< 0.11	
Styrene		< 3.2	< 0.64	< 0.32	
Tertiary butyl alcohol		< 1.7	< 0.33	**2.5**	
Tetrachloroethylene		**12**	< 1.7	**2.0**	
Tetrahydrofuran		< 5.9	< 1.2	< 0.59	
Toluene		**3,440**	< 0.45	**2.4** J	
trans-1,2-Dichloroethylene		**37**	< 0.23	< 0.11	
Trichloroethylene		**5,700**	< 0.81	< 0.41	100%
Trichlorofluoromethane		< 6.2	< 1.2	< 0.62	
Vinyl acetate		< 4.9	< 0.95	< 0.49	
Vinyl chloride*		**542**	**422**	**14**	97%
Xylenes (total)		**345**	< 0.61	**14**	
TVOCs		**14,720**	**630**	**135**	

Footnotes:

ug/mg^3 micrograms per cubic meter

* Compound is poorly adsorbed by activated carbon.

< Compound was not detected at or above the indicated value.

J Detected concentration is less than the quantitation limit.

TVOCs Total volatile organic compounds

Detections are **bolded**.

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Table 3. Liquid Treatment System Sampling Results

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Analyte	Sample ID:	LGAC-INF-20200922		LGAC-EFF-20200922	FRAC1-A2949-20200922
	Lab Sample ID:	JD13479-1		JD13479-2	JD13479-3 / 3R
	Date Sampled:	9/22/2020		9/22/2020	9/22/2020
Volatile Organic Compounds (ug/L, detections only):					
1,1-Dichloroethane		**5.2**		-	< 0.57
Acetone*		**92.4**		-	< 6
Benzene		**2.2**	J	-	< 0.43
cis-1,2-Dichloroethene		**779**		-	< 0.51
o-Xylene		**3.6**	J	-	< 0.59
Toluene		**76.6**		-	< 0.53
Trichloroethene		**110**		-	< 0.53
Vinyl chloride*		**45**		-	< 0.79
Xylene (total)		**3.6**	J	-	< 0.59
TVOCs		**1,110**		-	0
Semivolatile Organic Compounds (ug/L, detections only):					
1,4-Dioxane		**1.3**		-	< 0.66
2,4-Dimethylphenol		**3.7**	J	-	< 2.4
2-Methylnaphthalene		**0.34**	J	-	< 0.21
2-Methylphenol		**2.8**		-	< 0.89
3&4-Methylphenol		**3.4**		-	< 0.88
Acenaphthene		**0.21**	J	-	< 0.19
Acetophenone		**1.3**	J	-	< 0.21
Anthracene		**0.51**	J	-	< 0.21
bis(2-Chloroethyl)ether		**0.28**	J	-	< 0.25
Caprolactam		**1.6**	J	-	< 0.65
Dibenzofuran		**0.40**	J	-	< 0.22
Fluoranthene		**2.5**		-	< 0.17
Fluorene		**0.26**	J	-	< 0.17
Naphthalene		**0.42**	J	-	< 0.23
Phenanthrene		**7.3**		-	< 0.18
Phenol		**0.42**	J	-	< 0.39
Pyrene		**1.9**		-	< 0.22
Semivolatile Organic Compounds (SIM) (ug/L):					
1,4-Dioxane		**2.09**		-	< 0.050
Polynuclear Aromatic Hydrocarbons (ug/L):					
Aroclor 1016		< 0.10		-	< 0.098
Aroclor 1221		< 0.21		-	< 0.21
Aroclor 1232		< 0.13		-	< 0.13
Aroclor 1242		< 0.12		-	< 0.11
Aroclor 1248		< 0.064		-	< 0.063
Aroclor 1254		< 0.21		-	< 0.21
Aroclor 1260		< 0.078		-	< 0.076
Aroclor 1262		< 0.098		-	< 0.097
Aroclor 1268		< 0.088		-	< 0.087
Metals (mg/L):					
Cadmium		< 3.0		-	< 3.0
Chromium		< 10		-	< 10
Iron (Method 6010)		**30,300**		-	**759**
Iron (Method 200.7)		**-**		**397**	**801**
Manganese (Method 6010)		**905**		-	**176**
Manganese (Method 200.7)		**-**		-	**187**
General Chemistry (mg/L):					
Nitrogen, Nitrate		**0.33**		-	< 0.11
Nitrogen, Nitrate + Nitrite		**0.35**		-	**0.14**
Nitrogen, Nitrite		**0.021**		-	**0.066**
Nitrogen, Total Kjeldahl		**1.3**		-	**0.31**

Footnotes:

ug/L	micrograms per liter
mg/L	milligrams per liter
*	Poorly adsorbed on activated carbon.
<	Analyte was not detected at or above the indicated value.
J	Detected concentration is less than the laboratory quantitation limit.
TVOCs	Total volatile organic compounds

Detections are **bolded**.

Table 4: Ambient Air Laboratory Results (2020-08-21 through 2020-08-27)

Analyte	Target Screening Level (µg/m³)[1,3]	95% of Concentration Distribution NYSDOH Background Air (µg/m³)[2]	Ambient Air Concentration (µg/m³)				
			Sample Location				
			AMP-01	AMP-02	AMP-03	AMP-04*	AMP-01-DUP
Site-specific Compounds of Interest[1]							
1,1,1-Trichloroethane	520	0.7	< 0.20	< 0.19	< 0.18	< 0.17	< 0.20
1,1-Dichloroethane	45	< 0.25	< 0.14	< 0.14	< 0.13	< 0.12	< 0.14
1,1-Dichloroethene	8	<0.25	< 0.071	< 0.068	< 0.064	< 0.061	< 0.071
1,2-Dichloroethane	3	< 0.25	< 0.14	< 0.14	< 0.13	< 0.12	< 0.14
Benzene	8	5.8	**0.28 J**	**0.31**	**0.30**	**0.31**	**0.29**
Ethyl-benzene	29	1.9	< 0.16	< 0.15	< 0.14	< 0.13	< 0.16
m,p-Xylene	10	3.1	**0.43**	**0.36**	**0.34**	**0.33**	**0.42**
o-Xylene	10	2.3	**0.17**	**0.15**	**0.14**	**0.14**	**0.16**
Tetrachloroethene	30	1.6	< 0.24	< 0.23	< 0.22	< 0.21	< 0.24
Toluene	521	21	**0.75**	**0.68**	**0.66**	**0.69**	**0.78**
trans-1,2-Dichloroethene	82	NA2	< 0.71	< 0.68	< 0.64	< 0.61	< 0.71
Trichloroethene	2	0.5	< 0.19	< 0.18	< 0.17	< 0.17	< 0.19
Vinyl Chloride	8	< 0.25	< 0.046	< 0.044	< 0.041	< 0.040	< 0.046
Other Compounds[3]							
1,1,2,2-Tetrachloroethane	1.3	< 0.25	< 0.24	< 0.23	< 0.22	< 0.21	< 0.24
1,1,2-Trichloroethane	0.21	< 0.25	< 0.20	< 0.19	< 0.18	< 0.17	< 0.20
1,2-Dibromoethane (EDB)	0.12	< 0.25	< 0.28	< 0.26	< 0.25	< 0.24	< 0.28
1,4-Dichlorobenzene	7	0.8	< 0.22	< 0.20	< 0.19	< 0.19	< 0.22
Carbon Tetrachloride	12	1	**0.45**	**0.45**	**0.43**	**0.46**	**0.47**
Chloroethane	NA1	0.4	< 0.24	< 0.22	< 0.21	< 0.20	< 0.24
Chloroform	3	0.5	< 0.17	< 0.17	**0.16**	< 0.15	< 0.17
Chloromethane	310	4.6	< 1.8	< 1.8	< 1.7	< 1.6	< 1.8
cis-1,2-Dichloroethene	NA1	< 0.25	< 0.14	< 0.14	< 0.13	< 0.12	< 0.14
Freon 114	NA1	1.3	< 0.25	< 0.24	< 0.22	< 0.22	< 0.25
Freon 12	100	11	**2.2**	**2.2**	**2.1**	**2.2**	**2.2**
Methyl tert-butyl ether	260	NA2	< 0.64	< 0.62	< 0.58	< 0.56	< 0.64

Notes: µg/m³ - micrograms per cubic meter

< - indicates not detected at or above the indicated value

J - indicates sample result is estimated

*- sample collected over a 3-day period because of low vacuum

Bold - indicates detections

NA1 - no criteria given in the EPA RSL Calculator

NA2 - NYSDOH did not include this compound in the guidance document[2]

[1] Target Screening Levels for site-specific compounds of interest provided in Bethpage Ambient Air Monitoring Plan and are based on a one-year exposure duration (B&B Engineers & Geologists of New York, P.C., May 2020)

[2] NYSDOH Outdoor Air Background Values from Appendix C (Table C1) of Guidance for Evaluating Soil Vapor Intrusion in the State of New York (2006)

[3] Target Screening Levels for other compounds calculated using the EPA RSL calculator with the same inputs as described in the Bethpage Ambient Air Monitoring Plan

Table 4: Ambient Air Laboratory Results (2020-08-27 through 2020-09-02)

Analyte	Target Screening Level (µg/m³)[1,3]	95% of Concentration Distribution NYSDOH Background Air (µg/m³)[2]	Ambient Air Concentration (µg/m³)				
			Sample Location				
			AMP-01	AMP-02	AMP-03	AMP-04	AMP-04-DUP
Site-specific Compounds of Interest[1]							
1,1,1-Trichloroethane	520	0.7	< 0.18	< 0.18	< 0.17	< 0.18	< 0.18
1,1-Dichloroethane	45	< 0.25	< 0.13	< 0.14	< 0.13	< 0.13	< 0.13
1,1-Dichloroethene	8	<0.25	< 0.065	< 0.067	< 0.063	< 0.065	< 0.065
1,2-Dichloroethane	3	< 0.25	< 0.13	< 0.14	< 0.13	< 0.13	< 0.13
Benzene	8	5.8	< 0.26	< 0.27	**0.28**	**0.28**	< 0.26
Ethyl-benzene	29	1.9	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14
m,p-Xylene	10	3.1	< 0.29	< 0.29	< 0.27	< 0.28	< 0.28
o-Xylene	10	2.3	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14
Tetrachloroethene	30	1.6	< 0.22	< 0.23	< 0.21	< 0.22	< 0.22
Toluene	521	21	**0.78**	**0.57**	**0.56**	**0.58**	**0.62**
trans-1,2-Dichloroethene	82	NA2	< 0.65	< 0.67	< 0.63	< 0.65	< 0.65
Trichloroethene	2	0.5	< 0.18	< 0.18	< 0.17	**0.20**	< 0.18
Vinyl Chloride	8	< 0.25	< 0.042	< 0.043	< 0.040	< 0.042	< 0.042
Other Compounds[3]							
1,1,2,2-Tetrachloroethane	1.3	< 0.25	< 0.23	< 0.23	< 0.22	< 0.22	< 0.22
1,1,2-Trichloroethane	0.21	< 0.25	< 0.18	< 0.18	< 0.17	< 0.18	< 0.18
1,2-Dibromoethane (EDB)	0.12	< 0.25	< 0.25	< 0.26	< 0.24	< 0.25	< 0.25
1,4-Dichlorobenzene	7	0.8	**0.24**	< 0.20	< 0.19	< 0.20	< 0.20
Carbon Tetrachloride	12	1	**0.49**	**0.49**	**0.50**	**0.51**	**0.45**
Chloroethane	NA1	0.4	< 0.22	< 0.22	< 0.21	< 0.22	< 0.22
Chloroform	3	0.5	**0.16**	**0.16**	< 0.15	**0.16**	< 0.16
Chloromethane	310	4.6	< 1.7	< 1.7	< 1.6	< 1.7	< 1.7
cis-1,2-Dichloroethene	NA1	< 0.25	< 0.13	< 0.13	< 0.12	< 0.13	< 0.13
Freon 114	NA1	1.3	< 0.23	< 0.23	< 0.22	< 0.23	< 0.23
Freon 12	100	11	**2.9**	**2.9**	**3.0**	**2.9**	**2.2**
Methyl tert-butyl ether	260	NA2	< 0.59	< 0.60	< 0.57	< 0.59	< 0.59

Notes:

µg/m³ - micrograms per cubic meter

Bold - indicates detections

< - indicates not detected at or above the indicated value

NA1 - no criteria given in the EPA RSL Calculator

J - indicates sample result is estimated

NA2 - NYSDOH did not include this compound in the guidance document[2]

[1] Target Screening Levels for site-specific compounds of interest provided in Bethpage Ambient Air Monitoring Plan and are based on a one-year exposure duration (B&B Engineers & Geologists of New York, P.C., May 2020)

[2] NYSDOH Outdoor Air Background Values from Appendix C (Table C1) of Guidance for Evaluating Soil Vapor Intrusion in the State of New York (2006)

[3] Target Screening Levels for other compounds calculated using the EPA RSL calculator with the same inputs as described in the Bethpage Ambient Air Monitoring Plan

Table 4: Ambient Air Laboratory Results (2020-09-02 through 2020-09-08)

Analyte	Target Screening Level (µg/m³)[1,3]	95% of Concentration Distribution NYSDOH Background Air (µg/m³)[2]	Ambient Air Concentration (µg/m³)				
			Sample Location				
			AMP-01	AMP-02	AMP-03	AMP-04	AMP-01-DUP
Site-specific Compounds of Interest[1]							
1,1,1-Trichloroethane	520	0.7	< 0.17	< 0.27	< 0.14 J	< 0.22	< 0.17
1,1-Dichloroethane	45	< 0.25	< 0.13	< 0.2	< 0.1 J	< 0.16	< 0.13
1,1-Dichloroethene	8	<0.25	< 0.063	< 0.1	< 0.052 J	< 0.079	< 0.063
1,2-Dichloroethane	3	< 0.25	< 0.13	< 0.2	< 0.1 J	< 0.16	< 0.13
Benzene	8	5.8	**0.3**	< 0.4	**0.34 J**	**0.32**	**0.3**
Ethyl-benzene	29	1.9	< 0.14	< 0.22	< 0.11 J	< 0.17	< 0.14
m,p-Xylene	10	3.1	< 0.28	< 0.44	< 0.22 J	< 0.35	**0.28**
o-Xylene	10	2.3	< 0.14	< 0.22	< 0.11 J	< 0.17	< 0.14
Tetrachloroethene	30	1.6	< 0.22	< 0.34	< 0.18 J	< 0.27	< 0.22
Toluene	521	21	**0.7**	**0.63**	**0.56 J**	**0.61**	**0.84**
trans-1,2-Dichloroethene	82	NA2	< 0.63	< 1	< 0.52 J	< 0.79	< 0.63
Trichloroethene	2	0.5	< 0.17	< 0.27	< 0.14 J	< 0.21	< 0.17
Vinyl Chloride	8	< 0.25	< 0.041	< 0.064	< 0.033 J	< 0.051	< 0.041
Other Compounds[3]							
1,1,2,2-Tetrachloroethane	1.3	< 0.25	< 0.22	< 0.34	< 0.18 J	< 0.27	< 0.22
1,1,2-Trichloroethane	0.21	< 0.25	< 0.17	< 0.27	< 0.14 J	< 0.22	< 0.17
1,2-Dibromoethane (EDB)	0.12	< 0.25	< 0.24	< 0.38	< 0.2 J	< 0.31	< 0.24
1,4-Dichlorobenzene	7	0.8	< 0.19	< 0.3	< 0.16 J	< 0.24	< 0.19
Carbon Tetrachloride	12	1	**0.5**	**0.47**	**0.5 J**	**0.48**	**0.48**
Chloroethane	NA1	0.4	< 0.21	< 0.33	< 0.17 J	< 0.26	< 0.21
Chloroform	3	0.5	**0.19**	< 0.24	**0.21 J**	**0.22**	**0.2**
Chloromethane	310	4.6	< 1.6	< 2.6	< 1.3 J	< 2.1	< 1.6
cis-1,2-Dichloroethene	NA1	< 0.25	< 0.13	< 0.2	< 0.1 J	< 0.16	< 0.13
Freon 114	NA1	1.3	< 0.22	< 0.35	< 0.18 J	< 0.28	< 0.22
Freon 12	100	11	**2.8**	**2.7**	**2.8 J**	**2.7**	**2.7**
Methyl tert-butyl ether	260	NA2	< 0.58	< 0.9	< 0.47 J	< 0.72	< 0.57

Notes:

µg/m³ - micrograms per cubic meter

Bold - indicates detections

< - indicates not detected at or above the indicated value

NA1 - no criteria given in the EPA RSL Calculator

J - indicates sample result is estimated

NA2 - NYSDOH did not include this compound in the guidance document[2]

[1] Target Screening Levels for site-specific compounds of interest provided in Bethpage Ambient Air Monitoring Plan and are based on a one-year exposure duration (B&B Engineers & Geologists of New York, P.C., May 2020)

[2] NYSDOH Outdoor Air Background Values from Appendix C (Table C1) of Guidance for Evaluating Soil Vapor Intrusion in the State of New York (2006)

[3] Target Screening Levels for other compounds calculated using the EPA RSL calculator with the same inputs as described in the Bethpage Ambient Air Monitoring Plan

Table 4: Ambient Air Laboratory Results (2020-09-08 through 2020-09-14)

Analyte	Target Screening Level (µg/m³)[1,3]	95% of Concentration Distribution NYSDOH Background Air (µg/m³)[2]	Ambient Air Concentration (µg/m³)				
			Sample Location				
			AMP-01	AMP-02	AMP-03	AMP-04	AMP-02-DUP
Site-specific Compounds of Interest[1]							
1,1,1-Trichloroethane	520	0.7	< 0.17	< 0.16	< 0.16	< 0.16	< 0.18
1,1-Dichloroethane	45	< 0.25	< 0.12	< 0.12	< 0.12	< 0.12	< 0.13
1,1-Dichloroethene	8	<0.25	< 0.061	< 0.060	< 0.058	< 0.059	< 0.064
1,2-Dichloroethane	3	< 0.25	< 0.12	< 0.12	< 0.12	< 0.12	< 0.13
Benzene	8	5.8	< 0.25	< 0.24	< 0.23	< 0.24	< 0.26
Ethyl-benzene	29	1.9	< 0.13	< 0.13	< 0.13	< 0.13	< 0.14
m,p-Xylene	10	3.1	**0.27**	< 0.26	< 0.26	< 0.26	< 0.28
o-Xylene	10	2.3	< 0.13	< 0.13	< 0.13	< 0.13	< 0.14
Tetrachloroethene	30	1.6	< 0.21	< 0.21	< 0.20	< 0.20	< 0.22
Toluene	521	21	**1.2**	**0.81**	**0.60**	**0.61**	**0.78**
trans-1,2-Dichloroethene	82	NA2	< 0.61	< 0.60	< 0.58	< 0.59	< 0.64
Trichloroethene	2	0.5	< 0.17	< 0.16	< 0.16	< 0.16	< 0.17
Vinyl Chloride	8	< 0.25	< 0.040	< 0.039	< 0.038	< 0.038	< 0.041
Other Compounds[3]							
1,1,2,2-Tetrachloroethane	1.3	< 0.25	< 0.21	< 0.21	< 0.20	< 0.20	< 0.22
1,1,2-Trichloroethane	0.21	< 0.25	< 0.17	< 0.16	< 0.16	< 0.16	< 0.18
1,2-Dibromoethane (EDB)	0.12	< 0.25	< 0.24	< 0.23	< 0.22	< 0.23	< 0.25
1,4-Dichlorobenzene	7	0.8	< 0.19 J	< 0.18 J	< 0.18 J	< 0.18 J	< 0.19 J
Carbon Tetrachloride	12	1	**0.42**	**0.42**	**0.65**	**0.42**	**0.43**
Chloroethane	NA1	0.4	< 0.20	< 0.20	< 0.19	< 0.20	< 0.21
Chloroform	3	0.5	< 0.15	< 0.15	**0.15**	**0.14**	< 0.16
Chloromethane	310	4.6	< 1.6 J	< 1.6 J	< 1.5 J	< 1.5 J	< 1.7 J
cis-1,2-Dichloroethene	NA1	< 0.25	< 0.12	< 0.12	< 0.12	< 0.12	< 0.13
Freon 114	NA1	1.3	< 0.22	< 0.21	< 0.20	< 0.21	< 0.22
Freon 12	100	11	**1.9**	**2.0**	**2.0**	**2.0**	**2.0**
Methyl tert-butyl ether	260	NA2	< 0.56	< 0.55	< 0.53	< 0.53	< 0.58

Notes:

µg/m³ - micrograms per cubic meter

Bold - indicates detections

< - indicates not detected at or above the indicated value

NA1 - no criteria given in the EPA RSL Calculator

J - indicates sample result is estimated

NA2 - NYSDOH did not include this compound in the guidance document[2]

[1] Target Screening Levels for site-specific compounds of interest provided in Bethpage Ambient Air Monitoring Plan and are based on a one-year exposure duration

[2] NYSDOH Outdoor Air Background Values from Appendix C (Table C1) of Guidance for Evaluating Soil Vapor Intrusion in the State of New York (2006)

[3] Target Screening Levels for other compounds calculated using the EPA RSL calculator with the same inputs as described in the Bethpage Ambient Air Monitoring Plan

Table 4: Ambient Air Laboratory Results (2020-09-14 through 2020-09-19)

Analyte	Target Screening Level (µg/m³)[1,3]	95% of Concentration Distribution NYSDOH Background Air (µg/m³)[2]	Ambient Air Concentration (µg/m³)				
			Sample Location				
			AMP-01	AMP-02	AMP-03	AMP-04	AMP-04-DUP
Site-specific Compounds of Interest[1]							
1,1,1-Trichloroethane	520	0.7	< 0.2	< 0.22	< 0.19	< 0.18	< 0.18
1,1-Dichloroethane	45	< 0.25	< 0.14	< 0.16	< 0.14	< 0.13	< 0.13
1,1-Dichloroethene	8	<0.25	< 0.071	< 0.08	< 0.069	< 0.065	< 0.065
1,2-Dichloroethane	3	< 0.25	< 0.14	< 0.16	< 0.14	< 0.13	< 0.13
Benzene	8	5.8	**0.29**	< 0.32	**0.28 J**	< 0.26	**0.29**
Ethyl-benzene	29	1.9	< 0.16	< 0.17	< 0.15	< 0.14	< 0.14
m,p-Xylene	10	3.1	**0.36**	**0.36**	< 0.3	**0.34**	**0.38**
o-Xylene	10	2.3	< 0.16	< 0.17	< 0.15	**0.14**	**0.17**
Tetrachloroethene	30	1.6	< 0.24	**1**	< 0.24	< 0.22	< 0.22
Toluene	521	21	**0.58**	**0.62**	**0.57**	**0.61**	**0.64**
trans-1,2-Dichloroethene	82	NA2	< 0.71	< 0.8	< 0.69	< 0.65	< 0.65
Trichloroethene	2	0.5	< 0.19	**0.95**	< 0.19	< 0.18	< 0.18
Vinyl Chloride	8	< 0.25	< 0.046	< 0.051	< 0.045	< 0.042	< 0.042
Other Compounds[3]							
1,1,2,2-Tetrachloroethane	1.3	< 0.25	< 0.24	< 0.28	< 0.24	< 0.22	< 0.22
1,1,2-Trichloroethane	0.21	< 0.25	< 0.2	< 0.22	< 0.19	< 0.18	< 0.18
1,2-Dibromoethane (EDB)	0.12	< 0.25	< 0.28	< 0.31	< 0.27	< 0.25	< 0.25
1,4-Dichlorobenzene	7	0.8	< 0.22 J	< 0.24 J	< 0.21 J	< 0.2 J	< 0.2 J
Carbon Tetrachloride	12	1	**0.42**	**0.42**	**0.42**	**0.42**	**0.43**
Chloroethane	NA1	0.4	< 0.24	< 0.26	< 0.23	< 0.22	< 0.22
Chloroform	3	0.5	< 0.17	< 0.2	< 0.17	< 0.16	< 0.16
Chloromethane	310	4.6	< 1.8 J	< 2.1 J	< 1.8 J	< 1.7 J	< 1.7 J
cis-1,2-Dichloroethene	NA1	< 0.25	< 0.14	< 0.16	< 0.14	< 0.13	< 0.13
Freon 114	NA1	1.3	< 0.25	< 0.28	< 0.24	< 0.23	< 0.23
Freon 12	100	11	**1.9**	**1.9**	**1.9**	**1.9**	**2**
Methyl tert-butyl ether	260	NA2	< 0.64	< 0.72	< 0.63	< 0.59	< 0.59

Notes:

µg/m³ - micrograms per cubic meter

Bold - indicates detections

< - indicates not detected at or above the indicated value

NA1 - no criteria given in the EPA RSL Calculator

J - indicates sample result is estimated

NA2 - NYSDOH did not include this compound in the guidance document[2]

[1] Target Screening Levels for site-specific compounds of interest provided in Bethpage Ambient Air Monitoring Plan and are based on a one-year exposure duration (B&B Engineers & Geologists of New York, P.C., May 2020)

[2] NYSDOH Outdoor Air Background Values from Appendix C (Table C1) of Guidance for Evaluating Soil Vapor Intrusion in the State of New York (2006)

[3] Target Screening Levels for other compounds calculated using the EPA RSL calculator with the same inputs as described in the Bethpage Ambient Air Monitoring Plan

Table 4: Ambient Air Laboratory Results (2020-09-19 through 2020-09-25)

Analyte	Target Screening Level (µg/m³)[1,3]	95% of Concentration Distribution NYSDOH Background Air (µg/m³)[2]	Ambient Air Concentration (µg/m³)				
			Sample Location				
			AMP-01	AMP-02	AMP-03	AMP-04*	AMP-03-DUP
Site-specific Compounds of Interest[1]							
1,1,1-Trichloroethane	520	0.7	< 0.16	< 0.17	< 0.16	< 0.16	< 0.16
1,1-Dichloroethane	45	< 0.25	< 0.12	< 0.13	< 0.12	< 0.12	< 0.12
1,1-Dichloroethene	8	<0.25	< 0.060	< 0.062	< 0.058	< 0.058	< 0.058
1,2-Dichloroethane	3	< 0.25	< 0.12	< 0.13	< 0.12	< 0.12	< 0.12
Benzene	8	5.8	**0.62**	**0.50**	**0.48**	**0.31**	**0.50**
Ethyl-benzene	29	1.9	**0.18**	**0.16**	**0.15**	< 0.13	**0.16**
m,p-Xylene	10	3.1	**0.50**	**0.40**	**0.40**	< 0.26	**0.42**
o-Xylene	10	2.3	**0.18**	**0.14**	**0.15**	< 0.13	**0.15**
Tetrachloroethene	30	1.6	**0.56**	**0.26**	< 0.20	**0.74**	**0.20**
Toluene	521	21	**1.4**	**1.1**	**1.0**	**1.2**	**1.1**
trans-1,2-Dichloroethene	82	NA2	< 0.60	< 0.62	< 0.58	< 0.58	< 0.58
Trichloroethene	2	0.5	< 0.16	< 0.17	< 0.16	< 0.16	< 0.16
Vinyl Chloride	8	< 0.25	< 0.038	< 0.040	< 0.038	< 0.038	< 0.037
Other Compounds[3]							
1,1,2,2-Tetrachloroethane	1.3	< 0.25	< 0.21	< 0.21	< 0.20	< 0.20	< 0.20
1,1,2-Trichloroethane	0.21	< 0.25	< 0.16	< 0.17	< 0.16	< 0.16	< 0.16
1,2-Dibromoethane (EDB)	0.12	< 0.25	< 0.23	< 0.24	< 0.22	< 0.22	< 0.22
1,4-Dichlorobenzene	7	0.8	< 0.18	< 0.19	< 0.18	< 0.18	< 0.18
Carbon Tetrachloride	12	1	**0.50**	**0.42**	**0.40**	**0.44**	**0.43**
Chloroethane	NA1	0.4	< 0.20	< 0.20	< 0.19	< 0.19	< 0.19
Chloroform	3	0.5	**0.22**	**0.18**	**0.19**	**0.18**	**0.20**
Chloromethane	310	4.6	< 1.6	< 1.6	< 1.5	< 1.5	< 1.5
cis-1,2-Dichloroethene	NA1	< 0.25	< 0.12	< 0.12	< 0.12	< 0.12	< 0.12
Freon 114	NA1	1.3	< 0.21	< 0.22	< 0.20	< 0.20	< 0.20
Freon 12	100	11	**2.8**	**2.4**	**2.3**	**2.4**	**2.4**
Methyl tert-butyl ether	260	NA2	< 0.54	< 0.56	< 0.53	< 0.53	< 0.53

Notes: µg/m³ - micrograms per cubic meter

< - indicates not detected at or above the indicated value

Bold - indicates detections

J - indicates sample result is estimated

NA1 - no criteria given in the EPA RSL Calculator

*- sample collected over a 3-day period because of low vacuum

NA2 - NYSDOH did not include this compound in the guidance document[2]

[1] Target Screening Levels for site-specific compounds of interest provided in Bethpage Ambient Air Monitoring Plan and are based on a one-year exposure duration (B&B Engineers & Geologists of New York, P.C., May 2020)

[2] NYSDOH Outdoor Air Background Values from Appendix C (Table C1) of Guidance for Evaluating Soil Vapor Intrusion in the State of New York (2006)

[3] Target Screening Levels for other compounds calculated using the EPA RSL calculator with the same inputs as described in the Bethpage Ambient Air Monitoring Plan

Table 5:

Summary of Induced Vacuum Readings at Compliance Monitoring Points
Bethpage Park Soil Gas Containment System
Operable Unit 3 (Former Grumman Settling Ponds)
Northrop Grumman Systems Corporation,
Bethpage, New York

ARCADIS Design & Consultancy for natural and built assets

Well ID:	DW-7S		DW-7D	DW-3S	DW-3D	DW-5S		DW-5D	DW-1S			DW-1D	DW-4D	DW-8S		DW-2S		DW-2D		DW-11S	
MP ID:	VMWC-14A	VMWC-14B	VMWC-14D	VMWC-11B	VMWC-12D	VMWC-15A	VMWC-15B	VMWC-15E	VMWC-3A	VMWC-3B	VMWC-3C	VMWC-3D	VMWC-16D	VMWC-16A	VMWC-16B	VMWC-7A	VMWC-7B	VMWC-13D	VMWC-17D	VMWC-18A	VMWC-18B
Date	iwc	iwc	iwc	iwc	iwc	iwc	iwc	iwc	iwc	iwc	iwc	iwc	iwc	iwc	iwc	iwc	iwc	iwc	iwc	iwc	iwc
07/29/20	-0.11	-0.20	-0.21	-0.12	-0.13	-0.13	-0.13	-0.15	-0.14	-0.15	-0.15	-0.43	-0.26	-0.19	-0.18	-0.12	-0.13	-0.17	-0.27	-0.10	-0.12
09/03/20	-0.10	-0.18	-0.19	-0.13	-0.13	-0.14	-0.13	-0.12	-0.12	-0.11	-0.11	-0.12	-0.15	-0.14	-0.12	-0.10	-0.11	-0.17	-0.18	-0.10	-0.13
09/09/20	-0.12	-0.21	-0.22	-0.16	-0.16	-0.13	-0.13	-0.14	-0.14	-0.15	-0.16	-0.28	-0.26	-0.15	-0.14	-0.10	-0.11	-0.26	-0.23	-0.10	-0.10
09/16/20	-0.10	-0.18	-0.20	-0.12	-0.14	-0.14	-0.13	-0.15	-0.13	-0.13	-0.14	-0.23	-0.20	-0.17	-0.14	-0.10	-0.11	-0.12	-0.19	-0.10	-0.10
09/24/20	-0.10	-0.17	-0.18	-0.12	-0.13	-0.11	-0.11	-0.10	-0.12	-0.13	-0.14	-0.19	-0.23	-0.14	-0.15	-0.10	-0.10	-0.10	-0.20	-0.10	-0.12

Notes, Abbreviations, and Units:

1. Compliance goal is -0.1 iwc of vacuum at all compliance monitoring points, based on a twelve-month rolling average. Time weighted rolling average calculated by summing the products of the instantaneous induced vacuum readings and the number of days between readings for a 12-month monitoring period, and dividing by the total time period between the first and last quarterly induced vacuum readings.

DW Depressurization Well
iwc inches of water column
VMWC Vapor Monitoring Well Cluster