Progress Report No. 19
J&H Holding Company, LLC
491 Wortman Avenue, Brooklyn, NY 11208
Brownfield Cleanup Program Site No. C224139
Reporting Period: January 2017

1. Introduction

Langan Engineering, Environmental, Surveying and Landscape Architecture, D.P.C. (Langan) submits this monthly progress report on behalf of J&H Holding Company, LLC (the "Participant"). Monthly progress report submittal to the New York State Department of Environmental Conservation (NYSDEC) is performed in accordance with the Brownfield Cleanup Agreement (BCA) and Section 3.2 of the NYSDEC-approved Interim Remedial Measures Work Plan (IRMWP), prepared by Langan, dated April 28, 2015, and revised June 16, 2015. This monthly progress report summarizes work performed at 491 Wortman Avenue, Brooklyn, New York (the "Site") during January 2017.

The Site (Block 4384, Lots 31 & 36) is located at 491 Wortman Avenue in Brooklyn, New York (Figure 1) and consists of a rectangular shaped lot that is about 19,000 square feet (±0.44 acres). The Site is located in an area zoned for industrial/manufacturing use and is bound by Wortman Street to the south, Linwood Street to the west, Essex Street to the east and a one-story building to the north. Currently, a one-story building with a partial basement covers the entire Site footprint. The one-story building is comprised of a warehouse (i.e., the western portion) and office space (i.e. the eastern portion).

Environmental site investigations began in November 2008. Langan submitted the IRMWP, which the NYSDEC approved on June 18, 2015. Implementation of the IRMWP and the pending environmental activities are described further in this progress report.

2. Remedial Actions Relative to the Site during this Reporting Period

As detailed in Monthly Progress Report No. 18, the air sparge (AS) system shutdown on December 27, 2016 at 4:40pm due to a low pressure alarm that was caused by a mechanical failure of the air compressor (i.e., the belts tore). On January 9, 2017, the air compressor belts were replaced and the AS system was restarted.

The fifth quarterly on-site groundwater sampling event was conducted on January 24 and 25, 2017. Depth-to-water, total depth, and photoionization detector (PID) measurements were collected at monitoring wells MW-1 through MW-9 and piezometers PZ-1 and PZ-2 (thirteen locations total). Following the collection of field data, groundwater samples were collected from each monitoring well and piezometer for laboratory analysis of Target Compound List (TCL) volatile organic compounds (VOCs). The quarterly on-site groundwater monitoring locations are shown on Figure 2.

On January 25, 2017, Langan recorded process and performance monitoring data for the air sparge and soil vapor extraction (AS/SVE) system. As part of the monthly inspection, vapor samples were collected prior to the lead vapor-phase granular activated carbon (vGAC) unit (i.e.,

influent), after the lead vGAC unit and prior to the lag vGAC unit (i.e., mid-point), and after the lag vGAC unit (i.e., effluent). Routine equipment maintenance was performed as part of the annual maintenance. In addition, the SVE system flow gauge located on the influent line to the blower was replaced.

3. Actions Relative to the Site Anticipated for the Next Reporting Period

The following activities are planned:

- Continued operation, maintenance and monitoring (OM&M) of the AS/SVE system
- Preparation and submission of a Site Management Plan

4. Approved Activity Modifications (changes of work scope and/or schedule)

None

5. Results of Sampling, Testing and Other Relevant Data

OM&M sampling was performed as follows:

- An influent vapor sample was collected from the AS/SVE system and analyzed for volatile organic compounds (VOCs) via United States Environmental Protection Agency (USEPA) Method TO-15.
- A mid-point vapor sample was collected from the AS/SVE system and analyzed for VOCs via USEPA Method TO-15.
- An effluent vapor sample was collected from the AS/SVE system and analyzed for VOCs via USEPA Method TO-15.
- Thirteen groundwater samples (plus one duplicate) were collected from on-site groundwater monitoring wells MW-1, MW-2, MW-3 (shallow, middle, and deep), MW-4, MW-5, MW-6, MW-7, MW-8, MW-9, PZ-1, and PZ-2 and analyzed for TCL VOCs via USEPA Method 8260C.

Samples were analyzed by York Analytical Laboratories Inc. (York) of Stratford, CT. York is a New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP)-certified laboratory.

Based on the results of the most recent OM&M sampling, the AS/SVE system is functioning in compliance with Policy DAR-1: Guidelines for the Control of Toxic Ambient Air Contaminants (DAR-1). Mass removal of total chlorinated VOCs (CVOC) by the vGAC units was negligible during this reporting period.

Fifth quarter groundwater monitoring results exhibit VOC concentrations above the NYSDEC Technical and Operational Guidance Series (TOGS) 1.1.1 Ambient Water Quality Standards (AWQS) for Class GA water, but less than the baseline groundwater concentrations from August 2015 (reductions in total CVOC concentrations have been achieved in all wells).

The following tables are attached to this progress report; analytical lab reports are available upon request. The tables summarize the data collected to date and the functionality of the AS/SVE system, including mass of VOCs removed from the subsurface based on PID readings and laboratory data, as well as, the alarm history.

- Table 1: AS/SVE System Vapor Sampling Summary
- Table 2: AS/SVE System Vapor Sampling Results
- Table 3: AS/SVE System Mass Removal – PID Data
- Table 4: AS/SVE System Mass Removal – Laboratory Data
- Table 5: AS/SVE System DAR-1 Compliance – January 25, 2017
- Table 6: AS/SVE System Alarm History
- Table 7: Quarterly Groundwater Sampling Results – Fifth Quarter (lab reports available upon request)
- Table 8: Quarterly Groundwater Sampling Results Summary

6. Deliverables Submitted During This Reporting Period

A draft Remedial Action Work Plan was submitted via email to the NYSDEC for review on January 9, 2017.

7. Information Regarding Percentage of Completion

OM&M of the AS/SVE system is ongoing.

As of February 8, 2017 and since inception, the SVE system operated for 10,863 hours (95% uptime), and the AS system operated for 10,397 hours (91% uptime).

8. Unresolved Delays Encountered or Anticipated That May Affect the Schedule and Mitigation Efforts

None

9. Citizen Participation Plan Activities during This Reporting Period

None

10. Activities Anticipated in Support of the CPP for the Next Reporting Period

None

11. Miscellaneous Information

None

TABLES

TABLE 1: AS/SVE SYSTEM VAPOR SAMPLING SUMMARY
491 WORTMAN AVENUE
BROOKLYN, NEW YORK
LANGAN PROJECT NO. 170329301
BROWNFIELD CLEANUP PROGRAM SITE NO. C224139

SAMPLE NAME	SAMPLE DATE	SAMPLE TYPE	LOCATION	ANALYSIS
AS/SVE SYSTEM VAPOR SAMPLES				
Influent 102015	10/20/2015	Three, 1-Liter Tedlar Bags	vGAC Vessel Influent	TO-15 VOCs
Effluent 102015	10/20/2015	Three, 1-Liter Tedlar Bags	vGAC Vessel Effluent	TO-15 VOCs
Influent_102115	10/21/2015	Three, 1-Liter Tedlar Bags	vGAC Vessel Influent	TO-15 VOCs
Effluent_102115	10/21/2015	Three, 1-Liter Tedlar Bags	vGAC Vessel Effluent	TO-15 VOCs
Influent_102615	10/26/2015	Three, 1-Liter Tedlar Bags	vGAC Vessel Influent	TO-15 VOCs
Effluent_102615	10/26/2015	Three, 1-Liter Tedlar Bags	vGAC Vessel Effluent	TO-15 VOCs
Influent_113015	11/30/2015	Three, 1-Liter Tedlar Bags	vGAC Vessel Influent	TO-15 VOCs
Effluent_113015	11/30/2015	Three, 1-Liter Tedlar Bags	vGAC Vessel Effluent	TO-15 VOCs
Influent_122815	12/28/2015	Three, 1-Liter Tedlar Bags	vGAC Vessel Influent	TO-15 VOCs
Effluent_122815	12/28/2015	Three, 1-Liter Tedlar Bags	vGAC Vessel Effluent	TO-15 VOCs
Influent_012716	1/27/2016	Three, 1-Liter Tedlar Bags	vGAC Vessel Influent	TO-15 VOCs
Effluent_012716	1/27/2016	Three, 1-Liter Tedlar Bags	vGAC Vessel Effluent	TO-15 VOCs
Influent_022416	2/24/2016	Three, 1-Liter Tedlar Bags	vGAC Vessel Influent	TO-15 VOCs
Mid_022416	2/24/2016	Three, 1-Liter Tedlar Bags	vGAC Vessel Mid-Point	TO-15 VOCs
Effluent_022416	2/24/2016	Three, 1-Liter Tedlar Bags	vGAC Vessel Effluent	TO-15 VOCs
Influent_033016	3/30/2016	Three, 1-Liter Tedlar Bags	vGAC Vessel Influent	TO-15 VOCs
Effluent_033016	3/30/2016	Three, 1-Liter Tedlar Bags	vGAC Vessel Effluent	TO-15 VOCs
Influent_042916	4/29/2016	Three, 1-Liter Tedlar Bags	vGAC Vessel Influent	TO-15 VOCs
Effluent_042916	4/29/2016	Three, 1-Liter Tedlar Bags	vGAC Vessel Effluent	TO-15 VOCs
Influent_052616	5/26/2016	Three, 1-Liter Tedlar Bags	vGAC Vessel Influent	TO-15 VOCs
Effluent_052616	5/26/2016	Three, 1-Liter Tedlar Bags	vGAC Vessel Effluent	TO-15 VOCs
Influent_062916	6/29/2016	Three, 1-Liter Tedlar Bags	vGAC Vessel Influent	TO-15 VOCs
Effluent_062916	6/29/2016	Three, 1-Liter Tedlar Bags	vGAC Vessel Effluent	TO-15 VOCs
Influent_072816	7/28/2016	One, 3-Liter Tedlar Bags	vGAC Vessel Influent	TO-15 VOCs
Effluent_072816	7/28/2016	One, 3-Liter Tedlar Bags	vGAC Vessel Effluent	TO-15 VOCs
Influent_083116	8/31/2016	One, 3-Liter Tedlar Bags	vGAC Vessel Influent	TO-15 VOCs
Effluent_083116	8/31/2016	One, 3-Liter Tedlar Bags	vGAC Vessel Effluent	TO-15 VOCs
Influent_092916	9/29/2016	One, 3-Liter Tedlar Bags	vGAC Vessel Influent	TO-15 VOCs
Midpoint_092916	9/29/2016	One, 3-Liter Tedlar Bags	vGAAC Vessel Mid-Point	TO-15 VOCs
Effluent_092916	9/29/2016	One, 3-Liter Tedlar Bags	vGAC Vessel Effluent	TO-15 VOCs
Influent_103116	10/31/2016	One, 3-Liter Tedlar Bags	vGAC Vessel Influent	TO-15 VOCs
Effluent_103116	10/31/2016	One, 3-Liter Tedlar Bags	vGAC Vessel Effluent	TO-15 VOCs
Influent_112916	11/29/2016	One, 3-Liter Tedlar Bags	vGAC Vessel Influent	TO-15 VOCs
Effluent_112916	11/29/2016	One, 3-Liter Tedlar Bags	vGAC Vessel Effluent	TO-15 VOCs
Influent_122816	12/28/2016	One, 3-Liter Tedlar Bags	vGAC Vessel Influent	TO-15 VOCs
Effluent_122816	12/28/2016	One, 3-Liter Tedlar Bags	vGAC Vessel Effluent	TO-15 VOCs
Influent_012517	1/25/2017	One, 3-Liter Tedlar Bags	vGAC Vessel Influent	TO-15 VOCs
Midpoint_012517	1/25/2017	One, 3-Liter Tedlar Bags	vGAAC Vessel Mid-Point	TO-15 VOCs
Effluent_012517	1/25/2017	One, 3-Liter Tedlar Bags	vGAC Vessel Effluent	TO-15 VOCs

Notes:

1. The vapor samples were analyzed for VOCs via USEPA Method TO-15.
2. USEPA = United States Environmental Protection Agency
3. VOCs = volatile organic compounds
4. AS/SVE = air sparge/soil vapor extraction
5. vGAC = vapor-phase granular activated carbon

TABLE 2: AS/SVE SYSTEM VAPOR SAMPLING RESULTS
491 WORTMAN AVENUE
BROOKLYN, NEW YORK
LANGAN PROJECT NO. 170329301
BROWNFIELD CLEANUP PROGRAM SITE NO. C224139

LOCATION	vGAC INFLUENT		vGAC MID-POINT		vGAC EFFLUENT	
SAMPLE ID	INFLUENT_012517		MIDPOINT_012517		EFFLUENT_012517	
LAB SAMPLE ID	17A0861-01		17A0861-02		17A0861-03	
SAMPLE DATE	1/25/2017		1/25/2017		1/25/2017	
Volatile Organic Compounds (ug/m^3)						
1,1,1,2-Tetrachloroethane	0.690	U	0.690	U	0.690	U
1,1,1-Trichloroethane	0.550	U	0.550	U	0.550	U
1,1,2,2-Tetrachloroethane	0.690	U	0.690	U	0.690	U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	0.770	U	0.770	U	0.770	U
1,1,2-Trichloroethane	0.550	U	0.550	U	0.550	U
1,1-Dichloroethane	0.400	U	0.400	U	0.400	U
1,1-Dichloroethylene	0.400	U	0.400	U	0.400	U
1,2,4-Trichlorobenzene	0.740	U	0.740	U	0.740	U
1,2,4-Trimethylbenzene	1.200		0.490	U	0.690	
1,2-Dibromoethane	0.770	U	0.770	U	0.770	U
1,2-Dichlorobenzene	0.600	U	0.600	U	0.600	U
1,2-Dichloroethane	0.400	U	0.400	U	0.400	U
1,2-Dichloropropane	0.460	U	0.460	U	0.460	U
1,2-Dichlorotetrafluoroethane	0.700	U	0.700	U	0.700	U
1,3,5-Trimethylbenzene	0.490	U	0.490	U	0.490	U
1,3-Butadiene	0.660	U	0.660	U	0.660	U
1,3-Dichlorobenzene	0.600	U	0.600	U	0.600	U
1,3-Dichloropropane	0.460	U	0.460	U	0.460	U
1,4-Dichlorobenzene	0.600	U	0.600	U	0.600	U
1,4-Dioxane	0.720	U	0.720	U	0.720	U
2-Butanone	7.300		24.000		33.000	
2-Hexanone	0.820	U	0.820	U	0.820	U
3-Chloropropene	1.600	U	1.600	U	1.600	U
4-Methyl-2-pentanone	0.410	U	0.900		0.820	
Acetone	35.000		75.000		70.000	
Acrylonitrile	0.220	U	0.220	U	0.220	U
Benzene	0.540		2.700		1.600	
Benzyl chloride	0.520	U	0.520	U	0.520	U
Bromodichloromethane	0.670	U	0.670	U	0.670	U
Bromoform	1.000	U	1.000	U	1.000	U
Bromomethane	0.390	U	0.390	U	0.390	U
Carbon disulfide	0.310	U	0.650		0.690	
Carbon tetrachloride	0.380		0.160	U	0.160	U
Chlorobenzene	0.460	U	0.460	U	0.460	U
Chloroethane	0.260	U	2.700		3.600	
Chloroform	0.490	U	0.830		0.490	U
Chloromethane	1.200		1.400		1.600	
cis-1,2-Dichloroethylene	0.400	U	1.100		0.560	
cis-1,3-Dichloropropylene	0.450	U	0.450	U	0.450	U
Cyclohexane	0.340	U	0.340	U	0.340	U
Dibromochloromethane	0.850	U	0.850	U	0.850	U
Dichlorodifluoromethane	2.000		1.700		1.600	
Ethyl acetate	9.800		1.500		3.300	
Ethyl Benzene	0.610		0.430	U	0.480	
Hexachlorobutadiene	1.100	U	1.100	U	1.100	U
Isopropanol	0.490	U	0.490	U	0.490	U
Methyl Methacrylate	0.700		10.000		21.000	
Methyl tert-butyl ether (MTBE)	0.360	U	0.360	U	0.360	U
Methylene chloride	1.100		10.000		11.000	
n-Heptane	0.410	U	0.410	U	0.410	U
n-Hexane	0.600		3.300		3.800	
o-Xylene	0.960		0.430	U	0.430	
p- & m- Xylenes	2.500		0.870	U	1.200	
p-Ethyltoluene	1.000		0.490	U	0.590	
Propylene	0.170	U	0.170	U	0.170	U
Styrene	0.430	U	0.510		1.100	
Tetrachloroethylene	2.000		0.410		0.610	
Tetrahydrofuran	1.000		0.590	U	0.590	
Toluene	3.100		4.800		6.300	
trans-1,2-Dichloroethylene	0.400	U	0.400	U	0.400	U
trans-1,3-Dichloropropylene	0.450	U	0.450	U	0.450	U
Trichloroethylene	2.000		0.430		0.430	
Trichlorofluoromethane (Freon 11)	1.500		1.400		0.960	
Vinyl acetate	0.350	U	0.350	U	0.350	U
Vinyl bromide	0.440	U	0.440	U	0.440	U
Vinyl Chloride	0.260	U	2.700		4.000	

NOTES:
1. ug/m^3 = micrograms per cubic meter
2. vGAC = vapor-phase granular activated carbon
3. Samples collected at the "vGAC INFLUENT" were collected before to the lead vGAC vessel.
4. Samples collected at the "vGAC EFFLUENT" were collected after the lag vGAC vessel.

Q is the Qualifier Column with definitions as follows:
D = The result is from an analysis that required a dilution.
U = The analyte was not detected at or above the level indicated.

TABLE 3: AS/SVE SYSTEM MASS REMOVAL - PID DATA
491 WORTMAN AVENUE
BROOKLYN, NEW YORK
LANGAN PROJECT NO. 170329301
BROWNFIELD CLEANUP PROGRAM SITE NO. C224139

DATE	INFLUENT CONCENTRATION (ppmv)	SVE BLOWER FLOWRATE (scfm)	EFFLUENT CONCENTRATION (ppmv)	TOTAL OPERATIONAL HOURS	AVERAGE MOLECULAR WEIGHT	MASS REMOVAL RATE (lbs/hr)	TOTAL MASS REMOVED FROM SUBSURFACE (lbs)	CUMULATIVE MASS REMOVED FROM SUBSURFACE (lbs)
10/21/2015	55.0	688	1.8	30	100	0.57	17.02	17.02
10/26/2015	8.3	650	0.6	150	100	0.08	9.31	26.34
11/6/2015	5.5	560	0.0	383	100	0.05	11.13	37.46
11/30/2015	1.9	593	0.3	958	100	0.01	8.46	45.92
12/28/2015	3.7	570	0.0	1548	100	0.03	19.29	65.21
1/27/2016	1.2	525	0.5	2180	100	0.01	3.60	68.81
2/24/2016	2.5	578	0.0	2854	100	0.02	15.10	83.91
3/30/2016	0.2	550	0.0	3693	100	0.002	1.43	85.34
4/29/2016	2.0	571	0.0	4322	100	0.018	11.14	96.48
5/26/2016	0.4	600	0.0	4972	100	0.004	2.42	98.90
6/29/2016	0.5	600	0.0	5784	100	0.005	3.78	102.68
7/28/2016	3.0	600	0.0	6431	100	0.028	18.06	120.73
8/31/2016	2.7	600	0.0	7110	100	0.025	17.05	137.79
9/29/2016	7.5	760	2.0	7802	100	0.065	44.85	182.63
10/31/2016	0.0	520	0.0	8516	100	0.000	0.00	182.63
11/29/2016	0.0	560	0.0	9211	100	0.000	0.00	182.63
12/28/2016	0.0	520	0.0	9884	100	0.000	0.00	182.63
1/25/2017	2.8	600	0.0	10530	100	0.026	16.83	199.46

NOTES:
1. Blower flowrate is recorded from PDI-701 pitot tube flow indicator located on the blower discharge line.
2. The influent and effluent concentrations are based on the PID readings.
3. Mass Removal rate (lb/hr) = ((Conc in ppmv)(flowrate scfm)(MW)(60 min/hr)) / ((387)(1,000,000)).
4. PID = photoionization detector
5. ppmv = parts per million volume
6. scfm = standard cubic feet per minute
7. lbs/hr = pounds per hour
8. lbs = pounds
9. SVE = soil vapor extraction

TABLE 4: AS/SVE SYSTEM MASS REMOVAL - LABORATORY DATA
491 WORTMAN AVENUE
BROOKLYN, NEW YORK
LANGAN PROJECT NO. 170329301
BROWNFIELD CLEANUP PROGRAM SITE NO. C224139

DATE	INFLUENT CONCENTRATION (ug/m3)	SVE BLOWER FLOWRATE (scfm)	EFFLUENT CONCENTRATION (ug/m3)	TOTAL OPERATIONAL HOURS	INFLUENT RATE (mg/min)	EFFLUENT RATE (mg/min)	REMOVAL RATE (mg/min)	MASS REMOVED FROM SUBSURFACE (lbs)	TOTAL MASS REMOVED FROM SUBSURFACE (lbs)	MASS REMOVED BY CARBON (lbs)	TOTAL MASS REMOVED BY CARBON (lbs)	VGAC MASS REMOVAL EFFICIENCY (%)
10/20/2015	114,348	640	9,241	12	2049.12	165.60	1883.52	3.25	3.25	2.99	2.99	92
10/21/2015	32,758	688	1,129	30	631.05	21.75	609.30	1.50	4.76	1.45	4.44	97
10/26/2015	7,027	650	383	150	127.89	6.97	120.92	2.03	6.79	1.92	6.36	95
11/30/2015	3,144	593	426	958	52.20	7.07	45.13	5.58	12.36	4.82	11.18	86
12/28/2015	3,357	570	230	1548	53.58	3.67	49.91	4.18	16.55	3.89	15.08	93
1/27/2016	621	525	183	2180	9.13	2.69	6.44	0.76	17.31	0.54	15.62	71
2/24/2016	1,454	578	283	2854	23.53	4.58	18.94	2.10	19.41	1.69	17.31	81
3/30/2016	825	550	75	3693	12.71	1.16	11.55	1.41	20.82	1.28	18.59	91
4/29/2016	482	571	112	4322	7.70	1.79	5.91	0.64	21.46	0.49	19.08	77
5/26/2016	1,169	600	162	4972	19.64	2.73	16.91	1.69	23.15	1.45	20.53	86
6/29/2016	1,865	600	190	5784	31.33	3.19	28.14	3.37	26.51	3.02	23.56	90
7/28/2016	3,706	600	232	6431	62.26	3.90	58.36	5.33	31.84	4.99	28.55	94
8/31/2016	4,798	600	135	7110	80.61	2.26	78.35	7.24	39.08	7.04	35.59	97
9/29/2016	1,045	760	179	7802	22.24	3.81	18.43	2.04	41.12	1.69	37.27	83
10/31/2016	922	520	91	8516	13.42	1.32	12.10	1.27	42.38	1.14	38.42	90
11/29/2016	790	560	167	9211	12.38	2.62	9.76	1.14	43.52	0.90	39.31	79
12/28/2016	282	520	123	9884	4.11	1.79	2.32	0.37	43.89	0.21	39.52	56
1/25/2017	4.7	600	5.6	10530	0.08	0.09	-0.02	0.01	43.89	0.00	39.52	--

NOTES:
1. Blower flowrate is recorded from PDI-701 pitot tube flow indicator located on the blower discharge line.
2. The influent and effluent concentrations are based on the lab analytical data and not the PID readings.
3. ug/m3 = micrograms per cubic meter
4. scfm = standard cubic feet per minute
5. mg/min = milligrams per minute
6. lbs = pounds
7. SVE = soil vapor extraction
8. VGAC = vapor-phase granular activated carbon

TABLE 5: AS/SVE SYSTEM DAR-1 COMPLIANCE
491 WORTMAN AVENUE
BROOKLYN, NEW YORK
LANGAN PROJECT NO. 170329301
BROWNFIELD CLEANUP PROGRAM NO. C224139

SAMPLING DATE: 1/25/2017

CHEMICAL COMPOUND	CARBON EFFLUENT CONCENTRATION MEASURED ($\mu g/m^3$)	EMISSION FLOWRATE MEASURED (SCFM)	(m^3/min)	OUTLET CONCENTRATION (Q_p) (lb/hr)	OUTLET CONCENTRATION (Q_a) (lb/yr)	MAX ANNUAL IMPACT (C_a) ($\mu g/m^3$)	MAX POTENTIAL IMPACT (C_p) ($\mu g/m^3$)	MAX SHORT-TERM IMPACT (C_{st}) ($\mu g/m^3$)	DAR-1 STANDARDS SGC ($\mu g/m^3$)	AGC ($\mu g/m^3$)	EMISSION RESTRICTION REQUIRED (if C_p>AGC and C_a<AGC)	SGC EMISSION EXCEEDANCE (if C_{st}>SGC)	AGC EMISSION EXCEEDANCE (if C_a>AGC)
Volatile Organics, USEPA TO-15 Full List (ug/m^3)													
1,2,4-Trimethylbenzene	0.69	600	16.9902	1.55E-06	1.36E-02	1.22E-04	1.22E-04	7.91E-03	--	6	NO	No Standard	NO
2-Butanone	33	600	16.9902	7.40E-05	6.48E-01	5.83E-03	5.82E-03	3.78E-01	13000	5000	NO	NO	NO
4-Methyl-2-pentanone	0.82	600	16.9902	1.84E-06	1.61E-02	1.45E-04	1.45E-04	9.40E-03	31000	3000	NO	NO	NO
Acetone	70	600	16.9902	1.57E-04	1.38E+00	1.24E-02	1.23E-02	8.03E-01	180,000	30,000	NO	NO	NO
Benzene	1.6	600	16.9902	3.59E-06	3.14E-02	2.83E-04	2.82E-04	1.83E-02	1,300	0.13	NO	NO	NO
Carbon disulfide	0.69	600	16.9902	1.55E-06	1.36E-02	1.22E-04	1.22E-04	7.91E-03	6,200	700	NO	NO	NO
Chloroethane	3.6	600	16.9902	8.07E-06	7.07E-02	6.36E-04	6.35E-04	4.13E-02	--	--	No Standard	No Standard	No Standard
Chloromethane	1.6	600	16.9902	3.59E-06	3.14E-02	2.83E-04	2.82E-04	1.83E-02	6,200	700	NO	NO	NO
cis-1,2-Dichloroethylene	0.56	600	16.9902	1.26E-06	1.10E-02	9.89E-05	9.88E-05	6.42E-03	--	63	NO	No Standard	NO
Dichlorodifluoromethane	1.6	600	16.9902	3.59E-06	3.14E-02	2.83E-04	2.82E-04	1.83E-02	--	12,000	NO	No Standard	NO
Ethyl Acetate	3.30	600	16.9902	7.40E-06	6.48E-02	5.83E-04	5.82E-04	3.78E-02	--	3,400	NO	No Standard	NO
Ethyl Benzene	0.48	600	16.9902	1.08E-06	9.43E-03	8.48E-05	8.47E-05	5.50E-03	--	1,000	NO	No Standard	NO
Methyl methacrylate	21	600	16.9902	4.71E-05	4.13E-01	3.71E-03	3.70E-03	2.41E-01	41,000	700	NO	NO	NO
Methylene chloride	11	600	16.9902	2.47E-05	2.16E-01	1.94E-03	1.94E-03	1.26E-01	14,000	60	NO	NO	NO
n-Hexane	3.8	600	16.9902	8.52E-06	7.47E-02	6.71E-04	6.70E-04	4.36E-02	--	700	NO	No Standard	NO
o-Xylene	0.43	600	16.9902	9.64E-07	8.45E-03	7.60E-05	7.59E-05	4.93E-03	22,000	100	NO	NO	NO
p&m-Xylenes	1.2	600	16.9902	2.69E-06	2.36E-02	2.12E-04	2.12E-04	1.38E-02	22,000	100	NO	NO	NO
p-Ethyltoluene	0.59	600	16.9902	1.32E-06	1.16E-02	1.04E-04	1.04E-04	6.77E-03	--	--	No Standard	No Standard	No Standard
Styrene	1.1	600	16.9902	2.47E-06	2.16E-02	1.94E-04	1.94E-04	1.26E-02	17,000	1,000	NO	NO	NO
Tetrachloroethylene	0.61	600	16.9902	1.37E-06	1.20E-02	1.08E-04	1.08E-04	7.00E-03	300	4	NO	NO	NO
Tetrahydrofuran	0.59	600	16.9902	1.32E-06	1.16E-02	1.04E-04	1.04E-04	6.77E-03	30,000	350	NO	NO	NO
Toluene	6.3	600	16.9902	1.41E-05	1.24E-01	1.11E-03	1.11E-03	7.22E-02	37,000	5,000	NO	NO	NO
Trichloroethylene	0.43	600	16.9902	9.64E-07	8.45E-03	7.60E-05	7.59E-05	4.93E-03	14,000	0.2	NO	NO	NO
Trichlorofluoromethane	0.96	600	16.9902	2.15E-06	1.89E-02	1.70E-04	1.69E-04	1.10E-02	9,000	5,000	NO	NO	NO
Vinly Chloride	4	600	16.9902	8.97E-06	7.86E-02	7.07E-04	7.06E-04	4.59E-02	180,000	0.11	NO	NO	NO

NOTES AND QUALIFIERS:
1. Table only displays chemical compounds with detectable concentrations.
2. Concentrations below reporting limit (non detect) are assumed to be zero.
3. Air samples were analyzed for USEPA TO-15 compounds
4. All equations are referenced in NYSDEC, Division of Air Resources, Air Guide 1, Guidelines for the Control of Toxic Ambient Air Contaminants (11/12/97). Standard Point Source Method calculations were used.
5. Values in table are compared to DAR-1 Annual Guideline Concentrations (AGC)/Short-Term Guideline Concentrations (SGC) Tables dated February 28, 2014.
6. DAR-1 AGC and/or SGC values listed as "--" means there is no AGC or SGC standard for that compound.
7. SCFM = standard cubic feet per minute
8. Blower flowrate is recorded from PDI-701 pitot tube flow indicator located on the blower discharge line.
9. ug/m^3 = micrograms per cubic meter
10. m^3/min = cubic meter per minute
11. lb/hr = pounds per hour
12. lb/yr = pounds per year

TABLE 6: AS/SVE SYSTEM ALARM HISTORY
491 WORTMAN AVENUE
BROOKLYN, NEW YORK
LANGAN PROJECT NO. 170329301
BROWNFIELD CLEANUP PROGRAM NO. C224139

DATE	ALARM	ALARM DESCRIPTION	REASON	REMEDY
10/23/2015	PAL-2501	Compressor Low Pressure Alarm	Uncertain of the reason. There may be a power fluctuation that trips the low pressure alarm, which shuts the AS system down.	On-site observation confirmed that this was a false alarm and was not caused by compressor failure or a breach in the air sparge manifold. The alarm was manually reset.
10/28/2015	LAH-7301	Storage Tank High Level Alarm	The SVE system began to extract a larger volume of water than previously anticipated.	The storage tank was emptied into nine 55-gallon drums, and the SVE system vacuum has been optimized to extract a lesser volume of water.
11/5/2015	PAL-2501	Compressor Low Pressure Alarm	Caused by the air sparge compressor on/off time, which won't allow "OFF" time to be set to zero and therefore, the compressor cannot run continuously.	The air compressor timer has been by-passed and the compressor operation is linked to the SVE system operation. If the SVE system is operational, the compressor will operate unless a different AS system alarm has been triggered.
11/17/2015	PAL-2501	Compressor Low Pressure Alarm	This was an alarm test that was performed to ensure that the update to the Programmable Logic Controller (PLC) was successful.	The PLC update was successful and the air sparge compressor can run continuously. The air compressor timer is no longer being bypassed.
12/23/2015	LAH-7301	Storage Tank High Level Alarm	Following optimization, which included increasing the AS rate and the SVE system flow rate, the SVE system began to extract a larger volume of water than previously anticipated.	The storage tank was emptied into three 55-gallon drums. Both the AS and SVE system flow rates were adjusted in an effort to reduce excess water collection by the SVE system.
12/25/2015	LAH-7301	Storage Tank High Level Alarm	Following optimization, which included increasing the AS rate and the SVE system flow rate, the SVE system began to extract a larger volume of water than previously anticipated.	The storage tank was emptied into three 55-gallon drums. Both the AS and SVE system flow rates were adjusted in an effort to reduce excess water collection by the SVE system.
1/7/2016	LAH-7301	Storage Tank High Level Alarm	Following continued optimization of AS/SVE system, the SVE system began to extract a larger volume of water than anticipated.	The storage tank was emptied into eight 55-gallon drums. Both the AS and SVE system flow rates were adjusted in an effort to reduce excess water collection by the SVE system.
1/17/2016	LAH-7301	Storage Tank High Level Alarm	Following continued optimization of AS/SVE system, the SVE system began to extract a larger volume of water than anticipated.	The storage tank was emptied. Both the AS and SVE system flow rates were adjusted in an effort to reduce excess water collection by the SVE system.
2/1/2016	TAH-2501	Air Compressor High Temperature Alarm	The AS system is operating close to the alarm set point so that as much warm air as possible is continuously injected into the subsurface. A slight change in the air flow rate and/or ambient temperature most likely caused the rise in discharge air temperature.	The alarm was cleared and the AS system was restarted at a lower speed. The compressor speed was ramped up incrementally throughout the day until the previous set point was reached. The heat exchanger flow and AS manifold temperature are being monitored on a daily basis in an effort to prevent tripping the high temperature alarm again.
4/3/2016	PAL-701	Blower Influent High Pressure Alarm	The alarm was most likely triggered due to power fluctuations caused by high wind conditions.	The alarm was cleared and the SVE system was restarted at a higher frequency. The system was monitored remotely for the remainder of the day.
4/29/2016	TAH-2501	Air Compressor High Temperature Alarm	The AS system is operating close to the alarm set point so that as much warm air as possible is continuously injected into the subsurface. A slight change in the air flow rate and/or ambient temperature most likely caused the rise in discharge air temperature.	The alarm was cleared and the AS system was restarted. At restart, the allowable flow through the AS system was increased to alleviate the pressure on the air compressor discharge line. The heat exchanger flow and AS manifold temperature are being monitored on a daily basis in an effort to prevent tripping the high temperature alarm again.
8/9/2016	PAH-702	SVE System Effluent High Pressure Alarm	Anomalously high pressures were not noted on the SVE system discharge during the remote or on-site inspections. It is likely that the SVE effluent pressure switch needs to be recalibrated following almost a year's worth of continuous use.	The SVE system was restarted at a lower frequency and monitored on-site for about two hours.
8/26/2016	FAL-701	Blower Low Flow Alarm	The alarm was triggered due to a loose relay switch.	The switch was tightened during the August 31, 2016 monthly inspection and the system was restarted without further issue.
12/27/2016	PAL-2501	Compressor Low Pressure Alarm	The alarm was triggered due to a mechanical failure at the air compressor (i.e., the belts tore).	The air compressor belts were replaced on January 9, 2017 and the system was restarted.

TABLE 7: QUARTERLY GROUNDWATER SAMPLING RESULTS - FIFTH QUARTER
491 WORTMAN AVENUE
BROOKLYN, NEW YORK
LANGAN PROJECT NO. 170329301
BROWNFIELD CLEANUP PROGRAM SITE NO. C224139

Sample ID Laboratory ID Sampling Date Dilution Factor	NYSDEC TOGS STANDARDS AND GUIDANCE VALUES	MW01_012417 17A0856-03 1/24/2017 1		MW02_012417 17A0856-04 1/24/2017 1		MW3AS_012417 17A0856-05 1/24/2017 1		MW3AM_012417 17A0856-06 1/24/2017 1		MW3AD_012417 17A0856-07 1/24/2017 1		DUP01_012417 17A0856-09 1/24/2017 1		MW04_012417 17A0856-08 1/24/2017 1		MW05_012417 17A0856-10 1/24/2017 1	
Volatile Organic Compounds (µg/L)																	
1,1,2,2-Tetrachloroethane	5	0.200	U	0.200	U	0.600		0.200	U	0.200	U	0.200	U	0.200	U	0.200	U
1,1,2-Trichloroethane	1	0.200	U	0.200	U	0.200	U	0.200	U	0.200	U	0.200	U	0.200	U	0.200	U
1,1-Dichloroethane	5	0.200	U	0.200	U	0.200	U	0.200	U	0.200	U	0.200	U	0.200	U	0.200	U
1,1-Dichloroethylene	5	0.200	U	0.200	U	0.200	U	0.200	U	0.200	U	0.200	U	0.200	U	0.200	U
1,2-Dichlorobenzene	3	0.200	U	0.200	U	**94**		0.780		0.200	U	0.200	U	0.200	U	0.200	U
1,2-Dichloropropane	1	0.200	U	0.200	U	0.200	U	0.200	U	0.200	U	0.200	U	0.300	J	0.200	U
1,4-Dichlorobenzene	3	0.200	U	0.200	U	0.900		0.200	U	0.200	U	0.200	U	0.200	U	0.200	U
Acetone	50	1.100	JB	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Benzene	1	0.200	U	0.200	U	**2.3**		0.200	U	0.200	U	0.200	U	0.200	U	0.200	U
Chlorobenzene	5	0.200	U	0.200	U	2.600		0.200	U	0.200	U	0.200	U	0.200	U	0.200	U
Chloroform	7	0.200	U	0.200	U	0.200	U	0.220	J	1		1.100		0.200	U	0.200	U
cis-1,2-Dichloroethylene	5	0.200	U	0.200	U	0.510		0.200	U	0.200	U	0.200	U	0.200	U	0.200	U
Methyl tert-butyl ether (MTBE)	10	0.200	U	0.200	U	0.200	U	0.270	J	0.340	J	0.330	J	0.200	U	0.200	U
Tetrachloroethylene	5	0.200	U	0.560		**10**		**19**		**13**		**13**		0.520		0.420	J
Toluene	5	0.200	U	0.200	U	0.550		0.200	U	0.200	U	0.200	U	0.200	U	0.200	U
trans-1,2-Dichloroethylene	5	0.200	U	0.200	U	0.200	U	0.200	U	0.200	U	0.200	U	0.200	U	0.200	U
Trichloroethylene	5	0.200	U	0.360	J	**10**		1.700		0.810		0.750		0.970		0.200	U
Trichlorofluoromethane	5	0.200	U	0.200	U	0.200	U	0.200	U	0.200	U	0.200	U	0.200	U	0.200	U
Vinyl Chloride	2	0.200	U	0.200	U	0.200	U	0.200	U	0.200	U	0.200	U	0.200	U	0.200	U

Notes:
1. Groundwater sample analytical results are compared to New York State Department of Environmental Conservation (NYSDEC) Technical and Operational Guidance Series (TOGS) 1.1.1 Ambient Water Quality Standards and Guidance Values for Class GA water.
2. Only compounds with detections are shown.
3. Results exceeding the NYSDEC TOGS standards and guidance values are shaded and bolded.
4. µg/L = micrograms per liter
5. DUP01_012417 is a duplicate sample of MW3AD_012417.
6. Eleven monitoring wells and two piezometers associated with the air sparge and soil vapor extraction system (AS/SVE) system were sampled as part of the fifth round of quarterly groundwater sampling.

Qualifiers:
B = Analyte detected in the associated analysis batch blank.
D = The sample was diluted per the dilution factor shown.
J = Analyte detected at or above the MDL (method detection limit) but below the RL (Reporting Limit) - data is estimated.
U = Analyte not detected at or above the level indicated.

TABLE 7: QUARTERLY GROUNDWATER SAMPLING RESULTS - FIFTH QUARTER
491 WORTMAN AVENUE
BROOKLYN, NEW YORK
LANGAN PROJECT NO. 170329301
BROWNFIELD CLEANUP PROGRAM SITE NO. C224139

Sample ID	NYSDEC TOGS	MW06_012517		MW07_012517		MW08_012517		MW09_012517		PZ01_012417		PZ02_012417	
Laboratory ID	STANDARDS AND	17A0856-11		17A0856-12		17A0856-13		17A0856-14		17A0856-01		17A0856-02	
Sampling Date	GUIDANCE	1/25/2017		1/25/2017		1/25/2017		1/25/2017		1/24/2017		1/24/2017	
Dilution Factor	VALUES	25		1		1		1		1		1	
Volatile Organic Compounds (µg/L)													
1,1,2,2-Tetrachloroethane	5	0.200	U	0.200	U	0.200	U	0.200	U	0.200	U	0.200	U
1,1,2-Trichloroethane	1	0.330	J	0.200	U	0.200	U	0.200	U	0.200	U	0.200	U
1,1-Dichloroethane	5	1.300		0.200	U	0.480	J	0.200	U	0.200	U	0.200	U
1,1-Dichloroethylene	5	1.200		0.200	U	0.200	U	0.200	U	0.200	U	0.200	U
1,2-Dichlorobenzene	3	0.200	U	0.200	U	0.200	U	0.200	U	0.200	U	0.200	U
1,2-Dichloropropane	1	0.370	J	0.320	J	0.370	J	0.200	U	0.200	U	0.200	U
1,4-Dichlorobenzene	3	0.200	U	0.200	U	0.200	U	0.200	U	0.200	U	0.200	U
Acetone	50	1	U	1	U	1	U	1	U	1	U	1	U
Benzene	1	0.200	U	0.200	U	0.200	U	0.200	U	0.200	U	0.200	U
Chlorobenzene	5	0.200	U	0.200	U	0.200	U	0.200	U	0.200	U	0.200	U
Chloroform	7	0.860		0.200	U	0.200	U	0.200	U	0.200	U	0.200	U
cis-1,2-Dichloroethylene	5	**22**		0.200	U	**19**		0.200	U	0.200	U	0.200	U
Methyl tert-butyl ether (MTBE)	10	0.200	U	0.200	U	0.200	U	0.200	U	0.200	U	0.200	U
Tetrachloroethylene	5	**380**	D	0.200	U	3.200		**5.5**		0.200	U	0.660	
Toluene	5	0.200	U	0.200	U	0.200	U	0.200	U	0.200	U	0.200	U
trans-1,2-Dichloroethylene	5	2		0.200	U	0.200	U	0.200	U	0.200	U	0.200	U
Trichloroethylene	5	**410**	D	0.300	J	**20**		2		0.200	U	0.430	J
Trichlorofluoromethane	5	0.310	J	0.200	U	0.200	U	0.200	U	0.200	U	0.200	U
Vinyl Chloride	2	0.700		0.200	U	0.200	U	0.200	U	0.200	U	0.200	U

Notes:
1. Groundwater sample analytical results are compared to New York State Department of Environmental Conservation (NYSDEC) Technical and Operational Guidance Series (TOGS) 1.1.1 Ambient Water Quality Standards and Guidance Values for Class GA water.
2. Only compounds with detections are shown.
3. Results exceeding the NYSDEC TOGS standards and guidance values are shaded and bolded.
4. µg/L = micrograms per liter
5. DUP01_012417 is a duplicate sample of MW3AD_012417.
6. Eleven monitoring wells and two piezometers associated with the air sparge and soil vapor extraction system (AS/SVE) system were sampled as part of the fifth round of quarterly groundwater sampling.

Qualifiers:
B = Analyte detected in the associated analysis batch blank.
D = The sample was diluted per the dilution factor shown.
J = Analyte detected at or above the MDL (method detection limit) but below the RL (Reporting Limit) - data is estimated.
U = Analyte not detected at or above the level indicated.

TABLE 8: QUARTERLY GROUNDWATER SAMPLING RESULTS SUMMARY
491 WORTMAN AVENUE
BROOKLYN, NEW YORK
LANGAN PROJECT NO. 170329301
BROWNFIELD CLEANUP PROGRAM SITE NO. C224139

Compound	NYSDEC TOGS STANDARDS AND GUIDANCE VALUES	Sampling Location												
		MW-1	MW-2	MW-3S	MW-3M	MW-3D	MW-4	MW-5	MW-6*	MW-7*	MW-8*	MW-9	PZ-1	PZ-2
Baseline Sampling Results Summary (µg/L) - August 2015														
CVOCs	~	1274.9	2314	873.3	23.4	27.8	653	175	1236.3	1272	458	602	903.6	438.2
PCE	5	750	480	380	14	8.3	79	110	710	460	180	400	310	230
TCE	5	500	1800	480	5.9	16	540	55	500	780	240	190	580	200
cis-1,2- DCE	5	19	14	8.3	2.5	2.5	29	9	22	27	36	10	8.6	6.2
vinyl chloride	2	5.9	20	5	1	1	5	1	4.3	5	2	2	5	2
First Quarter Sampling Results Summary (µg/L) - January 2016														
CVOCs	~	12.8	2.14	7.6	23.4	16.13	14.8	1.87	676	11.41	184.56	5.8	10	2.6
PCE	5	6	1	2	20	14	3	1	240	2	15	4	3	1
TCE	5	5.3	0.74	5.2	3	1.7	11	0.37	400	9	130	1.4	5.4	1.2
cis-1,2- DCE	5	1.3	0.2	0.2	0.2	0.23	0.6	0.3	35	0.21	39	0.2	1.4	0.2
vinyl chloride	2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	1	0.2	0.56	0.2	0.2	0.2
Q1 Percent CVOC Reduction		*99%*	*99.9%*	*99%*	*0%*	*42%*	*98%*	*99%*	*45%*	*99%*	*60%*	*99%*	*99%*	*99%*
Second Quarter Sampling Results Summary (µg/L) - April 2016														
CVOCs	~	3.8	1.99	4.3	18.5	9.3	3.28	1.64	401	2.46	71.96	0.91	1.45	1.79
PCE	5	1.7	0.87	1.2	16	7.6	0.48	0.67	160	0.26	5.7	0.31	0.3	0.61
TCE	5	1.7	0.72	2.7	2.1	1.3	2.4	0.38	220	1.8	43	0.2	0.75	0.78
cis-1,2- DCE	5	0.2	0.2	0.2	0.2	0.2	0.2	0.39	19	0.2	23	0.2	0.2	0.2
vinyl chloride	2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	2	0.2	0.26	0.2	0.2	0.2
Q2 Percent CVOC Reduction from Last Quarter (Q1)		*70%*	*7%*	*43%*	*21%*	*42%*	*78%*	*12%*	*41%*	*78%*	*61%*	*84%*	*86%*	*31%*
Q2 Percent CVOC Reduction from Baseline		*99.7%*	*99.9%*	*99.5%*	*21%*	*67%*	*99.5%*	*99%*	*68%*	*99.8%*	*84%*	*99.8%*	*99.8%*	*99.6%*
Third Quarter Sampling Results Summary (µg/L) - July 2016														
CVOCs	~	1.65	4.26	7.69	24.5	14.01	6.26	3.48	1249.5	4.21	53.5	1.49	1.97	4.15
PCE	5	0.68	2.2	3	22	12	2.2	1.6	570	0.71	5.3	0.76	0.47	2
TCE	5	0.57	1.6	4.2	2.1	1.6	3.5	0.76	640	3.1	27	0.33	1.1	1.6
cis-1,2- DCE	5	0.2	0.26	0.29	0.2	0.21	0.36	0.92	39	0.2	21	0.2	0.2	0.35
vinyl chloride	2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.5	0.2	0.2	0.2	0.2	0.2
Q3 Percent CVOC Reduction from Last Quarter (Q2)		*57%*	*Increased*	*Increased*	*Increased*	*Increased*	*Increased*	*Increased*	*Increased*	*Increased*	*26%*	*Increased*	*Increased*	*Increased*
Q3 Percent CVOC Reduction from Baseline		*99.9%*	*99.8%*	*99.1%*	*Increased*	*50%*	*99%*	*98%*	*Increased*	*99.7%*	*88%*	*99.8%*	*99.8%*	*99.1%*

Notes:

1. Groundwater sample analytical results are compared to New York State Department of Environmental Conservation (NYSDEC) Technical and Operational Guidance Series (TOGS) 1.1.1 Ambient Water Quality Standards and Guidance Values for Class GA water.
2. Results exceeding the NYSDEC TOGS standards and guidance values are shaded.
3. PCE = tetrachlorothylene
4. TCE = trichloroethylene
5. cis-1,2-DCE = cis-1,2-Dichloroethylene
6. µg/L = microgram per liter
7. CVOC = chlorinated volatile organic compounds
8. * = Monitoring well is located in the sidewalk adjacent to the warehouse.

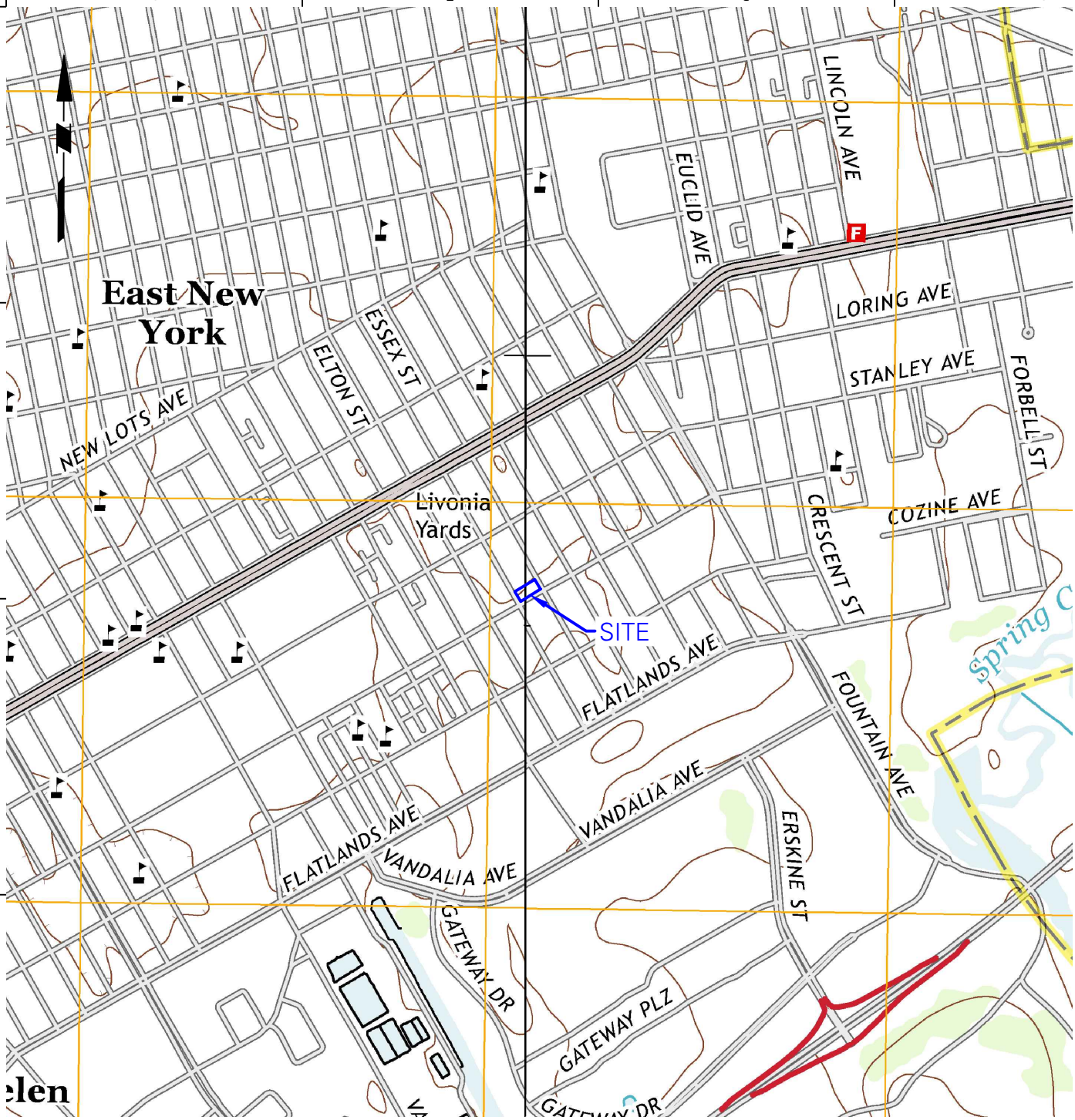
TABLE 8: QUARTERLY GROUNDWATER SAMPLING RESULTS SUMMARY
491 WORTMAN AVENUE
BROOKLYN, NEW YORK
LANGAN PROJECT NO. 170329301
BROWNFIELD CLEANUP PROGRAM SITE NO. C224139

Compound	NYSDEC TOGS STANDARDS AND GUIDANCE VALUES	Sampling Location												
		MW-1	MW-2	MW-3S	MW-3M	MW-3D	MW-4	MW-5	MW-6*	MW-7*	MW-8*	MW-9	PZ-1	PZ-2
Fourth Quarter Sampling Results Summary (µg/L) - October 2016														
CVOCs	~	0.91	8.39	18.59	18.1	11.36	3.38	0.84	158.4	1.1	33.9	0.99	0.81	1.57
PCE	5	0.22	4.6	8.8	16	10	0.98	0.24	67	0.2	2.7	0.39	0.2	0.54
TCE	5	0.29	3.2	9	1.7	0.96	2	0.2	87	0.5	19	0.2	0.21	0.63
cis-1,2- DCE	5	0.2	0.39	0.59	0.2	0.2	0.2	0.2	4.2	0.2	12	0.2	0.2	0.2
vinyl chloride	2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Q4 Percent CVOC Reduction from Last Quarter (Q3)		*45%*	*Increased*	*Increased*	*26%*	*19%*	*46%*	*76%*	*87%*	*74%*	*37%*	*34%*	*59%*	*62%*
Q4 Percent CVOC Reduction from Baseline		*99.9%*	*100%*	*98%*	*23%*	*59%*	*99%*	*100%*	*87%*	*99.9%*	*93%*	*99.8%*	*99.9%*	*99.6%*
Fifth Quarter Sampling Results Summary (µg/L) - January 2017														
CVOCs	~	0.8	1.32	20.71	21.1	14.21	1.89	1.02	812.7	0.9	42.4	7.9	0.8	1.49
PCE	5	0.2	0.56	10	19	13	0.52	0.42	380	0.2	3.2	5.5	0.2	0.66
TCE	5	0.2	0.36	10	1.7	0.81	0.97	0.2	410	0.3	20	2	0.2	0.43
cis-1,2- DCE	5	0.2	0.2	0.51	0.2	0.2	0.2	0.2	22	0.2	19	0.2	0.2	0.2
vinyl chloride	2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.7	0.2	0.2	0.2	0.2	0.2
Q5 Percent CVOC Reduction from Last Quarter (Q4)		*12%*	*84%*	*Increased*	*Increased*	*Increased*	*44%*	*Increased*	*Increased*	*18%*	*Increased*	*Increased*	*1%*	*5%*
Q5 Percent CVOC Reduction from Baseline		*99.9%*	*100%*	*98%*	*10%*	*49%*	*100%*	*99%*	*34%*	*99.9%*	*91%*	*98.7%*	*99.9%*	*99.7%*

Notes:

1. Groundwater sample analytical results are compared to New York State Department of Environmental Conservation (NYSDEC) Technical and Operational Guidance Series (TOGS) 1.1.1 Ambient Water Quality Standards and Guidance Values for Class GA water.
2. Results exceeding the NYSDEC TOGS standards and guidance values are shaded.
3. PCE = tetrachlorothylene
4. TCE = trichloroethylene
5. cis-1,2-DCE = cis-1,2-Dichloroethylene
6. µg/L = microgram per liter
7. CVOC = chlorinated volatile organic compounds
8. * = Monitoring well is located in the sidewalk adjacent to the warehouse.

FIGURES



LEGEND:

APPROXIMATE SITE BOUNDARY

NOTE: BASE MAPS ARE REFERENCED FROM THE UNITED STATES GEOLOGICAL SURVEY (USGS) TOPOGRAPHIC QUADRANGLE MAPS FOR BROOKLYN AND JAMAICA.

LANGAN

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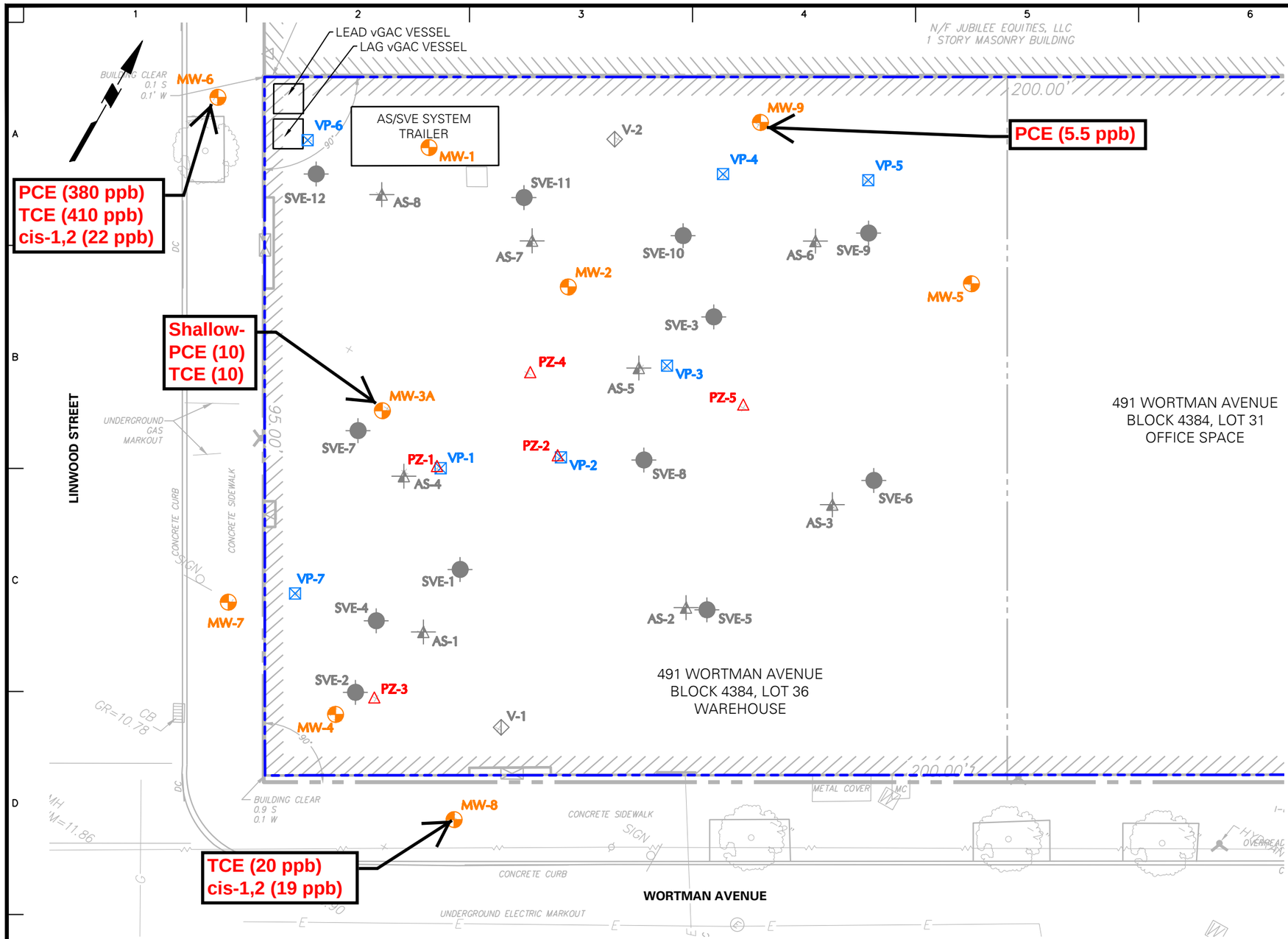
Langan CT, Inc.
Langan International LLC
Collectively known as Langan

Project	491 WORTMAN AVENUE BLOCK No. 4384, LOT Nos. 31 & 36 BROOKLYN KINGS NEW YORK
Figure Title	SITE LOCATION MAP
Project No.	170329301
Date	04/18/2015
Scale	N.T.S.
Drawn By / Checked By	MLR / GN
Submission Date	
Figure	1
Sheet	1 of 2

Filename: \\langan.com\data\NYC\data3\170329301\Cadd Data - 170329301\SheetFiles\Monthly Report 19\Figure 1 - Site Location Map - Updated.dwg Date: 2/8/2017 Time: 14:08 User: mrogers Style Table: Langan.stb Layout: Site Location Map



LEGEND:

- BUILDING LIMITS
- AS-6 — AIR SPARGE WELL
- SVE-9 — SOIL VAPOR EXTRACTION WELL
- VP-5 — VAPOR PROBE
- V-2 — VENT WELL
- MW-5 — MONITORING WELL
- PZ-5 — PIEZOMETER

NOTES:

1. THE BASEMAP IS REFERENCED FROM THE 491 WORTMAN AVENUE BOUNDARY SURVEY PREPARED BY LANGAN ENGINEERING, ENVIRONMENTAL, SURVEY, AND LANDSCAPE ARCHITECTURE, D.P.C. (LANGAN), DATED NOVEMBER 2, 2015
2. WELL LOCATIONS ARE BASED ON THE BOUNDARY SURVEY.
3. ELEVATIONS SHOWN ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).
4. 11 GROUNDWATER MONITORING WELLS AND 2 PIEZOMETERS ARE INCLUDED AS PART OF THE QUARTERLY GROUNDWATER SAMPLING PROGRAM.
5. MW-3A IS A NESTED MONITORING LOCATION WITH THREE SEPARATE WELLS SCREENED ACROSS A SHALLOW, MIDDLE, AND DEEP INTERVAL.

WARNING: IT IS A VIOLATION OF THE NYS EDUCATION LAW ARTICLE 145 FOR ANY PERSON, UNLESS HE IS ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS ITEM IN ANY WAY.

15 0 7.5 15
SCALE IN FEET

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Project
491 WORTMAN AVENUE
BLOCK No. 4384, LOT Nos. 31 & 36
BROOKLYN
KINGS **NEW YORK**

Figure Title
ON-SITE GROUNDWATER MONITORING LOCATIONS

Project No. 170329301	Figure No. 2
Date 01/21/2016	
Scale AS SHOWN	
Drawn By TCS / Checked By GN	
Submission Date	Sheet 2 of 2

Filename: \\langan.com\data\NY\data3\170329301\Cadd Data - 170329301\SheetFiles\Monthly Report 19\Figure 2 - Quarterly GW Wells.dwg Date: 2/8/2017 Time: 14:09 User: mrogers Style Table: Langan.stb Layout: ANSIB-BL

Progress Report No. 20
J&H Holding Company, LLC
491 Wortman Avenue, Brooklyn, NY 11208
Brownfield Cleanup Program Site No. C224139
Reporting Period: February 2017

1. Introduction

Langan Engineering, Environmental, Surveying and Landscape Architecture, D.P.C. (Langan) submits this monthly progress report on behalf of J&H Holding Company, LLC (the "Participant"). Monthly progress report submittal to the New York State Department of Environmental Conservation (NYSDEC) is performed in accordance with the Brownfield Cleanup Agreement (BCA) and Section 3.2 of the NYSDEC-approved Interim Remedial Measures Work Plan (IRMWP), prepared by Langan, dated April 28, 2015, and revised June 16, 2015. This monthly progress report summarizes work performed at 491 Wortman Avenue, Brooklyn, New York (the "Site") during February 2017.

The Site (Block 4384, Lots 31 & 36) is located at 491 Wortman Avenue in Brooklyn, New York (Figure 1) and consists of a rectangular shaped lot that is about 19,000 square feet (±0.44 acres). The Site is located in an area zoned for industrial/manufacturing use and is bound by Wortman Street to the south, Linwood Street to the west, Essex Street to the east and a one-story building to the north. Currently, a one-story building with a partial basement covers the entire Site footprint. The one-story building is comprised of a warehouse (i.e., the western portion) and office space (i.e. the eastern portion).

Environmental site investigations began in November 2008. Langan submitted the IRMWP, which the NYSDEC approved on June 18, 2015. Implementation of the IRMWP and the pending environmental activities are described further in this progress report.

2. Remedial Actions Relative to the Site during this Reporting Period

On February 22, 2017, Langan conducted radius-of-influence (ROI) testing at air sparge well AS-8 to determine its level of influence on monitoring well MW-6. The testing, which involved increasing the flow to AS-8 and collecting pressure data at MW-6, concluded that AS-8 does influence MW-6 when operated at the optimum flow range of 20 to 30 standard cubic feet per minute (scfm). To divert additional flow to AS-8, air sparge wells AS-3, AS-5, and AS-7 and soil vapor extraction wells SVE-3 and SVE-6 were shutdown. These air sparge and soil vapor extraction wells were chosen for shutdown because the sustained reductions observed in the nearby monitoring wells during the past five rounds of quarterly groundwater sampling. This system change will target trichloroethene (TCE) and tetrachloroethene (PCE) groundwater concentrations identified in MW-6 and enable rebound testing at monitoring wells MW-2 and PZ-2.

Following completion of the ROI test on February 22nd, Langan identified an issue with the soil vapor extraction (SVE) system's vapor/liquid separator (VLS) level switches that required shut down of the air sparge and soil vapor extraction (AS/SVE) system until a replacement level

switch assembly could be delivered to the site. On March 7, 2017, Langan installed the replacement level switch assembly and tested all of the electrical connections and controls associated with function of the VLS level switches.

On February 28, 2017, two drums containing nonhazardous wastewater were transported off-site to Clean Water of New York in Staten Island, New York by AARCO Environmental Services Corp. (AARCO). An additional drum containing hazardous wastewater was transported to Ross Incineration in Grafton, Ohio by AARCO.

On March 7th, following installation of the new level switch assembly, Langan recorded process and performance monitoring data for the AS/SVE system. As part of the monthly inspection, vapor samples were collected prior to the lead vapor-phase granular activated carbon (vGAC) unit (i.e., influent) and after the lag vGAC unit (i.e., effluent). Routine equipment maintenance was performed as part of the annual maintenance.

On March 8th, the AS/SVE system shut down after the low programmable logic controller (PLC) battery alarm was triggered. The AS/SVE system was inspected remotely, and Langan determined that the PLC battery would need to be replaced before restarting the AS/SVE system.

3. Actions Relative to the Site Anticipated for the Next Reporting Period

The following activities are planned:

- Receipt of final comments on the RAWP and start of the RAWP 45-day public comment period.
- Replacement of the PLC battery and start-up of the AS/SVE system.
- Continued operation, maintenance and monitoring (OM&M) of the AS/SVE system
- Preparation and submission of a Site Management Plan

4. Approved Activity Modifications (changes of work scope and/or schedule)

None

5. Results of Sampling, Testing and Other Relevant Data

OM&M sampling was performed as follows:

- An influent vapor sample was collected from the AS/SVE system and analyzed for volatile organic compounds (VOCs) via United States Environmental Protection Agency (USEPA) Method TO-15.
- An effluent vapor sample was collected from the AS/SVE system and analyzed for VOCs via USEPA Method TO-15.

Samples were analyzed by York Analytical Laboratories Inc. (York) of Stratford, CT. York is a New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP)-certified laboratory.

Laboratory analysis of the vapor samples was not complete as of the date of this progress report, and as such, the analytical results will be reported in next month's report. Tables 2, 4, and 5 (see below) are not included in this month's report.

The following tables are attached to this progress report; analytical lab reports are available upon request. The tables summarize the data collected to date and the functionality of the AS/SVE system, including mass of VOCs removed from the subsurface based on PID readings and laboratory data, as well as, the alarm history.

- Table 1: AS/SVE System Vapor Sampling Summary
- Table 2: AS/SVE System Vapor Sampling Results – not included
- Table 3: AS/SVE System Mass Removal – PID Data
- Table 4: AS/SVE System Mass Removal – Laboratory Data – not included
- Table 5: AS/SVE System DAR-1 Compliance – not included
- Table 6: AS/SVE System Alarm History

6. Deliverables Submitted During This Reporting Period

A revised draft of the Remedial Action Work Plan was submitted via email to the NYSDEC for review on February 16, 2017.

7. Information Regarding Percentage of Completion

OM&M of the AS/SVE system is ongoing.

As of March 7, 2017 and since inception, the SVE system operated for 11,195 hours (93% uptime), and the AS system operated for 10,729 hours (89% uptime).

8. Unresolved Delays Encountered or Anticipated That May Affect the Schedule and Mitigation Efforts

None

9. Citizen Participation Plan Activities during This Reporting Period

None

10. Activities Anticipated in Support of the CPP for the Next Reporting Period

None

11. Miscellaneous Information

The next monthly inspection will be conducted during third or fourth week of April 2017.

TABLES

TABLE 1: AS/SVE SYSTEM VAPOR SAMPLING SUMMARY
491 WORTMAN AVENUE
BROOKLYN, NEW YORK
LANGAN PROJECT NO. 170329301
BROWNFIELD CLEANUP PROGRAM SITE NO. C224139

SAMPLE NAME	SAMPLE DATE	SAMPLE TYPE	LOCATION	ANALYSIS
AS/SVE SYSTEM VAPOR SAMPLES				
Influent 102015	10/20/2015	Three, 1-Liter Tedlar Bags	vGAC Vessel Influent	TO-15 VOCs
Effluent 102015	10/20/2015	Three, 1-Liter Tedlar Bags	vGAC Vessel Effluent	TO-15 VOCs
Influent_102115	10/21/2015	Three, 1-Liter Tedlar Bags	vGAC Vessel Influent	TO-15 VOCs
Effluent_102115	10/21/2015	Three, 1-Liter Tedlar Bags	vGAC Vessel Effluent	TO-15 VOCs
Influent_102615	10/26/2015	Three, 1-Liter Tedlar Bags	vGAC Vessel Influent	TO-15 VOCs
Effluent_102615	10/26/2015	Three, 1-Liter Tedlar Bags	vGAC Vessel Effluent	TO-15 VOCs
Influent_113015	11/30/2015	Three, 1-Liter Tedlar Bags	vGAC Vessel Influent	TO-15 VOCs
Effluent_113015	11/30/2015	Three, 1-Liter Tedlar Bags	vGAC Vessel Effluent	TO-15 VOCs
Influent_122815	12/28/2015	Three, 1-Liter Tedlar Bags	vGAC Vessel Influent	TO-15 VOCs
Effluent_122815	12/28/2015	Three, 1-Liter Tedlar Bags	vGAC Vessel Effluent	TO-15 VOCs
Influent_012716	1/27/2016	Three, 1-Liter Tedlar Bags	vGAC Vessel Influent	TO-15 VOCs
Effluent_012716	1/27/2016	Three, 1-Liter Tedlar Bags	vGAC Vessel Effluent	TO-15 VOCs
Influent_022416	2/24/2016	Three, 1-Liter Tedlar Bags	vGAC Vessel Influent	TO-15 VOCs
Mid_022416	2/24/2016	Three, 1-Liter Tedlar Bags	vGAC Vessel Mid-Point	TO-15 VOCs
Effluent_022416	2/24/2016	Three, 1-Liter Tedlar Bags	vGAC Vessel Effluent	TO-15 VOCs
Influent_033016	3/30/2016	Three, 1-Liter Tedlar Bags	vGAC Vessel Influent	TO-15 VOCs
Effluent_033016	3/30/2016	Three, 1-Liter Tedlar Bags	vGAC Vessel Effluent	TO-15 VOCs
Influent_042916	4/29/2016	Three, 1-Liter Tedlar Bags	vGAC Vessel Influent	TO-15 VOCs
Effluent_042916	4/29/2016	Three, 1-Liter Tedlar Bags	vGAC Vessel Effluent	TO-15 VOCs
Influent_052616	5/26/2016	Three, 1-Liter Tedlar Bags	vGAC Vessel Influent	TO-15 VOCs
Effluent_052616	5/26/2016	Three, 1-Liter Tedlar Bags	vGAC Vessel Effluent	TO-15 VOCs
Influent_062916	6/29/2016	Three, 1-Liter Tedlar Bags	vGAC Vessel Influent	TO-15 VOCs
Effluent_062916	6/29/2016	Three, 1-Liter Tedlar Bags	vGAC Vessel Effluent	TO-15 VOCs
Influent_072816	7/28/2016	One, 3-Liter Tedlar Bags	vGAC Vessel Influent	TO-15 VOCs
Effluent_072816	7/28/2016	One, 3-Liter Tedlar Bags	vGAC Vessel Effluent	TO-15 VOCs
Influent_083116	8/31/2016	One, 3-Liter Tedlar Bags	vGAC Vessel Influent	TO-15 VOCs
Effluent_083116	8/31/2016	One, 3-Liter Tedlar Bags	vGAC Vessel Effluent	TO-15 VOCs
Influent_092916	9/29/2016	One, 3-Liter Tedlar Bags	vGAC Vessel Influent	TO-15 VOCs
Midpoint_092916	9/29/2016	One, 3-Liter Tedlar Bags	vGAAC Vessel Mid-Point	TO-15 VOCs
Effluent_092916	9/29/2016	One, 3-Liter Tedlar Bags	vGAC Vessel Effluent	TO-15 VOCs
Influent_103116	10/31/2016	One, 3-Liter Tedlar Bags	vGAC Vessel Influent	TO-15 VOCs
Effluent_103116	10/31/2016	One, 3-Liter Tedlar Bags	vGAC Vessel Effluent	TO-15 VOCs
Influent_112916	11/29/2016	One, 3-Liter Tedlar Bags	vGAC Vessel Influent	TO-15 VOCs
Effluent_112916	11/29/2016	One, 3-Liter Tedlar Bags	vGAC Vessel Effluent	TO-15 VOCs
Influent_122816	12/28/2016	One, 3-Liter Tedlar Bags	vGAC Vessel Influent	TO-15 VOCs
Effluent_122816	12/28/2016	One, 3-Liter Tedlar Bags	vGAC Vessel Effluent	TO-15 VOCs
Influent_012517	1/25/2017	One, 3-Liter Tedlar Bags	vGAC Vessel Influent	TO-15 VOCs
Midpoint_012517	1/25/2017	One, 3-Liter Tedlar Bags	vGAAC Vessel Mid-Point	TO-15 VOCs
Effluent_012517	1/25/2017	One, 3-Liter Tedlar Bags	vGAC Vessel Effluent	TO-15 VOCs
Influent_030717	3/7/2017	One, 3-Liter Tedlar Bags	vGAC Vessel Influent	TO-15 VOCs
Effluent_030717	3/7/2017	One, 3-Liter Tedlar Bags	vGAC Vessel Effluent	TO-15 VOCs

Notes:

1. The vapor samples were analyzed for VOCs via USEPA Method TO-15.
2. USEPA = United States Environmental Protection Agency
3. VOCs = volatile organic compounds
4. AS/SVE = air sparge/soil vapor extraction
5. vGAC = vapor-phase granular activated carbon

TABLE 3: AS/SVE SYSTEM MASS REMOVAL - PID DATA
491 WORTMAN AVENUE
BROOKLYN, NEW YORK
LANGAN PROJECT NO. 170329301
BROWNFIELD CLEANUP PROGRAM SITE NO. C224139

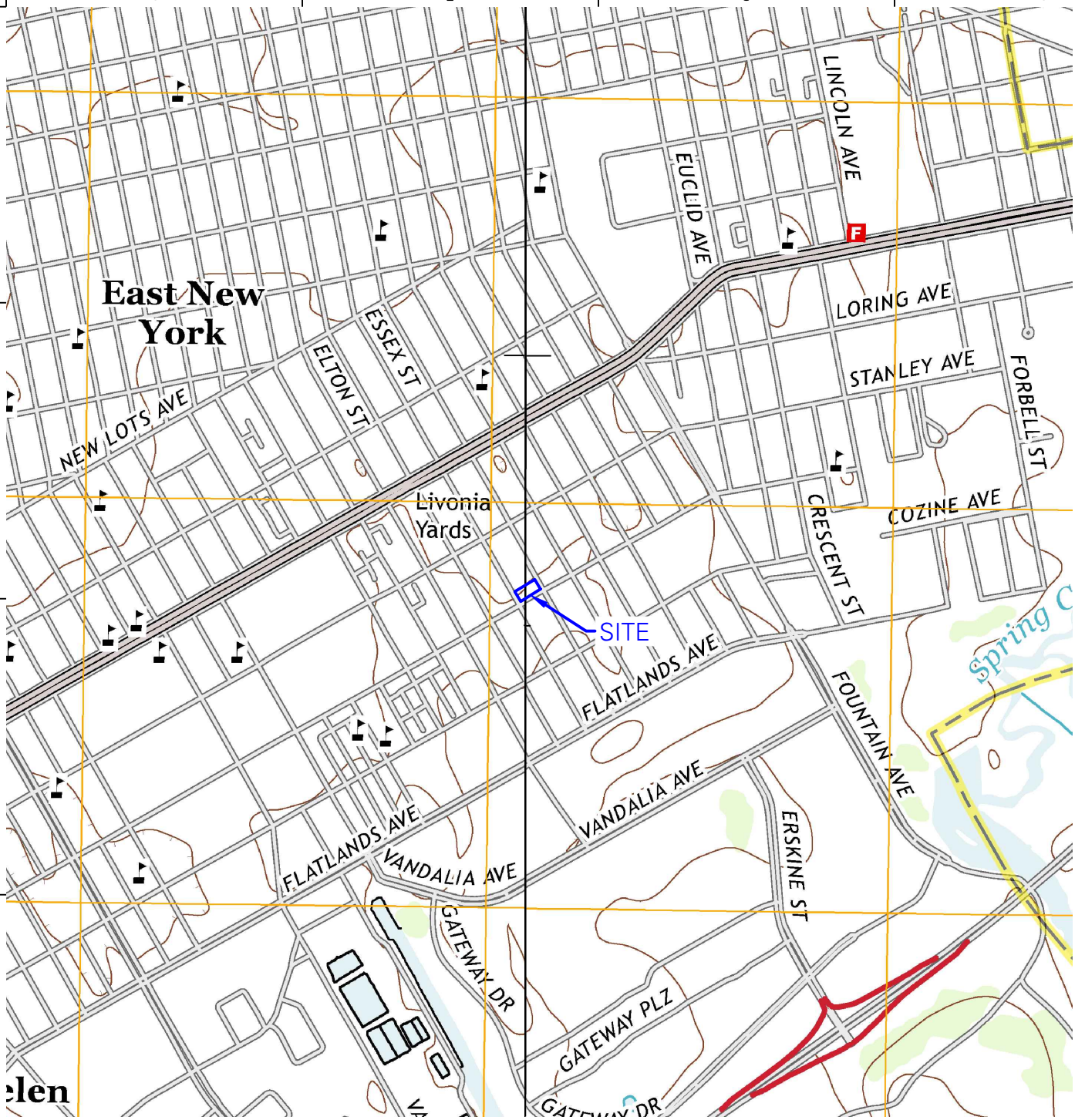
DATE	INFLUENT CONCENTRATION (ppmv)	SVE BLOWER FLOWRATE (scfm)	EFFLUENT CONCENTRATION (ppmv)	TOTAL OPERATIONAL HOURS	AVERAGE MOLECULAR WEIGHT	MASS REMOVAL RATE (lbs/hr)	TOTAL MASS REMOVED FROM SUBSURFACE (lbs)	CUMULATIVE MASS REMOVED FROM SUBSURFACE (lbs)
10/21/2015	55.0	688	1.8	30	100	0.57	17.02	17.02
10/26/2015	8.3	650	0.6	150	100	0.08	9.31	26.34
11/6/2015	5.5	560	0.0	383	100	0.05	11.13	37.46
11/30/2015	1.9	593	0.3	958	100	0.01	8.46	45.92
12/28/2015	3.7	570	0.0	1,548	100	0.03	19.29	65.21
1/27/2016	1.2	525	0.5	2,180	100	0.01	3.60	68.81
2/24/2016	2.5	578	0.0	2,854	100	0.02	15.10	83.91
3/30/2016	0.2	550	0.0	3,693	100	0.002	1.43	85.34
4/29/2016	2.0	571	0.0	4,322	100	0.018	11.14	96.48
5/26/2016	0.4	600	0.0	4,972	100	0.004	2.42	98.90
6/29/2016	0.5	600	0.0	5,784	100	0.005	3.78	102.68
7/28/2016	3.0	600	0.0	6,431	100	0.028	18.06	120.73
8/31/2016	2.7	600	0.0	7,110	100	0.025	17.05	137.79
9/29/2016	7.5	760	2.0	7,802	100	0.065	44.85	182.63
10/31/2016	0.0	520	0.0	8,516	100	0.000	0.00	182.63
11/29/2016	0.0	560	0.0	9,211	100	0.000	0.00	182.63
12/28/2016	0.0	520	0.0	9,884	100	0.000	0.00	182.63
1/25/2017	2.8	600	0.0	10,530	100	0.026	16.83	199.46
3/7/2017	0.1	360	0.0	11,186	100	0.001	0.37	199.82

NOTES:
1. Blower flowrate is recorded from PDI-701 pitot tube flow indicator located on the blower discharge line.
2. The influent and effluent concentrations are based on the PID readings.
3. Mass Removal rate (lb/hr) = ((Conc in ppmv)(flowrate scfm)(MW)(60 min/hr)) / ((387)(1,000,000)).
4. PID = photoionization detector
5. ppmv = parts per million volume
6. scfm = standard cubic feet per minute
7. lbs/hr = pounds per hour
8. lbs = pounds
9. SVE = soil vapor extraction

TABLE 6: AS/SVE SYSTEM ALARM HISTORY
491 WORTMAN AVENUE
BROOKLYN, NEW YORK
LANGAN PROJECT NO. 170329301
BROWNFIELD CLEANUP PROGRAM NO. C224139

DATE	ALARM	ALARM DESCRIPTION	REASON	REMEDY
10/23/2015	PAL-2501	Compressor Low Pressure Alarm	Uncertain of the reason. There may be a power fluctuation that trips the low pressure alarm, which shuts the AS system down.	On-site observation confirmed that this was a false alarm and was not caused by compressor failure or a breach in the air sparge manifold. The alarm was manually reset.
10/28/2015	LAH-7301	Storage Tank High Level Alarm	The SVE system began to extract a larger volume of water than previously anticipated.	The storage tank was emptied into nine 55-gallon drums, and the SVE system vacuum has been optimized to extract a lesser volume of water.
11/5/2015	PAL-2501	Compressor Low Pressure Alarm	Caused by the air sparge compressor on/off time, which won't allow "OFF" time to be set to zero and therefore, the compressor cannot run continuously.	The air compressor timer has been by-passed and the compressor operation is linked to the SVE system operation. If the SVE system is operational, the compressor will operate unless a different AS system alarm has been triggered.
11/17/2015	PAL-2501	Compressor Low Pressure Alarm	This was an alarm test that was performed to ensure that the update to the Programmable Logic Controller (PLC) was successful.	The PLC update was successful and the air sparge compressor can run continuously. The air compressor timer is no longer being bypassed.
12/23/2015	LAH-7301	Storage Tank High Level Alarm	Following optimization, which included increasing the AS rate and the SVE system flow rate, the SVE system began to extract a larger volume of water than previously anticipated.	The storage tank was emptied into three 55-gallon drums. Both the AS and SVE system flow rates were adjusted in an effort to reduce excess water collection by the SVE system.
12/25/2015	LAH-7301	Storage Tank High Level Alarm	Following optimization, which included increasing the AS rate and the SVE system flow rate, the SVE system began to extract a larger volume of water than previously anticipated.	The storage tank was emptied into three 55-gallon drums. Both the AS and SVE system flow rates were adjusted in an effort to reduce excess water collection by the SVE system.
1/7/2016	LAH-7301	Storage Tank High Level Alarm	Following continued optimization of AS/SVE system, the SVE system began to extract a larger volume of water than anticipated.	The storage tank was emptied into eight 55-gallon drums. Both the AS and SVE system flow rates were adjusted in an effort to reduce excess water collection by the SVE system.
1/17/2016	LAH-7301	Storage Tank High Level Alarm	Following continued optimization of AS/SVE system, the SVE system began to extract a larger volume of water than anticipated.	The storage tank was emptied. Both the AS and SVE system flow rates were adjusted in an effort to reduce excess water collection by the SVE system.
2/1/2016	TAH-2501	Air Compressor High Temperature Alarm	The AS system is operating close to the alarm set point so that as much warm air as possible is continuously injected into the subsurface. A slight change in the air flow rate and/or ambient temperature most likely caused the rise in discharge air temperature.	The alarm was cleared and the AS system was restarted at a lower speed. The compressor speed was ramped up incrementally throughout the day until the previous set point was reached. The heat exchanger flow and AS manifold temperature are being monitored on a daily basis in an effort to prevent tripping the high temperature alarm again.
4/3/2016	PAL-701	Blower Influent High Pressure Alarm	The alarm was most likely triggered due to power fluctuations caused by high wind conditions.	The alarm was cleared and the SVE system was restarted at a higher frequency. The system was monitored remotely for the remainder of the day.
4/29/2016	TAH-2501	Air Compressor High Temperature Alarm	The AS system is operating close to the alarm set point so that as much warm air as possible is continuously injected into the subsurface. A slight change in the air flow rate and/or ambient temperature most likely caused the rise in discharge air temperature.	The alarm was cleared and the AS system was restarted. At restart, the allowable flow through the AS system was increased to alleviate the pressure on the air compressor discharge line. The heat exchanger flow and AS manifold temperature are being monitored on a daily basis in an effort to prevent tripping the high temperature alarm again.
8/9/2016	PAH-702	SVE System Effluent High Pressure Alarm	Anomalously high pressures were not noted on the SVE system discharge during the remote or on-site inspections. It is likely that the SVE effluent pressure switch needs to be recalibrated following almost a year's worth of continuous use.	The SVE system was restarted at a lower frequency and monitored on-site for about two hours.
8/26/2016	FAL-701	Blower Low Flow Alarm	The alarm was triggered due to a loose relay switch.	The switch was tightened during the August 31, 2016 monthly inspection and the system was restarted without further issue.
12/27/2016	PAL-2501	Compressor Low Pressure Alarm	The alarm was triggered due to a mechanical failure at the air compressor (i.e., the belts tore).	The air compressor belts were replaced on January 9, 2017 and the system was restarted.
3/7/2017	FAL-401	Transfer Pump Low Flow Alarm	The alarm was likley triggered due to the fluctuating volume of water extracted by the SVE system.	The AS/SVE system was restarted. Both the AS and SVE system flow rates were adjusted in an effort to reduce excess water collection by the SVE system.
3/8/2017	Low PLC Battery	Low Programmable Loigc Controller (PLC) Battery	The alarm was triggered because the PLC battery can no longer hold a charge.	The PLC battery will be replaced.

FIGURES



LEGEND:

APPROXIMATE SITE BOUNDARY

NOTE: BASE MAPS ARE REFERENCED FROM THE UNITED STATES GEOLOGICAL SURVEY (USGS) TOPOGRAPHIC QUADRANGLE MAPS FOR BROOKLYN AND JAMAICA.

LANGAN

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Langan Engineering and Environmental Services, Inc.
Langan CT, Inc.
Langan International LLC
Collectively known as Langan

Project

491 WORTMAN AVENUE

BLOCK No. 4384, LOT Nos. 31 & 36
BROOKLYN
KINGS NEW YORK

Figure Title

SITE LOCATION MAP

Project No. 170329301	Figure 1
Date 04/18/2015	
Scale N.T.S.	
Drawn By MLR / Checked By GN	
Submission Date	Sheet 1 of 1

Filename: \\langan.com\data\NYC\data3\170329301\Cadd Data - 170329301\SheetFiles\Monthly Report 17 - Figure 1 Only\Figure 1 - Site Location Map.dwg Date: 12/5/2016 Time: 11:40 User: mrogers Style Table: Langan.stb Layout: Site Location Map

Progress Report No. 21
J&H Holding Company, LLC
491 Wortman Avenue, Brooklyn, NY 11208
Brownfield Cleanup Program Site No. C224139
Reporting Period: March 2017

1. Introduction

Langan Engineering, Environmental, Surveying and Landscape Architecture, D.P.C. (Langan) submits this monthly progress report on behalf of J&H Holding Company, LLC (the "Participant"). Monthly progress report submittal to the New York State Department of Environmental Conservation (NYSDEC) is performed in accordance with the Brownfield Cleanup Agreement (BCA) and Section 3.2 of the NYSDEC-approved Interim Remedial Measures Work Plan (IRMWP), prepared by Langan, dated April 28, 2015, and revised June 16, 2015. This monthly progress report summarizes work performed at 491 Wortman Avenue, Brooklyn, New York (the "Site") during March 2017.

The Site (Block 4384, Lots 31 & 36) is located at 491 Wortman Avenue in Brooklyn, New York (Figure 1) and consists of a rectangular shaped lot that is about 19,000 square feet (±0.44 acres). The Site is located in an area zoned for industrial/manufacturing use and is bound by Wortman Street to the south, Linwood Street to the west, Essex Street to the east and a one-story building to the north. Currently, a one-story building with a partial basement covers the entire Site footprint. The one-story building is comprised of a warehouse (i.e., the western portion) and office space (i.e. the eastern portion).

Environmental site investigations began in November 2008. Langan submitted the IRMWP, which the NYSDEC approved on June 18, 2015. Implementation of the IRMWP and the pending environmental activities are described further in this progress report.

2. Remedial Actions Relative to the Site during this Reporting Period

On March 7th, following installation of the new level switch assembly, Langan recorded process and performance monitoring data for the air sparge and soil vapor extraction (AS/SVE) system. As part of the monthly inspection, vapor samples were collected prior to the lead vapor-phase granular activated carbon (vGAC) unit (i.e., influent) and after the lag vGAC unit (i.e., effluent). Routine equipment maintenance was performed as part of the annual maintenance.

On March 8th, the AS/SVE system shut down after the low programmable logic controller (PLC) battery alarm was triggered. The AS/SVE system was inspected remotely, and Langan determined that the PLC battery would need to be replaced before restarting the AS/SVE system. On March 10th, Langan replaced the PLC battery and restarted the AS/SVE system.

On March 24th, the SVE system variable frequency drive (VFD) alarm was triggered, and on March 28th, Langan was on-site to visually inspect the AS/SVE system. A piece of debris caught in the SVE system blower belts was the cause of the alarm. The debris was removed and the system was restarted.

3. Actions Relative to the Site Anticipated for the Next Reporting Period

The following activities are planned:

- Continued operation, maintenance and monitoring (OM&M) of the AS/SVE system
- Preparation and submission of a Site Management Plan

4. Approved Activity Modifications (changes of work scope and/or schedule)

None

5. Results of Sampling, Testing and Other Relevant Data

OM&M sampling was performed as follows:

- An influent vapor sample was collected from the AS/SVE system and analyzed for volatile organic compounds (VOCs) via United States Environmental Protection Agency (USEPA) Method TO-15.
- An effluent vapor sample was collected from the AS/SVE system and analyzed for VOCs via USEPA Method TO-15.

Samples were analyzed by York Analytical Laboratories Inc. (York) of Stratford, CT. York is a New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP)-certified laboratory.

Based on the results of the most recent OM&M sampling, the AS/SVE system is functioning in compliance with Policy DAR-1: Guidelines for the Control of Toxic Ambient Air Contaminants (DAR-1).

The following tables are attached to this progress report; analytical lab reports are available upon request. The tables summarize the data collected to date and the functionality of the AS/SVE system, including mass of VOCs removed from the subsurface based on PID readings and laboratory data, as well as, the alarm history.

- Table 1: AS/SVE System Vapor Sampling Summary
- Table 2: AS/SVE System Vapor Sampling Results
- Table 3: AS/SVE System Mass Removal – PID Data (not included because a monthly inspection was not completed)
- Table 4: AS/SVE System Mass Removal – Laboratory Data
- Table 5: AS/SVE System DAR-1 Compliance – March 7, 2017
- Table 6: AS/SVE System Alarm History

6. Deliverables Submitted During This Reporting Period

Although not technically in this reporting period, the Environmental Easement was recorded with the NYSDEC on April 4, 2017.

7. Information Regarding Percentage of Completion

OM&M of the AS/SVE system is ongoing.

As of April 6, 2017 and since inception, the SVE system operated for 11,757 hours (92% uptime), and the AS system operated for 11,291 hours (88% uptime).

8. Unresolved Delays Encountered or Anticipated That May Affect the Schedule and Mitigation Efforts

None

9. Citizen Participation Plan Activities during This Reporting Period

Although not technically in this reporting period, the 45-day public comment period for the Remedial Action Work Plan began on April 5, 2017.

10. Activities Anticipated in Support of the CPP for the Next Reporting Period

None

11. Miscellaneous Information

The next monthly inspection will be conducted during third or fourth week of April 2017.

TABLES

TABLE 1: AS/SVE SYSTEM VAPOR SAMPLING SUMMARY
491 WORTMAN AVENUE
BROOKLYN, NEW YORK
LANGAN PROJECT NO. 170329301
BROWNFIELD CLEANUP PROGRAM SITE NO. C224139

SAMPLE NAME	SAMPLE DATE	SAMPLE TYPE	LOCATION	ANALYSIS
AS/SVE SYSTEM VAPOR SAMPLES				
Influent 102015	10/20/2015	Three, 1-Liter Tedlar Bags	vGAC Vessel Influent	TO-15 VOCs
Effluent 102015	10/20/2015	Three, 1-Liter Tedlar Bags	vGAC Vessel Effluent	TO-15 VOCs
Influent_102115	10/21/2015	Three, 1-Liter Tedlar Bags	vGAC Vessel Influent	TO-15 VOCs
Effluent_102115	10/21/2015	Three, 1-Liter Tedlar Bags	vGAC Vessel Effluent	TO-15 VOCs
Influent_102615	10/26/2015	Three, 1-Liter Tedlar Bags	vGAC Vessel Influent	TO-15 VOCs
Effluent_102615	10/26/2015	Three, 1-Liter Tedlar Bags	vGAC Vessel Effluent	TO-15 VOCs
Influent_113015	11/30/2015	Three, 1-Liter Tedlar Bags	vGAC Vessel Influent	TO-15 VOCs
Effluent_113015	11/30/2015	Three, 1-Liter Tedlar Bags	vGAC Vessel Effluent	TO-15 VOCs
Influent_122815	12/28/2015	Three, 1-Liter Tedlar Bags	vGAC Vessel Influent	TO-15 VOCs
Effluent_122815	12/28/2015	Three, 1-Liter Tedlar Bags	vGAC Vessel Effluent	TO-15 VOCs
Influent_012716	1/27/2016	Three, 1-Liter Tedlar Bags	vGAC Vessel Influent	TO-15 VOCs
Effluent_012716	1/27/2016	Three, 1-Liter Tedlar Bags	vGAC Vessel Effluent	TO-15 VOCs
Influent_022416	2/24/2016	Three, 1-Liter Tedlar Bags	vGAC Vessel Influent	TO-15 VOCs
Mid_022416	2/24/2016	Three, 1-Liter Tedlar Bags	vGAC Vessel Mid-Point	TO-15 VOCs
Effluent_022416	2/24/2016	Three, 1-Liter Tedlar Bags	vGAC Vessel Effluent	TO-15 VOCs
Influent_033016	3/30/2016	Three, 1-Liter Tedlar Bags	vGAC Vessel Influent	TO-15 VOCs
Effluent_033016	3/30/2016	Three, 1-Liter Tedlar Bags	vGAC Vessel Effluent	TO-15 VOCs
Influent_042916	4/29/2016	Three, 1-Liter Tedlar Bags	vGAC Vessel Influent	TO-15 VOCs
Effluent_042916	4/29/2016	Three, 1-Liter Tedlar Bags	vGAC Vessel Effluent	TO-15 VOCs
Influent_052616	5/26/2016	Three, 1-Liter Tedlar Bags	vGAC Vessel Influent	TO-15 VOCs
Effluent_052616	5/26/2016	Three, 1-Liter Tedlar Bags	vGAC Vessel Effluent	TO-15 VOCs
Influent_062916	6/29/2016	Three, 1-Liter Tedlar Bags	vGAC Vessel Influent	TO-15 VOCs
Effluent_062916	6/29/2016	Three, 1-Liter Tedlar Bags	vGAC Vessel Effluent	TO-15 VOCs
Influent_072816	7/28/2016	One, 3-Liter Tedlar Bags	vGAC Vessel Influent	TO-15 VOCs
Effluent_072816	7/28/2016	One, 3-Liter Tedlar Bags	vGAC Vessel Effluent	TO-15 VOCs
Influent_083116	8/31/2016	One, 3-Liter Tedlar Bags	vGAC Vessel Influent	TO-15 VOCs
Effluent_083116	8/31/2016	One, 3-Liter Tedlar Bags	vGAC Vessel Effluent	TO-15 VOCs
Influent_092916	9/29/2016	One, 3-Liter Tedlar Bags	vGAC Vessel Influent	TO-15 VOCs
Midpoint_092916	9/29/2016	One, 3-Liter Tedlar Bags	vGAAC Vessel Mid-Point	TO-15 VOCs
Effluent_092916	9/29/2016	One, 3-Liter Tedlar Bags	vGAC Vessel Effluent	TO-15 VOCs
Influent_103116	10/31/2016	One, 3-Liter Tedlar Bags	vGAC Vessel Influent	TO-15 VOCs
Effluent_103116	10/31/2016	One, 3-Liter Tedlar Bags	vGAC Vessel Effluent	TO-15 VOCs
Influent_112916	11/29/2016	One, 3-Liter Tedlar Bags	vGAC Vessel Influent	TO-15 VOCs
Effluent_112916	11/29/2016	One, 3-Liter Tedlar Bags	vGAC Vessel Effluent	TO-15 VOCs
Influent_122816	12/28/2016	One, 3-Liter Tedlar Bags	vGAC Vessel Influent	TO-15 VOCs
Effluent_122816	12/28/2016	One, 3-Liter Tedlar Bags	vGAC Vessel Effluent	TO-15 VOCs
Influent_012517	1/25/2017	One, 3-Liter Tedlar Bags	vGAC Vessel Influent	TO-15 VOCs
Midpoint_012517	1/25/2017	One, 3-Liter Tedlar Bags	vGAAC Vessel Mid-Point	TO-15 VOCs
Effluent_012517	1/25/2017	One, 3-Liter Tedlar Bags	vGAC Vessel Effluent	TO-15 VOCs
Influent_030717	3/7/2017	One, 3-Liter Tedlar Bags	vGAC Vessel Influent	TO-15 VOCs
Effluent_030717	3/7/2017	One, 3-Liter Tedlar Bags	vGAC Vessel Effluent	TO-15 VOCs

Notes:

1. The vapor samples were analyzed for VOCs via USEPA Method TO-15.
2. USEPA = United States Environmental Protection Agency
3. VOCs = volatile organic compounds
4. AS/SVE = air sparge/soil vapor extraction
5. vGAC = vapor-phase granular activated carbon

TABLE 2: AS/SVE SYSTEM VAPOR SAMPLING RESULTS
491 WORTMAN AVENUE
BROOKLYN, NEW YORK
LANGAN PROJECT NO. 170329301
BROWNFIELD CLEANUP PROGRAM SITE NO. C224139

LOCATION	vGAC INFLUENT		vGAC EFFLUENT	
SAMPLE ID	INFLUENT_030717		EFFLUENT_030717	
LAB SAMPLE ID	17C0284-01		17C0284-02	
SAMPLE DATE	3/7/2017		3/7/2017	
Volatile Organic Compounds (ug/m^3)				
1,1,1,2-Tetrachloroethane	27	U	6.9	U
1,1,1-Trichloroethane	22	U	5.5	U
1,1,2,2-Tetrachloroethane	27	U	6.9	U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	31	U	7.7	U
1,1,2-Trichloroethane	22	U	5.5	U
1,1-Dichloroethane	16	U	4	U
1,1-Dichloroethylene	16	U	4	U
1,2,4-Trichlorobenzene	30	U	7.4	U
1,2,4-Trimethylbenzene	20	U	4.9	D
1,2-Dibromoethane	31	U	7.7	U
1,2-Dichlorobenzene	24	U	6	U
1,2-Dichloroethane	16	U	4	U
1,2-Dichloropropane	18	U	4.6	U
1,2-Dichlorotetrafluoroethane	28	U	7	U
1,3,5-Trimethylbenzene	20	U	4.9	U
1,3-Butadiene	27	U	6.6	U
1,3-Dichlorobenzene	24	U	6	U
1,3-Dichloropropane	18	U	4.6	U
1,4-Dichlorobenzene	24	U	6	U
1,4-Dioxane	29	U	7.2	U
2-Butanone	12	U	5.3	D
2-Hexanone	33	U	8.2	U
3-Chloropropene	63	U	16	U
4-Methyl-2-pentanone	16	U	4.1	U
Acetone	34	D	40	D
Acrylonitrile	8.7	U	2.2	U
Benzene	13	U	3.2	U
Benzyl chloride	21	U	5.2	U
Bromodichloromethane	27	U	6.7	U
Bromoform	41	U	10	U
Bromomethane	16	U	3.9	U
Carbon disulfide	12	U	3.1	U
Carbon tetrachloride	6.3	U	1.6	U
Chlorobenzene	18	U	4.6	U
Chloroethane	11	U	2.6	U
Chloroform	20	U	4.9	U
Chloromethane	8.3	U	2.1	U
cis-1,2-Dichloroethylene	16	U	4	U
cis-1,3-Dichloropropylene	18	U	4.5	U
Cyclohexane	14	U	3.4	U
Dibromochloromethane	34	U	8.5	U
Dichlorodifluoromethane	20	U	4.9	U
Ethyl acetate	29	U	10	D
Ethyl Benzene	17	U	4.3	U
Hexachlorobutadiene	43	U	11	U
Isopropanol	20	U	4.9	U
Methyl Methacrylate	16	U	15	D
Methyl tert-butyl ether (MTBE)	14	U	3.6	U
Methylene chloride	28	U	12	D
n-Heptane	16	U	4.1	U
n-Hexane	14	U	3.5	U
o-Xylene	17	U	4.3	D
p- & m- Xylenes	35	U	13	D
p-Ethyltoluene	20	U	4.9	U
Propylene	6.9	U	1.7	U
Styrene	17	U	4.3	U
Tetrachloroethylene	68	D	1.7	U
Tetrahydrofuran	24	U	5.9	U
Toluene	15	U	6.8	D
trans-1,2-Dichloroethylene	16	U	4	U
trans-1,3-Dichloropropylene	18	U	4.5	U
Trichloroethylene	660	D	8.6	D
Trichlorofluoromethane (Freon 11)	22	U	5.6	U
Vinyl acetate	14	U	3.5	U
Vinyl bromide	17	U	4.4	U
Vinyl Chloride	10	U	2.6	U

NOTES:
1. ug/m^3 = micrograms per cubic meter
2. vGAC = vapor-phase granular activated carbon
3. Samples collected at the "vGAC INFLUENT" were collected before to the lead vGAC vessel.
4. Samples collected at the "vGAC EFFLUENT" were collected after the lag vGAC vessel.

Q is the Qualifier Column with definitions as follows:
D = The result is from an analysis that required a dilution.
U = The analyte was not detected at or above the level indicated.

TABLE 4: AS/SVE SYSTEM MASS REMOVAL - LABORATORY DATA
491 WORTMAN AVENUE
BROOKLYN, NEW YORK
LANGAN PROJECT NO. 170329301
BROWNFIELD CLEANUP PROGRAM SITE NO. C224139

DATE	INFLUENT CONCENTRATION (ug/m3)	SVE BLOWER FLOWRATE (scfm)	EFFLUENT CONCENTRATION (ug/m3)	TOTAL OPERATIONAL HOURS	INFLUENT RATE (mg/min)	EFFLUENT RATE (mg/min)	REMOVAL RATE (mg/min)	MASS REMOVED FROM SUBSURFACE (lbs)	TOTAL MASS REMOVED FROM SUBSURFACE (lbs)	MASS REMOVED BY CARBON (lbs)	TOTAL MASS REMOVED BY CARBON (lbs)	VGAC MASS REMOVAL EFFICIENCY (%)
10/20/2015	114,348	640	9,241	12	2049.12	165.60	1883.52	3.25	3.25	2.99	2.99	92
10/21/2015	32,758	688	1,129	30	631.05	21.75	609.30	1.50	4.76	1.45	4.44	97
10/26/2015	7,027	650	383	150	127.89	6.97	120.92	2.03	6.79	1.92	6.36	95
11/30/2015	3,144	593	426	958	52.20	7.07	45.13	5.58	12.36	4.82	11.18	86
12/28/2015	3,357	570	230	1,548	53.58	3.67	49.91	4.18	16.55	3.89	15.08	93
1/27/2016	621	525	183	2,180	9.13	2.69	6.44	0.76	17.31	0.54	15.62	71
2/24/2016	1,454	578	283	2,854	23.53	4.58	18.94	2.10	19.41	1.69	17.31	81
3/30/2016	825	550	75	3,693	12.71	1.16	11.55	1.41	20.82	1.28	18.59	91
4/29/2016	482	571	112	4,322	7.70	1.79	5.91	0.64	21.46	0.49	19.08	77
5/26/2016	1,169	600	162	4,972	19.64	2.73	16.91	1.69	23.15	1.45	20.53	86
6/29/2016	1,865	600	190	5,784	31.33	3.19	28.14	3.37	26.51	3.02	23.56	90
7/28/2016	3,706	600	232	6,431	62.26	3.90	58.36	5.33	31.84	4.99	28.55	94
8/31/2016	4,798	600	135	7,110	80.61	2.26	78.35	7.24	39.08	7.04	35.59	97
9/29/2016	1,045	760	179	7,802	22.24	3.81	18.43	2.04	41.12	1.69	37.27	83
10/31/2016	922	520	91	8,516	13.42	1.32	12.10	1.27	42.38	1.14	38.42	90
11/29/2016	790	560	167	9,211	12.38	2.62	9.76	1.14	43.52	0.90	39.31	79
12/28/2016	282	520	123	9,884	4.11	1.79	2.32	0.37	43.89	0.21	39.52	56
1/25/2017	4.7	600	5.6	10,530	0.08	0.09	-0.02	0.01	43.89	0.00	39.52	--
3/7/2017	762	360	120	11,186	7.68	1.21	6.47	0.67	44.56	0.56	40.08	84

NOTES:
1. Blower flowrate is recorded from PDI-701 pitot tube flow indicator located on the blower discharge line.
2. The influent and effluent concentrations are based on the lab analytical data and not the PID readings.
3. ug/m3 = micrograms per cubic meter
4. scfm = standard cubic feet per minute
5. mg/min = milligrams per minute
6. lbs = pounds
7. SVE = soil vapor extraction
8. VGAC = vapor-phase granular activated carbon

TABLE 5: AS/SVE SYSTEM DAR-1 COMPLIANCE
491 WORTMAN AVENUE
BROOKLYN, NEW YORK
LANGAN PROJECT NO. 170329301
BROWNFIELD CLEANUP PROGRAM NO. C224139

SAMPLING DATE: **3/7/2017**

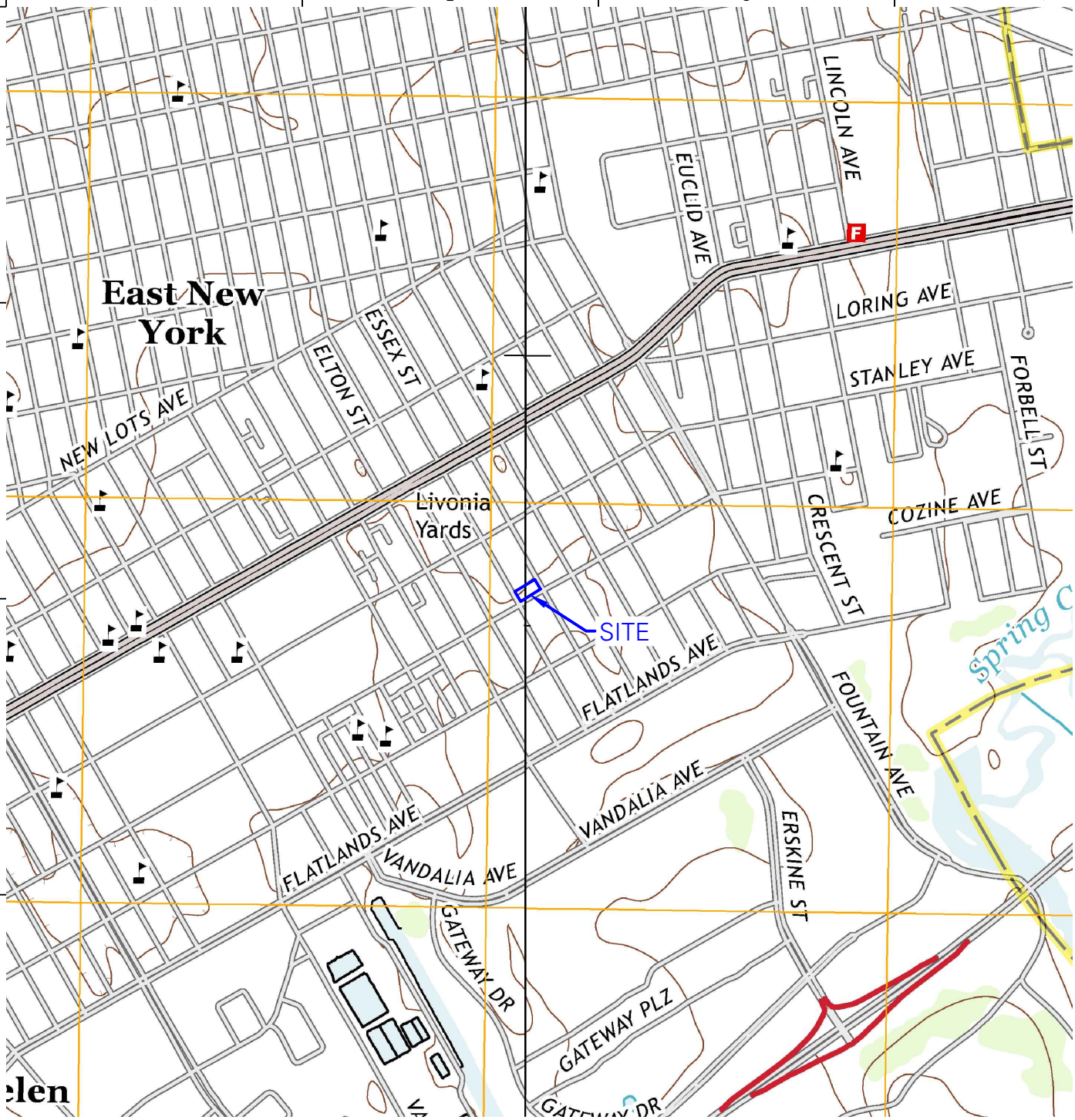
CHEMICAL COMPOUND	CARBON EFFLUENT CONCENRATION MEASURED ($\mu g/m^3$)	EMISSION FLOWRATE MEASURED (SCFM)	(m^3/min)	OUTLET CONCENTRATION (Q_p) (lb/hr)	OUTLET CONCENTRATION (Q_a) (lb/yr)	MAX ANNUAL IMPACT (C_a) ($\mu g/m^3$)	MAX POTENTIAL IMPACT (C_p) ($\mu g/m^3$)	MAX SHORT-TERM IMPACT (C_{st}) ($\mu g/m^3$)	DAR-1 STANDARDS SGC ($\mu g/m^3$)	AGC ($\mu g/m^3$)	EMISSION RESTRICTION REQUIRED (if C_p>AGC and C_a<AGC)	SGC EMISSION EXCEEDANCE (if C_{st}>SGC)	AGC EMISSION EXCEEDANCE (if C_a>AGC)
Volatile Organics, USEPA TO-15 Full List (ug/m^3)													
1,2,4-Trimethylbenzene	4.9	360	10.19412	6.59E-06	5.78E-02	5.19E-04	5.19E-04	3.37E-02	--	6	NO	No Standard	NO
2-Butanone	5.3	360	10.19412	7.13E-06	6.25E-02	5.62E-04	5.61E-04	3.65E-02	13000	5000	NO	NO	NO
Acetone	40	360	10.19412	5.38E-05	4.72E-01	4.24E-03	4.23E-03	2.75E-01	180,000	30,000	NO	NO	NO
Ethyl Acetate	10	360	10.19412	1.35E-05	1.18E-01	1.06E-03	1.06E-03	6.88E-02	--	3,400	NO	No Standard	NO
Methyl methacrylate	15	360	10.19412	2.02E-05	1.77E-01	1.59E-03	1.59E-03	1.03E-01	41,000	700	NO	NO	NO
Methylene chloride	12	360	10.19412	1.61E-05	1.41E-01	1.27E-03	1.27E-03	8.26E-02	14,000	60	NO	NO	NO
o-Xylene	4.3	360	10.19412	5.79E-06	5.07E-02	4.56E-04	4.55E-04	2.96E-02	22,000	100	NO	NO	NO
p&m-Xylenes	13	360	10.19412	1.75E-05	1.53E-01	1.38E-03	1.38E-03	8.94E-02	22,000	100	NO	NO	NO
Toluene	6.8	360	10.19412	9.15E-06	8.02E-02	7.21E-04	7.20E-04	4.68E-02	37,000	5,000	NO	NO	NO
Trichloroethylene	8.6	360	10.19412	1.16E-05	1.01E-01	9.11E-04	9.10E-04	5.92E-02	14,000	0.2	NO	NO	NO

NOTES AND QUALIFIERS:
1. Table only displays chemical compounds with detectable concentrations.
2. Concentrations below reporting limit (non detect) are assumed to be zero.
3. Air samples were analyzed for USEPA TO-15 compounds
4. All equations are referenced in NYSDEC, Division of Air Resources, Air Guide 1, Guidelines for the Control of Toxic Ambient Air Contaminants (11/12/97). Standard Point Source Method calculations were used.
5. Values in table are compared to DAR-1 Annual Guideline Concentrations (AGC)/Short-Term Guideline Concentrations (SGC) Tables dated February 28, 2014.
6. DAR-1 AGC and/or SGC values listed as "--" means there is no AGC or SGC standard for that compound.
7. SCFM = standard cubic feet per minute
8. Blower flowrate is recorded from PDI-701 pitot tube flow indicator located on the blower discharge line.
9. ug/m^3 = micrograms per cubic meter
10. m^3/min = cubic meter per minute
11. lb/hr = pounds per hour
12. lb/yr = pounds per year

TABLE 6: AS/SVE SYSTEM ALARM HISTORY
491 WORTMAN AVENUE
BROOKLYN, NEW YORK
LANGAN PROJECT NO. 170329301
BROWNFIELD CLEANUP PROGRAM NO. C224139

DATE	ALARM	ALARM DESCRIPTION	REASON	REMEDY
10/23/2015	PAL-2501	Compressor Low Pressure Alarm	Uncertain of the reason. There may be a power fluctuation that trips the low pressure alarm, which shuts the AS system down.	On-site observation confirmed that this was a false alarm and was not caused by compressor failure or a breach in the air sparge manifold. The alarm was manually reset.
10/28/2015	LAH-7301	Storage Tank High Level Alarm	The SVE system began to extract a larger volume of water than previously anticipated.	The storage tank was emptied into nine 55-gallon drums, and the SVE system vacuum has been optimized to extract a lesser volume of water.
11/5/2015	PAL-2501	Compressor Low Pressure Alarm	Caused by the air sparge compressor on/off time, which won't allow "OFF" time to be set to zero and therefore, the compressor cannot run continuously.	The air compressor timer has been by-passed and the compressor operation is linked to the SVE system operation. If the SVE system is operational, the compressor will operate unless a different AS system alarm has been triggered.
11/17/2015	PAL-2501	Compressor Low Pressure Alarm	This was an alarm test that was performed to ensure that the update to the Programmable Logic Controller (PLC) was successful.	The PLC update was successful and the air sparge compressor can run continuously. The air compressor timer is no longer being bypassed.
12/23/2015	LAH-7301	Storage Tank High Level Alarm	Following optimization, which included increasing the AS rate and the SVE system flow rate, the SVE system began to extract a larger volume of water than previously anticipated.	The storage tank was emptied into three 55-gallon drums. Both the AS and SVE system flow rates were adjusted in an effort to reduce excess water collection by the SVE system.
12/25/2015	LAH-7301	Storage Tank High Level Alarm	Following optimization, which included increasing the AS rate and the SVE system flow rate, the SVE system began to extract a larger volume of water than previously anticipated.	The storage tank was emptied into three 55-gallon drums. Both the AS and SVE system flow rates were adjusted in an effort to reduce excess water collection by the SVE system.
1/7/2016	LAH-7301	Storage Tank High Level Alarm	Following continued optimization of AS/SVE system, the SVE system began to extract a larger volume of water than anticipated.	The storage tank was emptied into eight 55-gallon drums. Both the AS and SVE system flow rates were adjusted in an effort to reduce excess water collection by the SVE system.
1/17/2016	LAH-7301	Storage Tank High Level Alarm	Following continued optimization of AS/SVE system, the SVE system began to extract a larger volume of water than anticipated.	The storage tank was emptied. Both the AS and SVE system flow rates were adjusted in an effort to reduce excess water collection by the SVE system.
2/1/2016	TAH-2501	Air Compressor High Temperature Alarm	The AS system is operating close to the alarm set point so that as much warm air as possible is continuously injected into the subsurface. A slight change in the air flow rate and/or ambient temperature most likely caused the rise in discharge air temperature.	The alarm was cleared and the AS system was restarted at a lower speed. The compressor speed was ramped up incrementally throughout the day until the previous set point was reached. The heat exchanger flow and AS manifold temperature are being monitored on a daily basis in an effort to prevent tripping the high temperature alarm again.
4/3/2016	PAL-701	Blower Influent High Pressure Alarm	The alarm was most likely triggered due to power fluctuations caused by high wind conditions.	The alarm was cleared and the SVE system was restarted at a higher frequency. The system was monitored remotely for the remainder of the day.
4/29/2016	TAH-2501	Air Compressor High Temperature Alarm	The AS system is operating close to the alarm set point so that as much warm air as possible is continuously injected into the subsurface. A slight change in the air flow rate and/or ambient temperature most likely caused the rise in discharge air temperature.	The alarm was cleared and the AS system was restarted. At restart, the allowable flow through the AS system was increased to alleviate the pressure on the air compressor discharge line. The heat exchanger flow and AS manifold temperature are being monitored on a daily basis in an effort to prevent tripping the high temperature alarm again.
8/9/2016	PAH-702	SVE System Effluent High Pressure Alarm	Anomalously high pressures were not noted on the SVE system discharge during the remote or on-site inspections. It is likely that the SVE effluent pressure switch needs to be recalibrated following almost a year's worth of continuous use.	The SVE system was restarted at a lower frequency and monitored on-site for about two hours.
8/26/2016	FAL-701	Blower Low Flow Alarm	The alarm was triggered due to a loose relay switch.	The switch was tightened during the August 31, 2016 monthly inspection and the system was restarted without further issue.
12/27/2016	PAL-2501	Compressor Low Pressure Alarm	The alarm was triggered due to a mechanical failure at the air compressor (i.e., the belts tore).	The air compressor belts were replaced on January 9, 2017 and the system was restarted.
3/7/2017	FAL-401	Transfer Pump Low Flow Alarm	The alarm was likley triggered due to the fluctuating volume of water extracted by the SVE system.	The AS/SVE system was restarted. Both the AS and SVE system flow rates were adjusted in an effort to reduce excess water collection by the SVE system.
3/8/2017	Low PLC Battery	Low Programmable Loigc Controller (PLC) Battery	The alarm was triggered because the PLC battery can no longer hold a charge.	The PLC battery was replaced on March 10, 2017.
3/24/2017	VFDA-701	SVE System Variable Frequency Drive (VFD) Alarm	The alarm was triggered because the SVE system blower was not functioning within the intended parameters.	The blower was visually inspected, a piece of debris caught in the belts was removed, and the system was restarted.

FIGURES



LEGEND:

APPROXIMATE SITE BOUNDARY

NOTE: BASE MAPS ARE REFERENCED FROM THE UNITED STATES GEOLOGICAL SURVEY (USGS) TOPOGRAPHIC QUADRANGLE MAPS FOR BROOKLYN AND JAMAICA.

LANGAN

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Langan Engineering, Environmental, Surveying and Landscape Architecture, D.P.C.
Langan Engineering and Environmental Services, Inc.
Langan CT, Inc.
Langan International LLC
Collectively known as Langan

Project

491 WORTMAN AVENUE

BLOCK No. 4384, LOT Nos. 31 & 36
BROOKLYN
KINGS NEW YORK

Figure Title

SITE LOCATION MAP

Project No. 170329301	Figure 1
Date 04/18/2015	
Scale N.T.S.	
Drawn By MLR / Checked By GN	
Submission Date	Sheet 1 of 1

Filename: \\langan.com\data\NYC\data3\170329301\Cadd Data - 170329301\SheetFiles\Monthly Report 17 - Figure 1 Only\Figure 1 - Site Location Map.dwg Date: 12/5/2016 Time: 11:40 User: mrogers Style Table: Langan.stb Layout: Site Location Map

Progress Report No. 22
J&H Holding Company, LLC
491 Wortman Avenue, Brooklyn, NY 11208
Brownfield Cleanup Program Site No. C224139
Reporting Period: April 2017

1. Introduction

Langan Engineering, Environmental, Surveying and Landscape Architecture, D.P.C. (Langan) submits this monthly progress report on behalf of J&H Holding Company, LLC (the "Participant"). Monthly progress report submittal to the New York State Department of Environmental Conservation (NYSDEC) is performed in accordance with the Brownfield Cleanup Agreement (BCA) and Section 3.2 of the NYSDEC-approved Interim Remedial Measures Work Plan (IRMWP), prepared by Langan, dated April 28, 2015, and revised June 16, 2015. This monthly progress report summarizes work performed at 491 Wortman Avenue, Brooklyn, New York (the "Site") during April 2017.

The Site (Block 4384, Lots 31 & 36) is located at 491 Wortman Avenue in Brooklyn, New York (Figure 1) and consists of a rectangular shaped lot that is about 19,000 square feet (±0.44 acres). The Site is located in an area zoned for industrial/manufacturing use and is bound by Wortman Street to the south, Linwood Street to the west, Essex Street to the east, and a one-story building to the north. Currently, a one-story building with a partial basement covers the entire Site footprint. The one-story building is comprised of a warehouse (i.e., the western portion) and office space and a smaller warehouse (i.e. the eastern portion).

Environmental site investigations began in November 2008. Langan submitted the IRMWP, which the NYSDEC approved on June 18, 2015. Implementation of the IRMWP and the pending environmental activities are described further in this progress report.

2. Remedial Actions Relative to the Site during this Reporting Period

Remedial actions for April 2017 were primarily related to air sparge and soil vapor extraction (AS/SVE) system performance monitoring and consisted of quarterly on-site groundwater monitoring, semi-annual off-site groundwater monitoring, and monthly system monitoring. In addition, on April 20, 2017, the programmable logic controller's (PLC) modem was evaluated and found to be unresponsive. The PLC modem was removed and shipped to the AS/SVE system manufacturer, Newterra Ltd., for diagnostic testing. This work did not affect operation of the AS/SVE system.

The first round of semi-annual, near-field, off-site groundwater sampling was conducted on April 25, 2017. Depth-to-water, total depth, and photoionization detector (PID) measurements were collected at monitoring wells ML-002 (shallow, middle, and deep), MW-10, and MW-11 (five locations total). Following the collection of field data, groundwater samples were collected from each monitoring well for laboratory analysis of Target Compound List (TCL) volatile organic compounds (VOCs). The near-field, off-site groundwater monitoring locations are shown on Figure 2.

The sixth quarterly on-site groundwater sampling event was conducted on April 25 and 26, 2017. Depth-to-water, total depth, and PID measurements were collected at monitoring wells MW-1 through MW-9 and piezometers PZ-1 and PZ-2 (thirteen locations total). Following the collection of field data, groundwater samples were collected from each monitoring well and piezometer for laboratory analysis of TCL VOCs. The quarterly on-site groundwater monitoring locations are shown on Figure 3.

On April 27, 2017, Langan recorded process and performance monitoring data for the AS/SVE system. As part of the monthly inspection, vapor samples were collected prior to the lead vapor-phase granular activated carbon (vGAC) unit (i.e., influent) and after the lag vGAC unit (i.e., effluent). Routine equipment maintenance, including greasing the blower and checking the belt tensions, was also performed.

3. Actions Relative to the Site Anticipated for the Next Reporting Period

The following activities are planned:

- Continued operation, maintenance and monitoring (OM&M) of the AS/SVE system
- Preparation and submission of a Final Engineering Report

4. Approved Activity Modifications (changes of work scope and/or schedule)

None

5. Results of Sampling, Testing and Other Relevant Data

OM&M sampling was performed as follows:

- An influent vapor sample was collected from the AS/SVE system and analyzed for VOCs via United States Environmental Protection Agency (USEPA) Method TO-15.
- An effluent vapor sample was collected from the AS/SVE system and analyzed for VOCs via USEPA Method TO-15.
- Thirteen groundwater samples (plus one duplicate) were collected from on-site groundwater monitoring wells MW-1, MW-2, MW-3 (shallow, middle, and deep), MW-4, MW-5, MW-6, MW-7, MW-8, MW-9, PZ-1, and PZ-2 and analyzed for TCL VOCs via USEPA Method 8260C.
- Five groundwater samples (plus one duplicate) were collected from near-field, off-site groundwater monitoring wells ML-002 (shallow, middle, and deep), MW-10, and MW-11 and analyzed for TCL VOCs via USEPA Method 8260C.

Samples were analyzed by Alpha Analytical (Alpha) of Westborough, MA. Alpha is a New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP)-certified laboratory.

Based on the results of the most recent OM&M sampling, the AS/SVE system is functioning in compliance with Policy DAR-1: Guidelines for the Control of Toxic Ambient Air Contaminants (DAR-1).

The groundwater results from the sixth quarter of on-site groundwater sampling exhibit chlorinated VOC (CVOC) concentrations above the Title 6 of the New York Codes, Rules, and Regulations (6 NYCRR) Part 703.5 Water Quality Standards, but less than the baseline groundwater sampling results from August 2015 in all wells except for one (reductions in total CVOC concentrations have been achieved). CVOC concentrations observed in monitoring well MW-3A (middle) have remained steady since operation of the AS/SVE system began.

The groundwater results from the first round of semi-annual, near-field, off-site groundwater sampling exhibit CVOC concentrations above the 6 NYCRR Part 703.5 Water Quality Standards in three of the five wells. When compared to the July 2016 sampling event, reductions in total CVOC concentrations have been achieved in two of the sampled wells.

The following tables are attached to this progress report; analytical lab reports are available upon request. The tables summarize the data collected to date and the functionality of the AS/SVE system, including mass of VOCs removed from the subsurface based on PID readings and laboratory data, as well as, the alarm history.

- Table 1: AS/SVE System Vapor Sampling Summary
- Table 2: AS/SVE System Vapor Sampling Results
- Table 3: AS/SVE System Mass Removal – PID Data
- Table 4: AS/SVE System Mass Removal – Laboratory Data
- Table 5: AS/SVE System DAR-1 Compliance – April 27, 2017
- Table 6: AS/SVE System Alarm History
- Table 7: Quarterly Groundwater Sampling Results – Sixth Quarter (lab reports available upon request)
- Table 8: Quarterly Groundwater Sampling Results Summary
- Table 9: Semi-Annual, Near-Field, Off-Site Groundwater Sampling Results – April 2017 (Round 1) (lab reports available upon request)
- Table 10: Semi-Annual, Near-Field, Off-Site Groundwater Sampling Results Summary

6. Deliverables Submitted During This Reporting Period

The Site Management Plan was submitted to the NYSDEC on April 10, 2017.

7. Information Regarding Percentage of Completion

OM&M of the AS/SVE system is ongoing.

As of May 8, 2017 and since inception, the SVE system operated for 12,518 hours (92% uptime), and the AS system operated for 12,051 hours (89% uptime).

8. Unresolved Delays Encountered or Anticipated That May Affect the Schedule and Mitigation Efforts

None

9. Citizen Participation Plan Activities during This Reporting Period

The 45-day public comment period for the Remedial Action Work Plan began on April 5, 2017.

10. Activities Anticipated in Support of the CPP for the Next Reporting Period

None

11. Miscellaneous Information

None

TABLES

TABLE 1: AS/SVE SYSTEM VAPOR SAMPLING SUMMARY
491 WORTMAN AVENUE
BROOKLYN, NEW YORK
LANGAN PROJECT NO. 170329301
BROWNFIELD CLEANUP PROGRAM SITE NO. C224139

SAMPLE NAME	SAMPLE DATE	SAMPLE TYPE	LOCATION	ANALYSIS
AS/SVE SYSTEM VAPOR SAMPLES				
Influent 102015	10/20/2015	Three, 1-Liter Tedlar Bags	vGAC Vessel Influent	TO-15 VOCs
Effluent 102015	10/20/2015	Three, 1-Liter Tedlar Bags	vGAC Vessel Effluent	TO-15 VOCs
Influent_102115	10/21/2015	Three, 1-Liter Tedlar Bags	vGAC Vessel Influent	TO-15 VOCs
Effluent_102115	10/21/2015	Three, 1-Liter Tedlar Bags	vGAC Vessel Effluent	TO-15 VOCs
Influent_102615	10/26/2015	Three, 1-Liter Tedlar Bags	vGAC Vessel Influent	TO-15 VOCs
Effluent_102615	10/26/2015	Three, 1-Liter Tedlar Bags	vGAC Vessel Effluent	TO-15 VOCs
Influent_113015	11/30/2015	Three, 1-Liter Tedlar Bags	vGAC Vessel Influent	TO-15 VOCs
Effluent_113015	11/30/2015	Three, 1-Liter Tedlar Bags	vGAC Vessel Effluent	TO-15 VOCs
Influent_122815	12/28/2015	Three, 1-Liter Tedlar Bags	vGAC Vessel Influent	TO-15 VOCs
Effluent_122815	12/28/2015	Three, 1-Liter Tedlar Bags	vGAC Vessel Effluent	TO-15 VOCs
Influent_012716	1/27/2016	Three, 1-Liter Tedlar Bags	vGAC Vessel Influent	TO-15 VOCs
Effluent_012716	1/27/2016	Three, 1-Liter Tedlar Bags	vGAC Vessel Effluent	TO-15 VOCs
Influent_022416	2/24/2016	Three, 1-Liter Tedlar Bags	vGAC Vessel Influent	TO-15 VOCs
Mid_022416	2/24/2016	Three, 1-Liter Tedlar Bags	vGAC Vessel Mid-Point	TO-15 VOCs
Effluent_022416	2/24/2016	Three, 1-Liter Tedlar Bags	vGAC Vessel Effluent	TO-15 VOCs
Influent_033016	3/30/2016	Three, 1-Liter Tedlar Bags	vGAC Vessel Influent	TO-15 VOCs
Effluent_033016	3/30/2016	Three, 1-Liter Tedlar Bags	vGAC Vessel Effluent	TO-15 VOCs
Influent_042916	4/29/2016	Three, 1-Liter Tedlar Bags	vGAC Vessel Influent	TO-15 VOCs
Effluent_042916	4/29/2016	Three, 1-Liter Tedlar Bags	vGAC Vessel Effluent	TO-15 VOCs
Influent_052616	5/26/2016	Three, 1-Liter Tedlar Bags	vGAC Vessel Influent	TO-15 VOCs
Effluent_052616	5/26/2016	Three, 1-Liter Tedlar Bags	vGAC Vessel Effluent	TO-15 VOCs
Influent_062916	6/29/2016	Three, 1-Liter Tedlar Bags	vGAC Vessel Influent	TO-15 VOCs
Effluent_062916	6/29/2016	Three, 1-Liter Tedlar Bags	vGAC Vessel Effluent	TO-15 VOCs
Influent_072816	7/28/2016	One, 3-Liter Tedlar Bags	vGAC Vessel Influent	TO-15 VOCs
Effluent_072816	7/28/2016	One, 3-Liter Tedlar Bags	vGAC Vessel Effluent	TO-15 VOCs
Influent_083116	8/31/2016	One, 3-Liter Tedlar Bags	vGAC Vessel Influent	TO-15 VOCs
Effluent_083116	8/31/2016	One, 3-Liter Tedlar Bags	vGAC Vessel Effluent	TO-15 VOCs
Influent_092916	9/29/2016	One, 3-Liter Tedlar Bags	vGAC Vessel Influent	TO-15 VOCs
Midpoint_092916	9/29/2016	One, 3-Liter Tedlar Bags	vGAAC Vessel Mid-Point	TO-15 VOCs
Effluent_092916	9/29/2016	One, 3-Liter Tedlar Bags	vGAC Vessel Effluent	TO-15 VOCs
Influent_103116	10/31/2016	One, 3-Liter Tedlar Bags	vGAC Vessel Influent	TO-15 VOCs
Effluent_103116	10/31/2016	One, 3-Liter Tedlar Bags	vGAC Vessel Effluent	TO-15 VOCs
Influent_112916	11/29/2016	One, 3-Liter Tedlar Bags	vGAC Vessel Influent	TO-15 VOCs
Effluent_112916	11/29/2016	One, 3-Liter Tedlar Bags	vGAC Vessel Effluent	TO-15 VOCs
Influent_122816	12/28/2016	One, 3-Liter Tedlar Bags	vGAC Vessel Influent	TO-15 VOCs
Effluent_122816	12/28/2016	One, 3-Liter Tedlar Bags	vGAC Vessel Effluent	TO-15 VOCs
Influent_012517	1/25/2017	One, 3-Liter Tedlar Bags	vGAC Vessel Influent	TO-15 VOCs
Midpoint_012517	1/25/2017	One, 3-Liter Tedlar Bags	vGAAC Vessel Mid-Point	TO-15 VOCs
Effluent_012517	1/25/2017	One, 3-Liter Tedlar Bags	vGAC Vessel Effluent	TO-15 VOCs
Influent_030717	3/7/2017	One, 3-Liter Tedlar Bags	vGAC Vessel Influent	TO-15 VOCs
Effluent_030717	3/7/2017	One, 3-Liter Tedlar Bags	vGAC Vessel Effluent	TO-15 VOCs
Influent_042717	4/27/2017	Two, 5-Liter Tedlar Bags	vGAC Vessel Effluent	TO-15 VOCs
Effluent_042717	4/27/2017	Two, 5-Liter Tedlar Bags	vGAC Vessel Effluent	TO-15 VOCs

Notes:

1. The vapor samples were analyzed for VOCs via USEPA Method TO-15.
2. USEPA = United States Environmental Protection Agency
3. VOCs = volatile organic compounds
4. AS/SVE = air sparge/soil vapor extraction
5. vGAC = vapor-phase granular activated carbon

TABLE 2: AS/SVE SYSTEM VAPOR SAMPLING RESULTS
491 WORTMAN AVENUE
BROOKLYN, NEW YORK
LANGAN PROJECT NO. 170329301
BROWNFIELD CLEANUP PROGRAM SITE NO. C224139

LOCATION	vGAC INFLUENT		vGAC EFFLUENT	
SAMPLE ID	INFLUENT_042717		EFFLUENT_042717	
LAB SAMPLE ID	L1713508-01		L1713508-02	
SAMPLE DATE	4/27/2017		4/27/2017	
Volatile Organic Compounds (ug/m^3)				
1,1,1-Trichloroethane	2.2		1.1	U
1,1,2,2-Tetrachloroethane	2.8	U	1.4	U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	3.1	U	1.5	U
1,1,2-Trichloroethane	2.2	U	1.1	U
1,1-Dichloroethane	1.6	U	0.8	U
1,1-Dichloroethylene	1.6	U	0.8	U
1,2,4-Trichlorobenzene	3.0	U	1.5	U
1,2,4-Trimethylbenzene	2.0	U	1.0	U
1,2-Dibromoethane	3.1	U	1.5	U
1,2-Dichlorobenzene	2.4	U	1.2	U
1,2-Dichloroethane	1.6	U	0.8	U
1,2-Dichloropropane	78		4.1	
1,2-Dichlorotetrafluoroethane	2.8	U	1.4	U
1,3,5-Trimethylbenzene	2.0	U	1.0	U
1,3-Butadiene	0.9	U	0.4	U
1,3-Dichlorobenzene	2.4	U	1.2	U
1,4-Dichlorobenzene	2.4	U	1.2	U
1,4-Dioxane	1.4	U	0.7	U
2-Butanone	5.9		3.6	
2-Hexanone	1.6	U	0.8	U
3-Chloropropene	1.3	U	0.6	U
4-Methyl-2-pentanone	4.1	U	2.1	U
Acetone	48		39	
Benzene	8.2		3.6	
Benzyl chloride	2.1	U	1.0	U
Bromodichloromethane	2.7	U	1.3	U
Bromoform	4.1	U	2.1	U
Bromomethane	1.6	U	0.8	U
Carbon disulfide	1.3	U	1.3	
Carbon tetrachloride	2.5	U	1.3	U
Chlorobenzene	1.8	U	0.9	U
Chloroethane	2.4		0.5	U
Chloroform	2.0	U	1.0	U
Chloromethane	3.6		0.6	
cis-1,2-Dichloroethylene	3.6		1.7	
cis-1,3-Dichloropropylene	1.8	U	0.9	U
Cyclohexane	1.4	U	0.7	U
Dibromochloromethane	3.4	U	1.7	U
Dichlorodifluoromethane	2.0		1.7	
Ethyl acetate	8.1		1.8	U
Ethyl Benzene	2.3		1.4	
Hexachlorobutadiene	4.3	U	2.1	U
Isopropanol	2.5	U	1.8	
Methyl tert-butyl ether (MTBE)	1.4	U	0.7	U
Methylene chloride	8.9		12	
n-Heptane	1.6	U	0.8	U
n-Hexane	2.7		0.8	
o-Xylene	2.3		2.2	
p- & m- Xylenes	5.3		4.5	
p-Ethyltoluene	2.0	U	1.0	U
Styrene	1.7	U	0.9	U
Tetrachloroethylene	159		1.4	U
Tetrahydrofuran	3.0	U	1.5	U
Toluene	15.9		6.0	
trans-1,2-Dichloroethylene	1.6	U	0.8	U
trans-1,3-Dichloropropylene	1.8	U	0.9	U
Trichloroethylene	650		1.1	U
Trichlorofluoromethane (Freon 11)	2.3	U	1.4	
Vinyl bromide	1.8	U	0.9	U
Vinyl Chloride	1.0	U	0.5	U

NOTES:
1. ug/m^3 = micrograms per cubic meter
2. vGAC = vapor-phase granular activated carbon
3. Samples collected at the "vGAC INFLUENT" were collected before to the lead vGAC vessel.
4. Samples collected at the "vGAC EFFLUENT" were collected after the lag vGAC vessel.

Q is the Qualifier Column with definitions as follows:
D = The result is from an analysis that required a dilution.
U = The analyte was not detected at or above the level indicated.

TABLE 3: AS/SVE SYSTEM MASS REMOVAL - PID DATA
491 WORTMAN AVENUE
BROOKLYN, NEW YORK
LANGAN PROJECT NO. 170329301
BROWNFIELD CLEANUP PROGRAM SITE NO. C224139

DATE	INFLUENT CONCENTRATION (ppmv)	SVE BLOWER FLOWRATE (scfm)	EFFLUENT CONCENTRATION (ppmv)	TOTAL OPERATIONAL HOURS	AVERAGE MOLECULAR WEIGHT	MASS REMOVAL RATE (lbs/hr)	TOTAL MASS REMOVED FROM SUBSURFACE (lbs)	CUMULATIVE MASS REMOVED FROM SUBSURFACE (lbs)
10/21/2015	55.0	688	1.8	30	100	0.57	17.02	17.02
10/26/2015	8.3	650	0.6	150	100	0.08	9.31	26.34
11/6/2015	5.5	560	0.0	383	100	0.05	11.13	37.46
11/30/2015	1.9	593	0.3	958	100	0.01	8.46	45.92
12/28/2015	3.7	570	0.0	1,548	100	0.03	19.29	65.21
1/27/2016	1.2	525	0.5	2,180	100	0.01	3.60	68.81
2/24/2016	2.5	578	0.0	2,854	100	0.02	15.10	83.91
3/30/2016	0.2	550	0.0	3,693	100	0.002	1.43	85.34
4/29/2016	2.0	571	0.0	4,322	100	0.018	11.14	96.48
5/26/2016	0.4	600	0.0	4,972	100	0.004	2.42	98.90
6/29/2016	0.5	600	0.0	5,784	100	0.005	3.78	102.68
7/28/2016	3.0	600	0.0	6,431	100	0.028	18.06	120.73
8/31/2016	2.7	600	0.0	7,110	100	0.025	17.05	137.79
9/29/2016	7.5	760	2.0	7,802	100	0.065	44.85	182.63
10/31/2016	0.0	520	0.0	8,516	100	0.000	0.00	182.63
11/29/2016	0.0	560	0.0	9,211	100	0.000	0.00	182.63
12/28/2016	0.0	520	0.0	9,884	100	0.000	0.00	182.63
1/25/2017	2.8	600	0.0	10,530	100	0.026	16.83	199.46
3/7/2017	0.1	360	0.0	11,186	100	0.001	0.37	199.82
4/27/2017	0.0	600	0.0	12,185	100	0.000	0.00	199.82

NOTES:
1. Blower flowrate is recorded from PDI-701 pitot tube flow indicator located on the blower discharge line.
2. The influent and effluent concentrations are based on the PID readings.
3. Mass Removal rate (lb/hr) = ((Conc in ppmv)(flowrate scfm)(MW)(60 min/hr)) / ((387)(1,000,000)).
4. PID = photoionization detector
5. ppmv = parts per million volume
6. scfm = standard cubic feet per minute
7. lbs/hr = pounds per hour
8. lbs = pounds
9. SVE = soil vapor extraction

TABLE 4: AS/SVE SYSTEM MASS REMOVAL - LABORATORY DATA
491 WORTMAN AVENUE
BROOKLYN, NEW YORK
LANGAN PROJECT NO. 170329301
BROWNFIELD CLEANUP PROGRAM SITE NO. C224139

DATE	INFLUENT CONCENTRATION (ug/m3)	SVE BLOWER FLOWRATE (scfm)	EFFLUENT CONCENTRATION (ug/m3)	TOTAL OPERATIONAL HOURS	INFLUENT RATE (mg/min)	EFFLUENT RATE (mg/min)	REMOVAL RATE (mg/min)	MASS REMOVED FROM SUBSURFACE (lbs)	TOTAL MASS REMOVED FROM SUBSURFACE (lbs)	MASS REMOVED BY CARBON (lbs)	TOTAL MASS REMOVED BY CARBON (lbs)	VGAC MASS REMOVAL EFFICIENCY (%)
10/20/2015	114,348	640	9,241	12	2049.12	165.60	1883.52	3.25	3.25	2.99	2.99	92
10/21/2015	32,758	688	1,129	30	631.05	21.75	609.30	1.50	4.76	1.45	4.44	97
10/26/2015	7,027	650	383	150	127.89	6.97	120.92	2.03	6.79	1.92	6.36	95
11/30/2015	3,144	593	426	958	52.20	7.07	45.13	5.58	12.36	4.82	11.18	86
12/28/2015	3,357	570	230	1,548	53.58	3.67	49.91	4.18	16.55	3.89	15.08	93
1/27/2016	621	525	183	2,180	9.13	2.69	6.44	0.76	17.31	0.54	15.62	71
2/24/2016	1,454	578	283	2,854	23.53	4.58	18.94	2.10	19.41	1.69	17.31	81
3/30/2016	825	550	75	3,693	12.71	1.16	11.55	1.41	20.82	1.28	18.59	91
4/29/2016	482	571	112	4,322	7.70	1.79	5.91	0.64	21.46	0.49	19.08	77
5/26/2016	1,169	600	162	4,972	19.64	2.73	16.91	1.69	23.15	1.45	20.53	86
6/29/2016	1,865	600	190	5,784	31.33	3.19	28.14	3.37	26.51	3.02	23.56	90
7/28/2016	3,706	600	232	6,431	62.26	3.90	58.36	5.33	31.84	4.99	28.55	94
8/31/2016	4,798	600	135	7,110	80.61	2.26	78.35	7.24	39.08	7.04	35.59	97
9/29/2016	1,045	760	179	7,802	22.24	3.81	18.43	2.04	41.12	1.69	37.27	83
10/31/2016	922	520	91	8,516	13.42	1.32	12.10	1.27	42.38	1.14	38.42	90
11/29/2016	790	560	167	9,211	12.38	2.62	9.76	1.14	43.52	0.90	39.31	79
12/28/2016	282	520	123	9,884	4.11	1.79	2.32	0.37	43.89	0.21	39.52	56
1/25/2017	4.7	600	5.6	10,530	0.08	0.09	-0.02	0.01	43.89	0.00	39.52	--
3/7/2017	762	360	120	11,186	7.68	1.21	6.47	0.67	44.56	0.56	40.08	84
4/27/2017	1,008	600	86	12,185	16.93	1.44	15.49	2.24	46.80	2.05	42.13	91

NOTES:
1. Blower flowrate is recorded from PDI-701 pitot tube flow indicator located on the blower discharge line.
2. The influent and effluent concentrations are based on the lab analytical data and not the PID readings.
3. ug/m3 = micrograms per cubic meter
4. scfm = standard cubic feet per minute
5. mg/min = milligrams per minute
6. lbs = pounds
7. SVE = soil vapor extraction
8. VGAC = vapor-phase granular activated carbon

TABLE 5: AS/SVE SYSTEM DAR-1 COMPLIANCE
491 WORTMAN AVENUE
BROOKLYN, NEW YORK
LANGAN PROJECT NO. 170329301
BROWNFIELD CLEANUP PROGRAM NO. C224139

SAMPLING DATE: **4/27/2017**

CHEMICAL COMPOUND	CARBON EFFLUENT CONCENTRATION MEASURED ($\mu g/m^3$)	EMISSION FLOWRATE MEASURED (SCFM)	(m^3/min)	OUTLET CONCENTRATION (Q_p) (lb/hr)	OUTLET CONCENTRATION (Q_a) (lb/yr)	MAX ANNUAL IMPACT (C_a) ($\mu g/m^3$)	MAX POTENTIAL IMPACT (C_p) ($\mu g/m^3$)	MAX SHORT-TERM IMPACT (C_{st}) ($\mu g/m^3$)	DAR-1 STANDARDS SGC ($\mu g/m^3$)	AGC ($\mu g/m^3$)	EMISSION RESTRICTION REQUIRED (if C_p>AGC and C_a<AGC)	SGC EMISSION EXCEEDANCE (if C_{st}>SGC)	AGC EMISSION EXCEEDANCE (if C_a>AGC)
Volatile Organics, USEPA TO-15 Full List (ug/m^3)													
1,2-Dichloropropane	4.05	600	16.9902	9.08E-06	7.96E-02	7.15E-04	7.15E-04	4.64E-02	--	4	NO	No Standard	NO
2-Butanone	3.57	600	16.9902	8.01E-06	7.01E-02	6.31E-04	6.30E-04	4.09E-02	13000	5000	NO	NO	NO
Acetone	38.7	600	16.9902	8.68E-05	7.60E-01	6.84E-03	6.83E-03	4.44E-01	180,000	30,000	NO	NO	NO
Benzene	3.61	600	16.9902	8.10E-06	7.09E-02	6.38E-04	6.37E-04	4.14E-02	1,300	0.13	NO	NO	NO
Carbon disulfide	1.25	600	16.9902	2.80E-06	2.46E-02	2.21E-04	2.21E-04	1.43E-02	6,200	700	NO	NO	NO
Chloromethane	0.57	600	16.9902	1.27E-06	1.12E-02	1.00E-04	1.00E-04	6.51E-03	6,200	700	NO	NO	NO
cis-1,2-Dichloroethylene	1.65	600	16.9902	3.70E-06	3.24E-02	2.91E-04	2.91E-04	1.89E-02	--	63	NO	No Standard	NO
Dichlorodifluoromethane	1.71	600	16.9902	3.84E-06	3.36E-02	3.02E-04	3.02E-04	1.96E-02	--	12,000	NO	No Standard	NO
Ethanol	26.8	600	16.9902	6.01E-05	5.27E-01	4.73E-03	4.73E-03	3.07E-01	--	45,000	NO	No Standard	NO
Ethyl Benzene	1.41	600	16.9902	3.16E-06	2.77E-02	2.49E-04	2.49E-04	1.62E-02	--	1,000	NO	No Standard	NO
Isopropanol	1.83	600	16.9902	4.10E-06	3.60E-02	3.23E-04	3.23E-04	2.10E-02	98,000	7,000	NO	NO	NO
Methylene chloride	12.3	600	16.9902	2.76E-05	2.42E-01	2.17E-03	2.17E-03	1.41E-01	14,000	60	NO	NO	NO
n-Hexane	0.84	600	16.9902	1.87E-06	1.64E-02	1.47E-04	1.47E-04	9.58E-03	--	700	NO	No Standard	NO
o-Xylene	2.21	600	16.9902	4.96E-06	4.34E-02	3.90E-04	3.90E-04	2.53E-02	22,000	100	NO	NO	NO
p&m-Xylenes	4.47	600	16.9902	1.00E-05	8.78E-02	7.90E-04	7.89E-04	5.13E-02	22,000	100	NO	NO	NO
Tert Butyl Alcholo	25.8	600	16.9902	5.79E-05	5.07E-01	4.56E-03	4.55E-03	2.96E-01	--	720	NO	No Standard	NO
Toluene	6.03	600	16.9902	1.35E-05	1.18E-01	1.07E-03	1.06E-03	6.92E-02	37,000	5,000	NO	NO	NO
Trichlorofluoromethane	1.42	600	16.9902	3.18E-06	2.79E-02	2.51E-04	2.51E-04	1.63E-02	9,000	5,000	NO	NO	NO

NOTES AND QUALIFIERS:
1. Table only displays chemical compounds with detectable concentrations.
2. Concentrations below reporting limit (non detect) are assumed to be zero.
3. Air samples were analyzed for USEPA TO-15 compounds
4. All equations are referenced in NYSDEC, Division of Air Resources, Air Guide 1, Guidelines for the Control of Toxic Ambient Air Contaminants (11/12/97). Standard Point Source Method calculations were used.
5. Values in table are compared to DAR-1 Annual Guideline Concentrations (AGC)/Short-Term Guideline Concentrations (SGC) Tables dated February 28, 2014.
6. DAR-1 AGC and/or SGC values listed as "--" means there is no AGC or SGC standard for that compound.
7. SCFM = standard cubic feet per minute
8. Blower flowrate is recorded from PDI-701 pitot tube flow indicator located on the blower discharge line.
9. ug/m^3 = micrograms per cubic meter
10. m^3/min = cubic meter per minute
11. lb/hr = pounds per hour
12. lb/yr = pounds per year

TABLE 6: AS/SVE SYSTEM ALARM HISTORY
491 WORTMAN AVENUE
BROOKLYN, NEW YORK
LANGAN PROJECT NO. 170329301
BROWNFIELD CLEANUP PROGRAM NO. C224139

DATE	ALARM	ALARM DESCRIPTION	REASON	REMEDY
10/23/2015	PAL-2501	Compressor Low Pressure Alarm	Uncertain of the reason. There may be a power fluctuation that trips the low pressure alarm, which shuts the AS system down.	On-site observation confirmed that this was a false alarm and was not caused by compressor failure or a breach in the air sparge manifold. The alarm was manually reset.
10/28/2015	LAH-7301	Storage Tank High Level Alarm	The SVE system began to extract a larger volume of water than previously anticipated.	The storage tank was emptied into nine 55-gallon drums, and the SVE system vacuum has been optimized to extract a lesser volume of water.
11/5/2015	PAL-2501	Compressor Low Pressure Alarm	Caused by the air sparge compressor on/off time, which won't allow "OFF" time to be set to zero and therefore, the compressor cannot run continuously.	The air compressor timer has been by-passed and the compressor operation is linked to the SVE system operation. If the SVE system is operational, the compressor will operate unless a different AS system alarm has been triggered.
11/17/2015	PAL-2501	Compressor Low Pressure Alarm	This was an alarm test that was performed to ensure that the update to the Programmable Logic Controller (PLC) was successful.	The PLC update was successful and the air sparge compressor can run continuously. The air compressor timer is no longer being bypassed.
12/23/2015	LAH-7301	Storage Tank High Level Alarm	Following optimization, which included increasing the AS rate and the SVE system flow rate, the SVE system began to extract a larger volume of water than previously anticipated.	The storage tank was emptied into three 55-gallon drums. Both the AS and SVE system flow rates were adjusted in an effort to reduce excess water collection by the SVE system.
12/25/2015	LAH-7301	Storage Tank High Level Alarm	Following optimization, which included increasing the AS rate and the SVE system flow rate, the SVE system began to extract a larger volume of water than previously anticipated.	The storage tank was emptied into three 55-gallon drums. Both the AS and SVE system flow rates were adjusted in an effort to reduce excess water collection by the SVE system.
1/7/2016	LAH-7301	Storage Tank High Level Alarm	Following continued optimization of AS/SVE system, the SVE system began to extract a larger volume of water than anticipated.	The storage tank was emptied into eight 55-gallon drums. Both the AS and SVE system flow rates were adjusted in an effort to reduce excess water collection by the SVE system.
1/17/2016	LAH-7301	Storage Tank High Level Alarm	Following continued optimization of AS/SVE system, the SVE system began to extract a larger volume of water than anticipated.	The storage tank was emptied. Both the AS and SVE system flow rates were adjusted in an effort to reduce excess water collection by the SVE system.
2/1/2016	TAH-2501	Air Compressor High Temperature Alarm	The AS system is operating close to the alarm set point so that as much warm air as possible is continuously injected into the subsurface. A slight change in the air flow rate and/or ambient temperature most likely caused the rise in discharge air temperature.	The alarm was cleared and the AS system was restarted at a lower speed. The compressor speed was ramped up incrementally throughout the day until the previous set point was reached. The heat exchanger flow and AS manifold temperature are being monitored on a daily basis in an effort to prevent tripping the high temperature alarm again.
4/3/2016	PAL-701	Blower Influent High Pressure Alarm	The alarm was most likely triggered due to power fluctuations caused by high wind conditions.	The alarm was cleared and the SVE system was restarted at a higher frequency. The system was monitored remotely for the remainder of the day.
4/29/2016	TAH-2501	Air Compressor High Temperature Alarm	The AS system is operating close to the alarm set point so that as much warm air as possible is continuously injected into the subsurface. A slight change in the air flow rate and/or ambient temperature most likely caused the rise in discharge air temperature.	The alarm was cleared and the AS system was restarted. At restart, the allowable flow through the AS system was increased to alleviate the pressure on the air compressor discharge line. The heat exchanger flow and AS manifold temperature are being monitored on a daily basis in an effort to prevent tripping the high temperature alarm again.
8/9/2016	PAH-702	SVE System Effluent High Pressure Alarm	Anomalously high pressures were not noted on the SVE system discharge during the remote or on-site inspections. It is likely that the SVE effluent pressure switch needs to be recalibrated following almost a year's worth of continuous use.	The SVE system was restarted at a lower frequency and monitored on-site for about two hours.
8/26/2016	FAL-701	Blower Low Flow Alarm	The alarm was triggered due to a loose relay switch.	The switch was tightened during the August 31, 2016 monthly inspection and the system was restarted without further issue.
12/27/2016	PAL-2501	Compressor Low Pressure Alarm	The alarm was triggered due to a mechanical failure at the air compressor (i.e., the belts tore).	The air compressor belts were replaced on January 9, 2017 and the system was restarted.
3/7/2017	FAL-401	Transfer Pump Low Flow Alarm	The alarm was likley triggered due to the fluctuating volume of water extracted by the SVE system.	The AS/SVE system was restarted. Both the AS and SVE system flow rates were adjusted in an effort to reduce excess water collection by the SVE system.
3/8/2017	Low PLC Battery	Low Programmable Loigc Controller (PLC) Battery	The alarm was triggered because the PLC battery can no longer hold a charge.	The PLC battery was replaced on March 10, 2017.
3/24/2017	VFDA-701	SVE System Variable Frequency Drive (VFD) Alarm	The alarm was triggered because the SVE system blower was not functioning within the intended parameters.	The blower was visually inspected, a piece of debris caught in the belts was removed, and the system was restarted.

TABLE 7: QUARTERLY GROUNDWATER SAMPLING RESULTS - SIXTH QUARTER
491 WORTMAN AVENUE
BROOKLYN, NEW YORK
LANGAN PROJECT NO. 170329301
BROWNFIELD CLEANUP PROGRAM SITE NO. C224139

Sample ID Laboratory ID Sampling Date Dilution Factor	NYSDEC TOGS STANDARDS AND GUIDANCE VALUES	MW01_042517 L1713148-01 4/25/2017 1		GWDUP02_042517 L1713148-09 4/25/2017 1		MW02_042517 L1713148-02 4/25/2017 1		MW3AS_042617 L1713342-01 4/26/2017 1		MW3AM_042617 L1713342-02 4/26/2017 1		MW3AD_042617 L1713342-03 4/26/2017 1		MW04_042517 L1713148-03 4/25/2017 1	
Volatile Organic Compounds (µg/L)															
1,2-Dichloroethene, Total		2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
1,2-Dichloropropane	1	**1**		**1**		0.77	J	**1.8**		*1*	U	*1*	U	0.91	J
Acetone	50	5	U	5	U	5	U	5	U	5	U	5	U	5	U
cis-1,2-Dichloroethene	5	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
Tetrachloroethene	5	0.5	U	0.5	U	**5.5**		1.2		**19**		**12**		1.5	
Trichloroethene	5	0.5	U	0.5	U	2.6		1.7		1.9		0.85		1.8	
Vinyl chloride	2	1	U	1	U	1	U	1	U	1	U	1	U	1	U

Notes:
1. Groundwater sample analytical results are compared to New York State Department of Environmental Conservation (NYSDEC) Technical and Operational Guidance Series (TOGS) 1.1.1 Ambient Water Quality Standards and Guidance Values for Class GA water.
2. With the exception of vinyl chloride, only compounds with detections are shown.
3. Results exceeding the NYSDEC TOGS standards and guidance values are shaded and bolded.
4. Italicized results indicate an exceedance above NYSDEC TOGS that was not detected as or above the level indicated.
5. µg/L = micrograms per liter
6. GWDUP02_042517 is a duplicate sample of MW01_042517.
7. Eleven monitoring wells and two piezometers associated with the air sparge and soil vapor extraction system (AS/SVE) system were sampled as part of the sixth round of quarterly groundwater sampling.

Qualifiers:
J = Analyte detected at or above the MDL (method detection limit) but below the RL (Reporting Limit) - data is estimated.
U = Analyte not detected at or above the level indicated.

TABLE 7: QUARTERLY GROUNDWATER SAMPLING RESULTS - SIXTH QUARTER
491 WORTMAN AVENUE
BROOKLYN, NEW YORK
LANGAN PROJECT NO. 170329301
BROWNFIELD CLEANUP PROGRAM SITE NO. C224139

Sample ID Laboratory ID Sampling Date Dilution Factor	NYSDEC TOGS STANDARDS AND GUIDANCE VALUES	MW05_042617 L1713342-04 4/26/2017 1		MW06_042517 L1713148-04 4/25/2017 1		MW07_042517 L1713148-05 4/25/2017 1		MW08_042517 L1713148-06 4/25/2017 1		MW09_042617 L1713342-05 4/26/2017 1		PZ01_042517 L1713148-07 4/25/2017 1		PZ02_042517 L1713148-08 4/25/2017 1	
Volatile Organic Compounds (µg/L)															
1,2-Dichloroethene, Total		2.5	U	2.3	J	2.5	U	8.9		2.5	U	2.5	U	2.5	U
1,2-Dichloropropane	1	**1.6**		0.86	J	**1.2**		0.54	J	**1.5**		**1.3**		**1**	
Acetone	50	5	U	5	U	5	U	5	U	2.8	J	5	U	5	U
cis-1,2-Dichloroethene	5	2.5	U	2.3	J	2.5	U	**8.9**		2.5	U	2.5	U	2.5	U
Tetrachloroethene	5	0.5	U	**26**		0.5	U	2.1		0.4	J	0.5	U	0.26	J
Trichloroethene	5	0.5	U	**28**		0.4	J	**5.5**		0.25	J	0.5	U	0.33	J
Vinyl chloride	2	1	U	1	U	1	U	1	U	1	U	1	U	1	U

Notes:
1. Groundwater sample analytical results are compared to New York State Department of Environmental Conservation (NYSDEC) Technical and Operational Guidance Series (TOGS) 1.1.1 Ambient Water Quality Standards and Guidance Values for Class GA water.
2. With the exception of vinyl chloride, only compounds with detections are shown.
3. Results exceeding the NYSDEC TOGS standards and guidance values are shaded and bolded.
4. Italicized results indicate an exceedance above NYSDEC TOGS that was not detected as or above the level indicated.
5. µg/L = micrograms per liter
6. GWDUP02_042517 is a duplicate sample of MW01_042517.
7. Eleven monitoring wells and two piezometers associated with the air sparge and soil vapor extraction system (AS/SVE) system were sampled as part of the sixth round of quarterly groundwater sampling.

Qualifiers:
J = Analyte detected at or above the MDL (method detection limit) but below the RL (Reporting Limit) - data is estimated.
U = Analyte not detected at or above the level indicated.

TABLE 8: QUARTERLY GROUNDWATER SAMPLING RESULTS SUMMARY
491 WORTMAN AVENUE
BROOKLYN, NEW YORK
LANGAN PROJECT NO. 170329301
BROWNFIELD CLEANUP PROGRAM SITE NO. C224139

Compound	NYSDEC TOGS STANDARDS AND GUIDANCE VALUES	Sampling Location												
		MW-1	MW-2	MW-3S	MW-3M	MW-3D	MW-4	MW-5	MW-6*	MW-7*	MW-8*	MW-9	PZ-1	PZ-2
Baseline Sampling Results Summary (µg/L) - August 2015														
CVOCs	~	1274.9	2314	873.3	23.4	27.8	653	175	1236.3	1272	458	602	903.6	438.2
PCE	5	750	480	380	14	8.3	79	110	710	460	180	400	310	230
TCE	5	500	1800	480	5.9	16	540	55	500	780	240	190	580	200
cis-1,2- DCE	5	19	14	8.3	2.5	2.5	29	9	22	27	36	10	8.6	6.2
vinyl chloride	2	5.9	20	5	1	1	5	1	4.3	5	2	2	5	2
First Quarter Sampling Results Summary (µg/L) - January 2016														
CVOCs	~	12.8	2.14	7.6	23.4	16.13	14.8	1.87	676	11.41	184.56	5.8	10	2.6
PCE	5	6	1	2	20	14	3	1	240	2	15	4	3	1
TCE	5	5.3	0.74	5.2	3	1.7	11	0.37	400	9	130	1.4	5.4	1.2
cis-1,2- DCE	5	1.3	0.2	0.2	0.2	0.23	0.6	0.3	35	0.21	39	0.2	1.4	0.2
vinyl chloride	2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	1	0.2	0.56	0.2	0.2	0.2
Q1 Percent CVOC Reduction		*99%*	*99.9%*	*99%*	*0%*	*42%*	*98%*	*99%*	*45%*	*99%*	*60%*	*99%*	*99%*	*99%*
Second Quarter Sampling Results Summary (µg/L) - April 2016														
CVOCs	~	3.8	1.99	4.3	18.5	9.3	3.28	1.64	401	2.46	71.96	0.91	1.45	1.79
PCE	5	1.7	0.87	1.2	16	7.6	0.48	0.67	160	0.26	5.7	0.31	0.3	0.61
TCE	5	1.7	0.72	2.7	2.1	1.3	2.4	0.38	220	1.8	43	0.2	0.75	0.78
cis-1,2- DCE	5	0.2	0.2	0.2	0.2	0.2	0.2	0.39	19	0.2	23	0.2	0.2	0.2
vinyl chloride	2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	2	0.2	0.26	0.2	0.2	0.2
Q2 Percent CVOC Reduction from Last Quarter (Q1)		*70%*	*7%*	*43%*	*21%*	*42%*	*78%*	*12%*	*41%*	*78%*	*61%*	*84%*	*86%*	*31%*
Q2 Percent CVOC Reduction from Baseline		*99.7%*	*99.9%*	*99.5%*	*21%*	*67%*	*99.5%*	*99%*	*68%*	*99.8%*	*84%*	*99.8%*	*99.8%*	*99.6%*
Third Quarter Sampling Results Summary (µg/L) - July 2016														
CVOCs	~	1.65	4.26	7.69	24.5	14.01	6.26	3.48	1249.5	4.21	53.5	1.49	1.97	4.15
PCE	5	0.68	2.2	3	22	12	2.2	1.6	570	0.71	5.3	0.76	0.47	2
TCE	5	0.57	1.6	4.2	2.1	1.6	3.5	0.76	640	3.1	27	0.33	1.1	1.6
cis-1,2- DCE	5	0.2	0.26	0.29	0.2	0.21	0.36	0.92	39	0.2	21	0.2	0.2	0.35
vinyl chloride	2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.5	0.2	0.2	0.2	0.2	0.2
Q3 Percent CVOC Reduction from Last Quarter (Q2)		*57%*	*Increased*	*Increased*	*Increased*	*Increased*	*Increased*	*Increased*	*Increased*	*Increased*	*26%*	*Increased*	*Increased*	*Increased*
Q3 Percent CVOC Reduction from Baseline		*99.9%*	*99.8%*	*99.1%*	*Increased*	*50%*	*99%*	*98%*	*Increased*	*99.7%*	*88%*	*99.8%*	*99.8%*	*99.1%*

Notes:

1. Groundwater sample analytical results are compared to New York State Department of Environmental Conservation (NYSDEC) Technical and Operational Guidance Series (TOGS) 1.1.1 Ambient Water Quality Standards and Guidance Values for Class GA water.
2. Results exceeding the NYSDEC TOGS standards and guidance values are shaded.
3. PCE = tetrachlorothylene
4. TCE = trichloroethylene
5. cis-1,2-DCE = cis-1,2-Dichloroethylene
6. µg/L = microgram per liter
7. CVOC = chlorinated volatile organic compounds
8. * = Monitoring well is located in the sidewalk adjacent to the warehouse.

TABLE 8: QUARTERLY GROUNDWATER SAMPLING RESULTS SUMMARY
491 WORTMAN AVENUE
BROOKLYN, NEW YORK
LANGAN PROJECT NO. 170329301
BROWNFIELD CLEANUP PROGRAM SITE NO. C224139

Compound	NYSDEC TOGS STANDARDS AND GUIDANCE VALUES	Sampling Location												
		MW-1	MW-2	MW-3S	MW-3M	MW-3D	MW-4	MW-5	MW-6*	MW-7*	MW-8*	MW-9	PZ-1	PZ-2
Fourth Quarter Sampling Results Summary (µg/L) - October 2016														
CVOCs	~	0.91	8.39	18.59	18.1	11.36	3.38	0.84	158.4	1.1	33.9	0.99	0.81	1.57
PCE	5	0.22	4.6	8.8	16	10	0.98	0.24	67	0.2	2.7	0.39	0.2	0.54
TCE	5	0.29	3.2	9	1.7	0.96	2	0.2	87	0.5	19	0.2	0.21	0.63
cis-1,2- DCE	5	0.2	0.39	0.59	0.2	0.2	0.2	0.2	4.2	0.2	12	0.2	0.2	0.2
vinyl chloride	2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Q4 Percent CVOC Reduction from Last Quarter (Q3)		*45%*	*Increased*	*Increased*	*26%*	*19%*	*46%*	*76%*	*87%*	*74%*	*37%*	*34%*	*59%*	*62%*
Q4 Percent CVOC Reduction from Baseline		*99.9%*	*100%*	*98%*	*23%*	*59%*	*99%*	*100%*	*87%*	*99.9%*	*93%*	*99.8%*	*99.9%*	*99.6%*
Fifth Quarter Sampling Results Summary (µg/L) - January 2017														
CVOCs	~	0.8	1.32	20.71	21.1	14.21	1.89	1.02	812.7	0.9	42.4	7.9	0.8	1.49
PCE	5	0.2	0.56	10	19	13	0.52	0.42	380	0.2	3.2	5.5	0.2	0.66
TCE	5	0.2	0.36	10	1.7	0.81	0.97	0.2	410	0.3	20	2	0.2	0.43
cis-1,2- DCE	5	0.2	0.2	0.51	0.2	0.2	0.2	0.2	22	0.2	19	0.2	0.2	0.2
vinyl chloride	2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.7	0.2	0.2	0.2	0.2	0.2
Q5 Percent CVOC Reduction from Last Quarter (Q4)		*12%*	*84%*	*Increased*	*Increased*	*Increased*	*44%*	*Increased*	*Increased*	*18%*	*Increased*	*Increased*	*1%*	*5%*
Q5 Percent CVOC Reduction from Baseline		*99.9%*	*100%*	*98%*	*10%*	*49%*	*100%*	*99%*	*34%*	*99.9%*	*91%*	*98.7%*	*99.9%*	*99.7%*
Sixth Quarter Sampling Results Summary (µg/L) - April 2017														
CVOCs	~	4.5	11.6	6.4	24.4	16.35	6.8	4.5	57.3	4.4	17.5	4.15	4.5	4.09
PCE	5	0.5	5.5	1.2	19	12	1.5	0.5	26	0.5	2.1	0.4	0.5	0.26
TCE	5	0.5	2.6	1.7	1.9	0.85	1.8	0.5	28	0.4	5.5	0.25	0.5	0.33
cis-1,2- DCE	5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.3	2.5	8.9	2.5	2.5	2.5
vinyl chloride	2	1	1	1	1	1	1	1	1	1	1	1	1	1
Q6 Percent CVOC Reduction from Last Quarter (Q5)		*Increased*	*Increased*	*69%*	*Increased*	*Increased*	*Increased*	*Increased*	*93%*	*Increased*	*59%*	*47%*	*Increased*	*Increased*
Q6 Percent CVOC Reduction from Baseline		*99.6%*	*99%*	*99%*	*Increased*	*41%*	*99%*	*97%*	*95%*	*99.7%*	*96%*	*99.3%*	*99.5%*	*99.1%*

Notes:

1. Groundwater sample analytical results are compared to New York State Department of Environmental Conservation (NYSDEC) Technical and Operational Guidance Series (TOGS) 1.1.1 Ambient Water Quality Standards and Guidance Values for Class GA water.
2. Results exceeding the NYSDEC TOGS standards and guidance values are shaded.
3. PCE = tetrachlorothylene
4. TCE = trichloroethylene
5. cis-1,2-DCE = cis-1,2-Dichloroethylene
6. µg/L = microgram per liter
7. CVOC = chlorinated volatile organic compounds
8. * = Monitoring well is located in the sidewalk adjacent to the warehouse.

TABLE 9: SEMI-ANNUAL, NEAR-FIELD, OFF-SITE GROUNDWATER SAMPLING RESULTS - APRIL 2017 (ROUND 1)
491 WORTMAN AVENUE
BROOKLYN, NEW YORK
LANGAN PROJECT NO. 170329301
BROWNFIELD CLEANUP PROGRAM SITE NO. C224139

Sample ID Laboratory ID Sampling Date Dilution Factor	NYSDEC TOGS STANDARDS AND GUIDANCE VALUES	ML002S_042517 L1713147-01 4/25/2017 1		ML002M_042517 L1713147-02 4/25/2017 1		ML002D_042517 L1713147-03 4/25/2017 1		MW10_042517 L1713147-04 4/25/2017 1		GWDUP01_042517 L1713147-06 4/25/2017 1		MW11_042517 L1713147-05 4/25/2017 1	
Volatile Organic Compounds (µg/L)													
1,1-Dichloroethene	5	0.5	U	0.5	U	0.5	U	0.25	J	0.26	J	0.5	U
1,2-Dichloroethene, Total	~	2.5	U	2.5	U	2.5	U	0.93	J	0.91	J	2.5	U
Bromodichloromethane	50	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.35	J
Chloroform	7	**9.7**		2.5	U	1.4	J	2.5	U	2.5	U	**19**	
cis-1,2-Dichloroethene	5	2.5	U	2.5	U	2.5	U	0.93	J	0.91	J	2.5	U
Tetrachloroethene	5	1.4		**14**		**9.5**		**5.6**		**5.8**		0.56	
Trichloroethene	5	0.59		2.4		1.1		4.7		4.8		0.52	
Vinyl chloride	2	1	U	1	U	1	U	1	U	1	U	1	U

Notes:
1. Groundwater sample analytical results are compared to New York State Department of Environmental Conservation (NYSDEC) Technical and Operational Guidance Series (TOGS) 1.1.1 Ambient Water Quality Standards and Guidance Values for Class GA water.
2. With the exception of vinyl chloride, only compounds with detections are shown.
3. Results exceeding the NYSDEC TOGS standards and guidance values are shaded and bolded.
4. µg/L = micrograms per liter
5. GWDUP01_042517 is a duplicate sample of MW10_042517.
6. Five monitoring wells were sampled as part of the first round of semi-annual, near-field, off-site groundwater sampling.

Qualifiers:
J = Analyte detected at or above the MDL (method detection limit) but below the RL (Reporting Limit) - data is estimated.
U = Analyte not detected at or above the level indicated.

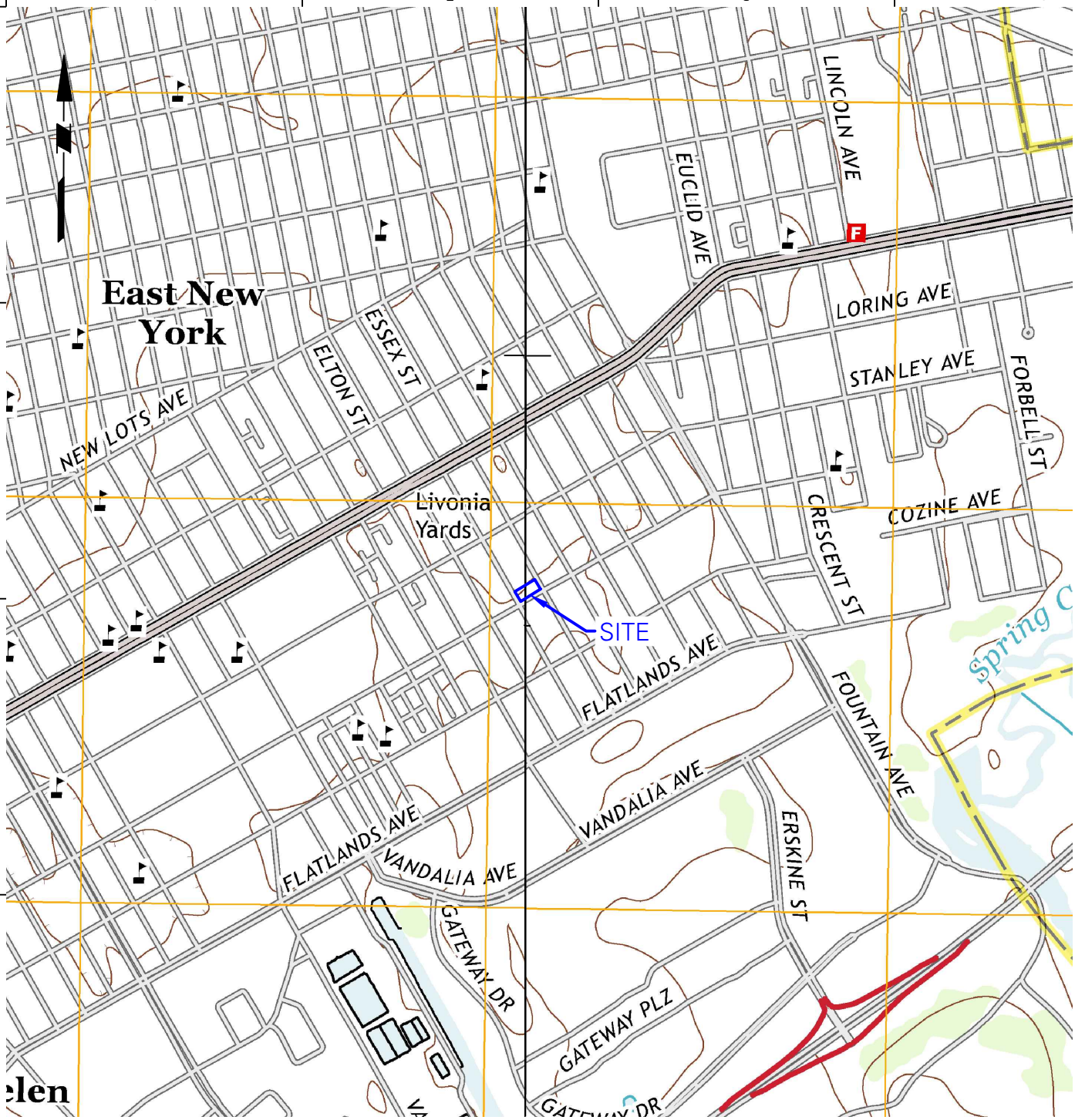
TABLE 10: SEMI-ANNUAL, NEAR-FIELD, OFF-SITE GROUNDWATER SAMPLING RESULTS SUMMARY
491 WORTMAN AVENUE
BROOKLYN, NEW YORK
LANGAN PROJECT NO. 170329301
BROWNFIELD CLEANUP PROGRAM SITE NO. C224139

Compound	NYSDEC TOGS STANDARDS AND GUIDANCE VALUES	Sampling Location				
		ML002S	ML002M	ML002D	MW10	MW11
NYSDEC-Requested Sample Results Summary (µg/L) - July 2016						
CVOCs	~	38.17	16.54	--	188.2	2.9
PCE	5	17	14	NS	120	1.50
TCE	5	20	2.10	NS	57	1
cis-1,2- DCE	5	0.97	0.24	NS	11	0.20
vinyl chloride	2	0.20	0.20	NS	0.20	0.20
First Round Sampling Results Summary (µg/L) - April 2017						
CVOCs	~	5.49	19.9	14.1	12.23	4.58
PCE	5	1.4	14	9.5	5.6	0.56
TCE	5	0.59	2.4	1.1	4.7	0.52
cis-1,2- DCE	5	2.5	2.5	2.5	0.93	2.5
vinyl chloride	2	1	1	1	1	1
Round 1 Percent CVOC Reduction		*86%*	*Increased*	--	*94%*	*Increased*

Notes:

1. Groundwater sample analytical results are compared to New York State Department of Environmental Conservation (NYSDEC) Technical and Operational Guidance Series (TOGS) 1.1.1 Ambient Water Quality Standards and Guidance Values for Class GA water.
2. Results exceeding the NYSDEC TOGS standards and guidance values are shaded.
3. PCE = tetrachlorothylene
4. TCE = trichloroethylene
5. cis-1,2-DCE = cis-1,2-Dichloroethylene
6. µg/L = microgram per liter
7. CVOC = chlorinated volatile organic compounds
8. NS = not sampled

FIGURES



LEGEND:

APPROXIMATE SITE BOUNDARY

NOTE: BASE MAPS ARE REFERENCED FROM THE UNITED STATES GEOLOGICAL SURVEY (USGS) TOPOGRAPHIC QUADRANGLE MAPS FOR BROOKLYN AND JAMAICA.

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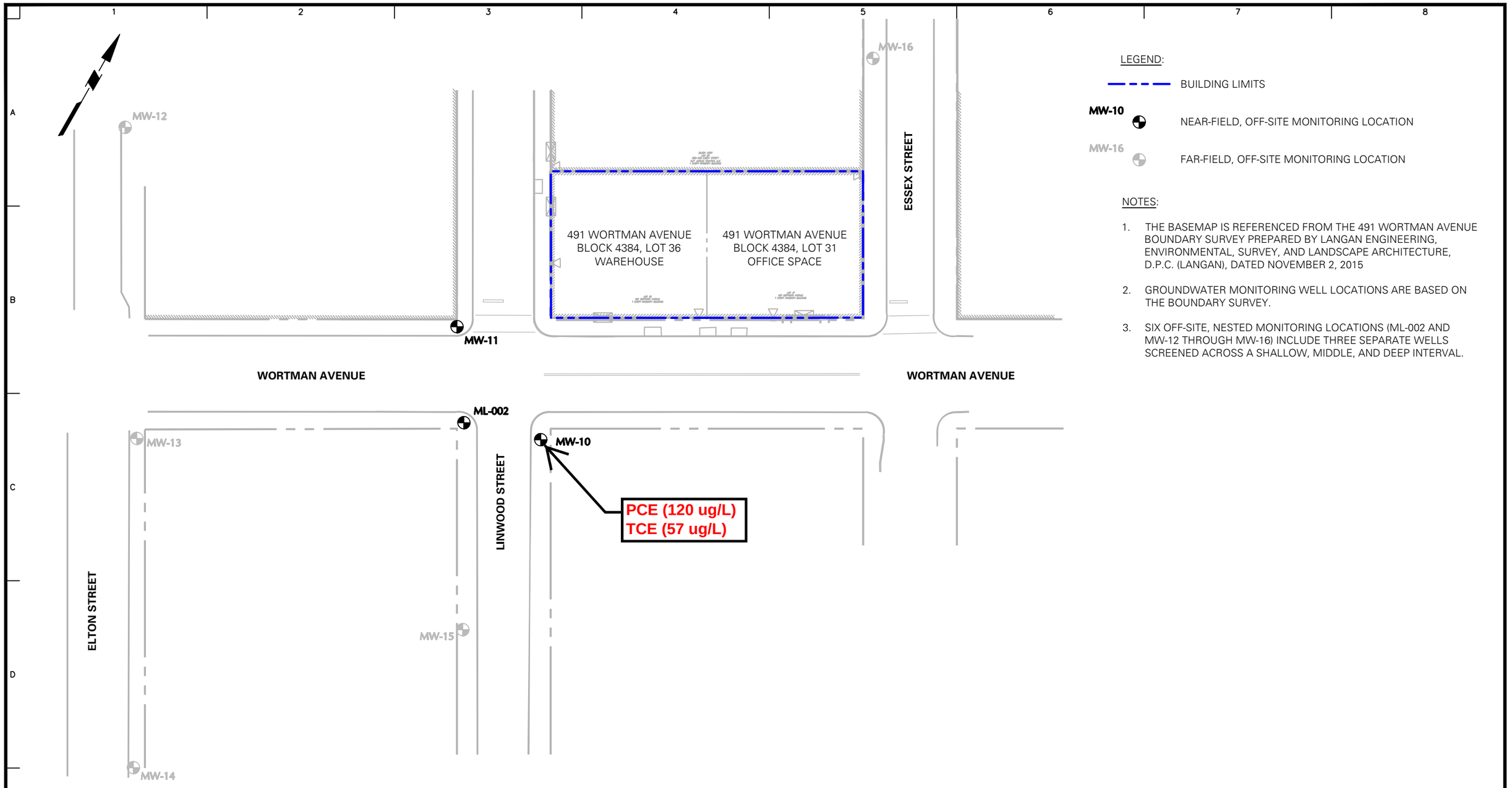
Langan International LLC
Collectively known as Langan

Project
491 WORTMAN AVENUE
BLOCK No. 4384, LOT Nos. 31 & 36
BROOKLYN
KINGS NEW YORK

Figure Title
SITE LOCATION MAP

Project No. 170329301	Figure 1
Date 04/18/2015	
Scale N.T.S.	
Drawn By MLR / Checked By GN	
Submission Date	Sheet 1 of 3

Filename: \\langan.com\data\NYC\data3\170329301\Cadd Data - 170329301\SheetFiles\Monthly Report 22\Figure 1 - Site Location Map - Updated.dwg Date: 5/9/2017 Time: 12:48 User: mrogers Style Table: Langan.stb Layout: Site Location Map



LEGEND:

- BUILDING LIMITS
- MW-10 — NEAR-FIELD, OFF-SITE MONITORING LOCATION
- MW-16 — FAR-FIELD, OFF-SITE MONITORING LOCATION

NOTES:

1. THE BASEMAP IS REFERENCED FROM THE 491 WORTMAN AVENUE BOUNDARY SURVEY PREPARED BY LANGAN ENGINEERING, ENVIRONMENTAL, SURVEY, AND LANDSCAPE ARCHITECTURE, D.P.C. (LANGAN), DATED NOVEMBER 2, 2015
2. GROUNDWATER MONITORING WELL LOCATIONS ARE BASED ON THE BOUNDARY SURVEY.
3. SIX OFF-SITE, NESTED MONITORING LOCATIONS (ML-002 AND MW-12 THROUGH MW-16) INCLUDE THREE SEPARATE WELLS SCREENED ACROSS A SHALLOW, MIDDLE, AND DEEP INTERVAL.

WARNING: IT IS A VIOLATION OF THE NYS EDUCATION LAW ARTICLE 145 FOR ANY PERSON, UNLESS HE IS ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS ITEM IN ANY WAY.

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Langan Engineering and Environmental Services, Inc.
Langan CT, Inc.
Langan International LLC
Collectively known as Langan

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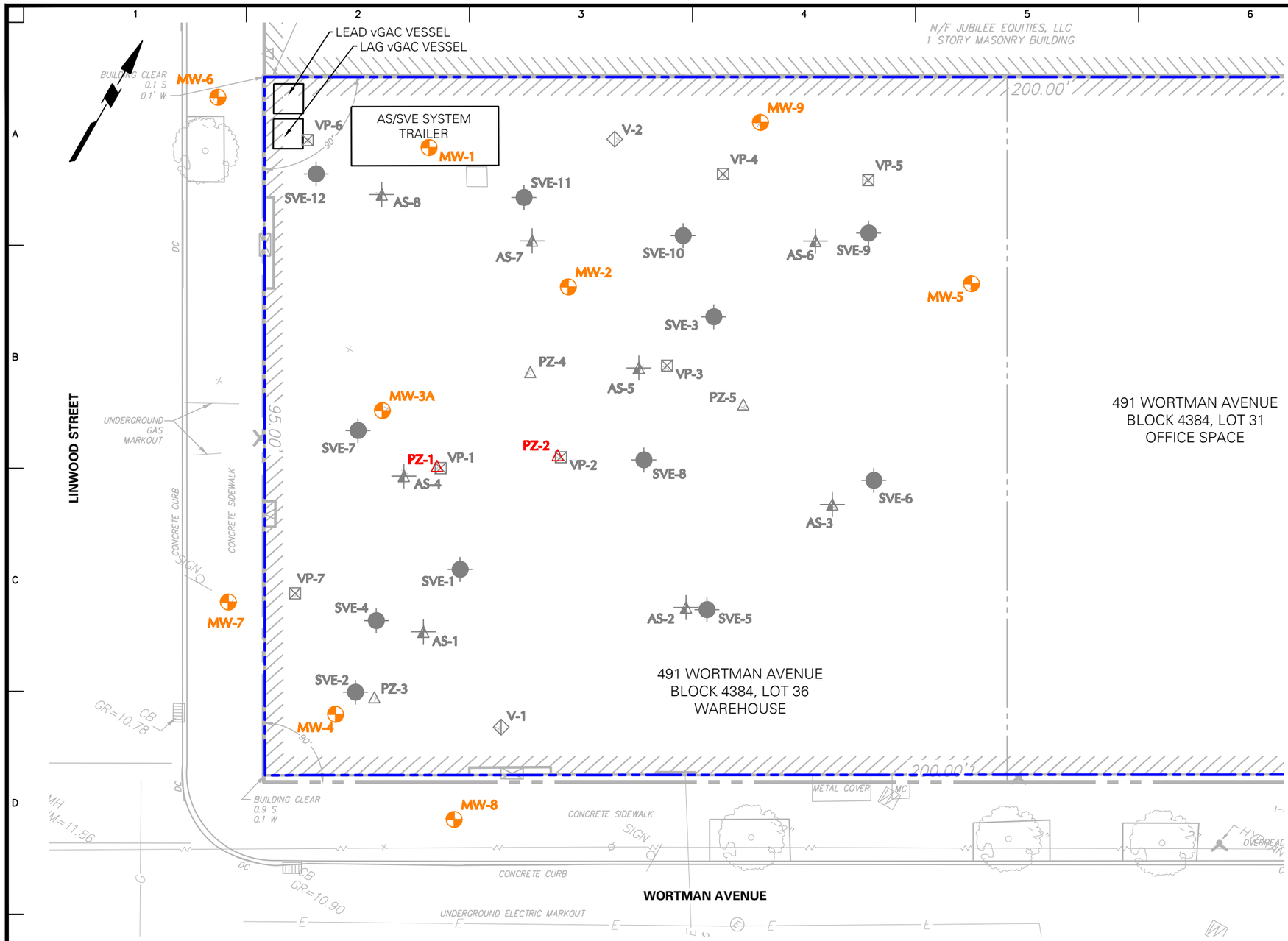
BLOCK No. 4384, LOT Nos. 31 & 36
BROOKLYN
KINGS **NEW YORK**

Figure Title
OFF-SITE GROUNDWATER MONITORING WELL LOCATIONS

Project No. 170329301	Figure No. 2
Date 10/03/2016	
Scale AS SHOWN	
Drawn By MLR / Checked By GN	
Submission Date	Sheet 2 of 3

Filename: \\langan.com\data\NYC\data3\170329301\Cadd Data - 170329301\SheetFiles\Monthly Report 22\Figure 2 - Off-Site MW Locations.dwg Date: 5/9/2017 Time: 12:51 User: mrogers Style Table: Langan.stb Layout: ANSIB-BL



LEGEND:

- BUILDING LIMITS
- AS-6 — AIR SPARGE WELL
- SVE-9 — SOIL VAPOR EXTRACTION WELL
- VP-5 — VAPOR PROBE
- V-2 — VENT WELL
- MW-5 — MONITORING WELL
- PZ-2 — PIEZOMETER (SAMPLED)
- PZ-5 — PIEZOMETER (NOT INCLUDED IN SAMPLING PROGRAM)

NOTES:

1. THE BASEMAP IS REFERENCED FROM THE 491 WORTMAN AVENUE BOUNDARY SURVEY PREPARED BY LANGAN ENGINEERING, ENVIRONMENTAL, SURVEY, AND LANDSCAPE ARCHITECTURE, D.P.C. (LANGAN), DATED NOVEMBER 2, 2015
2. WELL LOCATIONS ARE BASED ON THE BOUNDARY SURVEY.
3. ELEVATIONS SHOWN ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).
4. 11 GROUNDWATER MONITORING WELLS AND 2 PIEZOMETERS ARE INCLUDED AS PART OF THE QUARTERLY GROUNDWATER SAMPLING PROGRAM.
5. MW-3A IS A NESTED MONITORING LOCATION WITH THREE SEPARATE WELLS SCREENED ACROSS A SHALLOW, MIDDLE, AND DEEP INTERVAL.

WARNING: IT IS A VIOLATION OF THE NYS EDUCATION LAW ARTICLE 145 FOR ANY PERSON, UNLESS HE IS ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS ITEM IN ANY WAY.

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KINGS **NEW YORK**

Figure Title
ON-SITE GROUNDWATER MONITORING LOCATIONS

Project No. 170329301	Figure No. 3
Date 01/21/2016	
Scale AS SHOWN	
Drawn By TCS / Checked By GN	
Submission Date	Sheet 3 of 3

Filename: \\langan.com\data\NYC\data3\170329301\Cadd Data - 170329301\SheetFiles\Monthly Report 22\Figure 2 - Quarterly GW Wells.dwg Date: 5/9/2017 Time: 12:55 User: mrogers Style Table: Langan.stb Layout: ANSIB-BL

Progress/Inspection Report No. 1
J&H Holding Company, LLC
491 Wortman Avenue, Brooklyn, NY 11208
Brownfield Cleanup Program Site No. C224139
Reporting Period: May 2017

1. Introduction

Langan Engineering, Environmental, Surveying and Landscape Architecture, D.P.C. (Langan) submits this progress/inspection report on behalf of J&H Holding Company, LLC (the "Participant"). In accordance with Section 7.1 of the Site Management Plan (SMP), which is pending approval by the New York State Department of Environmental Conservation (NYSDEC), this progress/inspection report summarizes work performed at the Former Watermark Designs Facility (the "Site") during May 2017. The Final Engineering Report (FER) was submitted to the NYSDEC on May 25, 2017, and in accordance with the Brownfield Cleanup Agreement (BCA) submission of Monthly Brownfield Cleanup Program (BCP) Progress Reports is no longer required for the Site.

The Site (Block 4384, Lots 31 & 36) is located at 491 Wortman Avenue in Brooklyn, New York (Figure 1) and consists of a rectangular shaped lot that is about 19,000 square feet (±0.44 acres). The Site is located in an area zoned for industrial/manufacturing use and is bound by Wortman Street to the south, Linwood Street to the west, Essex Street to the east, and a one-story building to the north. Currently, a one-story building with a partial basement covers the entire Site footprint. The one-story building is comprised of a warehouse (i.e., the western portion) and office space and a smaller warehouse (i.e. the eastern portion).

2. Remedial Actions Relative to the Site during this Reporting Period

On May 12, 2017, Langan installed the new programmable logic controller (PLC) modem, and on May 25, 2017, Langan recorded process and performance monitoring data for the air sparge and soil vapor extraction (AS/SVE) system. As part of the monthly inspection, vapor samples were collected prior to the lead vapor-phase granular activated carbon (vGAC) unit (i.e., influent) and after the lag vGAC unit (i.e., effluent). Routine equipment maintenance, including greasing the blower and checking the belt tensions, was also performed.

3. Actions Relative to the Site Anticipated for the Next Reporting Period

The following activities are planned:

- Continued operation, maintenance and monitoring (OM&M) of the AS/SVE system

4. Approved Activity Modifications (changes of work scope and/or schedule)

None

5. Results of Sampling, Testing and Other Relevant Data

OM&M sampling was performed as follows:

- An influent vapor sample was collected from the AS/SVE system and analyzed for volatile organic compounds (VOCs) via United States Environmental Protection Agency (USEPA) Method TO-15.
- An effluent vapor sample was collected from the AS/SVE system and analyzed for VOCs via USEPA Method TO-15.

Samples were analyzed by Alpha Analytical of Westborough, MA. Alpha is a New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP)-certified laboratory.

Based on the results of the most recent OM&M sampling, the AS/SVE system is functioning in compliance with Policy DAR-1: Guidelines for the Control of Toxic Ambient Air Contaminants (DAR-1).

The following tables are attached to this progress report; analytical lab reports are available upon request. The tables summarize the data collected and the functionality of the AS/SVE system, including mass of VOCs removed from the subsurface based on photoionization detector (PID) readings and laboratory data, as well as, the alarm history.

- Table1: AS/SVE System Vapor Sampling Results
- Table 2: AS/SVE System Mass Removal – PID Data
- Table 3: AS/SVE System Mass Removal – Laboratory Data
- Table 4: AS/SVE System DAR-1 Compliance – May 25, 2017
- Table 5: AS/SVE System Alarm History

6. Deliverables Submitted During This Reporting Period

The FER was submitted to the NYSDEC on May 25, 2017. NYSDEC provided comments to the SMP on June 2, 2017.

7. Information Regarding Percentage of Completion

OM&M of the AS/SVE system is ongoing.

As of June 7, 2017 and since inception, the SVE system operated for 13,070 hours (92% uptime), and the AS system operated for 12,604 hours (88% uptime).

8. Unresolved Delays Encountered or Anticipated That May Affect the Schedule and Mitigation Efforts

None

9. Citizen Participation Plan Activities during This Reporting Period

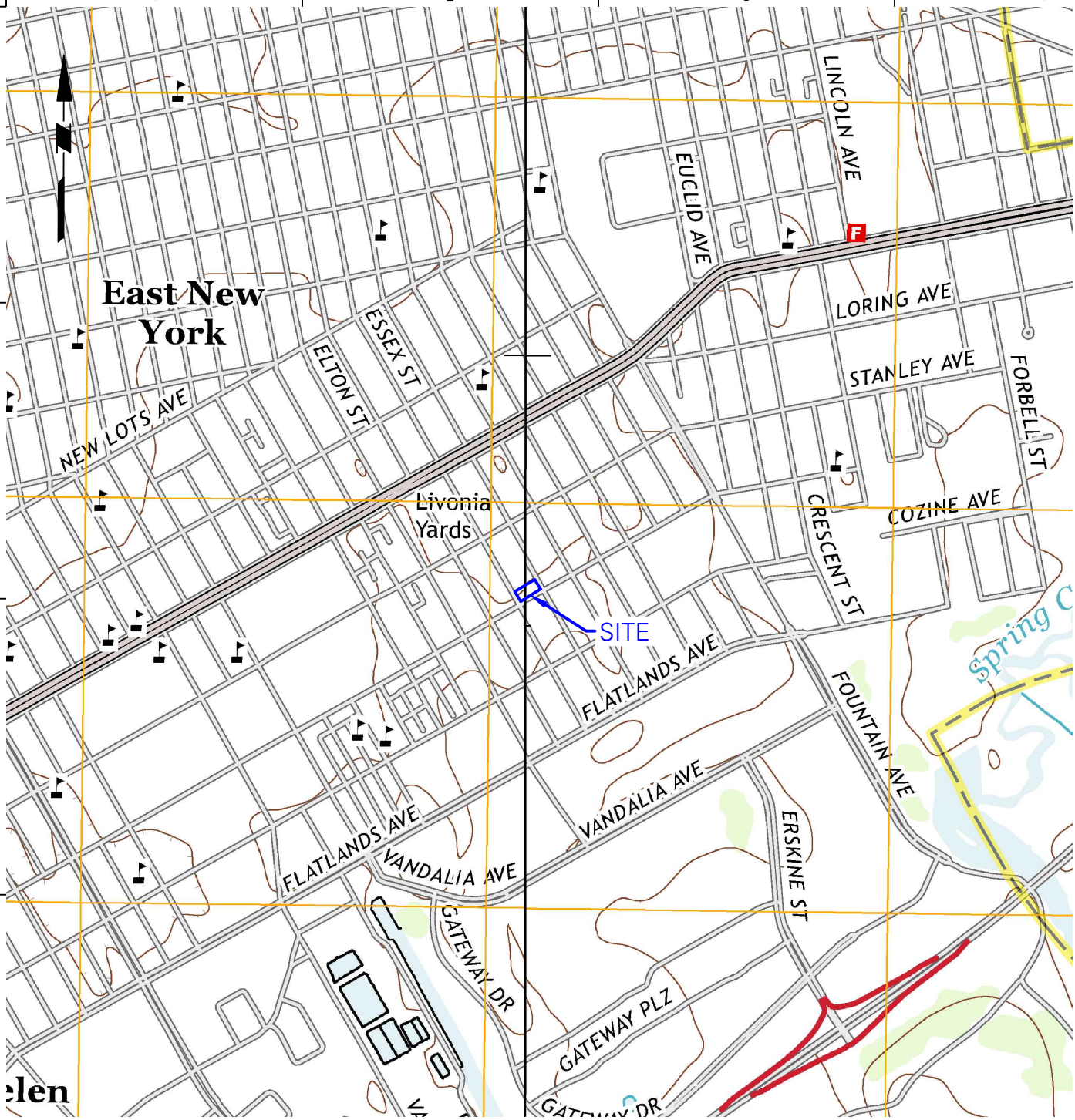
None

10. Activities Anticipated in Support of the CPP for the Next Reporting Period

None

11. Miscellaneous Information

Based on receipt of the NYSDEC's comments on the SMP and submittal of the draft FER, issuance of a certificate of completion is anticipated before the end of August 2017.



LEGEND:

APPROXIMATE SITE BOUNDARY

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Figure Title
SITE LOCATION MAP

Project No. 170329301	Figure 1
Date 04/18/2015	
Scale N.T.S.	
Drawn By MLR / Checked By GN	
Submission Date	Sheet 1 of 3

Filename: \\langan.com\data\NYC\data3\170329301\Cadd Data - 170329301\SheetFiles\Monthly Report 22\Figure 1 - Site Location Map - Updated.dwg Date: 5/9/2017 Time: 12:48 User: mrogers Style Table: Langan.stb Layout: Site Location Map

TABLE 1: AS/SVE SYSTEM VAPOR SAMPLING RESULTS
FORMER WATERMARK DESIGNS FACILITY
BROOKLYN, NEW YORK
LANGAN PROJECT NO. 170329301
BROWNFIELD CLEANUP PROGRAM SITE NO. C224139

LOCATION	vGAC INFLUENT		vGAC EFFLUENT	
SAMPLE ID	INFLUENT_052517		EFFLUENT_052517	
LAB SAMPLE ID	L1717266-01		L1717266-02	
SAMPLE DATE	5/25/2017		5/25/2017	
Volatile Organic Compounds (ug/m^3)				
1,1,1-Trichloroethane	2.2	U	2.3	U
1,1,2,2-Tetrachloroethane	2.8	U	2.8	U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	3.2	U	3.2	U
1,1,2-Trichloroethane	2.2	U	2.3	U
1,1-Dichloroethane	1.7	U	1.7	U
1,1-Dichloroethylene	1.6	U	1.6	U
1,2,4-Trichlorobenzene	3.1	U	3.1	U
1,2,4-Trimethylbenzene	2.0	U	2.0	U
1,2-Dibromoethane	3.2	U	3.2	U
1,2-Dichlorobenzene	2.5	U	2.5	U
1,2-Dichloroethane	1.7	U	1.7	U
1,2-Dichloropropane	124		1.9	U
1,3,5-Trimethylbenzene	2.0	U	2.0	U
1,3-Butadiene	0.9	U	0.9	U
1,3-Dichlorobenzene	2.5	U	2.5	U
1,4-Dichlorobenzene	2.5	U	2.5	U
1,4-Dioxane	1.5	U	1.5	U
2-Butanone	11.4		3.0	U
2-Hexanone	1.7	U	1.7	U
3-Chloropropene	1.3	U	1.3	U
4-Methyl-2-pentanone	4.2	U	4.2	U
Acetone	41		18	
Benzene	1.9		1.3	U
Benzyl chloride	2.1	U	2.1	U
Bromodichloromethane	2.8	U	2.8	U
Bromoform	4.3	U	4.3	U
Bromomethane	1.6	U	1.6	U
Carbon disulfide	1.3	U	1.3	U
Carbon tetrachloride	2.6	U	2.6	U
Chlorobenzene	1.9	U	1.9	U
Chloroethane	1.1	U	1.1	U
Chloroform	2.5		2.0	U
Chloromethane	0.8	U	0.9	U
cis-1,2-Dichloroethylene	11.1		2.5	
cis-1,3-Dichloropropylene	2.0		1.9	U
Cyclohexane	1.9		1.4	U
Dibromochloromethane	3.5	U	3.5	U
Dichlorodifluoromethane	2.0	U	2.4	
Ethyl acetate	16.4		3.7	U
Ethyl Benzene	1.8	U	1.8	U
Hexachlorobutadiene	4.4	U	4.4	U
Methyl tert-butyl ether (MTBE)	1.5	U	1.5	U
Methylene chloride	29.8		25	
n-Hexane	1.5		1.5	U
o-Xylene	1.8	U	1.8	U
p- & m- Xylenes	3.6	U	3.6	U
Styrene	1.8	U	1.8	U
Tetrachloroethylene	112		2.8	U
Tetrahydrofuran	6.3		3.0	U
Toluene	6.4		1.6	U
trans-1,2-Dichloroethylene	1.6	U	1.6	U
trans-1,3-Dichloropropylene	1.9	U	1.9	U
Trichloroethylene	403		2.2	U
Trichlorofluoromethane (Freon 11)	2.3	U	2.3	U
Vinyl bromide	1.8	U	1.8	U
Vinyl Chloride	1.1	U	1.1	U

NOTES:
1. ug/m^3 = micrograms per cubic meter
2. vGAC = vapor-phase granular activated carbon
3. Samples collected at the "vGAC INFLUENT" were collected before to the lead vGAC vessel.
4. Samples collected at the "vGAC EFFLUENT" were collected after the lag vGAC vessel.

Q is the Qualifier Column with definitions as follows:
D = The result is from an analysis that required a dilution.
U = The analyte was not detected at or above the level indicated.

TABLE 2: AS/SVE SYSTEM MASS REMOVAL - PID DATA
FORMER WATERMARK DESIGNS FACILITY
BROOKLYN, NEW YORK
LANGAN PROJECT NO. 170329301
BROWNFIELD CLEANUP PROGRAM SITE NO. C224139

DATE	INFLUENT CONCENTRATION (ppmv)	SVE BLOWER FLOWRATE (scfm)	EFFLUENT CONCENTRATION (ppmv)	TOTAL OPERATIONAL HOURS	AVERAGE MOLECULAR WEIGHT	MASS REMOVAL RATE (lbs/hr)	TOTAL MASS REMOVED FROM SUBSURFACE (lbs)	CUMULATIVE MASS REMOVED FROM SUBSURFACE (lbs)
10/21/2015	55.0	688	1.8	30	100	0.57	17.02	17.02
10/26/2015	8.3	650	0.6	150	100	0.08	9.31	26.34
11/6/2015	5.5	560	0.0	383	100	0.05	11.13	37.46
11/30/2015	1.9	593	0.3	958	100	0.01	8.46	45.92
12/28/2015	3.7	570	0.0	1,548	100	0.03	19.29	65.21
1/27/2016	1.2	525	0.5	2,180	100	0.01	3.60	68.81
2/24/2016	2.5	578	0.0	2,854	100	0.02	15.10	83.91
3/30/2016	0.2	550	0.0	3,693	100	0.002	1.43	85.34
4/29/2016	2.0	571	0.0	4,322	100	0.018	11.14	96.48
5/26/2016	0.4	600	0.0	4,972	100	0.004	2.42	98.90
6/29/2016	0.5	600	0.0	5,784	100	0.005	3.78	102.68
7/28/2016	3.0	600	0.0	6,431	100	0.028	18.06	120.73
8/31/2016	2.7	600	0.0	7,110	100	0.025	17.05	137.79
9/29/2016	7.5	760	2.0	7,802	100	0.065	44.85	182.63
10/31/2016	0.0	520	0.0	8,516	100	0.000	0.00	182.63
11/29/2016	0.0	560	0.0	9,211	100	0.000	0.00	182.63
12/28/2016	0.0	520	0.0	9,884	100	0.000	0.00	182.63
1/25/2017	2.8	600	0.0	10,530	100	0.026	16.83	199.46
3/7/2017	0.1	360	0.0	11,186	100	0.001	0.37	199.82
4/27/2017	0.0	600	0.0	12,185	100	0.000	0.00	199.82
5/25/2017	0.8	600	0.0	12,760	100	0.008	4.42	204.24

NOTES:
1. Blower flowrate is recorded from PDI-701 pitot tube flow indicator located on the blower discharge line.
2. The influent and effluent concentrations are based on the PID readings.
3. Mass Removal rate (lb/hr) = ((Conc in ppmv)(flowrate scfm)(MW)(60 min/hr)) / ((387)(1,000,000)).
4. PID = photoionization detector
5. ppmv = parts per million volume
6. scfm = standard cubic feet per minute
7. lbs/hr = pounds per hour
8. lbs = pounds
9. SVE = soil vapor extraction

TABLE 3: AS/SVE SYSTEM MASS REMOVAL - LABORATORY DATA
FORMER WATERMARK DESIGNS FACILITY
BROOKLYN, NEW YORK
LANGAN PROJECT NO. 170329301
BROWNFIELD CLEANUP PROGRAM SITE NO. C224139

DATE	INFLUENT CONCENTRATION (ug/m3)	SVE BLOWER FLOWRATE (scfm)	EFFLUENT CONCENTRATION (ug/m3)	TOTAL OPERATIONAL HOURS	INFLUENT RATE (mg/min)	EFFLUENT RATE (mg/min)	REMOVAL RATE (mg/min)	MASS REMOVED FROM SUBSURFACE (lbs)	TOTAL MASS REMOVED FROM SUBSURFACE (lbs)	MASS REMOVED BY CARBON (lbs)	TOTAL MASS REMOVED BY CARBON (lbs)	VGAC MASS REMOVAL EFFICIENCY (%)
10/20/2015	114,348	640	9,241	12	2049.12	165.60	1883.52	3.25	3.25	2.99	2.99	92
10/21/2015	32,758	688	1,129	30	631.05	21.75	609.30	1.50	4.76	1.45	4.44	97
10/26/2015	7,027	650	383	150	127.89	6.97	120.92	2.03	6.79	1.92	6.36	95
11/30/2015	3,144	593	426	958	52.20	7.07	45.13	5.58	12.36	4.82	11.18	86
12/28/2015	3,357	570	230	1,548	53.58	3.67	49.91	4.18	16.55	3.89	15.08	93
1/27/2016	621	525	183	2,180	9.13	2.69	6.44	0.76	17.31	0.54	15.62	71
2/24/2016	1,454	578	283	2,854	23.53	4.58	18.94	2.10	19.41	1.69	17.31	81
3/30/2016	825	550	75	3,693	12.71	1.16	11.55	1.41	20.82	1.28	18.59	91
4/29/2016	482	571	112	4,322	7.70	1.79	5.91	0.64	21.46	0.49	19.08	77
5/26/2016	1,169	600	162	4,972	19.64	2.73	16.91	1.69	23.15	1.45	20.53	86
6/29/2016	1,865	600	190	5,784	31.33	3.19	28.14	3.37	26.51	3.02	23.56	90
7/28/2016	3,706	600	232	6,431	62.26	3.90	58.36	5.33	31.84	4.99	28.55	94
8/31/2016	4,798	600	135	7,110	80.61	2.26	78.35	7.24	39.08	7.04	35.59	97
9/29/2016	1,045	760	179	7,802	22.24	3.81	18.43	2.04	41.12	1.69	37.27	83
10/31/2016	922	520	91	8,516	13.42	1.32	12.10	1.27	42.38	1.14	38.42	90
11/29/2016	790	560	167	9,211	12.38	2.62	9.76	1.14	43.52	0.90	39.31	79
12/28/2016	282	520	123	9,884	4.11	1.79	2.32	0.37	43.89	0.21	39.52	56
1/25/2017	4.7	600	5.6	10,530	0.08	0.09	-0.02	0.01	43.89	0.00	39.52	--
3/7/2017	762	360	120	11,186	7.68	1.21	6.47	0.67	44.56	0.56	40.08	84
4/27/2017	1,008	600	86	12,185	16.93	1.44	15.49	2.24	46.80	2.05	42.13	91
5/25/2017	771	600	48	12,760	12.95	0.81	12.15	0.99	47.78	0.92	43.05	94

NOTES:
1. Blower flowrate is recorded from PDI-701 pitot tube flow indicator located on the blower discharge line.
2. The influent and effluent concentrations are based on the lab analytical data and not the PID readings.
3. ug/m3 = micrograms per cubic meter
4. scfm = standard cubic feet per minute
5. mg/min = milligrams per minute
6. lbs = pounds
7. SVE = soil vapor extraction
8. VGAC = vapor-phase granular activated carbon

TABLE 4: AS/SVE SYSTEM DAR-1 COMPLIANCE
FORMER WATERMARK DESIGNS FACILITY
BROOKLYN, NEW YORK
LANGAN PROJECT NO. 170329301
BROWNFIELD CLEANUP PROGRAM NO. C224139

SAMPLING DATE: **5/25/2017**

CHEMICAL COMPOUND	CARBON EFFLUENT CONCENRATION MEASURED ($\mu g/m^3$)	EMISSION FLOWRATE MEASURED (SCFM)	(m^3/min)	OUTLET CONCENTRATION (Q_p) (lb/hr)	OUTLET CONCENTRATION (Q_a) (lb/yr)	MAX ANNUAL IMPACT (C_a) ($\mu g/m^3$)	MAX POTENTIAL IMPACT (C_p) ($\mu g/m^3$)	MAX SHORT-TERM IMPACT (C_{st}) ($\mu g/m^3$)	DAR-1 STANDARDS SGC ($\mu g/m^3$)	AGC ($\mu g/m^3$)	EMISSION RESTRICTION REQUIRED (if C_p>AGC and C_a<AGC)	SGC EMISSION EXCEEDANCE (if C_{st}>SGC)	AGC EMISSION EXCEEDANCE (if C_a>AGC)
Volatile Organics, USEPA TO-15 Full List (ug/m^3)													
Acetone	17.6	600	16.9902	3.95E-05	3.46E-01	3.11E-03	3.11E-03	2.02E-01	180,000	30,000	NO	NO	NO
cis-1,2-Dichloroethylene	2.46	600	16.9902	5.52E-06	4.83E-02	4.35E-04	4.34E-04	2.82E-02	--	63	NO	No Standard	NO
Dichlorodifluoromethane	2.38	600	16.9902	5.34E-06	4.68E-02	4.20E-04	4.20E-04	2.73E-02	--	12,000	NO	No Standard	NO
Methylene chloride	25.2	600	16.9902	5.65E-05	4.95E-01	4.45E-03	4.45E-03	2.89E-01	14,000	60	NO	NO	NO

NOTES AND QUALIFIERS:
1. Table only displays chemical compounds with detectable concentrations.
2. Concentrations below reporting limit (non detect) are assumed to be zero.
3. Air samples were analyzed for USEPA TO-15 compounds
4. All equations are referenced in NYSDEC, Division of Air Resources, Air Guide 1, Guidelines for the Control of Toxic Ambient Air Contaminants (11/12/97). Standard Point Source Method calculations were used.
5. Values in table are compared to DAR-1 Annual Guideline Concentrations (AGC)/Short-Term Guideline Concentrations (SGC) Tables dated February 28, 2014.
6. DAR-1 AGC and/or SGC values listed as "--" means there is no AGC or SGC standard for that compound.
7. SCFM = standard cubic feet per minute
8. Blower flowrate is recorded from PDI-701 pitot tube flow indicator located on the blower discharge line.
9. ug/m^3 = micrograms per cubic meter
10. m^3/min = cubic meter per minute
11. lb/hr = pounds per hour
12. lb/yr = pounds per year

TABLE 5: AS/SVE SYSTEM ALARM HISTORY
FORMER WATERMARK DESIGNS FACILITY
BROOKLYN, NEW YORK
LANGAN PROJECT NO. 170329301
BROWNFIELD CLEANUP PROGRAM NO. C224139

DATE	ALARM	ALARM DESCRIPTION	REASON	REMEDY
10/23/2015	PAL-2501	Compressor Low Pressure Alarm	Uncertain of the reason. There may be a power fluctuation that trips the low pressure alarm, which shuts the AS system down.	On-site observation confirmed that this was a false alarm and was not caused by compressor failure or a breach in the air sparge manifold. The alarm was manually reset.
10/28/2015	LAH-7301	Storage Tank High Level Alarm	The SVE system began to extract a larger volume of water than previously anticipated.	The storage tank was emptied into nine 55-gallon drums, and the SVE system vacuum has been optimized to extract a lesser volume of water.
11/5/2015	PAL-2501	Compressor Low Pressure Alarm	Caused by the air sparge compressor on/off time, which won't allow "OFF" time to be set to zero and therefore, the compressor cannot run continuously.	The air compressor timer has been by-passed and the compressor operation is linked to the SVE system operation. If the SVE system is operational, the compressor will operate unless a different AS system alarm has been triggered.
11/17/2015	PAL-2501	Compressor Low Pressure Alarm	This was an alarm test that was performed to ensure that the update to the Programmable Logic Controller (PLC) was successful.	The PLC update was successful and the air sparge compressor can run continuously. The air compressor timer is no longer being bypassed.
12/23/2015	LAH-7301	Storage Tank High Level Alarm	Following optimization, which included increasing the AS rate and the SVE system flow rate, the SVE system began to extract a larger volume of water than previously anticipated.	The storage tank was emptied into three 55-gallon drums. Both the AS and SVE system flow rates were adjusted in an effort to reduce excess water collection by the SVE system.
12/25/2015	LAH-7301	Storage Tank High Level Alarm	Following optimization, which included increasing the AS rate and the SVE system flow rate, the SVE system began to extract a larger volume of water than previously anticipated.	The storage tank was emptied into three 55-gallon drums. Both the AS and SVE system flow rates were adjusted in an effort to reduce excess water collection by the SVE system.
1/7/2016	LAH-7301	Storage Tank High Level Alarm	Following continued optimization of AS/SVE system, the SVE system began to extract a larger volume of water than anticipated.	The storage tank was emptied into eight 55-gallon drums. Both the AS and SVE system flow rates were adjusted in an effort to reduce excess water collection by the SVE system.
1/17/2016	LAH-7301	Storage Tank High Level Alarm	Following continued optimization of AS/SVE system, the SVE system began to extract a larger volume of water than anticipated.	The storage tank was emptied. Both the AS and SVE system flow rates were adjusted in an effort to reduce excess water collection by the SVE system.
2/1/2016	TAH-2501	Air Compressor High Temperature Alarm	The AS system is operating close to the alarm set point so that as much warm air as possible is continuously injected into the subsurface. A slight change in the air flow rate and/or ambient temperature most likely caused the rise in discharge air temperature.	The alarm was cleared and the AS system was restarted at a lower speed. The compressor speed was ramped up incrementally throughout the day until the previous set point was reached. The heat exchanger flow and AS manifold temperature are being monitored on a daily basis in an effort to prevent tripping the high temperature alarm again.
4/3/2016	PAL-701	Blower Influent High Pressure Alarm	The alarm was most likely triggered due to power fluctuations caused by high wind conditions.	The alarm was cleared and the SVE system was restarted at a higher frequency. The system was monitored remotely for the remainder of the day.
4/29/2016	TAH-2501	Air Compressor High Temperature Alarm	The AS system is operating close to the alarm set point so that as much warm air as possible is continuously injected into the subsurface. A slight change in the air flow rate and/or ambient temperature most likely caused the rise in discharge air temperature.	The alarm was cleared and the AS system was restarted. At restart, the allowable flow through the AS system was increased to alleviate the pressure on the air compressor discharge line. The heat exchanger flow and AS manifold temperature are being monitored on a daily basis in an effort to prevent tripping the high temperature alarm again.
8/9/2016	PAH-702	SVE System Effluent High Pressure Alarm	Anomalously high pressures were not noted on the SVE system discharge during the remote or on-site inspections. It is likely that the SVE effluent pressure switch needs to be recalibrated following almost a year's worth of continuous use.	The SVE system was restarted at a lower frequency and monitored on-site for about two hours.
8/26/2016	FAL-701	Blower Low Flow Alarm	The alarm was triggered due to a loose relay switch.	The switch was tightened during the August 31, 2016 monthly inspection and the system was restarted without further issue.
12/27/2016	PAL-2501	Compressor Low Pressure Alarm	The alarm was triggered due to a mechanical failure at the air compressor (i.e., the belts tore).	The air compressor belts were replaced on January 9, 2017 and the system was restarted.
3/7/2017	FAL-401	Transfer Pump Low Flow Alarm	The alarm was likley triggered due to the fluctuating volume of water extracted by the SVE system.	The AS/SVE system was restarted. Both the AS and SVE system flow rates were adjusted in an effort to reduce excess water collection by the SVE system.
3/8/2017	Low PLC Battery	Low Programmable Loigc Controller (PLC) Battery	The alarm was triggered because the PLC battery can no longer hold a charge.	The PLC battery was replaced on March 10, 2017.
3/24/2017	VFDA-701	SVE System Variable Frequency Drive (VFD) Alarm	The alarm was triggered because the SVE system blower was not functioning within the intended parameters.	The blower was visually inspected, a piece of debris caught in the belts was removed, and the system was restarted.

Progress/Inspection Report No. 2
J&H Holding Company, LLC
491 Wortman Avenue, Brooklyn, NY 11208
Brownfield Cleanup Program Site No. C224139
Reporting Period: June 2017

1. Introduction

Langan Engineering, Environmental, Surveying and Landscape Architecture, D.P.C. (Langan) submits this progress/inspection report on behalf of J&H Holding Company, LLC (the "Participant"). In accordance with Section 7.1 of the Site Management Plan (SMP), which is was approved by the New York State Department of Environmental Conservation (NYSDEC) on June 28, 2017, this progress/inspection report summarizes work performed at the Former Watermark Designs Facility (the "Site") during June 2017. The Final Engineering Report (FER) was submitted to the NYSDEC on May 25, 2017, and in accordance with the Brownfield Cleanup Agreement (BCA) submission of Monthly Brownfield Cleanup Program (BCP) Progress Reports is no longer required for the Site.

The Site (Block 4384, Lots 31 & 36) is located at 491 Wortman Avenue in Brooklyn, New York (Figure 1) and consists of a rectangular shaped lot that is about 19,000 square feet (±0.44 acres). The Site is located in an area zoned for industrial/manufacturing use and is bound by Wortman Street to the south, Linwood Street to the west, Essex Street to the east, and a one-story building to the north. Currently, a one-story building with a partial basement covers the entire Site footprint. The one-story building is comprised of a warehouse (i.e., the western portion) and office space and a smaller warehouse (i.e. the eastern portion).

2. Remedial Actions Relative to the Site during this Reporting Period

On June 28, 2017, Langan recorded process and performance monitoring data for the air sparge and soil vapor extraction (AS/SVE) system. As part of the monthly inspection, vapor samples were collected prior to the lead vapor-phase granular activated carbon (vGAC) unit (i.e., influent) and after the lag vGAC unit (i.e., effluent). Routine equipment maintenance, including greasing the blower and checking the belt tensions, was also performed.

3. Actions Relative to the Site Anticipated for the Next Reporting Period

The following activities are planned:

- Continued operation, maintenance and monitoring (OM&M) of the AS/SVE system

4. Approved Activity Modifications (changes of work scope and/or schedule)

None

5. Results of Sampling, Testing and Other Relevant Data

OM&M sampling was performed as follows:

- An influent vapor sample was collected from the AS/SVE system and analyzed for volatile organic compounds (VOCs) via United States Environmental Protection Agency (USEPA) Method TO-15.
- An effluent vapor sample was collected from the AS/SVE system and analyzed for VOCs via USEPA Method TO-15.

Samples were analyzed by Alpha Analytical of Westborough, MA. Alpha is a New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP)-certified laboratory.

Based on the results of the most recent OM&M sampling, the AS/SVE system is functioning in compliance with Policy DAR-1: Guidelines for the Control of Toxic Ambient Air Contaminants (DAR-1).

The following tables are attached to this progress report; analytical lab reports are available upon request. The tables summarize the data collected and the functionality of the AS/SVE system, including mass of VOCs removed from the subsurface based on photoionization detector (PID) readings and laboratory data, as well as, the alarm history.

- Table1: AS/SVE System Vapor Sampling Results
- Table 2: AS/SVE System Mass Removal – PID Data
- Table 3: AS/SVE System Mass Removal – Laboratory Data
- Table 4: AS/SVE System DAR-1 Compliance – June 28, 2017
- Table 5: AS/SVE System Alarm History

6. Deliverables Submitted During This Reporting Period

None

7. Information Regarding Percentage of Completion

OM&M of the AS/SVE system is ongoing.

As of July 5, 2017 and since inception, the SVE system operated for 13,742 hours (92% uptime), and the AS system operated for 13,272 hours (89% uptime).

8. Unresolved Delays Encountered or Anticipated That May Affect the Schedule and Mitigation Efforts

None

9. Citizen Participation Plan Activities during This Reporting Period

None

10. Activities Anticipated in Support of the CPP for the Next Reporting Period

None

11. Miscellaneous Information

Based on receipt of the NYSDEC's comments on the SMP and submittal of the draft FER on May 25, 2017, issuance of a certificate of completion is anticipated before the end of August 2017.

TABLES

TABLE 1: AS/SVE SYSTEM VAPOR SAMPLING RESULTS
FORMER WATERMARK DESIGNS FACILITY
BROOKLYN, NEW YORK
LANGAN PROJECT NO. 170329301
BROWNFIELD CLEANUP PROGRAM SITE NO. C224139

LOCATION	vGAC INFLUENT		vGAC EFFLUENT	
SAMPLE ID	INFLUENT_062817		EFFLUENT_062817	
LAB SAMPLE ID	L1722132-01		L1722132-02	
SAMPLE DATE	6/28/2017		6/28/2017	
Volatile Organic Compounds (ug/m^3)				
1,1,1-Trichloroethane	5.5	U	1.1	U
1,1,2,2-Tetrachloroethane	6.9	U	1.4	U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	7.7	U	1.5	U
1,1,2-Trichloroethane	5.5	U	1.1	U
1,1-Dichloroethane	4.1	U	0.8	U
1,1-Dichloroethylene	4.0	U	0.8	U
1,2,4-Trichlorobenzene	7.4	U	1.5	U
1,2,4-Trimethylbenzene	4.9	U	1.0	U
1,2-Dibromoethane	7.7	U	1.5	U
1,2-Dichlorobenzene	6.0	U	1.2	U
1,2-Dichloroethane	4.1	U	0.8	U
1,2-Dichloropropane	87		0.9	U
1,3,5-Trimethylbenzene	4.9	U	1.0	U
1,3-Butadiene	2.2	U	0.4	U
1,3-Dichlorobenzene	6.0	U	1.2	U
1,4-Dichlorobenzene	6.0	U	1.2	U
1,4-Dioxane	3.6	U	0.7	U
2-Butanone	7.4	U	2.4	
2-Hexanone	4.1	U	0.8	U
3-Chloropropene	3.1	U	0.6	U
4-Methyl-2-pentanone	10.2	U	2.1	U
Acetone	22		27	
Benzene	3.2	U	1.6	
Benzyl chloride	5.2	U	1.0	U
Bromodichloromethane	6.7	U	1.3	U
Bromoform	10.3	U	2.1	U
Bromomethane	3.9	U	0.8	U
Carbon disulfide	3.1	U	1.4	
Carbon tetrachloride	6.3	U	1.3	U
Chlorobenzene	4.6	U	0.9	U
Chloroethane	2.6	U	0.5	U
Chloroform	4.9	U	1.5	
Chloromethane	2.1	U	0.4	
cis-1,2-Dichloroethylene	7.9		3.6	
cis-1,3-Dichloropropylene	4.5	U	0.9	U
Cyclohexane	3.4	U	0.7	U
Dibromochloromethane	8.5	U	1.7	U
Dichlorodifluoromethane	4.9	U	1.9	
Ethyl acetate	9.0	U	1.8	U
Ethyl Benzene	4.3	U	0.9	U
Hexachlorobutadiene	10.7	U	2.1	U
Methyl tert-butyl ether (MTBE)	3.6	U	0.7	U
Methylene chloride	19.0		25	
n-Hexane	3.5	U	2.5	
o-Xylene	4.3	U	0.9	U
p- & m- Xylenes	8.7	U	1.7	U
Styrene	4.3	U	0.9	U
Tetrachloroethylene	125		1.4	U
Tetrahydrofuran	7.4	U	1.5	U
Toluene	3.8	U	1.5	
trans-1,2-Dichloroethylene	4.0	U	0.8	U
trans-1,3-Dichloropropylene	4.5	U	0.9	U
Trichloroethylene	492		1.1	U
Trichlorofluoromethane (Freon 11)	5.6	U	1.2	
Vinyl bromide	4.4	U	0.9	U
Vinyl Chloride	2.6	U	0.5	U

NOTES:
1. ug/m^3 = micrograms per cubic meter
2. vGAC = vapor-phase granular activated carbon
3. Samples collected at the "vGAC INFLUENT" were collected before to the lead vGAC vessel.
4. Samples collected at the "vGAC EFFLUENT" were collected after the lag vGAC vessel.

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D = The result is from an analysis that required a dilution.
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BROOKLYN, NEW YORK
LANGAN PROJECT NO. 170329301
BROWNFIELD CLEANUP PROGRAM SITE NO. C224139

DATE	INFLUENT CONCENTRATION (ppmv)	SVE BLOWER FLOWRATE (scfm)	EFFLUENT CONCENTRATION (ppmv)	TOTAL OPERATIONAL HOURS	AVERAGE MOLECULAR WEIGHT	MASS REMOVAL RATE (lbs/hr)	TOTAL MASS REMOVED FROM SUBSURFACE (lbs)	CUMULATIVE MASS REMOVED FROM SUBSURFACE (lbs)
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10/26/2015	8.3	650	0.6	150	100	0.08	9.31	26.34
11/6/2015	5.5	560	0.0	383	100	0.05	11.13	37.46
11/30/2015	1.9	593	0.3	958	100	0.01	8.46	45.92
12/28/2015	3.7	570	0.0	1,548	100	0.03	19.29	65.21
1/27/2016	1.2	525	0.5	2,180	100	0.01	3.60	68.81
2/24/2016	2.5	578	0.0	2,854	100	0.02	15.10	83.91
3/30/2016	0.2	550	0.0	3,693	100	0.002	1.43	85.34
4/29/2016	2.0	571	0.0	4,322	100	0.018	11.14	96.48
5/26/2016	0.4	600	0.0	4,972	100	0.004	2.42	98.90
6/29/2016	0.5	600	0.0	5,784	100	0.005	3.78	102.68
7/28/2016	3.0	600	0.0	6,431	100	0.028	18.06	120.73
8/31/2016	2.7	600	0.0	7,110	100	0.025	17.05	137.79
9/29/2016	7.5	760	2.0	7,802	100	0.065	44.85	182.63
10/31/2016	0.0	520	0.0	8,516	100	0.000	0.00	182.63
11/29/2016	0.0	560	0.0	9,211	100	0.000	0.00	182.63
12/28/2016	0.0	520	0.0	9,884	100	0.000	0.00	182.63
1/25/2017	2.8	600	0.0	10,530	100	0.026	16.83	199.46
3/7/2017	0.1	360	0.0	11,186	100	0.001	0.37	199.82
4/27/2017	0.0	600	0.0	12,185	100	0.000	0.00	199.82
5/25/2017	0.8	600	0.0	12,760	100	0.008	4.42	204.24
6/28/2017	0.04	600	0.0	13,575	100	0.000	0.33	204.57

NOTES:
1. Blower flowrate is recorded from PDI-701 pitot tube flow indicator located on the blower discharge line.
2. The influent and effluent concentrations are based on the PID readings.
3. Mass Removal rate (lb/hr) = ((Conc in ppmv)(flowrate scfm)(MW)(60 min/hr)) / ((387)(1,000,000)).
4. PID = photoionization detector
5. ppmv = parts per million volume
6. scfm = standard cubic feet per minute
7. lbs/hr = pounds per hour
8. lbs = pounds
9. SVE = soil vapor extraction

TABLE 3: AS/SVE SYSTEM MASS REMOVAL - LABORATORY DATA
FORMER WATERMARK DESIGNS FACILITY
BROOKLYN, NEW YORK
LANGAN PROJECT NO. 170329301
BROWNFIELD CLEANUP PROGRAM SITE NO. C224139

DATE	INFLUENT CONCENTRATION (ug/m3)	SVE BLOWER FLOWRATE (scfm)	EFFLUENT CONCENTRATION (ug/m3)	TOTAL OPERATIONAL HOURS	INFLUENT RATE (mg/min)	EFFLUENT RATE (mg/min)	REMOVAL RATE (mg/min)	MASS REMOVED FROM SUBSURFACE (lbs)	TOTAL MASS REMOVED FROM SUBSURFACE (lbs)	MASS REMOVED BY CARBON (lbs)	TOTAL MASS REMOVED BY CARBON (lbs)
10/20/2015	114,348	640	9,241	12	2049.12	165.60	1883.52	3.25	3.25	2.99	2.99
10/21/2015	32,758	688	1,129	30	631.05	21.75	609.30	1.50	4.76	1.45	4.44
10/26/2015	7,027	650	383	150	127.89	6.97	120.92	2.03	6.79	1.92	6.36
11/30/2015	3,144	593	426	958	52.20	7.07	45.13	5.58	12.36	4.82	11.18
12/28/2015	3,357	570	230	1,548	53.58	3.67	49.91	4.18	16.55	3.89	15.08
1/27/2016	621	525	183	2,180	9.13	2.69	6.44	0.76	17.31	0.54	15.62
2/24/2016	1,454	578	283	2,854	23.53	4.58	18.94	2.10	19.41	1.69	17.31
3/30/2016	825	550	75	3,693	12.71	1.16	11.55	1.41	20.82	1.28	18.59
4/29/2016	482	571	112	4,322	7.70	1.79	5.91	0.64	21.46	0.49	19.08
5/26/2016	1,169	600	162	4,972	19.64	2.73	16.91	1.69	23.15	1.45	20.53
6/29/2016	1,865	600	190	5,784	31.33	3.19	28.14	3.37	26.51	3.02	23.56
7/28/2016	3,706	600	232	6,431	62.26	3.90	58.36	5.33	31.84	4.99	28.55
8/31/2016	4,798	600	135	7,110	80.61	2.26	78.35	7.24	39.08	7.04	35.59
9/29/2016	1,045	760	179	7,802	22.24	3.81	18.43	2.04	41.12	1.69	37.27
10/31/2016	922	520	91	8,516	13.42	1.32	12.10	1.27	42.38	1.14	38.42
11/29/2016	790	560	167	9,211	12.38	2.62	9.76	1.14	43.52	0.90	39.31
12/28/2016	282	520	123	9,884	4.11	1.79	2.32	0.37	43.89	0.21	39.52
1/25/2017	4.7	600	5.6	10,530	0.08	0.09	-0.02	0.01	43.89	0.00	39.52
3/7/2017	762	360	120	11,186	7.68	1.21	6.47	0.67	44.56	0.56	40.08
4/27/2017	1,008	600	86	12,185	16.93	1.44	15.49	2.24	46.80	2.05	42.13
5/25/2017	771	600	48	12,760	12.95	0.81	12.15	0.99	47.78	0.92	43.05
6/28/2017	754	600	69	13,575	12.66	1.16	11.50	1.36	49.15	1.24	44.29

NOTES:
1. Blower flowrate is recorded from PDI-701 pitot tube flow indicator located on the blower discharge line.
2. The influent and effluent concentrations are based on the lab analytical data and not the PID readings.
3. ug/m3 = micrograms per cubic meter
4. scfm = standard cubic feet per minute
5. mg/min = milligrams per minute
6. lbs = pounds
7. SVE = soil vapor extraction
8. VGAC = vapor-phase granular activated carbon

TABLE 4: AS/SVE SYSTEM DAR-1 COMPLIANCE
FORMER WATERMARK DESIGNS FACILITY
BROOKLYN, NEW YORK
LANGAN PROJECT NO. 170329301
BROWNFIELD CLEANUP PROGRAM NO. C224139

SAMPLING DATE: **6/28/2017**

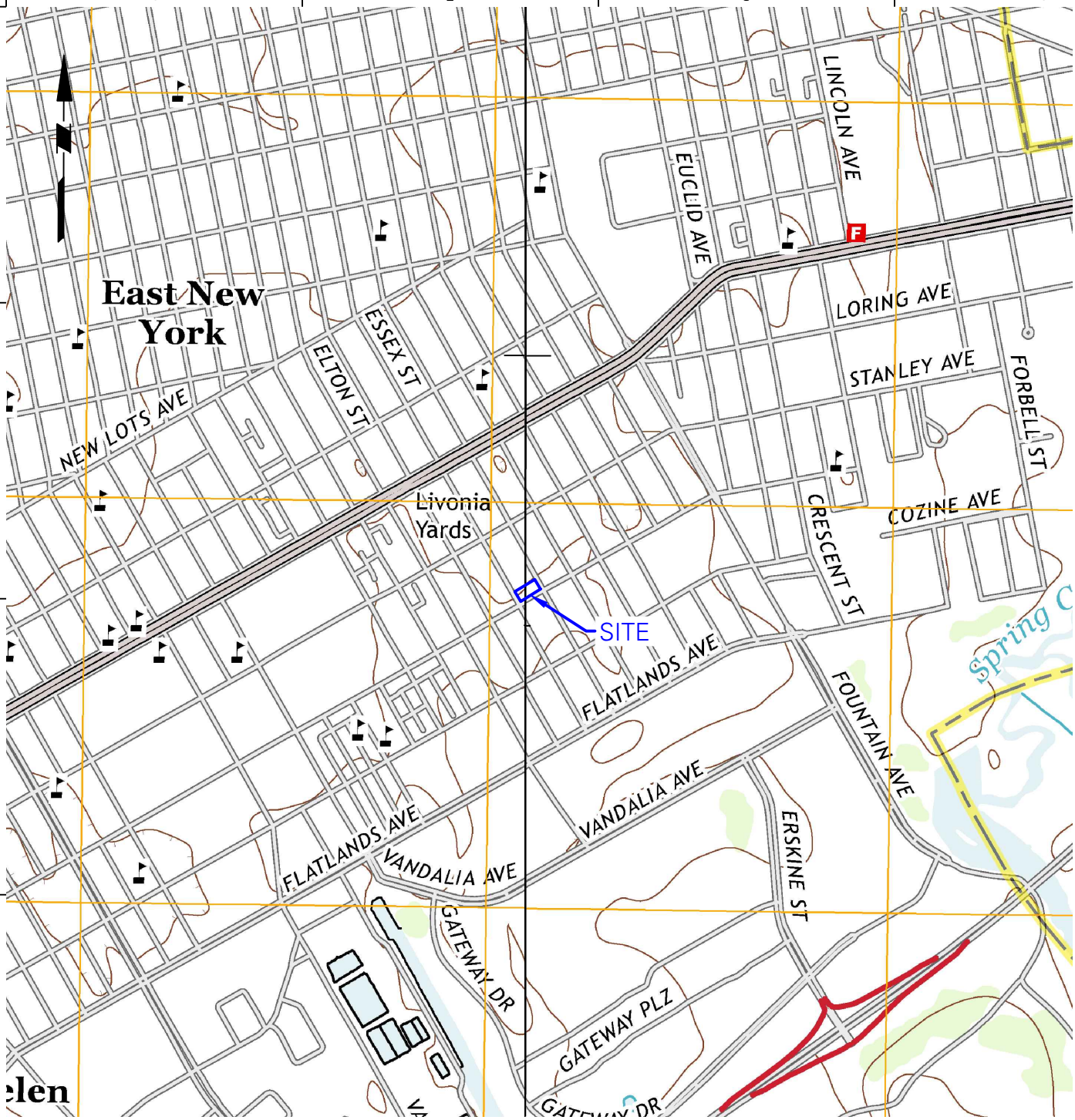
CHEMICAL COMPOUND	CARBON EFFLUENT CONCENRATION MEASURED ($\mu g/m^3$)	EMISSION FLOWRATE MEASURED (SCFM)	(m^3/min)	OUTLET CONCENTRATION (Q_p) (lb/hr)	OUTLET CONCENTRATION (Q_a) (lb/yr)	MAX ANNUAL IMPACT (C_a) ($\mu g/m^3$)	MAX POTENTIAL IMPACT (C_p) ($\mu g/m^3$)	MAX SHORT-TERM IMPACT (C_{st}) ($\mu g/m^3$)	DAR-1 STANDARDS SGC ($\mu g/m^3$)	AGC ($\mu g/m^3$)	EMISSION RESTRICTION REQUIRED (if C_p>AGC and C_a<AGC)	SGC EMISSION EXCEEDANCE (if C_{st}>SGC)	AGC EMISSION EXCEEDANCE (if C_a>AGC)
Volatile Organics, USEPA TO-15 Full List (ug/m^3)													
2-Butanone	2.38	600	16.9902	5.34E-06	4.68E-02	4.20E-04	4.20E-04	2.73E-02	13000	5000	NO	NO	NO
Acetone	26.6	600	16.9902	5.97E-05	5.23E-01	4.70E-03	4.69E-03	3.05E-01	180,000	30,000	NO	NO	NO
Benzene	1.64	600	16.9902	3.68E-06	3.22E-02	2.90E-04	2.89E-04	1.88E-02	1,300	0.13	NO	NO	NO
Carbon disulfide	1.38	600	16.9902	3.09E-06	2.71E-02	2.44E-04	2.43E-04	1.58E-02	6,200	700	NO	NO	NO
Chloroform	1.5	600	16.9902	3.34E-06	2.93E-02	2.63E-04	2.63E-04	1.71E-02	150	0.04	NO	NO	NO
Chloromethane	0.42	600	16.9902	9.44E-07	8.27E-03	7.44E-05	7.43E-05	4.83E-03	6,200	700	NO	NO	NO
cis-1,2-Dichloroethylene	3.56	600	16.9902	7.98E-06	6.99E-02	6.29E-04	6.28E-04	4.08E-02	--	63	NO	No Standard	NO
Dichlorodifluoromethane	1.85	600	16.9902	4.15E-06	3.63E-02	3.27E-04	3.26E-04	2.12E-02	--	12,000	NO	No Standard	NO
Ethanol	11.4	600	16.9902	2.56E-05	2.24E-01	2.01E-03	2.01E-03	1.31E-01	--	45,000	NO	No Standard	NO
Heptane	0.82	600	16.9902	1.84E-06	1.61E-02	1.45E-04	1.45E-04	9.40E-03	--	--	No Standard	No Standard	No Standard
Isopropanol	3.54	600	16.9902	7.94E-06	6.95E-02	6.25E-04	6.25E-04	4.06E-02	98,000	7,000	NO	NO	NO
Methylene chloride	24.8	600	16.9902	5.56E-05	4.87E-01	4.38E-03	4.38E-03	2.84E-01	14,000	60	NO	NO	NO
n-Hexane	2.47	600	16.9902	5.54E-06	4.85E-02	4.36E-04	4.36E-04	2.83E-02	--	700	NO	No Standard	NO
Tertiary Butyl Alcohol	19.1	600	16.9902	4.28E-05	3.75E-01	3.37E-03	3.37E-03	2.19E-01	--	720	NO	No Standard	NO
Toluene	1.46	600	16.9902	3.27E-06	2.87E-02	2.58E-04	2.58E-04	1.67E-02	37,000	5,000	NO	NO	NO
Trichlorofluoromethane	1.17	600	16.9902	2.62E-06	2.30E-02	2.07E-04	2.06E-04	1.34E-02	9,000	5,000	NO	NO	NO

NOTES AND QUALIFIERS:
1. Table only displays chemical compounds with detectable concentrations.
2. Concentrations below reporting limit (non detect) are assumed to be zero.
3. Air samples were analyzed for USEPA TO-15 compounds
4. All equations are referenced in NYSDEC, Division of Air Resources, Air Guide 1, Guidelines for the Control of Toxic Ambient Air Contaminants (11/12/97). Standard Point Source Method calculations were used.
5. Values in table are compared to DAR-1 Annual Guideline Concentrations (AGC)/Short-Term Guideline Concentrations (SGC) Tables dated February 28, 2014.
6. DAR-1 AGC and/or SGC values listed as "--" means there is no AGC or SGC standard for that compound.
7. SCFM = standard cubic feet per minute
8. Blower flowrate is recorded from PDI-701 pitot tube flow indicator located on the blower discharge line.
9. ug/m^3 = micrograms per cubic meter
10. m^3/min = cubic meter per minute
11. lb/hr = pounds per hour
12. lb/yr = pounds per year

TABLE 5: AS/SVE SYSTEM ALARM HISTORY
FORMER WATERMARK DESIGNS FACILITY
BROOKLYN, NEW YORK
LANGAN PROJECT NO. 170329301
BROWNFIELD CLEANUP PROGRAM NO. C224139

DATE	ALARM	ALARM DESCRIPTION	REASON	REMEDY
10/23/2015	PAL-2501	Compressor Low Pressure Alarm	Uncertain of the reason. There may be a power fluctuation that trips the low pressure alarm, which shuts the AS system down.	On-site observation confirmed that this was a false alarm and was not caused by compressor failure or a breach in the air sparge manifold. The alarm was manually reset.
10/28/2015	LAH-7301	Storage Tank High Level Alarm	The SVE system began to extract a larger volume of water than previously anticipated.	The storage tank was emptied into nine 55-gallon drums, and the SVE system vacuum has been optimized to extract a lesser volume of water.
11/5/2015	PAL-2501	Compressor Low Pressure Alarm	Caused by the air sparge compressor on/off time, which won't allow "OFF" time to be set to zero and therefore, the compressor cannot run continuously.	The air compressor timer has been by-passed and the compressor operation is linked to the SVE system operation. If the SVE system is operational, the compressor will operate unless a different AS system alarm has been triggered.
11/17/2015	PAL-2501	Compressor Low Pressure Alarm	This was an alarm test that was performed to ensure that the update to the Programmable Logic Controller (PLC) was successful.	The PLC update was successful and the air sparge compressor can run continuously. The air compressor timer is no longer being bypassed.
12/23/2015	LAH-7301	Storage Tank High Level Alarm	Following optimization, which included increasing the AS rate and the SVE system flow rate, the SVE system began to extract a larger volume of water than previously anticipated.	The storage tank was emptied into three 55-gallon drums. Both the AS and SVE system flow rates were adjusted in an effort to reduce excess water collection by the SVE system.
12/25/2015	LAH-7301	Storage Tank High Level Alarm	Following optimization, which included increasing the AS rate and the SVE system flow rate, the SVE system began to extract a larger volume of water than previously anticipated.	The storage tank was emptied into three 55-gallon drums. Both the AS and SVE system flow rates were adjusted in an effort to reduce excess water collection by the SVE system.
1/7/2016	LAH-7301	Storage Tank High Level Alarm	Following continued optimization of AS/SVE system, the SVE system began to extract a larger volume of water than anticipated.	The storage tank was emptied into eight 55-gallon drums. Both the AS and SVE system flow rates were adjusted in an effort to reduce excess water collection by the SVE system.
1/17/2016	LAH-7301	Storage Tank High Level Alarm	Following continued optimization of AS/SVE system, the SVE system began to extract a larger volume of water than anticipated.	The storage tank was emptied. Both the AS and SVE system flow rates were adjusted in an effort to reduce excess water collection by the SVE system.
2/1/2016	TAH-2501	Air Compressor High Temperature Alarm	The AS system is operating close to the alarm set point so that as much warm air as possible is continuously injected into the subsurface. A slight change in the air flow rate and/or ambient temperature most likely caused the rise in discharge air temperature.	The alarm was cleared and the AS system was restarted at a lower speed. The compressor speed was ramped up incrementally throughout the day until the previous set point was reached. The heat exchanger flow and AS manifold temperature are being monitored on a daily basis in an effort to prevent tripping the high temperature alarm again.
4/3/2016	PAL-701	Blower Influent High Pressure Alarm	The alarm was most likely triggered due to power fluctuations caused by high wind conditions.	The alarm was cleared and the SVE system was restarted at a higher frequency. The system was monitored remotely for the remainder of the day.
4/29/2016	TAH-2501	Air Compressor High Temperature Alarm	The AS system is operating close to the alarm set point so that as much warm air as possible is continuously injected into the subsurface. A slight change in the air flow rate and/or ambient temperature most likely caused the rise in discharge air temperature.	The alarm was cleared and the AS system was restarted. At restart, the allowable flow through the AS system was increased to alleviate the pressure on the air compressor discharge line. The heat exchanger flow and AS manifold temperature are being monitored on a daily basis in an effort to prevent tripping the high temperature alarm again.
8/9/2016	PAH-702	SVE System Effluent High Pressure Alarm	Anomalously high pressures were not noted on the SVE system discharge during the remote or on-site inspections. It is likely that the SVE effluent pressure switch needs to be recalibrated following almost a year's worth of continuous use.	The SVE system was restarted at a lower frequency and monitored on-site for about two hours.
8/26/2016	FAL-701	Blower Low Flow Alarm	The alarm was triggered due to a loose relay switch.	The switch was tightened during the August 31, 2016 monthly inspection and the system was restarted without further issue.
12/27/2016	PAL-2501	Compressor Low Pressure Alarm	The alarm was triggered due to a mechanical failure at the air compressor (i.e., the belts tore).	The air compressor belts were replaced on January 9, 2017 and the system was restarted.
3/7/2017	FAL-401	Transfer Pump Low Flow Alarm	The alarm was likley triggered due to the fluctuating volume of water extracted by the SVE system.	The AS/SVE system was restarted. Both the AS and SVE system flow rates were adjusted in an effort to reduce excess water collection by the SVE system.
3/8/2017	Low PLC Battery	Low Programmable Loigc Controller (PLC) Battery	The alarm was triggered because the PLC battery can no longer hold a charge.	The PLC battery was replaced on March 10, 2017.
3/24/2017	VFDA-701	SVE System Variable Frequency Drive (VFD) Alarm	The alarm was triggered because the SVE system blower was not functioning within the intended parameters.	The blower was visually inspected, a piece of debris caught in the belts was removed, and the system was restarted.
7/4/2017	TAH-2501	Air Compressor High Temperature Alarm	The AS system is operating close to the alarm set point so that as much warm air as possible is continuously injected into the subsurface. A slight change in the air flow rate and/or ambient temperature most likely caused the rise in discharge air temperature.	The alarm was cleared and the AS system was restarted. At restart, the allowable flow through the AS system was increased to alleviate the pressure on the air compressor discharge line. The heat exchanger flow and AS manifold temperature are being monitored on a daily basis in an effort to prevent tripping the high temperature alarm again.

FIGURES



LEGEND:

APPROXIMATE SITE BOUNDARY

NOTE: BASE MAPS ARE REFERENCED FROM THE UNITED STATES GEOLOGICAL SURVEY (USGS) TOPOGRAPHIC QUADRANGLE MAPS FOR BROOKLYN AND JAMAICA.

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Langan International LLC
Collectively known as Langan

Project
491 WORTMAN AVENUE
BLOCK No. 4384, LOT Nos. 31 & 36
BROOKLYN
KINGS NEW YORK

Figure Title
SITE LOCATION MAP

Project No. 170329301	Figure 1
Date 04/18/2015	
Scale N.T.S.	
Drawn By MLR / Checked By GN	
Submission Date	Sheet 1 of 3

Filename: \\langan.com\data\NYC\data3\170329301\Cadd Data - 170329301\SheetFiles\Monthly Report 22\Figure 1 - Site Location Map - Updated.dwg Date: 5/9/2017 Time: 12:48 User: mrogers Style Table: Langan.stb Layout: Site Location Map

Progress/Inspection Report No. 3
J&H Holding Company, LLC
491 Wortman Avenue, Brooklyn, NY 11208
Brownfield Cleanup Program Site No. C224139
Reporting Period: July 2017

1. Introduction

Langan Engineering, Environmental, Surveying and Landscape Architecture, D.P.C. (Langan) submits this progress/inspection report on behalf of J&H Holding Company, LLC (the "Participant"). In accordance with Section 7.1 of the Site Management Plan (SMP), which is was approved by the New York State Department of Environmental Conservation (NYSDEC) on June 28, 2017, this progress/inspection report summarizes work performed at the Former Watermark Designs Facility (the "Site") during July 2017. The Final Engineering Report (FER) was submitted to the NYSDEC on May 25, 2017, and in accordance with the Brownfield Cleanup Agreement (BCA) submission of Monthly Brownfield Cleanup Program (BCP) Progress Reports is no longer required for the Site.

The Site (Block 4384, Lots 31 & 36) is located at 491 Wortman Avenue in Brooklyn, New York (Figure 1) and consists of a rectangular shaped lot that is about 19,000 square feet (±0.44 acres). The Site is located in an area zoned for industrial/manufacturing use and is bound by Wortman Street to the south, Linwood Street to the west, Essex Street to the east, and a one-story building to the north. Currently, a one-story building with a partial basement covers the entire Site footprint. The one-story building is comprised of a warehouse (i.e., the western portion) and office space and a smaller warehouse (i.e. the eastern portion).

2. Remedial Actions Relative to the Site during this Reporting Period

The seventh quarterly on-site groundwater sampling event was conducted on July 19 and 20, 2017. Depth-to-water, total depth, and photoionization detector (PID) measurements were collected at monitoring wells MW-1 through MW-9 and piezometers PZ-1 and PZ-2 (thirteen locations total). Following the collection of field data, groundwater samples were collected from each monitoring well and piezometer for laboratory analysis of Target Compound List (TCL) volatile organic compounds (VOCs). Groundwater sampling locations are shown on Figure 2.

On July 21, 2017, Langan recorded process and performance monitoring data for the air sparge and soil vapor extraction (AS/SVE) system. As part of the monthly inspection, vapor samples were collected prior to the lead vapor-phase granular activated carbon (vGAC) unit (i.e., influent) and after the lag vGAC unit (i.e., effluent). Routine equipment maintenance, including greasing the blower and checking the belt tensions, was also performed.

3. Actions Relative to the Site Anticipated for the Next Reporting Period

The following activities are planned:

- Continued operation, maintenance and monitoring (OM&M) of the AS/SVE system

4. Approved Activity Modifications (changes of work scope and/or schedule)

None

5. Results of Sampling, Testing and Other Relevant Data

OM&M sampling was performed as follows:

- An influent vapor sample was collected from the AS/SVE system and analyzed for VOCs via United States Environmental Protection Agency (USEPA) Method TO-15.
- An effluent vapor sample was collected from the AS/SVE system and analyzed for VOCs via USEPA Method TO-15.
- Thirteen groundwater samples (plus one duplicate) were collected from on-site groundwater monitoring wells MW-1, MW-2, MW-3 (shallow, middle, and deep), MW-4, MW-5, MW-6, MW-7, MW-8, MW-9, PZ-1, and PZ-2 and analyzed for TCL VOCs via USEPA Method 8260C.

Samples were analyzed by Alpha Analytical of Westborough, MA. Alpha is a New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP)-certified laboratory.

Based on the results of the most recent OM&M sampling, the AS/SVE system is functioning in compliance with Policy DAR-1: Guidelines for the Control of Toxic Ambient Air Contaminants (DAR-1).

The groundwater results from the seventh quarter of on-site groundwater sampling exhibit chlorinated VOC (CVOC) concentrations above the Title 6 of the New York Codes, Rules, and Regulations (6 NYCRR) Part 703.5 Water Quality Standards in five of the wells sampled. The groundwater results for all wells are less than the baseline groundwater sampling results from August 2015 (reductions in total CVOC concentrations have been achieved).

The following tables are attached to this progress report; analytical lab reports are available upon request. The tables summarize the data collected to date and the functionality of the AS/SVE system, including mass of VOCs removed from the subsurface based on PID readings and laboratory data, as well as, the alarm history.

- Table1: AS/SVE System Vapor Sampling Results
- Table 2: AS/SVE System Mass Removal – PID Data
- Table 3: AS/SVE System Mass Removal – Laboratory Data
- Table 4: AS/SVE System DAR-1 Compliance
- Table 5: AS/SVE System Alarm History
- Table 6: Quarterly Groundwater Sampling Results – Seventh Quarter (lab reports available upon request)
- Table 7: Quarterly Groundwater Sampling Results Summary

6. Deliverables Submitted During This Reporting Period

NYSDEC provided comments to the FER on July 18, 2017. The PE-certified FER was submitted to the NYSDEC on July 28, 2017.

7. Information Regarding Percentage of Completion

OM&M of the AS/SVE system is ongoing.

As of July 31, 2017 and since inception, the SVE system operated for 14,296 hours (92% uptime), and the AS system operated for 13,826 hours (89% uptime).

8. Unresolved Delays Encountered or Anticipated That May Affect the Schedule and Mitigation Efforts

None

9. Citizen Participation Plan Activities during This Reporting Period

None

10. Activities Anticipated in Support of the CPP for the Next Reporting Period

None

11. Miscellaneous Information

Issuance of a certificate of completion is anticipated before the end of August 2017.

TABLES

TABLE 1: AS/SVE SYSTEM VAPOR SAMPLING RESULTS
FORMER WATERMARK DESIGNS FACILITY
BROOKLYN, NEW YORK
LANGAN PROJECT NO. 170329301
BROWNFIELD CLEANUP PROGRAM SITE NO. C224139

LOCATION	vGAC INFLUENT		vGAC EFFLUENT	
SAMPLE ID	INFLUENT_062817		EFFLUENT_062817	
LAB SAMPLE ID	L1725284-01		L1725284-02	
SAMPLE DATE	7/21/2017		7/21/2017	
Volatile Organic Compounds (ug/m^3)				
1,1,1-Trichloroethane	6.0		1.1	U
1,1,2,2-Tetrachloroethane	6.9	U	1.4	U
1,1,2-Trichloroethane	5.5	U	1.1	U
1,1-Dichloroethane	4.1	U	0.8	U
1,1-Dichloroethene	4.0	U	0.8	U
1,2,4-Trichlorobenzene	7.4	U	1.5	U
1,2,4-Trimethylbenzene	4.9	U	1.0	U
1,2-Dibromoethane	7.7	U	1.5	U
1,2-Dichlorobenzene	6.0	U	1.2	U
1,2-Dichloroethane	4.1	U	0.8	U
1,2-Dichloropropane	127.0		1.1	
1,3,5-Trimethylbenzene	5	U	1.0	U
1,3-Butadiene	2.2	U	0.4	U
1,3-Dichlorobenzene	6.0	U	1.2	U
1,4-Dichlorobenzene	6.0	U	1.2	U
1,4-Dioxane	3.6	U	0.7	U
2,2,4-Trimethylpentane	4.7	U	0.9	U
2-Butanone	10.0		6.7	
2-Hexanone	4.1	U	0.8	U
3-Chloropropene	3.1	U	0.6	U
4-Ethyltoluene	4.9	U	1.0	U
4-Methyl-2-pentanone	10	U	2	U
Acetone	74.8		63.7	
Benzene	3.2	U	4.9	
Benzyl chloride	5.2	U	1.0	U
Bromodichloromethane	6.7	U	1.3	U
Bromoform	10.3	U	2.1	U
Bromomethane	3.9	U	0.8	U
Carbon disulfide	3.1	U	1.9	
Carbon tetrachloride	6.3	U	1.3	U
Chlorobenzene	4.6	U	0.9	U
Chloroethane	2.6	U	0.5	U
Chloroform	4.9	U	1.5	
Chloromethane	2.1	U	0.6	
cis-1,2-Dichloroethene	4.4		3.4	
cis-1,3-Dichloropropene	4.5	U	0.9	U
Cyclohexane	3.4	U	0.7	U
Dibromochloromethane	8.5	U	1.7	U
Dichlorodifluoromethane	4.9	U	1.4	
Ethanol	64.4		46.7	
Ethyl Acetate	9.0	U	1.8	U
Ethylbenzene	4.3	U	0.9	U
Freon-113	7.7	U	19	
Freon-114	7.0	U	1.4	U
Heptane	4.1	U	0.8	U
Hexachlorobutadiene	10.7	U	2.1	U
Isopropanol	6.2	U	3.1	
Methyl tert butyl ether	4	U	1.1	
Methylene chloride	8.7	U	8.8	
n-Hexane	8.4		3.5	
o-Xylene	4.3	U	0.9	U
p/m-Xylene	8.7	U	1.7	U
Styrene	4	U	1.0	
Tertiary butyl Alcohol	117.0		57.3	
Tetrachloroethene	126.0		2.2	
Tetrahydrofuran	7.4	U	1.5	U
Toluene	6.41		3.81	
trans-1,2-Dichloroethene	3.96	U	0.793	U
trans-1,3-Dichloropropene	4.54	U	0.908	U
Trichloroethene	1890		1.36	
Trichlorofluoromethane	5.62	U	1.27	
Vinyl bromide	4.37	U	0.874	U
Vinyl chloride	2.56	U	0.511	U

NOTES:
1. ug/m^3 = micrograms per cubic meter
2. vGAC = vapor-phase granular activated carbon
3. Samples collected at the "vGAC INFLUENT" were collected before to the lead vGAC vessel.
4. Samples collected at the "vGAC EFFLUENT" were collected after the lag vGAC vessel.

Q is the Qualifier Column with definitions as follows:
D = The result is from an analysis that required a dilution.
U = The analyte was not detected at or above the level indicated.

TABLE 2: AS/SVE SYSTEM MASS REMOVAL - PID DATA
FORMER WATERMARK DESIGNS FACILITY
BROOKLYN, NEW YORK
LANGAN PROJECT NO. 170329301
BROWNFIELD CLEANUP PROGRAM SITE NO. C224139

DATE	INFLUENT CONCENTRATION (ppmv)	SVE BLOWER FLOWRATE (scfm)	EFFLUENT CONCENTRATION (ppmv)	TOTAL OPERATIONAL HOURS	AVERAGE MOLECULAR WEIGHT	MASS REMOVAL RATE (lbs/hr)	TOTAL MASS REMOVED FROM SUBSURFACE (lbs)	CUMULATIVE MASS REMOVED FROM SUBSURFACE (lbs)
10/21/2015	55.0	688	1.8	30	100	0.57	17.02	17.02
10/26/2015	8.3	650	0.6	150	100	0.08	9.31	26.34
11/6/2015	5.5	560	0.0	383	100	0.05	11.13	37.46
11/30/2015	1.9	593	0.3	958	100	0.01	8.46	45.92
12/28/2015	3.7	570	0.0	1,548	100	0.03	19.29	65.21
1/27/2016	1.2	525	0.5	2,180	100	0.01	3.60	68.81
2/24/2016	2.5	578	0.0	2,854	100	0.02	15.10	83.91
3/30/2016	0.2	550	0.0	3,693	100	0.002	1.43	85.34
4/29/2016	2.0	571	0.0	4,322	100	0.018	11.14	96.48
5/26/2016	0.4	600	0.0	4,972	100	0.004	2.42	98.90
6/29/2016	0.5	600	0.0	5,784	100	0.005	3.78	102.68
7/28/2016	3.0	600	0.0	6,431	100	0.028	18.06	120.73
8/31/2016	2.7	600	0.0	7,110	100	0.025	17.05	137.79
9/29/2016	7.5	760	2.0	7,802	100	0.065	44.85	182.63
10/31/2016	0.0	520	0.0	8,516	100	0.000	0.00	182.63
11/29/2016	0.0	560	0.0	9,211	100	0.000	0.00	182.63
12/28/2016	0.0	520	0.0	9,884	100	0.000	0.00	182.63
1/25/2017	2.8	600	0.0	10,530	100	0.026	16.83	199.46
3/7/2017	0.1	360	0.0	11,186	100	0.001	0.37	199.82
4/27/2017	0.0	600	0.0	12,185	100	0.000	0.00	199.82
5/25/2017	0.8	600	0.0	12,760	100	0.008	4.42	204.24
6/28/2017	0.04	600	0.0	13,575	100	0.000	0.33	204.57
7/21/2017	0.00	600	0.0	14,060	100	0.000	0.00	204.57

NOTES:
1. Blower flowrate is recorded from PDI-701 pitot tube flow indicator located on the blower discharge line.
2. The influent and effluent concentrations are based on the PID readings.
3. Mass Removal rate (lb/hr) = ((Conc in ppmv)(flowrate scfm)(MW)(60 min/hr)) / ((387)(1,000,000)).
4. PID = photoionization detector
5. ppmv = parts per million volume
6. scfm = standard cubic feet per minute
7. lbs/hr = pounds per hour
8. lbs = pounds
9. SVE = soil vapor extraction

TABLE 3: AS/SVE SYSTEM MASS REMOVAL - LABORATORY DATA
FORMER WATERMARK DESIGNS FACILITY
BROOKLYN, NEW YORK
LANGAN PROJECT NO. 170329301
BROWNFIELD CLEANUP PROGRAM SITE NO. C224139

DATE	INFLUENT CONCENTRATION (ug/m3)	SVE BLOWER FLOWRATE (scfm)	EFFLUENT CONCENTRATION (ug/m3)	TOTAL OPERATIONAL HOURS	INFLUENT RATE (mg/min)	EFFLUENT RATE (mg/min)	REMOVAL RATE (mg/min)	MASS REMOVED FROM SUBSURFACE (lbs)	TOTAL MASS REMOVED FROM SUBSURFACE (lbs)	MASS REMOVED BY CARBON (lbs)	TOTAL MASS REMOVED BY CARBON (lbs)
10/20/2015	114,348	640	9,241	12	2049.12	165.60	1883.52	3.25	3.25	2.99	2.99
10/21/2015	32,758	688	1,129	30	631.05	21.75	609.30	1.50	4.76	1.45	4.44
10/26/2015	7,027	650	383	150	127.89	6.97	120.92	2.03	6.79	1.92	6.36
11/30/2015	3,144	593	426	958	52.20	7.07	45.13	5.58	12.36	4.82	11.18
12/28/2015	3,357	570	230	1,548	53.58	3.67	49.91	4.18	16.55	3.89	15.08
1/27/2016	621	525	183	2,180	9.13	2.69	6.44	0.76	17.31	0.54	15.62
2/24/2016	1,454	578	283	2,854	23.53	4.58	18.94	2.10	19.41	1.69	17.31
3/30/2016	825	550	75	3,693	12.71	1.16	11.55	1.41	20.82	1.28	18.59
4/29/2016	482	571	112	4,322	7.70	1.79	5.91	0.64	21.46	0.49	19.08
5/26/2016	1,169	600	162	4,972	19.64	2.73	16.91	1.69	23.15	1.45	20.53
6/29/2016	1,865	600	190	5,784	31.33	3.19	28.14	3.37	26.51	3.02	23.56
7/28/2016	3,706	600	232	6,431	62.26	3.90	58.36	5.33	31.84	4.99	28.55
8/31/2016	4,798	600	135	7,110	80.61	2.26	78.35	7.24	39.08	7.04	35.59
9/29/2016	1,045	760	179	7,802	22.24	3.81	18.43	2.04	41.12	1.69	37.27
10/31/2016	922	520	91	8,516	13.42	1.32	12.10	1.27	42.38	1.14	38.42
11/29/2016	790	560	167	9,211	12.38	2.62	9.76	1.14	43.52	0.90	39.31
12/28/2016	282	520	123	9,884	4.11	1.79	2.32	0.37	43.89	0.21	39.52
1/25/2017	4.7	600	5.6	10,530	0.08	0.09	-0.02	0.01	43.89	0.00	39.52
3/7/2017	762	360	120	11,186	7.68	1.21	6.47	0.67	44.56	0.56	40.08
4/27/2017	1,008	600	86	12,185	16.93	1.44	15.49	2.24	46.80	2.05	42.13
5/25/2017	771	600	48	12,760	12.95	0.81	12.15	0.99	47.78	0.92	43.05
6/28/2017	754	600	69	13,575	12.66	1.16	11.50	1.36	49.15	1.24	44.29
7/21/2017	2,434	600	235	14,060	40.89	3.95	36.94	2.62	51.77	2.37	46.66

NOTES:
1. Blower flowrate is recorded from PDI-701 pitot tube flow indicator located on the blower discharge line.
2. The influent and effluent concentrations are based on the lab analytical data and not the PID readings.
3. ug/m3 = micrograms per cubic meter
4. scfm = standard cubic feet per minute
5. mg/min = milligrams per minute
6. lbs = pounds
7. SVE = soil vapor extraction
8. VGAC = vapor-phase granular activated carbon

TABLE 4: AS/SVE SYSTEM DAR-1 COMPLIANCE
FORMER WATERMARK DESIGNS FACILITY
BROOKLYN, NEW YORK
LANGAN PROJECT NO. 170329301
BROWNFIELD CLEANUP PROGRAM NO. C224139

SAMPLING DATE: **7/21/2017**

CHEMICAL COMPOUND	CARBON EFFLUENT CONCENRATION MEASURED ($\mu g/m^3$)	EMISSION FLOWRATE MEASURED (SCFM)	(m^3/min)	OUTLET CONCENTRATION (Q_p) (lb/hr)	OUTLET CONCENTRATION (Q_a) (lb/yr)	MAX ANNUAL IMPACT (C_a) ($\mu g/m^3$)	MAX POTENTIAL IMPACT (C_p) ($\mu g/m^3$)	MAX SHORT-TERM IMPACT (C_{st}) ($\mu g/m^3$)	DAR-1 STANDARDS SGC ($\mu g/m^3$)	AGC ($\mu g/m^3$)	EMISSION RESTRICTION REQUIRED (if C_p>AGC and C_a<AGC)	SGC EMISSION EXCEEDANCE (if C_{st}>SGC)	AGC EMISSION EXCEEDANCE (if C_a>AGC)
Volatile Organics, USEPA TO-15 Full List (ug/m^3)													
1,2-Dichloropropane	1.1	600	16.9902	2.42E-06	2.12E-02	1.91E-04	1.91E-04	1.24E-02	--	4	NO	No Standard	NO
2-Butanone	6.7	600	16.9902	1.51E-05	1.32E-01	1.19E-03	1.19E-03	7.71E-02	13000	5000	NO	NO	NO
Acetone	63.7	600	16.9902	1.43E-04	1.25E+00	1.13E-02	1.12E-02	7.31E-01	180,000	30,000	NO	NO	NO
Benzene	4.9	600	16.9902	1.10E-05	9.61E-02	8.64E-04	8.63E-04	5.61E-02	1,300	0.13	NO	NO	NO
Carbon disulfide	1.9	600	16.9902	4.33E-06	3.79E-02	3.41E-04	3.41E-04	2.21E-02	6,200	700	NO	NO	NO
Chloroform	1.5	600	16.9902	3.39E-06	2.97E-02	2.67E-04	2.66E-04	1.73E-02	150	0.04	NO	NO	NO
Chloromethane	0.6	600	16.9902	1.44E-06	1.26E-02	1.13E-04	1.13E-04	7.36E-03	6,200	700	NO	NO	NO
cis-1,2-Dichloroethylene	3.4	600	16.9902	7.60E-06	6.66E-02	5.99E-04	5.98E-04	3.89E-02	--	63	NO	No Standard	NO
Dichlorodifluoromethane	1.4	600	16.9902	3.23E-06	2.83E-02	2.54E-04	2.54E-04	1.65E-02	--	12,000	NO	No Standard	NO
Ethanol	46.7	600	16.9902	1.05E-04	9.17E-01	8.25E-03	8.24E-03	5.36E-01	--	45,000	NO	No Standard	NO
Isopropanol	3.1	600	16.9902	7.00E-06	6.13E-02	5.51E-04	5.50E-04	3.58E-02	98,000	7,000	NO	NO	NO
Freon 113	19	600	16.9902	4.26E-05	3.73E-01	3.36E-03	3.35E-03	2.18E-01	960,000	180,000	NO	NO	NO
Methylene chloride	8.8	600	16.9902	1.98E-05	1.73E-01	1.56E-03	1.56E-03	1.01E-01	14,000	60	NO	NO	NO
Methyl tert butyl ether	1.1	600	16.9902	2.47E-06	2.16E-02	1.94E-04	1.94E-04	1.26E-02	--	3.8	NO	No Standard	NO
n-Hexane	3.5	600	16.9902	7.89E-06	6.92E-02	6.22E-04	6.21E-04	4.04E-02	--	700	NO	No Standard	NO
Styrene	1.0	600	16.9902	2.24E-06	1.96E-02	1.77E-04	1.76E-04	1.15E-02	17,000	1,000	NO	NO	NO
Tertiary Butyl Alcohol	57.3	600	16.9902	1.29E-04	1.13E+00	1.01E-02	1.01E-02	6.57E-01	--	720	NO	No Standard	NO
Tetrachloroethene	2.2	600	16.9902	4.93E-06	4.32E-02	3.89E-04	3.88E-04	2.52E-02	300	4	NO	NO	NO
Toluene	3.8	600	16.9902	8.54E-06	7.49E-02	6.73E-04	6.72E-04	4.37E-02	37,000	5,000	NO	NO	NO
Trichloroethylene	1.4	600	16.9902	3.05E-06	2.67E-02	2.40E-04	2.40E-04	1.56E-02	14,000	0.2	NO	NO	NO
Trichlorofluoromethane	1.3	600	16.9902	2.85E-06	2.50E-02	2.24E-04	2.24E-04	1.46E-02	9,000	5,000	NO	NO	NO

NOTES AND QUALIFIERS:
1. Table only displays chemical compounds with detectable concentrations.
2. Concentrations below reporting limit (non detect) are assumed to be zero.
3. Air samples were analyzed for USEPA TO-15 compounds
4. All equations are referenced in NYSDEC, Division of Air Resources, Air Guide 1, Guidelines for the Control of Toxic Ambient Air Contaminants (11/12/97). Standard Point Source Method calculations were used.
5. Values in table are compared to DAR-1 Annual Guideline Concentrations (AGC)/Short-Term Guideline Concentrations (SGC) Tables dated February 28, 2014.
6. DAR-1 AGC and/or SGC values listed as "--" means there is no AGC or SGC standard for that compound.
7. SCFM = standard cubic feet per minute
8. Blower flowrate is recorded from PDI-701 pitot tube flow indicator located on the blower discharge line.
9. ug/m^3 = micrograms per cubic meter
10. m^3/min = cubic meter per minute
11. lb/hr = pounds per hour
12. lb/yr = pounds per year

TABLE 5: AS/SVE SYSTEM ALARM HISTORY
FORMER WATERMARK DESIGNS FACILITY
BROOKLYN, NEW YORK
LANGAN PROJECT NO. 170329301
BROWNFIELD CLEANUP PROGRAM NO. C224139

DATE	ALARM	ALARM DESCRIPTION	REASON	REMEDY
10/23/2015	PAL-2501	Compressor Low Pressure Alarm	Uncertain of the reason. There may be a power fluctuation that trips the low pressure alarm, which shuts the AS system down.	On-site observation confirmed that this was a false alarm and was not caused by compressor failure or a breach in the air sparge manifold. The alarm was manually reset.
10/28/2015	LAH-7301	Storage Tank High Level Alarm	The SVE system began to extract a larger volume of water than previously anticipated.	The storage tank was emptied into nine 55-gallon drums, and the SVE system vacuum has been optimized to extract a lesser volume of water.
11/5/2015	PAL-2501	Compressor Low Pressure Alarm	Caused by the air sparge compressor on/off time, which won't allow "OFF" time to be set to zero and therefore, the compressor cannot run continuously.	The air compressor timer has been by-passed and the compressor operation is linked to the SVE system operation. If the SVE system is operational, the compressor will operate unless a different AS system alarm has been triggered.
11/17/2015	PAL-2501	Compressor Low Pressure Alarm	This was an alarm test that was performed to ensure that the update to the Programmable Logic Controller (PLC) was successful.	The PLC update was successful and the air sparge compressor can run continuously. The air compressor timer is no longer being bypassed.
12/23/2015	LAH-7301	Storage Tank High Level Alarm	Following optimization, which included increasing the AS rate and the SVE system flow rate, the SVE system began to extract a larger volume of water than previously anticipated.	The storage tank was emptied into three 55-gallon drums. Both the AS and SVE system flow rates were adjusted in an effort to reduce excess water collection by the SVE system.
12/25/2015	LAH-7301	Storage Tank High Level Alarm	Following optimization, which included increasing the AS rate and the SVE system flow rate, the SVE system began to extract a larger volume of water than previously anticipated.	The storage tank was emptied into three 55-gallon drums. Both the AS and SVE system flow rates were adjusted in an effort to reduce excess water collection by the SVE system.
1/7/2016	LAH-7301	Storage Tank High Level Alarm	Following continued optimization of AS/SVE system, the SVE system began to extract a larger volume of water than anticipated.	The storage tank was emptied into eight 55-gallon drums. Both the AS and SVE system flow rates were adjusted in an effort to reduce excess water collection by the SVE system.
1/17/2016	LAH-7301	Storage Tank High Level Alarm	Following continued optimization of AS/SVE system, the SVE system began to extract a larger volume of water than anticipated.	The storage tank was emptied. Both the AS and SVE system flow rates were adjusted in an effort to reduce excess water collection by the SVE system.
2/1/2016	TAH-2501	Air Compressor High Temperature Alarm	The AS system is operating close to the alarm set point so that as much warm air as possible is continuously injected into the subsurface. A slight change in the air flow rate and/or ambient temperature most likely caused the rise in discharge air temperature.	The alarm was cleared and the AS system was restarted at a lower speed. The compressor speed was ramped up incrementally throughout the day until the previous set point was reached. The heat exchanger flow and AS manifold temperature are being monitored on a daily basis in an effort to prevent tripping the high temperature alarm again.
4/3/2016	PAL-701	Blower Influent High Pressure Alarm	The alarm was most likely triggered due to power fluctuations caused by high wind conditions.	The alarm was cleared and the SVE system was restarted at a higher frequency. The system was monitored remotely for the remainder of the day.
4/29/2016	TAH-2501	Air Compressor High Temperature Alarm	The AS system is operating close to the alarm set point so that as much warm air as possible is continuously injected into the subsurface. A slight change in the air flow rate and/or ambient temperature most likely caused the rise in discharge air temperature.	The alarm was cleared and the AS system was restarted. At restart, the allowable flow through the AS system was increased to alleviate the pressure on the air compressor discharge line. The heat exchanger flow and AS manifold temperature are being monitored on a daily basis in an effort to prevent tripping the high temperature alarm again.
8/9/2016	PAH-702	SVE System Effluent High Pressure Alarm	Anomalously high pressures were not noted on the SVE system discharge during the remote or on-site inspections. It is likely that the SVE effluent pressure switch needs to be recalibrated following almost a year's worth of continuous use.	The SVE system was restarted at a lower frequency and monitored on-site for about two hours.
8/26/2016	FAL-701	Blower Low Flow Alarm	The alarm was triggered due to a loose relay switch.	The switch was tightened during the August 31, 2016 monthly inspection and the system was restarted without further issue.
12/27/2016	PAL-2501	Compressor Low Pressure Alarm	The alarm was triggered due to a mechanical failure at the air compressor (i.e., the belts tore).	The air compressor belts were replaced on January 9, 2017 and the system was restarted.
3/7/2017	FAL-401	Transfer Pump Low Flow Alarm	The alarm was likley triggered due to the fluctuating volume of water extracted by the SVE system.	The AS/SVE system was restarted. Both the AS and SVE system flow rates were adjusted in an effort to reduce excess water collection by the SVE system.
3/8/2017	Low PLC Battery	Low Programmable Loigc Controller (PLC) Battery	The alarm was triggered because the PLC battery can no longer hold a charge.	The PLC battery was replaced on March 10, 2017.
3/24/2017	VFDA-701	SVE System Variable Frequency Drive (VFD) Alarm	The alarm was triggered because the SVE system blower was not functioning within the intended parameters.	The blower was visually inspected, a piece of debris caught in the belts was removed, and the system was restarted.
7/4/2017	TAH-2501	Air Compressor High Temperature Alarm	The AS system is operating close to the alarm set point so that as much warm air as possible is continuously injected into the subsurface. A slight change in the air flow rate and/or ambient temperature most likely caused the rise in discharge air temperature.	The alarm was cleared and the AS system was restarted. At restart, the allowable flow through the AS system was increased to alleviate the pressure on the air compressor discharge line. The heat exchanger flow and AS manifold temperature are being monitored on a daily basis in an effort to prevent tripping the high temperature alarm again.

TABLE 6: QUARTERLY GROUNDWATER SAMPLING RESULTS – SEVENTH QUARTER
FORMER WATERMARK DESIGNS FACILITY
BROOKLYN, NEW YORK
LANGAN PROJECT NO. 170329301
BROWNFIELD CLEANUP PROGRAM NO. C224139

Sample ID Laboratory ID Sampling Date	NYSDEC TOGS STANDARDS AND GUIDANCE VALUES	MW-1_071917 L1724841-01 7/19/2017		MW-2_072017 L1725105-01 7/20/2017		MW-3AD_072017 L1725105-04 7/20/2017		MW-3AM_072017 L1725105-03 7/20/2017		MW-3AS_072017 L1725105-02 7/20/2017		MW-4_071917 L1724841-04 7/19/2017		MW-5_072017 L1725105-05 7/20/2017		MW-6_071917 L1724841-05 7/19/2017	
Volatile Organic Compounds (µg/L)																	
1,1-Dichloroethene	5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	3.6	
1,2-Dichloroethene	~	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	34	J
1,2-Dichloropropane	1	**1.2**		**2.2**		1	U	0.15	J	**1.5**		**2.1**		**2.3**		0.72	J
Acetone	50	5	U	3.2	J	2.2	J	5	U	5	U	5	U	2.4	J	25	U
cis-1,2-Dichloroethene	5	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	**26**	
Tetrachloroethene	5	0.5	U	0.67		**14**		**11**		0.22	J	0.33	J	0.5	U	**490**	
trans-1,2-Dichloroethene	5	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	**8**	J
Trichloroethene	5	0.5	U	0.44	J	0.74		1.5		0.26	J	0.38	J	0.5	U	**240**	
Vinyl chloride	2	1	U	1	U	1	U	1	U	1	U	1	U	1	U	**2**	J

Notes:
1. Groundwater sample analytical results are compared to New York State Department of Environmental Conservation (NYSDEC) Technical and Operational Guidance Series (TOGS) 1.1.1 Ambient Water Quality Standards and Guidance Values for Class GA water.
2. Results exceeding the NYSDEC TOGS standards and guidance values are shaded and bolded.
3. µg/L = micrograms per liter
4. DUP01_071917 is a duplicate sample of MW-8_071917.
5. Eleven monitoring wells and two piezometers associated with the air sparge and soil vapor extraction system (AS/SVE) system were sampled as part of the seventh round of quarterly groundwater sampling.

Qualifiers:
J = Analyte detected at or above the MDL (method detection limit) but below the RL (Reporting Limit) - data is estimated.
U = Analyte not detected at or above the level indicated.

TABLE 6: QUARTERLY GROUNDWATER SAMPLING RESULTS – SEVENTH QUARTER
FORMER WATERMARK DESIGNS FACILITY
BROOKLYN, NEW YORK
LANGAN PROJECT NO. 170329301
BROWNFIELD CLEANUP PROGRAM NO. C224139

Sample ID Laboratory ID Sampling Date	NYSDEC TOGS STANDARDS AND GUIDANCE VALUES	MW-7_071917 L1724841-06 7/19/2017		MW-8_071917 L1724841-07 7/19/2017		DUP01_071917 L1724841-09 7/19/2017		MW-9_072017 L1725105-06 7/20/2017		PZ-1_072017 L1725105-07 7/20/2017		PZ-2_071917 L1724841-08 7/19/2017	
Volatile Organic Compounds (µg/L)													
1,1-Dichloroethene	5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,2-Dichloroethene	~	2.5	U	9.2		9.3		2.5	U	2.5	U	2.5	U
1,2-Dichloropropane	1	**2.5**		**2.8**		**2.8**		**1.9**		1	U	**2.4**	
Acetone	50	5	U	5	U	5	U	3.4	J	4.1	J	5	U
cis-1,2-Dichloroethene	5	2.5	U	**9.2**		**9.3**		2.5	U	2.5	U	2.5	U
Tetrachloroethene	5	0.5	U	1.2		1.1		0.23	J	**10**		0.54	
trans-1,2-Dichloroethene	5	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
Trichloroethene	5	0.32	J	**5.8**		**5.8**		0.5	U	1.6		0.32	J
Vinyl chloride	2	1	U	1	U	1	U	1	U	1	U	1	U

Notes:
1. Groundwater sample analytical results are compared to New York State Department of Environmental Conservation (NYSDEC) Technical and Operational Guidance Series (TOGS) 1.1.1 Ambient Water Quality Standards and Guidance Values for Class GA water.
2. Results exceeding the NYSDEC TOGS standards and guidance values are shaded and bolded.
3. µg/L = micrograms per liter
4. DUP01_071917 is a duplicate sample of MW-8_071917.
5. Eleven monitoring wells and two piezometers associated with the air sparge and soil vapor extraction system (AS/SVE) system were sampled as part of the seventh round of quarterly groundwater sampling.

Qualifiers:
J = Analyte detected at or above the MDL (method detection limit) but below the RL (Reporting Limit) - data is estimated.
U = Analyte not detected at or above the level indicated.

TABLE 7: QUARTERLY GROUNDWATER SAMPLING RESULTS SUMMARY
FORMER WATERMARK DESIGNS FACILITY
BROOKLYN, NEW YORK
LANGAN PROJECT NO. 170329301
BROWNFIELD CLEANUP PROGRAM SITE NO. C224139

Compound	NYSDEC TOGS STANDARDS AND GUIDANCE VALUES	Sampling Location												
		MW-1	MW-2	MW-3S	MW-3M	MW-3D	MW-4	MW-5	MW-6*	MW-7*	MW-8*	MW-9	PZ-1	PZ-2
Baseline Sampling Results Summary (µg/L) - August 2015														
CVOCs	~	1274.9	2314	873.3	23.4	27.8	653	175	1236.3	1272	458	602	903.6	438.2
PCE	5	750	480	380	14	8.3	79	110	710	460	180	400	310	230
TCE	5	500	1800	480	5.9	16	540	55	500	780	240	190	580	200
cis-1,2- DCE	5	19	14	8.3	2.5	2.5	29	9	22	27	36	10	8.6	6.2
vinyl chloride	2	5.9	20	5	1	1	5	1	4.3	5	2	2	5	2
First Quarter Sampling Results Summary (µg/L) - January 2016														
CVOCs	~	12.8	2.14	7.6	23.4	16.13	14.8	1.87	676	11.41	184.56	5.8	10	2.6
PCE	5	6	1	2	20	14	3	1	240	2	15	4	3	1
TCE	5	5.3	0.74	5.2	3	1.7	11	0.37	400	9	130	1.4	5.4	1.2
cis-1,2- DCE	5	1.3	0.2	0.2	0.2	0.23	0.6	0.3	35	0.21	39	0.2	1.4	0.2
vinyl chloride	2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	1	0.2	0.56	0.2	0.2	0.2
Q1 Percent CVOC Reduction		*99%*	*99.9%*	*99%*	*0%*	*42%*	*98%*	*99%*	*45%*	*99%*	*60%*	*99%*	*99%*	*99%*
Second Quarter Sampling Results Summary (µg/L) - April 2016														
CVOCs	~	3.8	1.99	4.3	18.5	9.3	3.28	1.64	401	2.46	71.96	0.91	1.45	1.79
PCE	5	1.7	0.87	1.2	16	7.6	0.48	0.67	160	0.26	5.7	0.31	0.3	0.61
TCE	5	1.7	0.72	2.7	2.1	1.3	2.4	0.38	220	1.8	43	0.2	0.75	0.78
cis-1,2- DCE	5	0.2	0.2	0.2	0.2	0.2	0.2	0.39	19	0.2	23	0.2	0.2	0.2
vinyl chloride	2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	2	0.2	0.26	0.2	0.2	0.2
Q2 Percent CVOC Reduction from Last Quarter (Q1)		*70%*	*7%*	*43%*	*21%*	*42%*	*78%*	*12%*	*41%*	*78%*	*61%*	*84%*	*86%*	*31%*
Q2 Percent CVOC Reduction from Baseline		*99.7%*	*99.9%*	*99.5%*	*21%*	*67%*	*99.5%*	*99%*	*68%*	*99.8%*	*84%*	*99.8%*	*99.8%*	*99.6%*
Third Quarter Sampling Results Summary (µg/L) - July 2016														
CVOCs	~	1.65	4.26	7.69	24.5	14.01	6.26	3.48	1249.5	4.21	53.5	1.49	1.97	4.15
PCE	5	0.68	2.2	3	22	12	2.2	1.6	570	0.71	5.3	0.76	0.47	2
TCE	5	0.57	1.6	4.2	2.1	1.6	3.5	0.76	640	3.1	27	0.33	1.1	1.6
cis-1,2- DCE	5	0.2	0.26	0.29	0.2	0.21	0.36	0.92	39	0.2	21	0.2	0.2	0.35
vinyl chloride	2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.5	0.2	0.2	0.2	0.2	0.2
Q3 Percent CVOC Reduction from Last Quarter (Q2)		*57%*	*Increased*	*Increased*	*Increased*	*Increased*	*Increased*	*Increased*	*Increased*	*Increased*	*26%*	*Increased*	*Increased*	*Increased*
Q3 Percent CVOC Reduction from Baseline		*99.9%*	*99.8%*	*99.1%*	*Increased*	*50%*	*99%*	*98%*	*Increased*	*99.7%*	*88%*	*99.8%*	*99.8%*	*99.1%*

Notes:

1. Groundwater sample analytical results are compared to New York State Department of Environmental Conservation (NYSDEC) Technical and Operational Guidance Series (TOGS) 1.1.1 Ambient Water Quality Standards and Guidance Values for Class GA water.
2. Results exceeding the NYSDEC TOGS standards and guidance values are shaded.
3. PCE = tetrachlorothylene
4. TCE = trichloroethylene
5. cis-1,2-DCE = cis-1,2-Dichloroethylene
6. µg/L = microgram per liter
7. CVOC = chlorinated volatile organic compounds
8. * = Monitoring well is located in the sidewalk adjacent to the warehouse.

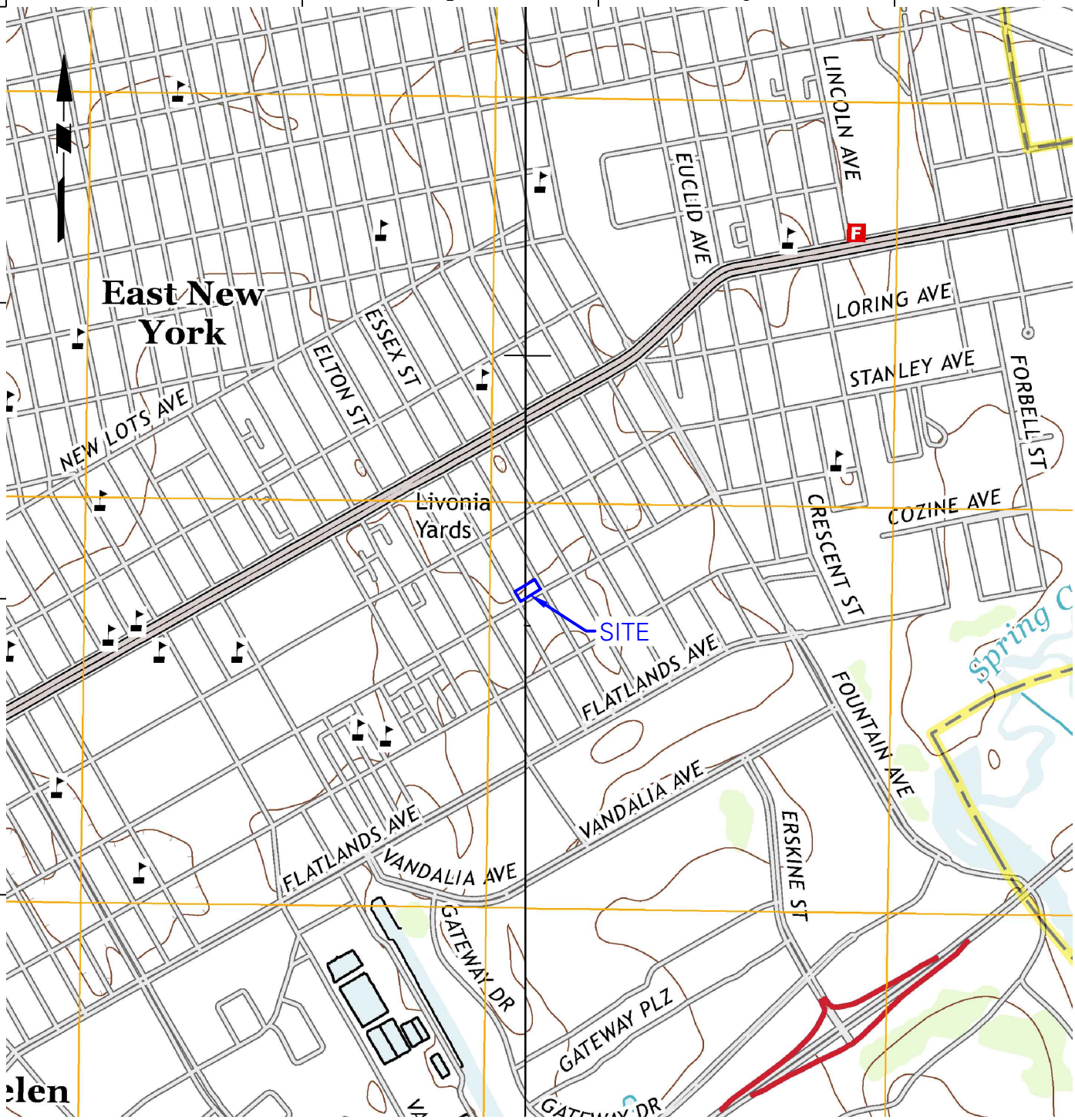
TABLE 7: QUARTERLY GROUNDWATER SAMPLING RESULTS SUMMARY
FORMER WATERMARK DESIGNS FACILITY
BROOKLYN, NEW YORK
LANGAN PROJECT NO. 170329301
BROWNFIELD CLEANUP PROGRAM SITE NO. C224139

Compound	NYSDEC TOGS STANDARDS AND GUIDANCE VALUES	Sampling Location												
		MW-1	MW-2	MW-3S	MW-3M	MW-3D	MW-4	MW-5	MW-6*	MW-7*	MW-8*	MW-9	PZ-1	PZ-2
Fourth Quarter Sampling Results Summary (µg/L) - October 2016														
CVOCs	~	0.91	8.39	18.59	18.1	11.36	3.38	0.84	158.4	1.1	33.9	0.99	0.81	1.57
PCE	5	0.22	4.6	8.8	16	10	0.98	0.24	67	0.2	2.7	0.39	0.2	0.54
TCE	5	0.29	3.2	9	1.7	0.96	2	0.2	87	0.5	19	0.2	0.21	0.63
cis-1,2- DCE	5	0.2	0.39	0.59	0.2	0.2	0.2	0.2	4.2	0.2	12	0.2	0.2	0.2
vinyl chloride	2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Q4 Percent CVOC Reduction from Last Quarter (Q3)		*45%*	*Increased*	*Increased*	*26%*	*19%*	*46%*	*76%*	*87%*	*74%*	*37%*	*34%*	*59%*	*62%*
Q4 Percent CVOC Reduction from Baseline		*99.9%*	*100%*	*98%*	*23%*	*59%*	*99%*	*100%*	*87%*	*99.9%*	*93%*	*99.8%*	*99.9%*	*99.6%*
Fifth Quarter Sampling Results Summary (µg/L) - January 2017														
CVOCs	~	0.8	1.32	20.71	21.1	14.21	1.89	1.02	812.7	0.9	42.4	7.9	0.8	1.49
PCE	5	0.2	0.56	10	19	13	0.52	0.42	380	0.2	3.2	5.5	0.2	0.66
TCE	5	0.2	0.36	10	1.7	0.81	0.97	0.2	410	0.3	20	2	0.2	0.43
cis-1,2- DCE	5	0.2	0.2	0.51	0.2	0.2	0.2	0.2	22	0.2	19	0.2	0.2	0.2
vinyl chloride	2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.7	0.2	0.2	0.2	0.2	0.2
Q5 Percent CVOC Reduction from Last Quarter (Q4)		*12%*	*84%*	*Increased*	*Increased*	*Increased*	*44%*	*Increased*	*Increased*	*18%*	*Increased*	*Increased*	*1%*	*5%*
Q5 Percent CVOC Reduction from Baseline		*99.9%*	*100%*	*98%*	*10%*	*49%*	*100%*	*99%*	*34%*	*99.9%*	*91%*	*98.7%*	*99.9%*	*99.7%*
Sixth Quarter Sampling Results Summary (µg/L) - April 2017														
CVOCs	~	4.5	11.6	6.4	24.4	16.35	6.8	4.5	57.3	4.4	17.5	4.15	4.5	4.09
PCE	5	0.5	5.5	1.2	19	12	1.5	0.5	26	0.5	2.1	0.4	0.5	0.26
TCE	5	0.5	2.6	1.7	1.9	0.85	1.8	0.5	28	0.4	5.5	0.25	0.5	0.33
cis-1,2- DCE	5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.3	2.5	8.9	2.5	2.5	2.5
vinyl chloride	2	1	1	1	1	1	1	1	1	1	1	1	1	1
Q6 Percent CVOC Reduction from Last Quarter (Q5)		*Increased*	*Increased*	*69%*	*Increased*	*Increased*	*Increased*	*Increased*	*93%*	*Increased*	*59%*	*47%*	*Increased*	*Increased*
Q6 Percent CVOC Reduction from Baseline		*99.6%*	*99%*	*99%*	*Increased*	*41%*	*99%*	*97%*	*95%*	*99.7%*	*96%*	*99.3%*	*99.5%*	*99.1%*
Seventh Quarter Sampling Results Summary (µg/L) - July 2017														
CVOCs	~	4.5	4.61	18.24	16	3.98	4.21	4.5	758	4.32	17.2	4.23	15.1	4.36
PCE	5	0.5	0.67	14	11	0.22	0.33	0.5	490	0.5	1.2	0.23	10	0.54
TCE	5	0.5	0.44	0.74	1.5	0.26	0.38	0.5	240	0.32	5.8	0.5	1.6	0.32
cis-1,2- DCE	5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	26	2.5	9.2	2.5	2.5	2.5
vinyl chloride	2	1	1	1	1	1	1	1	2	1	1	1	1	1
Q7 Percent CVOC Reduction from Last Quarter (Q6)		*None*	*60%*	*Increased*	*34%*	*76%*	*38%*	*None*	*Increased*	*2%*	*2%*	*Increased*	*Increased*	*Increased*
Q7 Percent CVOC Reduction from Baseline		*99.6%*	*100%*	*98%*	*32%*	*86%*	*99.4%*	*97%*	*39%*	*100%*	*96%*	*99.3%*	*98%*	*99%*

Notes:

1. Groundwater sample analytical results are compared to New York State Department of Environmental Conservation (NYSDEC) Technical and Operational Guidance Series (TOGS) 1.1.1 Ambient Water Quality Standards and Guidance Values for Class GA water.
2. Results exceeding the NYSDEC TOGS standards and guidance values are shaded.
3. PCE = tetrachlorothylene
4. TCE = trichloroethylene
5. cis-1,2-DCE = cis-1,2-Dichloroethylene
6. µg/L = microgram per liter
7. CVOC = chlorinated volatile organic compounds
8. * = Monitoring well is located in the sidewalk adjacent to the warehouse.

FIGURES



LEGEND:

APPROXIMATE SITE BOUNDARY

NOTE: BASE MAPS ARE REFERENCED FROM THE UNITED STATES GEOLOGICAL SURVEY (USGS) TOPOGRAPHIC QUADRANGLE MAPS FOR BROOKLYN AND JAMAICA.

LANGAN

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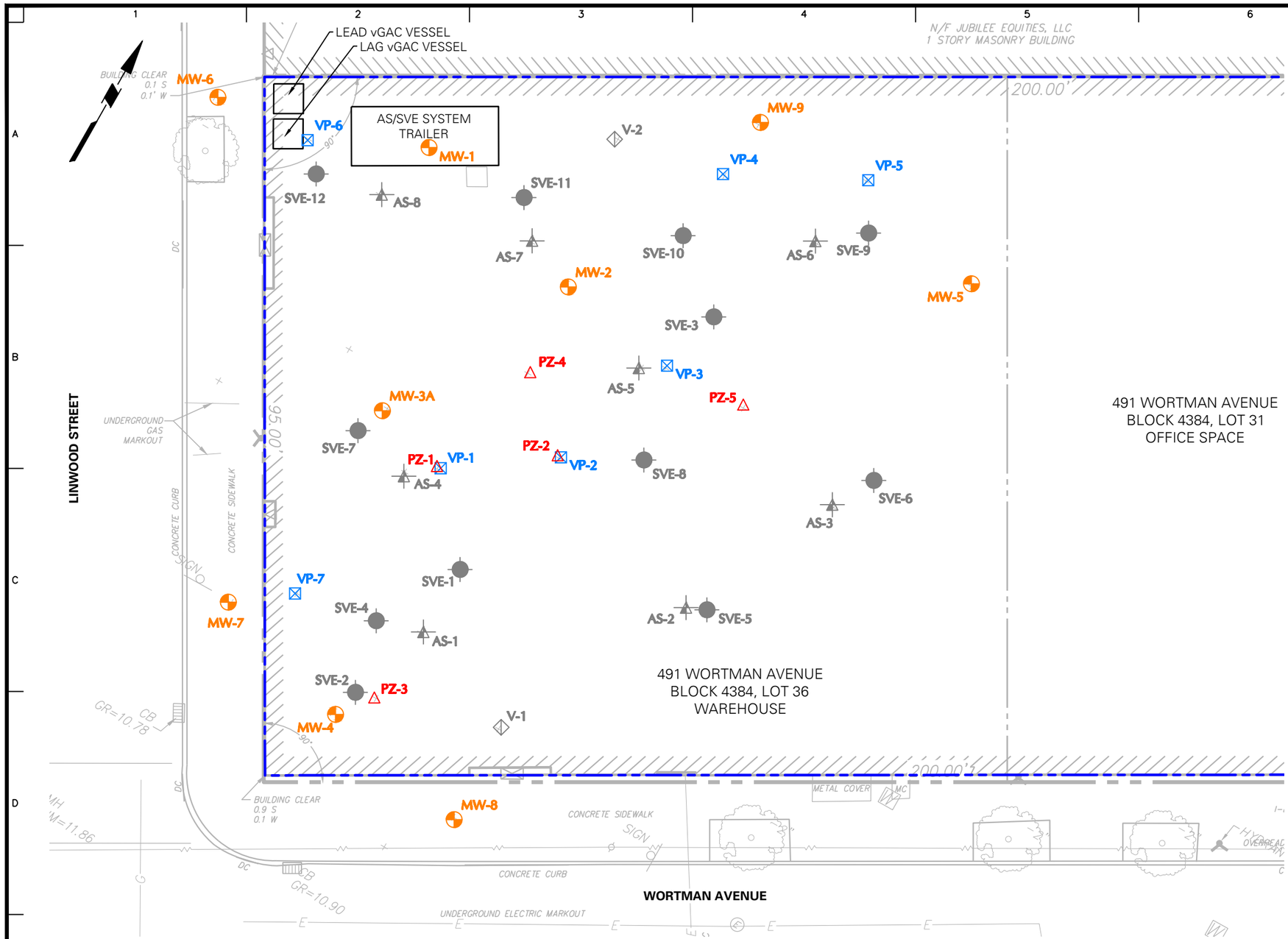
Langan CT, Inc.
Langan International LLC
Collectively known as Langan

Project	491 WORTMAN AVENUE BLOCK No. 4384, LOT Nos. 31 & 36 BROOKLYN KINGS NEW YORK
Figure Title	SITE LOCATION MAP
Project No.	170329301
Date	04/18/2015
Scale	N.T.S.
Drawn By / Checked By	MLR / GN
Submission Date	
Figure	1
Sheet	1 of 2

Filename: \\langan.com\data\NYC\data3\170329301\Cadd Data - 170329301\SheetFiles\Monthly Report 19\Figure 1 - Site Location Map - Updated.dwg Date: 2/8/2017 Time: 14:08 User: mrogers Style Table: Langan.stb Layout: Site Location Map



LEGEND:

- BUILDING LIMITS
- AS-6 — AIR SPARGE WELL
- SVE-9 — SOIL VAPOR EXTRACTION WELL
- VP-5 — VAPOR PROBE
- V-2 — VENT WELL
- MW-5 — MONITORING WELL
- PZ-5 — PIEZOMETER

NOTES:

1. THE BASEMAP IS REFERENCED FROM THE 491 WORTMAN AVENUE BOUNDARY SURVEY PREPARED BY LANGAN ENGINEERING, ENVIRONMENTAL, SURVEY, AND LANDSCAPE ARCHITECTURE, D.P.C. (LANGAN), DATED NOVEMBER 2, 2015
2. WELL LOCATIONS ARE BASED ON THE BOUNDARY SURVEY.
3. ELEVATIONS SHOWN ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).
4. 11 GROUNDWATER MONITORING WELLS AND 2 PIEZOMETERS ARE INCLUDED AS PART OF THE QUARTERLY GROUNDWATER SAMPLING PROGRAM.
5. MW-3A IS A NESTED MONITORING LOCATION WITH THREE SEPARATE WELLS SCREENED ACROSS A SHALLOW, MIDDLE, AND DEEP INTERVAL.

15 0 7.5 15
SCALE IN FEET

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Langan International LLC
Collectively known as Langan

Project
491 WORTMAN AVENUE
BLOCK No. 4384, LOT Nos. 31 & 36
BROOKLYN
KINGS **NEW YORK**

Figure Title
ON-SITE GROUNDWATER MONITORING LOCATIONS

Project No. 170329301	Figure No. 2
Date 01/21/2016	
Scale AS SHOWN	
Drawn By TCS / Checked By GN	
Submission Date	Sheet 2 of 2

Filename: \\langan.com\data\NY\data3\170329301\Cadd Data - 170329301\SheetFiles\Monthly Report 19\Figure 2 - Quarterly GW Wells.dwg Date: 2/8/2017 Time: 14:09 User: mrogers Style Table: Langan.stb Layout: ANSIB-BL

Progress/Inspection Report No. 4
J&H Holding Company, LLC
491 Wortman Avenue, Brooklyn, NY 11208
Brownfield Cleanup Program Site No. C224139
Reporting Period: August 2017

1. Introduction

Langan Engineering, Environmental, Surveying and Landscape Architecture, D.P.C. (Langan) submits this progress/inspection report on behalf of J&H Holding Company, LLC (the "Participant"). In accordance with Section 7.1 of the Site Management Plan (SMP), which was approved by the New York State Department of Environmental Conservation (NYSDEC) on June 28, 2017, this progress/inspection report summarizes work performed at the Former Watermark Designs Facility (the "Site") during August 2017. The Final Engineering Report (FER) was submitted to the NYSDEC on May 25, 2017, and in accordance with the Brownfield Cleanup Agreement (BCA) submission of Monthly Brownfield Cleanup Program (BCP) Progress Reports is no longer required for the Site.

The Site (Block 4384, Lots 31 & 36) is located at 491 Wortman Avenue in Brooklyn, New York (Figure 1) and consists of a rectangular shaped lot that is about 19,000 square feet (±0.44 acres). The Site is located in an area zoned for industrial/manufacturing use and is bound by Wortman Street to the south, Linwood Street to the west, Essex Street to the east, and a one-story building to the north. Currently, a one-story building with a partial basement covers the entire Site footprint. The one-story building is comprised of a warehouse (i.e., the western portion) and office space and a smaller warehouse (i.e. the eastern portion).

2. Remedial Actions Relative to the Site during this Reporting Period

On August 17 and 18, 2017, the second annual vapor sampling event was conducted. Vapor probes VP-1 through VP-7 were sampled for laboratory analysis of volatile organic compounds (VOCs) via United States Environmental Protection Agency (USEPA) Method TO-15. The vapor probe locations are shown on Figure 2.

On August 25, 2017, Langan recorded process and performance monitoring data for the air sparge and soil vapor extraction (AS/SVE) system. As part of the monthly inspection, vapor samples were collected prior to the lead vapor-phase granular activated carbon (vGAC) unit (i.e., influent) and after the lag vGAC unit (i.e., effluent). Routine equipment maintenance, including greasing the blower and checking the belt tensions, was performed. During the monthly inspection, AS-6 was shut down and air flow was increased at AS-8 to 33 standard cubic feet per minute (scfm).

3. Actions Relative to the Site Anticipated for the Next Reporting Period

The following activities are planned:

- Continued operation, maintenance and monitoring (OM&M) of the AS/SVE system

4. Approved Activity Modifications (changes of work scope and/or schedule)

Per an NYSDEC email dated August 28, 2017, near-field, off-site groundwater monitoring wells MW-6, MW-7, and MW-8 will be sampled quarterly, rather than semi-annually, for at least the next four quarterly groundwater sampling events.

5. Results of Sampling, Testing and Other Relevant Data

OM&M sampling was performed as follows:

- Seven vapor samples were collected from on-site vapor probes VP-1, VP-2, VP-3, VP-4, VP-5, VP-6, and VP-7 and analyzed for VOCs via USEPA Method TO-15.
- An influent vapor sample was collected from the AS/SVE system and analyzed for VOCs via USEPA Method TO-15.
- An effluent vapor sample was collected from the AS/SVE system and analyzed for VOCs via USEPA Method TO-15.

Samples were analyzed by Alpha Analytical of Westborough, MA. Alpha is a New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP)-certified laboratory.

Based on the results of the most recent OM&M sampling, the AS/SVE system is functioning in compliance with Policy DAR-1: Guidelines for the Control of Toxic Ambient Air Contaminants (DAR-1).

The following tables are attached to this progress report; analytical lab reports are available upon request. The tables summarize the data collected and the functionality of the AS/SVE system, including mass of VOCs removed from the subsurface based on photoionization detector (PID) readings and laboratory data, as well as, the alarm history.

- Table1: AS/SVE System Vapor Sampling Results
- Table 2: AS/SVE System Mass Removal – PID Data
- Table 3: AS/SVE System Mass Removal – Laboratory Data
- Table 4: AS/SVE System DAR-1 Compliance – August 25, 2017
- Table 5: AS/SVE System Alarm History
- Table 6: Annual Vapor Sampling Results – Second Round
- Table 7: Annual Vapor Sampling Results Summary

6. Deliverables Submitted During This Reporting Period

The FER Fact Sheet was translated into Spanish and submitted to NYSDEC on August 21, 2017.

7. Information Regarding Percentage of Completion

OM&M of the AS/SVE system is ongoing.

As of September 5, 2017 and since inception, the SVE system operated for 15,115 hours (92% uptime), and the AS system operated for 14,645 hours (89% uptime).

8. Unresolved Delays Encountered or Anticipated That May Affect the Schedule and Mitigation Efforts

None

9. Citizen Participation Plan Activities during This Reporting Period

The FER Fact Sheet was distributed to the public on August 30, 2017.

10. Activities Anticipated in Support of the CPP for the Next Reporting Period

None

11. Miscellaneous Information

Issuance of a certificate of completion is anticipated before the end of September 2017.

TABLES

TABLE 1: AS/SVE SYSTEM VAPOR SAMPLING RESULTS
FORMER WATERMARK DESIGNS FACILITY
BROOKLYN, NEW YORK
LANGAN PROJECT NO. 170329301
BROWNFIELD CLEANUP PROGRAM SITE NO. C224139

LOCATION	vGAC INFLUENT		vGAC EFFLUENT	
SAMPLE ID	INFLUENT_082517		EFFLUENT_082517	
LAB SAMPLE ID	L1730012-01		L1730012-02	
SAMPLE DATE	8/25/2017		8/25/2017	
Volatile Organic Compounds (ug/m^3)				
1,1,1-Trichloroethane	5.6		1.1	U
1,1,2,2-Tetrachloroethane	2.8	U	1.4	U
1,1,2-Trichloroethane	2.2	U	1.1	U
1,1-Dichloroethane	1.6	U	0.8	U
1,1-Dichloroethene	1.6	U	0.8	U
1,2,4-Trichlorobenzene	3.0	U	1.5	U
1,2,4-Trimethylbenzene	2.0	U	1.0	U
1,2-Dibromoethane	3.1	U	1.5	U
1,2-Dichlorobenzene	2.4	U	1.2	U
1,2-Dichloroethane	1.6	U	0.8	U
1,2-Dichloropropane	54.1		0.9	U
1,3,5-Trimethylbenzene	2	U	1.0	U
1,3-Butadiene	0.9	U	0.4	U
1,3-Dichlorobenzene	2.4	U	1.2	U
1,4-Dichlorobenzene	2.4	U	1.2	U
1,4-Dioxane	1.4	U	0.7	U
2,2,4-Trimethylpentane	1.9	U	0.9	U
2-Butanone	10.0		5.5	
2-Hexanone	1.6	U	0.8	U
3-Chloropropene	1.3	U	0.6	U
4-Ethyltoluene	2.0	U	1.0	U
4-Methyl-2-pentanone	6		2	U
Acetone	106.0		61.3	
Benzene	8.9		0.6	U
Benzyl chloride	2.1	U	1.0	U
Bromodichloromethane	2.7	U	1.3	U
Bromoform	4.1	U	2.1	U
Bromomethane	1.6	U	0.8	U
Carbon disulfide	3.2		2.1	
Carbon tetrachloride	2.5	U	1.3	U
Chlorobenzene	1.8	U	0.9	U
Chloroethane	1.1	U	0.5	U
Chloroform	3.7		2.1	
Chloromethane	1.6		0.4	
cis-1,2-Dichloroethene	6.3		5.3	
cis-1,3-Dichloropropene	1.8	U	0.9	U
Cyclohexane	1.4	U	0.7	U
Dibromochloromethane	3.4	U	1.7	U
Dichlorodifluoromethane	2.0	U	1.6	
Ethanol	52.4		47.9	
Ethyl Acetate	3.6	U	1.8	U
Ethylbenzene	2.0		0.9	U
Freon-113	3.1	U	2	U
Freon-114	2.8	U	1.4	U
Heptane	1.8		0.8	U
Hexachlorobutadiene	4.3	U	2.1	U
Isopropanol	3.8		3.2	
Methyl tert butyl ether	1	U	0.7	U
Methylene chloride	3.5	U	3.3	B
n-Hexane	7.4	B	10.3	B
o-Xylene	1.7	U	0.9	U
p/m-Xylene	4.2		1.7	U
Styrene	3		1.4	
Tertiary butyl Alcohol	76.4	B	96.7	B
Tetrachloroethene	241		1.4	
Tetrahydrofuran	3.0	U	1.5	U
Toluene	11.2		2.59	
trans-1,2-Dichloroethene	1.59	U	0.793	U
trans-1,3-Dichloropropene	1.82	U	0.908	U
Trichloroethene	726		1.07	U
Trichlorofluoromethane	2.25	U	1.41	
Vinyl bromide	1.75	U	0.874	U
Vinyl chloride	1.02	U	0.511	U

NOTES:
1. ug/m^3 = micrograms per cubic meter
2. vGAC = vapor-phase granular activated carbon
3. Samples collected at the "vGAC INFLUENT" were collected before to the lead vGAC vessel.
4. Samples collected at the "vGAC EFFLUENT" were collected after the lag vGAC vessel.

Q is the Qualifier Column with definitions as follows:
B = The analyte was detected in the batch blank.
U = The analyte was not detected at or above the level indicated.

TABLE 2: AS/SVE SYSTEM MASS REMOVAL - PID DATA
FORMER WATERMARK DESIGNS FACILITY
BROOKLYN, NEW YORK
LANGAN PROJECT NO. 170329301
BROWNFIELD CLEANUP PROGRAM SITE NO. C224139

DATE	INFLUENT CONCENTRATION (ppmv)	SVE BLOWER FLOWRATE (scfm)	EFFLUENT CONCENTRATION (ppmv)	TOTAL OPERATIONAL HOURS	AVERAGE MOLECULAR WEIGHT	MASS REMOVAL RATE (lbs/hr)	TOTAL MASS REMOVED FROM SUBSURFACE (lbs)	CUMULATIVE MASS REMOVED FROM SUBSURFACE (lbs)
10/21/2015	55.0	688	1.8	30	100	0.57	17.02	17.02
10/26/2015	8.3	650	0.6	150	100	0.08	9.31	26.34
11/6/2015	5.5	560	0.0	383	100	0.05	11.13	37.46
11/30/2015	1.9	593	0.3	958	100	0.01	8.46	45.92
12/28/2015	3.7	570	0.0	1,548	100	0.03	19.29	65.21
1/27/2016	1.2	525	0.5	2,180	100	0.01	3.60	68.81
2/24/2016	2.5	578	0.0	2,854	100	0.02	15.10	83.91
3/30/2016	0.2	550	0.0	3,693	100	0.002	1.43	85.34
4/29/2016	2.0	571	0.0	4,322	100	0.018	11.14	96.48
5/26/2016	0.4	600	0.0	4,972	100	0.004	2.42	98.90
6/29/2016	0.5	600	0.0	5,784	100	0.005	3.78	102.68
7/28/2016	3.0	600	0.0	6,431	100	0.028	18.06	120.73
8/31/2016	2.7	600	0.0	7,110	100	0.025	17.05	137.79
9/29/2016	7.5	760	2.0	7,802	100	0.065	44.85	182.63
10/31/2016	0.0	520	0.0	8,516	100	0.000	0.00	182.63
11/29/2016	0.0	560	0.0	9,211	100	0.000	0.00	182.63
12/28/2016	0.0	520	0.0	9,884	100	0.000	0.00	182.63
1/25/2017	2.8	600	0.0	10,530	100	0.026	16.83	199.46
3/7/2017	0.1	360	0.0	11,186	100	0.001	0.37	199.82
4/27/2017	0.0	600	0.0	12,185	100	0.000	0.00	199.82
5/25/2017	0.8	600	0.0	12,760	100	0.008	4.42	204.24
6/28/2017	0.04	600	0.0	13,575	100	0.000	0.33	204.57
7/21/2017	0.00	600	0.0	14,060	100	0.000	0.00	204.57
8/25/2017	0.00	600	0.0	14,852	100	0.000	0.00	204.57

NOTES:
1. Blower flowrate is recorded from PDI-701 pitot tube flow indicator located on the blower discharge line.
2. The influent and effluent concentrations are based on the PID readings.
3. Mass Removal rate (lb/hr) = ((Conc in ppmv)(flowrate scfm)(MW)(60 min/hr)) / ((387)(1,000,000)).
4. PID = photoionization detector
5. ppmv = parts per million volume
6. scfm = standard cubic feet per minute
7. lbs/hr = pounds per hour
8. lbs = pounds
9. SVE = soil vapor extraction

TABLE 3: AS/SVE SYSTEM MASS REMOVAL - LABORATORY DATA
FORMER WATERMARK DESIGNS FACILITY
BROOKLYN, NEW YORK
LANGAN PROJECT NO. 170329301
BROWNFIELD CLEANUP PROGRAM SITE NO. C224139

DATE	INFLUENT CONCENTRATION (ug/m3)	SVE BLOWER FLOWRATE (scfm)	EFFLUENT CONCENTRATION (ug/m3)	TOTAL OPERATIONAL HOURS	INFLUENT RATE (mg/min)	EFFLUENT RATE (mg/min)	REMOVAL RATE (mg/min)	MASS REMOVED FROM SUBSURFACE (lbs)	TOTAL MASS REMOVED FROM SUBSURFACE (lbs)	MASS REMOVED BY CARBON (lbs)	TOTAL MASS REMOVED BY CARBON (lbs)
10/20/2015	114,348	640	9,241	12	2049.12	165.60	1883.52	3.25	3.25	2.99	2.99
10/21/2015	32,758	688	1,129	30	631.05	21.75	609.30	1.50	4.76	1.45	4.44
10/26/2015	7,027	650	383	150	127.89	6.97	120.92	2.03	6.79	1.92	6.36
11/30/2015	3,144	593	426	958	52.20	7.07	45.13	5.58	12.36	4.82	11.18
12/28/2015	3,357	570	230	1,548	53.58	3.67	49.91	4.18	16.55	3.89	15.08
1/27/2016	621	525	183	2,180	9.13	2.69	6.44	0.76	17.31	0.54	15.62
2/24/2016	1,454	578	283	2,854	23.53	4.58	18.94	2.10	19.41	1.69	17.31
3/30/2016	825	550	75	3,693	12.71	1.16	11.55	1.41	20.82	1.28	18.59
4/29/2016	482	571	112	4,322	7.70	1.79	5.91	0.64	21.46	0.49	19.08
5/26/2016	1,169	600	162	4,972	19.64	2.73	16.91	1.69	23.15	1.45	20.53
6/29/2016	1,865	600	190	5,784	31.33	3.19	28.14	3.37	26.51	3.02	23.56
7/28/2016	3,706	600	232	6,431	62.26	3.90	58.36	5.33	31.84	4.99	28.55
8/31/2016	4,798	600	135	7,110	80.61	2.26	78.35	7.24	39.08	7.04	35.59
9/29/2016	1,045	760	179	7,802	22.24	3.81	18.43	2.04	41.12	1.69	37.27
10/31/2016	922	520	91	8,516	13.42	1.32	12.10	1.27	42.38	1.14	38.42
11/29/2016	790	560	167	9,211	12.38	2.62	9.76	1.14	43.52	0.90	39.31
12/28/2016	282	520	123	9,884	4.11	1.79	2.32	0.37	43.89	0.21	39.52
1/25/2017	4.7	600	5.6	10,530	0.08	0.09	-0.02	0.01	43.89	0.00	39.52
3/7/2017	762	360	120	11,186	7.68	1.21	6.47	0.67	44.56	0.56	40.08
4/27/2017	1,008	600	86	12,185	16.93	1.44	15.49	2.24	46.80	2.05	42.13
5/25/2017	771	600	48	12,760	12.95	0.81	12.15	0.99	47.78	0.92	43.05
6/28/2017	754	600	69	13,575	12.66	1.16	11.50	1.36	49.15	1.24	44.29
7/21/2017	2,434	600	235	14,060	40.89	3.95	36.94	2.62	51.77	2.37	46.66
8/25/2017	1,334	600	246	14,852	22.41	4.13	18.28	2.35	54.12	1.91	48.58

NOTES:
1. Blower flowrate is recorded from PDI-701 pitot tube flow indicator located on the blower discharge line.
2. The influent and effluent concentrations are based on the lab analytical data and not the PID readings.
3. ug/m3 = micrograms per cubic meter
4. scfm = standard cubic feet per minute
5. mg/min = milligrams per minute
6. lbs = pounds
7. SVE = soil vapor extraction
8. VGAC = vapor-phase granular activated carbon

TABLE 4: AS/SVE SYSTEM DAR-1 COMPLIANCE
FORMER WATERMARK DESIGNS FACILITY
BROOKLYN, NEW YORK
LANGAN PROJECT NO. 170329301
BROWNFIELD CLEANUP PROGRAM NO. C224139

SAMPLING DATE: 8/25/2017

CHEMICAL COMPOUND	CARBON EFFLUENT CONCENTRATION MEASURED ($\mu g/m^3$)	EMISSION FLOWRATE MEASURED (SCFM)	(m^3/min)	OUTLET CONCENTRATION (Q_p) (lb/hr)	OUTLET CONCENTRATION (Q_a) (lb/yr)	MAX ANNUAL IMPACT (C_a) ($\mu g/m^3$)	MAX POTENTIAL IMPACT (C_p) ($\mu g/m^3$)	MAX SHORT-TERM IMPACT (C_{st}) ($\mu g/m^3$)	DAR-1 STANDARDS SGC ($\mu g/m^3$)	AGC ($\mu g/m^3$)	EMISSION RESTRICTION REQUIRED (if C_p>AGC and C_a<AGC)	SGC EMISSION EXCEEDANCE (if C_{st}>SGC)	AGC EMISSION EXCEEDANCE (if C_a>AGC)
Volatile Organics, USEPA TO-15 Full List (ug/m^3)													
2-Butanone	5.46	600	16.9902	1.22E-05	1.07E-01	9.64E-04	9.63E-04	6.26E-02	13000	5000	NO	NO	NO
Acetone	61.3	600	16.9902	1.37E-04	1.20E+00	1.08E-02	1.08E-02	7.03E-01	180,000	30,000	NO	NO	NO
Carbon disulfide	2.06	600	16.9902	4.62E-06	4.05E-02	3.64E-04	3.63E-04	2.36E-02	6,200	700	NO	NO	NO
Chloroform	2.09	600	16.9902	4.69E-06	4.11E-02	3.69E-04	3.69E-04	2.40E-02	150	0.04	NO	NO	NO
Chloromethane	0.432	600	16.9902	9.69E-07	8.49E-03	7.63E-05	7.62E-05	4.95E-03	6,200	700	NO	NO	NO
cis-1,2-Dichloroethylene	5.27	600	16.9902	1.18E-05	1.04E-01	9.31E-04	9.30E-04	6.04E-02	--	63	NO	No Standard	NO
Dichlorodifluoromethane	1.55	600	16.9902	3.48E-06	3.05E-02	2.74E-04	2.73E-04	1.78E-02	--	12,000	NO	No Standard	NO
Ethanol	47.9	600	16.9902	1.07E-04	9.41E-01	8.46E-03	8.45E-03	5.49E-01	--	45,000	NO	No Standard	NO
Isopropanol	3.17	600	16.9902	7.11E-06	6.23E-02	5.60E-04	5.59E-04	3.64E-02	98,000	7,000	NO	NO	NO
Methylene chloride	3.27	600	16.9902	7.33E-06	6.42E-02	5.78E-04	5.77E-04	3.75E-02	14,000	60	NO	NO	NO
n-Hexane	10.3	600	16.9902	2.31E-05	2.02E-01	1.82E-03	1.82E-03	1.18E-01	--	700	NO	No Standard	NO
Styrene	1.35	600	16.9902	3.03E-06	2.65E-02	2.38E-04	2.38E-04	1.55E-02	17,000	1,000	NO	NO	NO
Tertiary Butyl Alcohol	96.7	600	16.9902	2.17E-04	1.90E+00	1.71E-02	1.71E-02	1.11E+00	--	720	NO	No Standard	NO
Tetrachloroethene	1.42	600	16.9902	3.18E-06	2.79E-02	2.51E-04	2.51E-04	1.63E-02	300	4	NO	NO	NO
Toluene	2.59	600	16.9902	5.81E-06	5.09E-02	4.57E-04	4.57E-04	2.97E-02	37,000	5,000	NO	NO	NO
Trichlorofluoromethane	1.41	600	16.9902	3.16E-06	2.77E-02	2.49E-04	2.49E-04	1.62E-02	9,000	5,000	NO	NO	NO

NOTES AND QUALIFIERS:
1. Table only displays chemical compounds with detectable concentrations.
2. Concentrations below reporting limit (non detect) are assumed to be zero.
3. Air samples were analyzed for USEPA TO-15 compounds
4. All equations are referenced in NYSDEC, Division of Air Resources, Air Guide 1, Guidelines for the Control of Toxic Ambient Air Contaminants (11/12/97). Standard Point Source Method calculations were used.
5. Values in table are compared to DAR-1 Annual Guideline Concentrations (AGC)/Short-Term Guideline Concentrations (SGC) Tables dated February 28, 2014.
6. DAR-1 AGC and/or SGC values listed as "--" means there is no AGC or SGC standard for that compound.
7. SCFM = standard cubic feet per minute
8. Blower flowrate is recorded from PDI-701 pitot tube flow indicator located on the blower discharge line.
9. ug/m^3 = micrograms per cubic meter
10. m^3/min = cubic meter per minute
11. lb/hr = pounds per hour
12. lb/yr = pounds per year

TABLE 5: AS/SVE SYSTEM ALARM HISTORY
FORMER WATERMARK DESIGNS FACILITY
BROOKLYN, NEW YORK
LANGAN PROJECT NO. 170329301
BROWNFIELD CLEANUP PROGRAM NO. C224139

DATE	ALARM	ALARM DESCRIPTION	REASON	REMEDY
10/23/2015	PAL-2501	Compressor Low Pressure Alarm	Uncertain of the reason. There may be a power fluctuation that trips the low pressure alarm, which shuts the AS system down.	On-site observation confirmed that this was a false alarm and was not caused by compressor failure or a breach in the air sparge manifold. The alarm was manually reset.
10/28/2015	LAH-7301	Storage Tank High Level Alarm	The SVE system began to extract a larger volume of water than previously anticipated.	The storage tank was emptied into nine 55-gallon drums, and the SVE system vacuum has been optimized to extract a lesser volume of water.
11/5/2015	PAL-2501	Compressor Low Pressure Alarm	Caused by the air sparge compressor on/off time, which won't allow "OFF" time to be set to zero and therefore, the compressor cannot run continuously.	The air compressor timer has been by-passed and the compressor operation is linked to the SVE system operation. If the SVE system is operational, the compressor will operate unless a different AS system alarm has been triggered.
11/17/2015	PAL-2501	Compressor Low Pressure Alarm	This was an alarm test that was performed to ensure that the update to the Programmable Logic Controller (PLC) was successful.	The PLC update was successful and the air sparge compressor can run continuously. The air compressor timer is no longer being bypassed.
12/23/2015	LAH-7301	Storage Tank High Level Alarm	Following optimization, which included increasing the AS rate and the SVE system flow rate, the SVE system began to extract a larger volume of water than previously anticipated.	The storage tank was emptied into three 55-gallon drums. Both the AS and SVE system flow rates were adjusted in an effort to reduce excess water collection by the SVE system.
12/25/2015	LAH-7301	Storage Tank High Level Alarm	Following optimization, which included increasing the AS rate and the SVE system flow rate, the SVE system began to extract a larger volume of water than previously anticipated.	The storage tank was emptied into three 55-gallon drums. Both the AS and SVE system flow rates were adjusted in an effort to reduce excess water collection by the SVE system.
1/7/2016	LAH-7301	Storage Tank High Level Alarm	Following continued optimization of AS/SVE system, the SVE system began to extract a larger volume of water than anticipated.	The storage tank was emptied into eight 55-gallon drums. Both the AS and SVE system flow rates were adjusted in an effort to reduce excess water collection by the SVE system.
1/17/2016	LAH-7301	Storage Tank High Level Alarm	Following continued optimization of AS/SVE system, the SVE system began to extract a larger volume of water than anticipated.	The storage tank was emptied. Both the AS and SVE system flow rates were adjusted in an effort to reduce excess water collection by the SVE system.
2/1/2016	TAH-2501	Air Compressor High Temperature Alarm	The AS system is operating close to the alarm set point so that as much warm air as possible is continuously injected into the subsurface. A slight change in the air flow rate and/or ambient temperature most likely caused the rise in discharge air temperature.	The alarm was cleared and the AS system was restarted at a lower speed. The compressor speed was ramped up incrementally throughout the day until the previous set point was reached. The heat exchanger flow and AS manifold temperature are being monitored on a daily basis in an effort to prevent tripping the high temperature alarm again.
4/3/2016	PAL-701	Blower Influent High Pressure Alarm	The alarm was most likely triggered due to power fluctuations caused by high wind conditions.	The alarm was cleared and the SVE system was restarted at a higher frequency. The system was monitored remotely for the remainder of the day.
4/29/2016	TAH-2501	Air Compressor High Temperature Alarm	The AS system is operating close to the alarm set point so that as much warm air as possible is continuously injected into the subsurface. A slight change in the air flow rate and/or ambient temperature most likely caused the rise in discharge air temperature.	The alarm was cleared and the AS system was restarted. At restart, the allowable flow through the AS system was increased to alleviate the pressure on the air compressor discharge line. The heat exchanger flow and AS manifold temperature are being monitored on a daily basis in an effort to prevent tripping the high temperature alarm again.
8/9/2016	PAH-702	SVE System Effluent High Pressure Alarm	Anomalously high pressures were not noted on the SVE system discharge during the remote or on-site inspections. It is likely that the SVE effluent pressure switch needs to be recalibrated following almost a year's worth of continuous use.	The SVE system was restarted at a lower frequency and monitored on-site for about two hours.
8/26/2016	FAL-701	Blower Low Flow Alarm	The alarm was triggered due to a loose relay switch.	The switch was tightened during the August 31, 2016 monthly inspection and the system was restarted without further issue.
12/27/2016	PAL-2501	Compressor Low Pressure Alarm	The alarm was triggered due to a mechanical failure at the air compressor (i.e., the belts tore).	The air compressor belts were replaced on January 9, 2017 and the system was restarted.
3/7/2017	FAL-401	Transfer Pump Low Flow Alarm	The alarm was likley triggered due to the fluctuating volume of water extracted by the SVE system.	The AS/SVE system was restarted. Both the AS and SVE system flow rates were adjusted in an effort to reduce excess water collection by the SVE system.
3/8/2017	Low PLC Battery	Low Programmable Loigc Controller (PLC) Battery	The alarm was triggered because the PLC battery can no longer hold a charge.	The PLC battery was replaced on March 10, 2017.
3/24/2017	VFDA-701	SVE System Variable Frequency Drive (VFD) Alarm	The alarm was triggered because the SVE system blower was not functioning within the intended parameters.	The blower was visually inspected, a piece of debris caught in the belts was removed, and the system was restarted.
7/4/2017	TAH-2501	Air Compressor High Temperature Alarm	The AS system is operating close to the alarm set point so that as much warm air as possible is continuously injected into the subsurface. A slight change in the air flow rate and/or ambient temperature most likely caused the rise in discharge air temperature.	The alarm was cleared and the AS system was restarted. At restart, the allowable flow through the AS system was increased to alleviate the pressure on the air compressor discharge line. The heat exchanger flow and AS manifold temperature are being monitored on a daily basis in an effort to prevent tripping the high temperature alarm again.
8/2/2017	FAL-701	Blower Low Flow Alarm	The alarm was likely triggered by a momentary power surge.	The alarm was cleared and the AS/SVE system was restarted. The system was monitored remotely for the remainder of the day.

TABLE 6: ANNUAL VAPOR SAMPLING RESULTS - SECOND ROUND
491 WORTMAN AVENUE
BROOKLYN, NEW YORK
LANGAN PROJECT NO. 170329301
BROWNFIELD CLEANUP PROGRAM NO. C224139

Sample ID	VP-01_081817		VP-02_081817		VP-03_081817		VP-04_081717		VP-05_081717		VP-06_081717		VP-07_081817	
Laboratory ID	L1729172-01		L1729172-02		L1729172-03		L1729037-01		L1729037-02		L1729037-03		L1729172-04	
Sampling Date	8/18/2017		8/18/2017		8/18/2017		8/17/2017		8/17/2017		8/17/2017		8/18/2017	
Volatile Organic Compounds (ug/m^3)														
1,1,1-Trichloroethane	2.63		2.62		2.62		3.64	U	2.73	U	2.50		3.18	
1,2,4-Trimethylbenzene	19.8	U	10	U	5	U	4		4		6		3	
1,2-Dichloropropane	54.5		68		71		66		47		49		40	
2-Butanone	658		275		493		410		537		372		380	
Acetone	135		103		285		93		159		146		102	
Carbon disulfide	12.5	U	6	U	3	U	7		4		5		2	
Chloroform	19.6	U	9.77	U	5.71		3.26	U	2.44	U	1.95	U	1.95	U
Chloromethane	8.3	U	4	U	2	U	1	U	1	U	2		1	U
cis-1,2-Dichloroethene	1.75		5.95		1.09		2.64	U	1.98	U	2	U	1.59	U
Cyclohexane	13.8	U	6.88	U	3.44	U	2.30	U	2	U	1.86		1.38	U
Dichlorodifluoromethane	19.9	U	10	U	5	U	58		2	U	2	U	2	U
Ethanol	188	U	94.20	U	47	U	32	U	29.80		63.90		18.80	U
Ethylbenzene	17.5	U	9	U	4	U	3	U	3		5		2	U
Heptane	16.5	U	8	U	4	U	3	U	2	U	9		2	U
Isopropanol	24.6	U	12.30	U	6.15	U	4.10	U	3.24		8.68		2.46	U
n-Hexane	14.2	U	7.05	U	3.52	U	2.35	U	1.76	U	1.76		1.41	U
o-Xylene	17.5	U	8.69	U	4.34	U	2.90	U	3.69		6		2	U
p/m-Xylene	34.9	U	17.40	U	9	U	6		9		12.70		4	
Styrene	17.1	U	9	U	4	U	3	U	4		8		2	
Tetrachloroethene	373		360		361		275		356		442		392	
Tetrahydrofuran	301		372		513		1,030		324		345		264	
Toluene	15.1	U	8	U	6		6		9		28		4	
Trichloroethene	5,080		3,090		1,460		332		226		543		645	
Trichlorofluoromethane	22.6	U	11	U	6	U	4	U	3		3		5	
Total VOCs	**6,606**		**4,276**		**3,198**		**2,286**		**1,721**		**2,060**		**1,847**	

NOTES:
1. Only compounds with detections are shown.
2. ug/m^3 = micrograms per cubic meter

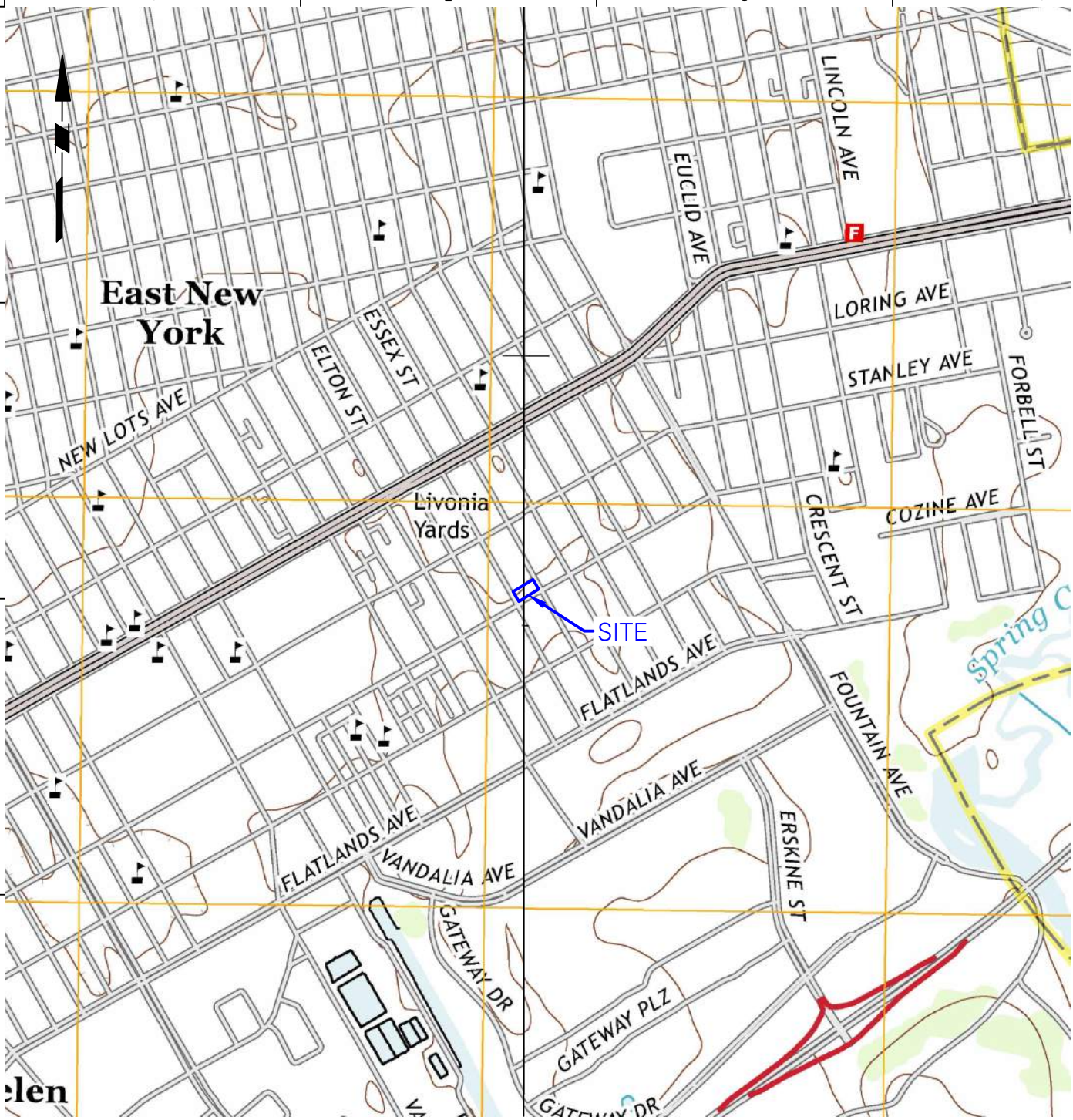
Qualifiers:
U = Analyte not detected at or above the level indicated.

TABLE 7: ANNUAL VAPOR SAMPLING RESULTS SUMMARY
491 WORTMAN AVENUE
BROOKLYN, NEW YORK
LANGAN PROJECT NO. 170329301
BROWNFIELD CLEANUP PROGRAM SITE NO. C224139

Compound	Sampling Location						
	VP-01	VP-02	VP-03	VP-04	VP-05	VP-06	VP-07
Baseline Sampling Results Summary (ug/m^3) - August 2015							
CVOCs	1,909,219	3,414,000	2,044,050	309,649	371,597	47,923	390,070
PCE	18,000	32,800	22,700	10,400	2,400	5,250	6,850
TCE	1,890,000	3,380,000	2,020,000	299,000	369,000	42,500	383,000
cis-1,2- DCE	741	730	821	151	120	105	145
vinyl chloride	478	470	529	97.6	77.2	67.7	75.2
First Annual Sampling Results Summary (ug/m^3) - July 2016							
CVOCs	3,346	5,595	11,255	320	576	2,325	1,065
PCE	230	370	240	25	130	1400	49
TCE	3,100	5,200	11,000	280	430	910	1,000
cis-1,2- DCE	9.6	19	9.2	9.2	9.6	9	9.5
vinyl chloride	6.2	5.7	5.9	5.9	6.2	5.8	6.1
Percent CVOC Reduction Compared to Baseline	99.8%	99.8%	99.4%	99.9%	99.8%	95%	99.7%
Second Annual Sampling Results Summary (ug/m^3) - August 2017							
CVOCs	5,456	3,456	1,822	611	585	988	1,040
PCE	373	360	361	275	356	442	392
TCE	5,080	3,090	1,460	332	226	543	645
cis-1,2- DCE	1.75	5.95	1.09	2.64	1.98	1.59	1.59
vinyl chloride	1.03	0.511	0.256	1.71	1.28	1.02	1.02
Percent CVOC Reduction Compared to Baseline	99.7%	99.9%	99.9%	99.8%	99.8%	97.9%	99.7%
Percent CVOC Reduction Compared to Round 1	Increased	38.2%	83.8%	Increased	Increased	57.5%	2.3%

NOTES:
1. ug/m^3 = micrograms per cubic meter
2. PCE = tetrachlorothene
3. TCE = trichloroethene
4. cis-1,2-DCE = cis-1,2-dichloroethene
5. CVOC = chlorinated volatile organic compounds

FIGURES



LEGEND:

APPROXIMATE SITE BOUNDARY

NOTE: BASE MAPS ARE REFERENCED FROM THE UNITED STATES GEOLOGICAL SURVEY (USGS) TOPOGRAPHIC QUADRANGLE MAPS FOR BROOKLYN AND JAMAICA.

LANGAN

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Langan Engineering and Environmental Services, Inc.
Langan CT, Inc.
Langan International LLC
Collectively known as Langan

Project

491 WORTMAN AVENUE

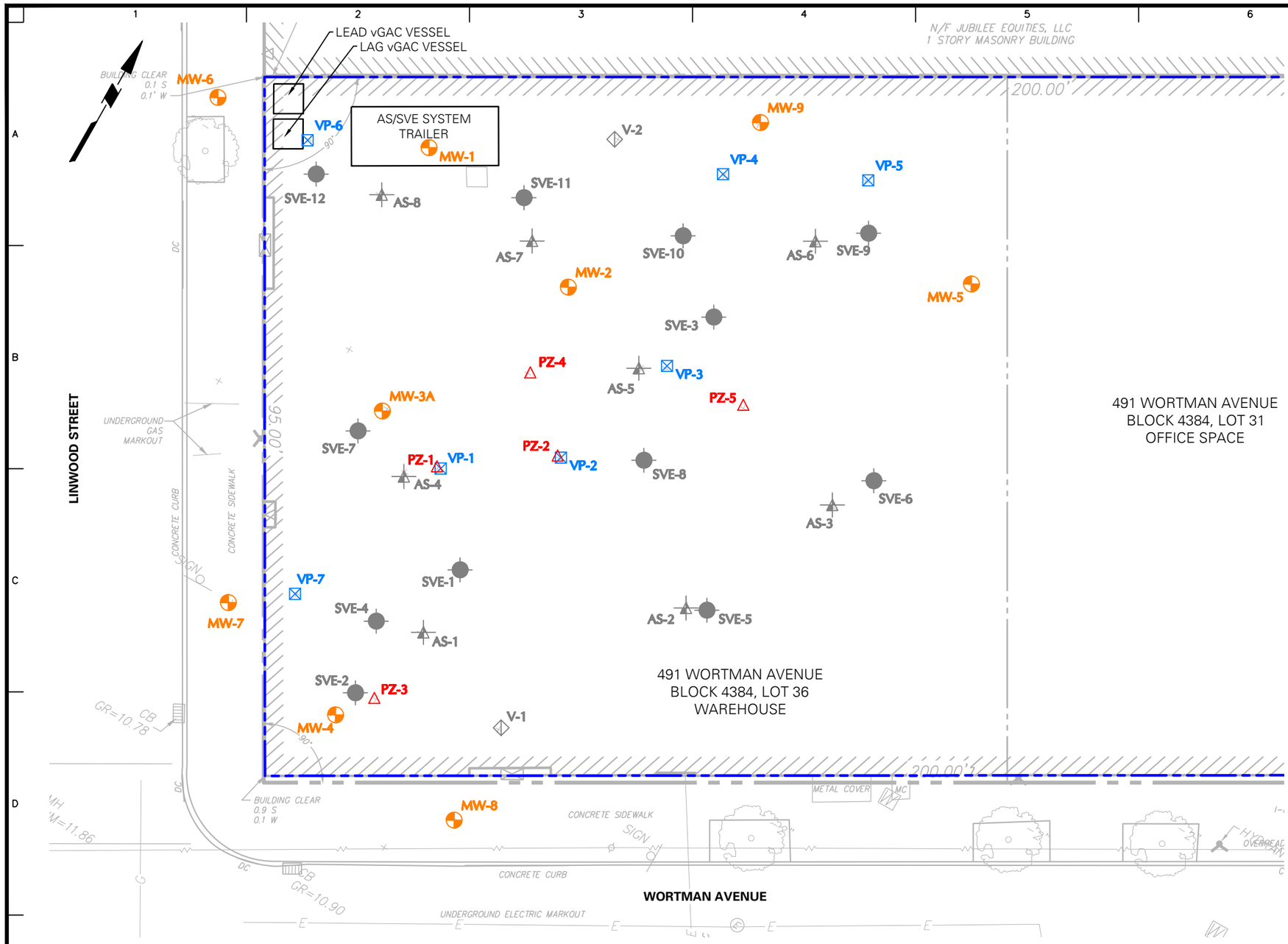
BLOCK No. 4384, LOT Nos. 31 & 36
BROOKLYN
KINGS NEW YORK

Figure Title

SITE LOCATION MAP

Project No. 170329301	Figure 1
Date 04/18/2015	
Scale N.T.S.	
Drawn By MLR / Checked By GN	
Submission Date	Sheet 1 of 2

Filename: \\langan.com\data\NYC\data3\170329301\Cadd Data - 170329301\SheetFiles\Monthly Report 19\Figure 1 - Site Location Map - Updated.dwg Date: 2/8/2017 Time: 14:08 User: mrogers Style Table: Langan.stb Layout: Site Location Map



LEGEND:

- BUILDING LIMITS
- AS-6 — AIR SPARGE WELL
- SVE-9 — SOIL VAPOR EXTRACTION WELL
- VP-5 — VAPOR PROBE
- V-2 — VENT WELL
- MW-5 — MONITORING WELL
- PZ-5 — PIEZOMETER

NOTES:

1. THE BASEMAP IS REFERENCED FROM THE 491 WORTMAN AVENUE BOUNDARY SURVEY PREPARED BY LANGAN ENGINEERING, ENVIRONMENTAL, SURVEY, AND LANDSCAPE ARCHITECTURE, D.P.C. (LANGAN), DATED NOVEMBER 2, 2015
2. WELL LOCATIONS ARE BASED ON THE BOUNDARY SURVEY.
3. ELEVATIONS SHOWN ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).
4. 11 GROUNDWATER MONITORING WELLS AND 2 PIEZOMETERS ARE INCLUDED AS PART OF THE QUARTERLY GROUNDWATER SAMPLING PROGRAM.
5. MW-3A IS A NESTED MONITORING LOCATION WITH THREE SEPARATE WELLS SCREENED ACROSS A SHALLOW, MIDDLE, AND DEEP INTERVAL.

WARNING: IT IS A VIOLATION OF THE NYS EDUCATION LAW ARTICLE 145 FOR ANY PERSON, UNLESS HE IS ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS ITEM IN ANY WAY.

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SCALE IN FEET

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KINGS **NEW YORK**

Figure Title
ON-SITE AND NEAR-FIELD MONITORING LOCATIONS

Project No. 170329301	Figure No. 2
Date 01/21/2016	
Scale AS SHOWN	
Drawn By TCS / Checked By GN	
Submission Date	Sheet 2 of 2

Filename: \\langan.com\data\NY\data3\170329301\Cadd Data - 170329301\SheetFiles\Monthly Report 19\Figure 2 - Quarterly GW Wells.dwg Date: 9/5/2017 Time: 18:41 User: mrogers Style Table: Langan.stb Layout: ANSIB-BL