

August 9, 2013

Mr. Eugene Melnyk
Division of Environmental Remediation
New York State Department of Environmental Conservation
270 Michigan Avenue
Buffalo, New York 14203-2899

Re: Brownfield Cleanup Program Site #C907027
Anderson Cleaners Site
Jamestown, New York

Dear Mr. Melnyk:

Day Environmental, Inc. (DAY) prepared this letter on behalf of Anderson Cleaners (Anderson) summarizing the work completed to date as part of the Plume Containment Remedy implemented at the above-referenced site (the Site). This work was done in accordance with the provisions outlined in a document titled *Remedial Action Work Plan: Anderson Cleaners Site 5 Hunt Road Jamestown, New York BCP #C907027* dated March 2013 prepared by DAY (the RAWP). The New York State Department of Environmental Conservation (NYSDEC) approved the work proposed in the RAWP for the Plume Containment Remedy in a letter dated March 28, 2013.

Background Testing

Prior to the implementation of the Plume Containment Remedy, background samples were collected from select overburden/top of till monitoring wells located in proximity of the treatment area and tested for in-situ parameters, and submitted to an analytical laboratory for testing of halogenated VOCs. Table 1 includes a summary of the in-situ measurements made as part of the Long Term Monitoring Program implemented at the Site for the parameters: groundwater elevation, pH, dissolved oxygen (DO), oxygen reduction potential (ORP), and specific conductance. A summary of the halogenated volatile organic compounds (VOCs) detected in groundwater samples collected from the overburden/top of till monitoring wells prior to the implementation of the Plume Containment Remedy is presented as Table 2.

In addition, groundwater samples were collected on June 26, 2013 from monitoring wells CW-2 and CW-4, and submitted to Spectrum Analytical Services, Inc. (Spectrum) for testing of the metals iron, calcium, magnesium and manganese; the anions chloride, sulfate, and nitrate; total organic carbon (TOC); dissolved organic carbon (DOC); and volatile fatty acids (VFA). A copy of the Spectrum Laboratory Report documenting the results of this testing is included as Attachment A.

Permeable Reactive Barrier Injections

On July 17, 2013 and July 24, 2013, a permeable reactive barrier (PRB) was constructed in the “Primary Treatment Area” designated in the RAWP. The Primary Treatment Area is in the location where the highest dissolved VOC concentrations have been detected to date in groundwater samples collected from monitoring wells positioned near the property line of the Site, and in downgradient locations relative to identified source areas, (i.e., generally between a 21-inch storm sewer and a 4-inch sanitary sewer).

The PRB was constructed by the injection of a slurry mixture containing a total of approximately 1,400 lbs. of EHC In-Situ Chemical Reduction Reagent (EHC) manufactured by FMC Corporation and water into the overburden/top of till zone through the injection points, designated Location #1 through Location #12 on Figure 1. A sub-contractor was retained to complete the injections using a direct push drill rig and grout pump. At each injection point, a 2.25-inch inside diameter flush-coupled drill rod fitted with a disposable tip was driven to a predetermined depth (i.e., typically the top of the glacial till layer as identified by previous test borings), and the rods were pulled up approximately one foot leaving the expendable tip in the bottom of the borehole. An EHC slurry mixture ranging between 24% and 34% by weight, with an average slurry mixture of 27.25%, was pumped into the boreholes as the drill rods were removed. Pertinent information recorded during the EHC injections, including quantities and concentrations of EHC injected, injection depth ranges, injection pressures, etc. are summarized on Table 3. [Note: Artesian groundwater conditions in the overburden at the Site caused some of the EHC/water slurry to be forced up and out of the injection point, in some locations, subsequent to removing the direct push rods from the injection point and prior to the sealing of the borehole with bentonite clay. To the extent possible, the ‘lost’ slurry was re-captured and injected into subsequent injection locations. However, approximately 2% of the total slurry injected could not be re-captured and injected. This material was placed in a shallow excavation within the treatment area.]

Effectiveness Monitoring

As described in the RAWP, samples will be collected from monitoring wells CW-1, CW-2, CW-4, CW-5, MW-200 and MW-201 approximately three months after the completion of the injection event (i.e., on or about October 24, 2013) and tested for the in-situ parameters of pH, ORP and DO, and submitted to an analytical laboratory for testing of halogenated VOCs via USEPA Method 8260. In addition, the samples collected from monitoring well CW-2 and CW-4 will be tested for TOC, DOC, iron and VFA. The results of the effectiveness testing will be used to determine whether additional injections are warranted.

Please contact the undersigned if you have questions regarding the information presented herein.

Very truly yours,
Day Environmental, Inc.



Raymond L. Kampff
Associate Principal

RLK/s

Figures

Figure 1 Site Plan Depicting Injection Locations July 2013

Tables

Table 1 Summary of In-Situ Water Quality Parameters

Table 2 Summary of Analytical Laboratory Results - Groundwater Samples;
Overburden/Top of Till Monitoring Wells

Table 3 Summary of EHC Injections

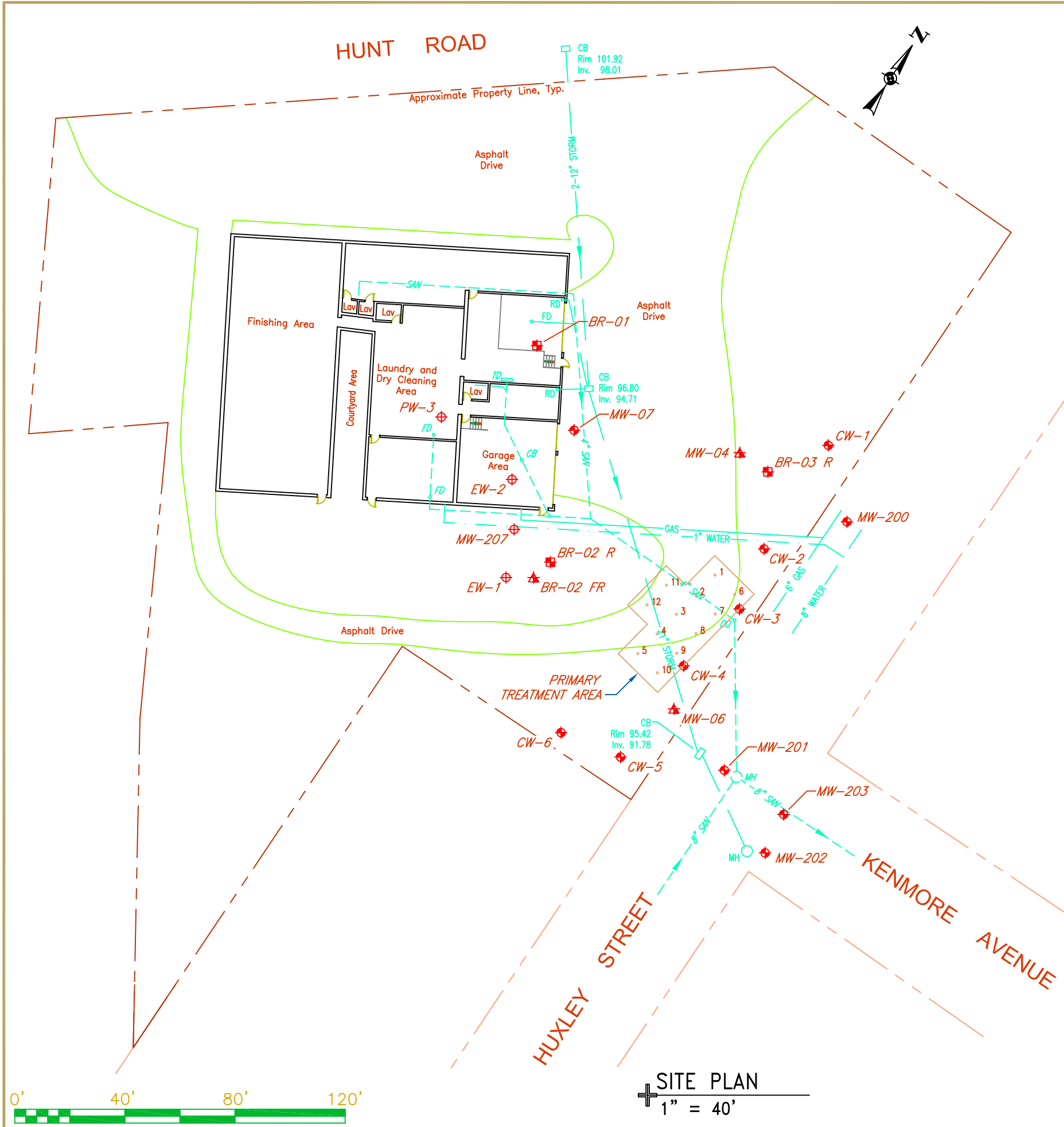
Attachments

Attachment A Analytical Laboratory Report: Background Testing CW-2 and CW-4

cc: M. Lyons

FIGURE

Time Plotted: Friday, August 09, 2013 7:56:11 AM
File Name: U:\McPhee\Drawings\Brownfield\3563\40 Scale Plume Contain System July 2013.dwg
Ref1: Xerox432AnsiB-2; 11 x 17
Ref2: Layout Name: Layout1
Ref3: Scale Plume Contain System July 2013.dwg
Scale Plume Contain System July 2013.dwg



LEGEND:

- BR-03 R Bedrock Monitoring Well
- MW-04 Top of Rock/Fractured Rock Monitoring Well
- CW-1 Overburden/Top of Till Monitoring Well
- EW-1 DNAPL Extraction Well
- 1 Approximate Location and Designation of Injection Point Completed July 17, 2013 or July 24, 2013
- CB Catch Basin
- FD Floor Drain
- MH Manhole
- Rim 100.83 Rim Elevation In Feet
- Inv. 95.55 Invert Elevation In Feet
- RD Roof Drain
- TD Trench Drain
- 6" GAS Gas Line (Approx 2.5 feet below grade)
- 8" SAN Sanitary Sewer (Approx 5-7 feet below grade)
- STORM Storm Sewer (Approx 4-6 feet below grade)
- 8" WATER Water Line (Approx 5-7 feet below grade)

NOTES:

- Site Plan produced from drawings by Habiterre Associates, Thorsell, Kennedy, Casker, Arnone & Hedin. P.C. entitled "Addition and Renovations, Anderson Cleaners, Inc", drawings A-1 Floor Plan dated October 22, 1985 and L-1 Grading Plan and from notes of site visits by representatives of Day Environmental, Inc.
- Well locations MW-04, MW-06, MW-07 and MW-08 were obtained in the field by a Trimble GeoXT GPS. Other well and test boring locations were obtained by tape measurement from existing site structure. Locations should be considered accurate to the degree implied by the method used.
- Utility locations were obtained in the field by a Trimble GeoXT GPS, from drawings referenced in Note 1, A 1967 map from Jamestown DPW showing the proposed location of a permanent easement for the purpose of constructing and maintaining a storm sewer from the existing catch basin on the west side of Huxley Street to the west city line, and from a 1951 DPW storm sewer filed book number 438S, page 107. Locations should be considered accurate to the degree implied by the method used.
- Elevation survey data determined by Michael J. Rodgers, LS, PC, and referenced to an arbitrary site wide datum. Elevations should be considered accurate to the degree implied by the method used.
- Approximate depths of gas line, sanitary sewer, storm sewer and water line were obtained from a hand drawn plan from "Jamestown Board of Public Utilities, Anderson Cleaners Sewer Connection Map", dated October 2, 1985.

PROJECT MANAGER	DATE	DATE DRAWN	DATE ISSUED
RLK	7-2013	8-2-2013	8-2-2013
DRAWN BY	SCALE	As Noted	
RJM			

day
DAY ENVIRONMENTAL, INC.
ENVIRONMENTAL CONSULTANTS
ROCHESTER, NEW YORK 14606
NEW YORK, NEW YORK 10170

PROJECT TITLE	DRAWING TITLE
5 HUNT ROAD JAMESTOWN, NEW YORK	REMEDIAL ACTION WORK PLAN - BCP #C907027
Site Plan Depicting Injection Location Completed July 2013	

PROJECT NO.	FIGURE 1
3563S-04	

TABLES

Table 1
Long Term Monitoring Program
5 Hunt Road
Jamestown, New York
NYSDEC BCP Site #C907027

Summary of Water Quality Parameters - Groundwater Samples

WELL ID	Parameter	DATE		
		8/8/2012	3/6/2013	6/26/2013
MW-07	GW Elevation (ft)	95.27	95.90	95.01
	pH (su)	N/M	7.04	7.73
	S.C. (mS/cm)	N/M	1.70	N/M
	D.O. (mg/l)	0.9	0.10	0.7
	O.R.P. (mV)	106	100	57
MW-200	GW Elevation (ft)	92.99	95.46	92.95
	pH (su)	N/M	8.23	7.74
	S.C. (mS/cm)	N/M	2.68	N/M
	D.O. (mg/l)	0.6	4.24	0.6
	O.R.P. (mV)	70	196	-57
MW-201	GW Elevation (ft)	92.08	92.44	93.69
	pH (su)	N/M	7.58	7.97
	S.C. (mS/cm)	N/M	2.11	N/M
	D.O. (mg/l)	2.3	1.38	0.7
	O.R.P. (mV)	-31	-53	-13
CW-1	GW Elevation (ft)	--	96.64	95.62
	pH (su)	--	N/M	8.02
	S.C. (mS/cm)	--	N/M	N/M
	D.O. (mg/l)	--	N/M	4.0
	O.R.P. (mV)	--	N/M	122
CW-2	GW Elevation (ft)	--	96.46	95.97
	pH (su)	--	7.65	7.79
	S.C. (mS/cm)	--	2.01	N/M
	D.O. (mg/l)	--	0.88	0.6
	O.R.P. (mV)	--	299	175
CW-3	GW Elevation (ft)	--	94.97	94.34
	pH (su)	--	7.77	7.82
	S.C. (mS/cm)	--	1.90	N/M
	D.O. (mg/l)	--	0.70	0.9
	O.R.P. (mV)	--	310	40
CW-4	GW Elevation (ft)	--	94.63	94.10
	pH (su)	--	8.10	7.69
	S.C. (mS/cm)	--	1.64	N/M
	D.O. (mg/l)	--	0.23	0.9
	O.R.P. (mV)	--	193	190
CW-5	GW Elevation (ft)	--	94.42	93.97
	pH (su)	--	N/M	7.93
	S.C. (mS/cm)	--	N/M	N/M
	D.O. (mg/l)	--	N/M	1.2
	O.R.P. (mV)	--	N/M	33
CW-6	GW Elevation (ft)	--	95.87	95.19
	pH (su)	--	N/M	7.94
	S.C. (mS/cm)	--	N/M	N/M
	D.O. (mg/l)	--	N/M	1.3
	O.R.P. (mV)	--	N/M	32
MW-04	GW Elevation (ft)	97.72	100.16	N/M
	pH (su)	N/M	7.83	N/M
	S.C. (mS/cm)	N/M	1.11	N/M
	D.O. (mg/l)	0.7	0.14	N/M
	O.R.P. (mV)	95	133	N/M
MW-06	GW Elevation (ft)	96.95	100.09	N/M
	pH (su)	N/M	8.37	N/M
	S.C. (mS/cm)	N/M	0.70	N/M
	D.O. (mg/l)	2	0.00	N/M
	O.R.P. (mV)	-52	197	N/M
BR-02FR	GW Elevation (ft)	97.89	100.22	N/M
	pH (su)	N/M	7.58	N/M
	S.C. (mS/cm)	N/M	0.62	N/M
	D.O. (mg/l)	0.6	0.13	N/M
	O.R.P. (mV)	121	74	N/M
BR-02R	GW Elevation (ft)	97.99	100.46	N/M
	pH (su)	N/M	8.17	N/M
	S.C. (mS/cm)	N/M	0.60	N/M
	D.O. (mg/l)	0.8	0.00	N/M
	O.R.P. (mV)	88	-164	N/M
BR-03R	GW Elevation (ft)	98.39	100.01	N/M
	pH (su)	N/M	7.86	N/M
	S.C. (mS/cm)	N/M	0.51	N/M
	D.O. (mg/l)	0.3	0.00	N/M
	O.R.P. (mV)	69	131	N/M

NM = Not Measured

Table 2
Long Term Monitoring - Overburden/Top of Till Monitoring Wells
Summary of Analytical Laboratory Results
Groundwater Samples

Anderson Cleaners Site
Jamestown, New York
BCP Site C907027

Constituent	Sample Locations and Sample Dates																		
	MW-07										CW-1	CW-2		CW-3		CW-4		CW-5	CW-6
	5/25/2005	1/12/2006	9/12/2006	1/4/2007	2/13/2007	3/15/2007	7/24/2008	8/8/2012	11/16/2012	3/6/2013	12/7/2012	11/16/2012	3/6/2013	11/16/2012	3/6/2013	11/16/2012	3/6/2013	11/16/2012	11/16/2012
PCE	9,600 E	8,590	9,170	5,310	6,440	4,240	11,600	15,600	6,410	2,140	13.3	155	308	794	910	39,800	31,300	U (0.7)	U (0.7)
TCE	6,500	U (200)	U (200)	U (200)	U (200)	U (200)	U (200)	U (151)	U (151)	U (37.8)	1.0	60.8	40.0	U (7.6)	U (15.1)	U (378)	U (378)	U (0.8)	U (0.8)
trans 1,2-DCE	61	U (200)	U (200)	U (200)	U (200)	U (200)	U (200)	U (136)	U (136)	U (34.0)	U (1.0)	1.8	U (3.4)	U (6.8)	U (13.6)	U (340)	U (340)	U (0.7)	U (0.7)
cis 1,2-DCE	7,100	-	-	U (200)	U (200)	U (200)	245	U (143)	U (143)	U (35.8)	1.3	37.4	24.4	28.5	25.4	U (358)	U (358)	U (0.7)	U (0.7)
VC	1,000	U (200)	U (200)	U (200)	U (200)	U (200)	U (200)	U (161)	U (161)	U (40.4)	U (1.0)	1.2	U (4.0)	U (8.1)	U (16.1)	U (404)	U (404)	U (0.8)	U (0.8)
Total VOCs	24,261	8,590	9,170	5,310	6,440	4,240	11,845	15,600	6,410	2,140	15.6	256.2	372.4	822.5	935.4	39,800	31,300	0	0

Constituent	Sample Locations and Sample Dates																	
	MW-200					MW-201												
	4/20/2006	7/24/2008	8/8/2012	11/16/2012	3/6/2013	4/24/2006	1/4/2007	2/13/2007	3/15/2007	8/31/2007	11/8/2007	4/2/2008	7/24/2008	12/20/2008	8/8/2012	11/16/2012	12/7/2012	3/6/2013
PCE	U (2.0)	U (2.0)	1.4	U (0.7)	1.8	10,500	14,200	2,610	423	1,000	402	U (100)	U (200)	U (200)	U (186)	U (0.7)	U (250)	U (186)
TCE	U (2.0)	U (2.0)	3.2	5.6	1.5	970	U (200)	17,500	937	772 E	232	U (100)	U (200)	U (200)	U (189)	U (0.8)	U (250)	U (189)
trans 1,2-DCE	U (2.0)	U (2.0)	0.8	U (0.7)	U (0.7)	U (200)	U (200)	1,290	94.4	361 E	141	U (100)	U (200)	U (200)	U (170)	U (0.7)	U (250)	U (170)
cis 1,2-DCE	-	4.56	32.6	45.6	7.2	-	U (200)	7,860	U (20)	16,000	9,130	4,040	7,820	752	10,400	27.7	9,570	11,200
VC	U (2.0)	U (2.0)	0.9	0.8	U (0.8)	U (200)	U (200)	U (200)	U (20)	566 E	1,180	1,710	4,260	1,050	650	14.7	848	588
Total VOCs	ND	4.56	38.9	52.0	10.5	11,470	14,200	29,260	1,454	18,699	11,085	5,750	12,080	1,804	11,050	42.4	10,418	11,788

Notes:

All samples tested for halogenated VOCs by USEPA Method 8260B and concentrations are shown in ug/L or parts per billion.

U (200) = constituent not detected at the concentration shown in parenthesis.

E = estimated concentration

PCE = tetrachloroethene

TCE = trichloroethene

trans 1,2-DCE = trans 1,2-dichloroethene

cis 1,2-DCE = cis 1,2-dichloroethene

VC = vinyl chloride

Table 3
Summary of EHC Injections
July 17 and July 24, 2013

Anderson Cleaners Site
Jamestown, New York
BCP Site C907027

Location	Date/Time	EHC (lbs.)	Water (gallons)	Volume of Slurry (EHC + Water)	EHC % in slurry by weight	Max boring Depth (Ft)	Injection start depth (Ft)	Injection end depth (Ft)	Pressure Max (psi)	Pressure Min (psi)	Slurry Loss during closure (gal)	Additional Slurry Recaptured from Previous Injection(s) and placed (gal)	Approximate Total Volume Slurry Injected (gal)
1	7/17/13 9:40	135	40	52	29	15	14	10	90	20	15	0	37
2	7/24/13 8:30	124	45	56	25	14	12	8	50	30	8	0	48
3	7/17/13 10:50	116	40	50	26	15	14	10	100	50	0	5	55
4	7/24/13 9:30	124	45	56	25	14	12	10	0	0	20	0	36
5	7/17/13 12:30	140	43	55	28	14	13	9	65	50	5	0	50
6	7/24/13 11:00	112	40	50	25	14	12	6	40	30	15	25	60
7	7/17/13 16:00	112	40	50	25	14	13	8	50	40	0	10	60
8	7/17/13 15:00	138	43	55	28	14	13	8	0	0	0	0	55
9	7/17/13 14:00	112	43	53	24	8.5	7.5	6.5	40	30	0	5	58
10	7/24/13 10:00	87	20	28	34	12.5	11	11	0	0	25	15	18
11	7/24/13 12:15	100	30	39	29	14	10	6	0	0	1	0	38
12	7/24/13 13:15	100	30	39	29	14	12	6	0	0	2	20	57
Totals		1400	459	579	27 (avg.)	--	--	--	--	--	91	80	568

Notes:

Slurry Loss during closure at location 4 and location 20 includes slurry that was not injected due to breakthrough into an adjacent borehole. This slurry was injected into subsequent locations.

An Injection pressure of 0 indicated no gauge reading (i.e., assume less than 5 psi).

ATTACHMENT A

Analytical Laboratory Report: Background Testing CW-2 and CW-4

Report Date:
16-Jul-13 17:21



SPECTRUM ANALYTICAL, INC.

Featuring

HANIBAL TECHNOLOGY

Laboratory Report

- ☒ Final Report
☐ Re-Issued Report
☐ Revised Report

Day Environmental, Inc.
1563 Lyell Avenue
Rochester, NY 14606
Attn: Ray Kampff

Project: 5 Hunt Rd. Jamestown, NY
Project #: 35635-04

<u>Laboratory ID</u>	<u>Client Sample ID</u>	<u>Matrix</u>	<u>Date Sampled</u>	<u>Date Received</u>
SB72538-01	CW-2	Ground Water	26-Jun-13 09:10	02-Jul-13 21:00
SB72538-02	CW-4	Ground Water	26-Jun-13 08:50	02-Jul-13 21:00

I attest that the information contained within the report has been reviewed for accuracy and checked against the quality control requirements for each method. These results relate only to the sample(s) as received.
All applicable NELAC requirements have been met.

Massachusetts # M-MA138/MA1110
Connecticut # PH-0777
Florida # E87600/E87936
Maine # MA138
New Hampshire # 2538
New Jersey # MA011/MA012
New York # 11393/11840
Pennsylvania # 68-04426/68-02924
Rhode Island # 98
USDA # S-51435



Authorized by:

Nicole Leja
Laboratory Director

Spectrum Analytical holds certification in the State of New York for the analytes as indicated with an X in the "Cert." column within this report. Please note that the State of New York does not offer certification for all analytes. Please refer to our website for specific certification holdings in each state.

Please note that this report contains 7 pages of analytical data plus Chain of Custody document(s). When the Laboratory Report is indicated as revised, this report supersedes any previously dated reports for the laboratory ID(s) referenced above. Where this report identifies subcontracted analyses, copies of the subcontractor's test report are available upon request. This report may not be reproduced, except in full, without written approval from Spectrum Analytical, Inc.

Spectrum Analytical, Inc. is a NELAC accredited laboratory organization and meets NELAC testing standards. Use of the NELAC logo however does not insure that Spectrum is currently accredited for the specific method or analyte indicated. Please refer to our "Quality" web page at www.spectrum-analytical.com for a full listing of our current certifications and fields of accreditation. States in which Spectrum Analytical, Inc. holds NELAC certification are New York, New Hampshire, New Jersey and Florida. All analytical work for Volatile Organic and Air analysis are transferred to and conducted at our 830 Silver Street location (NY-11840, FL-E87936 and NJ-MA012).

Please contact the Laboratory or Technical Director at 800-789-9115 with any questions regarding the data contained in this laboratory report.

CASE NARRATIVE:

The samples were received 1.2 degrees Celsius, please refer to the Chain of Custody for details specific to temperature upon receipt. An infrared thermometer with a tolerance of +/- 1.0 degrees Celsius was used immediately upon receipt of the samples.

If a Matrix Spike (MS), Matrix Spike Duplicate (MSD) or Duplicate (DUP) was not requested on the Chain of Custody, method criteria may have been fulfilled with a source sample not of this Sample Delivery Group.

See below for any non-conformances and issues relating to quality control samples and/or sample analysis/matrix.

EPA 300.0

Laboratory Control Samples:

1315720 SRM

Chloride percent recovery 112 (90-110) is outside individual acceptance criteria, but within overall method allowances. All reported results of the following samples are considered to have a potentially high bias:

CW-2

Sulfate as SO4 percent recovery 115 (90-110) is outside individual acceptance criteria, but within overall method allowances. All reported results of the following samples are considered to have a potentially high bias:

CW-2

1315720-SRM1

The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS recovery.

Chloride
Sulfate as SO4

Samples:

SB72538-01 CW-2

Sample dilution required for high concentration of target analytes to be within the instrument calibration range.

Chloride
Sulfate as SO4

This sample was analyzed outside the EPA recommended holding time per client request.

Nitrate as N

SB72538-02 CW-4

Sample dilution required for high concentration of target analytes to be within the instrument calibration range.

Chloride

This sample was analyzed outside the EPA recommended holding time per client request.

Nitrate as N

SW846 6010C

Spikes:

1316298-MS1 Source: SB72538-02

The RPD and/or percent recovery for this QC spike sample cannot be accurately calculated due to the high concentration of analyte inherent in the sample.

Magnesium

1316298-MSD1 Source: SB72538-02

SW846 6010C

Spikes:

1316298-MSD1 *Source: SB72538-02*

The RPD and/or percent recovery for this QC spike sample cannot be accurately calculated due to the high concentration of analyte inherent in the sample.

Magnesium

The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS recovery.

Iron

1316298-PS1 *Source: SB72538-02*

The RPD and/or percent recovery for this QC spike sample cannot be accurately calculated due to the high concentration of analyte inherent in the sample.

Magnesium

Duplicates:

1316298-DUP1 *Source: SB72538-01*

Sample dilution required for high concentration of target analytes to be within the instrument calibration range.

Magnesium

The RPD exceeded the QC control limits; however precision is demonstrated with acceptable RPD values for MS/MSD.

Iron

Samples:

SB72538-01 *CW-2*

Sample dilution required for high concentration of target analytes to be within the instrument calibration range.

Magnesium

Sample Acceptance Check Form

Client: Day Environmental, Inc.
Project: 5 Hunt Rd. Jamestown, NY / 35635-04
Work Order: SB72538
Sample(s) received on: 7/2/2013
Received by: Vickie Knowles

The following outlines the condition of samples for the attached Chain of Custody upon receipt.

	<u>Yes</u>	<u>No</u>	<u>N/A</u>
1. Were custody seals present?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. Were custody seals intact?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3. Were samples received at a temperature of $\leq 6^{\circ}\text{C}$?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Were samples cooled on ice upon transfer to laboratory representative?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
5. Were samples refrigerated upon transfer to laboratory representative?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Were sample containers received intact?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Were samples properly labeled (labels affixed to sample containers and include sample ID, site location, and/or project number and the collection date)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Were samples accompanied by a Chain of Custody document?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Does Chain of Custody document include proper, full, and complete documentation, which shall include sample ID, site location, and/or project number, date and time of collection, collector's name, preservation type, sample matrix and any special remarks concerning the sample?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
10. Did sample container labels agree with Chain of Custody document?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Were samples received within method-specific holding times?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Sample Identification

CW-2

SB72538-01

Client Project #

35635-04

Matrix

Ground Water

Collection Date/Time

26-Jun-13 09:10

Received

02-Jul-13

<i>CAS No.</i>	<i>Analyte(s)</i>	<i>Result</i>	<i>Flag</i>	<i>Units</i>	<i>*RDL</i>	<i>MDL</i>	<i>Dilution</i>	<i>Method Ref.</i>	<i>Prepared</i>	<i>Analyzed</i>	<i>Analyst</i>	<i>Batch</i>	<i>Cert.</i>
----------------	-------------------	---------------	-------------	--------------	-------------	------------	-----------------	--------------------	-----------------	-----------------	----------------	--------------	--------------

Total Metals by EPA 200/6000 Series Methods

Preservation

**Field
Preserved**

N/A

1

EPA 200/6000
methods

BEL

1315736

Total Metals by EPA 6000/7000 Series Methods

7440-50-8	Copper	0.154		mg/l	0.0050	0.0011	1	SW846 6010C	12-Jul-13	15-Jul-13	EDT	1316298	X
7439-89-6	Iron	96.4		mg/l	0.0150	0.0074	1	"	"	16-Jul-13	"	"	X
7439-95-4	Magnesium	77.8	D, GS1	mg/l	0.0500	0.0062	5	"	"	15-Jul-13	"	"	X
7439-96-5	Manganese	2.25		mg/l	0.0020	0.0012	1	"	"	15-Jul-13	"	"	X

General Chemistry Parameters

16887-00-6	Chloride	443	D, GS1	mg/l	18.0	3.53	18	EPA 300.0	03-Jul-13	04-Jul-13	ELE	1315720	X
	Dissolved Organic Carbon	1.82		mg/l	1.00	0.572	1	SM 5310B	11-Jul-13	11-Jul-13	TDD	1316508	
14797-55-8	Nitrate as N	0.246	O09	mg/l	0.100	0.0750	1	EPA 300.0	05-Jul-13 17:34	06-Jul-13 01:51	ELE	1315875	X
14808-79-8	Sulfate as SO4	32.5	GS1	mg/l	1.00	0.177	1	"	03-Jul-13	04-Jul-13	"	1315720	X
	Total Organic Carbon	2.42		mg/l	1.00	0.283	1	SM 5310B	11-Jul-13	11-Jul-13	TDD	1316505	X

Subcontracted AnalysesSubcontracted AnalysesPrepared by method Modified EPA 300.0*Analysis performed by Spectrum Analytical, Inc. - North Kingstown, RI*

127-17-3	Pyruvic Acid	< 5.0		mg/L	5.0	1.0	1	Modified EPA 300.0	08-Jul-13	08-Jul-13	11522	72614	
50-21-5	Lactic Acid	< 5.0		mg/L	5.0	0.18	1	"	"	"	"	"	
64-19-7	Acetic Acid	< 5.0		mg/L	5.0	0.20	1	"	"	"	"	"	
79-09-4	Propionic Acid	< 5.0		mg/L	5.0	0.22	1	"	"	"	"	"	
107-92-6	Butyric Acid	< 5.0		mg/L	5.0	0.33	1	"	"	"	"	"	

This laboratory report is not valid without an authorized signature on the cover page.

Sample Identification

CW-4

SB72538-02

Client Project #

35635-04

Matrix

Ground Water

Collection Date/Time

26-Jun-13 08:50

Received

02-Jul-13

<i>CAS No.</i>	<i>Analyte(s)</i>	<i>Result</i>	<i>Flag</i>	<i>Units</i>	<i>*RDL</i>	<i>MDL</i>	<i>Dilution</i>	<i>Method Ref.</i>	<i>Prepared</i>	<i>Analyzed</i>	<i>Analyst</i>	<i>Batch</i>	<i>Cert.</i>
----------------	-------------------	---------------	-------------	--------------	-------------	------------	-----------------	--------------------	-----------------	-----------------	----------------	--------------	--------------

Total Metals by EPA 200/6000 Series Methods

Preservation

**Field
Preserved**

N/A

1

EPA 200/6000
methods

BEL

1315736

Total Metals by EPA 6000/7000 Series Methods

7440-50-8	Copper	0.0316		mg/l	0.0050	0.0011	1	SW846 6010C	12-Jul-13	15-Jul-13	EDT	1316298	X
7439-89-6	Iron	14.9		mg/l	0.0150	0.0074	1	"	"	16-Jul-13	"	"	X
7439-95-4	Magnesium	34.9		mg/l	0.0100	0.0012	1	"	"	15-Jul-13	"	"	X
7439-96-5	Manganese	0.522		mg/l	0.0020	0.0012	1	"	"	"	"	"	X

General Chemistry Parameters

16887-00-6	Chloride	284	D, GS1	mg/l	10.0	1.96	10	EPA 300.0	05-Jul-13	06-Jul-13	ELE	1315875	X
	Dissolved Organic Carbon	2.17		mg/l	1.00	0.572	1	SM 5310B	11-Jul-13	11-Jul-13	TDD	1316508	
14797-55-8	Nitrate as N	0.218	O09	mg/l	0.100	0.0750	1	EPA 300.0	05-Jul-13 17:34	06-Jul-13 02:36	ELE	1315875	X
14808-79-8	Sulfate as SO4	19.4		mg/l	1.00	0.177	1	"	"	"	"	"	X
	Total Organic Carbon	2.17		mg/l	1.00	0.283	1	SM 5310B	11-Jul-13	11-Jul-13	TDD	1316505	X

Subcontracted AnalysesSubcontracted AnalysesPrepared by method Modified EPA 300.0*Analysis performed by Spectrum Analytical, Inc. - North Kingstown, RI*

127-17-3	Pyruvic Acid	< 5.0		mg/L	5.0	1.0	1	Modified EPA 300.0	08-Jul-13	08-Jul-13	11522	72614	
50-21-5	Lactic Acid	< 5.0		mg/L	5.0	0.18	1	"	"	"	"	"	
64-19-7	Acetic Acid	< 5.0		mg/L	5.0	0.20	1	"	"	"	"	"	
79-09-4	Propionic Acid	< 5.0		mg/L	5.0	0.22	1	"	"	"	"	"	
107-92-6	Butyric Acid	< 5.0		mg/L	5.0	0.33	1	"	"	"	"	"	

This laboratory report is not valid without an authorized signature on the cover page.

Notes and Definitions

D	Data reported from a dilution
GS1	Sample dilution required for high concentration of target analytes to be within the instrument calibration range.
J	Detected above the Method Detection Limit but below the Reporting Limit; therefore, result is an estimated concentration (CLP J-Flag).
O09	This sample was analyzed outside the EPA recommended holding time per client request.
QM2	The RPD and/or percent recovery for this QC spike sample cannot be accurately calculated due to the high concentration of analyte inherent in the sample.
QM7	The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS recovery.
QR6	The RPD exceeded the QC control limits; however precision is demonstrated with acceptable RPD values for MS/MSD.
U	Analyte included in the analysis, but not detected at or above the MDL.
Ua	Compound not detected below method detection limit
dry	Sample results reported on a dry weight basis
NR	Not Reported
RPD	Relative Percent Difference

Laboratory Control Sample (LCS): A known matrix spiked with compound(s) representative of the target analytes, which is used to document laboratory performance.

Matrix Duplicate: An intra-laboratory split sample which is used to document the precision of a method in a given sample matrix.

Matrix Spike: An aliquot of a sample spiked with a known concentration of target analyte(s). The spiking occurs prior to sample preparation and analysis. A matrix spike is used to document the bias of a method in a given sample matrix.

Method Blank: An analyte-free matrix to which all reagents are added in the same volumes or proportions as used in sample processing. The method blank should be carried through the complete sample preparation and analytical procedure. The method blank is used to document contamination resulting from the analytical process.

Method Detection Limit (MDL): The minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero and is determined from analysis of a sample in a given matrix type containing the analyte.

Reportable Detection Limit (RDL): The lowest concentration that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operating conditions. For many analytes the RDL analyte concentration is selected as the lowest non-zero standard in the calibration curve. While the RDL is approximately 5 to 10 times the MDL, the RDL for each sample takes into account the sample volume/weight, extract/digestate volume, cleanup procedures and, if applicable, dry weight correction. Sample RDLs are highly matrix-dependent.

Surrogate: An organic compound which is similar to the target analyte(s) in chemical composition and behavior in the analytical process, but which is not normally found in environmental samples. These compounds are spiked into all blanks, standards, and samples prior to analysis. Percent recoveries are calculated for each surrogate.

Continuing Calibration Verification: The calibration relationship established during the initial calibration must be verified at periodic intervals. Concentrations, intervals, and criteria are method specific.

Validated by:
Rebecca Merz

