

GROUNDWATER SAMPLING REPORT

**“CENTRAL BOULEVARD ELEMENTARY
SCHOOL”**

**60 CENTRAL BOULEVARD
BETHPAGE, NEW YORK 11714**

**PREPARED FOR:
BETHPAGE UNION FREE SCHOOL DISTRICT
10 CHERRY AVENUE
BETHPAGE, NEW YORK 11714**

**JCB PROJECT #: 18-40900
DECEMBER 2018**

**J.C. BRODERICK & ASSOCIATES, INC.
Environmental Consulting & Testing**

**1775 Expressway Drive North
Hauppauge, New York 11788
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Section No. 1.0: Introduction

J.C. Broderick and Associates, Inc. (JCB) was retained by the Bethpage Union Free School District to perform annual groundwater sampling and analysis from three (3) existing groundwater monitoring wells located at the Central Boulevard Campus.

Section No. 2.0: Site Description and Location

The subject site is located at 60 Central Boulevard, Bethpage, New York 11714. The subject site is located on the west side of Central Boulevard, between Brenner Avenue to the North and Jean Avenue to the south. According to the United States Geological Survey (USGS) *Amityville, New York 1994 7.5 Minute Series Topographical Map*, the subject site is situated at an approximate elevation of 100 feet above mean sea level. The location of the subject site is shown on the Site Location Map Appendix-A Figure-1.

Section No. 3.0: Subsurface Investigation Procedures

The following sections summarizes the subsurface investigation performed. Please refer to the attachments of this document for additional details.

Section No. 3.1: Monitoring Well Gauging

On August 23, 2018, JCB checked the monitoring wells for the presence of light non-aqueous phase liquid (LNAPL) utilizing a Solinst® Model 122 Product/Water Interface Meter and depth to the groundwater table was recorded to the nearest 0.01 ft.

The following table summarizes the groundwater data:

Table No. 1: Depth to Groundwater Gauged with Interface Meter		
Well Number	Depth to Product (ft)	Depth to Groundwater (ft)
MW-1	No Product	41.38
MW-2	No Product	41.19
MW-3	No Product	41.30

Section No. 3.2: Groundwater Sampling

On August 23, 2018, JCB collected three (3) groundwater samples from the existing groundwater monitoring wells (MW-1, MW-2, and MW-3). The sample collection was witnessed, and split samples were collected by a contractor retained by the New York State Department of Environmental Conservation (NYSDEC). Prior to sampling, the casing volume of each monitoring well was calculated and a minimum of three (3) casing volumes of water were purged utilizing a check valve with mechanical assistance. During the purging process, specific groundwater parameters were monitored by a YSI Multi-meter.

The following table summarizes the purged water testing.

Table No. 2: Groundwater Monitoring During Sample Collection					
MW-1	DTW (ft)	TD (ft)	Water Column (ft)		
	41.38	49.58	8.20		
Time	Temp (°C)	TDS (g/l)	DO (%)	pH	ORP (mV)
13:50	18.85	0.528	4.10	6.52	186.3
13:55	19.21	0.507	4.19	5.45	203.7
14:00	18.42	0.497	3.86	6.43	211.2
14:05	18.10	0.499	4.26	6.47	213.8
14:15	18.39	0.483	4.95	6.58	207.5
14:20	16.50	0.487	4.32	6.56	220.9
14:25	16.17	0.483	4.34	6.55	225.0
14:30	16.10	0.482	4.30	6.63	228.0
14:35	Samples Collected				
MW-2	DTW (ft)	TD (ft)	Water Column (ft)		
	41.19	49.29	8.10		
Time	Temp (°C)	TDS (g/l)	DO (%)	pH	ORP (mV)
15:12	17.57	0.374	4.71	6.57	133.3
15:17	16.77	0.370	4.11	6.64	155.8
15:22	16.60	0.365	3.97	6.73	164.0
15:27	Samples Collected				
MW-3	DTW (ft)	TD (ft)	Water Column (ft)		
	41.30	49.11	7.81		
Time	Temp (°C)	TDS (g/l)	DO (%)	pH	ORP (mV)
15:40	17.01	0.549	4.49	3.74	148.9
15:45	16.08	0.549	4.12	6.84	172.5
15:50	16.05	0.531	4.11	6.83	181.8
15:55	Samples Collected				

Notes:
 DTW = Depth to Groundwater Table
 TD = Total Depth of Well
 Temp = Temperature in degrees celcius
 TDS = Total Dissolved Solids in grams per liter
 DO = Dissolved Oxygen in percent
 pH = Potential of Hydrogen, unitless
 ORP = Oxygen-Reduction Potential in millivolts

The following table summarizes the groundwater samples submitted for laboratory analysis:

Table No. 3: Summary of Groundwater Samples Submitted for Laboratory Analysis			
Sample ID#	Date Sampled	Description of Sample	Analysis Method
MW-1	08-23-18	Monitoring Well No. 1	EPA 8260 + Freon EPA 903.0 EPA 904.0
MW-2	08-23-18	Monitoring Well No. 2	EPA 8260 + Freon EPA 903.0 EPA 904.0
MW-3	08-23-18	Monitoring Well No. 3	EPA 8260 + Freon EPA 903.0 EPA 904.0

Notes:
EPA = Environmental Protection Agency

Section No. 4.0: Groundwater Laboratory Analytical Summary

Groundwater samples selected for laboratory analysis were placed into laboratory supplied containers, assigned individual identification numbers and then placed into an appropriately conditioned cooler. Chain of Custody documents were prepared, and the samples were then delivered to an independent New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP) certified laboratory for analysis.

Groundwater samples submitted for laboratory analysis were analyzed for volatile organic compounds (VOCs) plus Freon utilizing Environmental Protection Agency (EPA) Method 8260. York Analytical Laboratories, Inc. (York) provided laboratory analytical services. Copies of York's NYSDOH certifications are available upon request

Groundwater samples submitted for laboratory analysis were analyzed for Radium 226 utilizing Environmental Protection Agency (EPA) Method 903.0, and for Radium 228 utilizing EPA Method 904. EMSL Analytical, Inc. (EMSL) provided laboratory analytical services. Copies of EMSL's NYSDOH certifications are available upon request

The laboratory analytical results for the groundwater samples were reviewed and compared to Table No. 1 of the Ambient Water Quality Standards and Guidance Values of the New York State Department of Environmental Conservation, Division of Water, Technical and Operational Guidance Series (TOGS) (1.1.1).

The following table summarizes the VOC analytical results in groundwater:

The review of the laboratory VOC analysis revealed the following significant findings:

The laboratory analysis results from the groundwater samples submitted from MW-1, MW-2, and MW-3 did indicate detectable concentrations of toluene; however, the levels reported were below the above referenced guidance values for groundwater.

The following table summarizes the Radium analytical results in groundwater:

Table No. 5: Summary of Groundwater Samples Submitted for Radon Analysis				
Client Sample ID	Allowable Standards	MW-1	MW-2	MW-3
EPA 903.0 & EPA 904	pCi/L	9/26/2018	9/26/2018	9/26/2018
Radium 226 (pCi/g)	3.0	1.47	0.22	0.60
Radium 228 (pCi/g)	5.0	0.90	<0.44	<0.46

Notes:
pCi/L = picocuries per liter

The review of the laboratory Radon analysis revealed the following significant findings:

The laboratory analysis results from the groundwater samples submitted from MW-1 did indicate detectable concentrations of Radium 226 and Radium 228; however, the levels reported were below the above referenced guidance values for groundwater. The laboratory analysis results from the groundwater samples submitted from MW-2 and MW-3 did indicate detectable concentrations of only Radium 226; however, the levels reported were below the above referenced guidance values for groundwater.

Section No. 5.0: Quality Assurance and Quality Control (QA/QC) Procedures

In order to prevent cross-contamination between sampling locations, all re-usable sampling equipment which came into contact with sample materials was decontaminated prior to each use. Equipment used for sample collection was wiped clean, washed in a solution of Alconox and thoroughly rinsed with potable water. New and dedicated polyethylene tubing was used for collection of each groundwater sample. All sampling personnel wore disposable latex, nylon, or nitrile gloves during sampling events. At a minimum, gloves were changed between before each laboratory sample was collected. All collected samples were placed into an appropriately conditioned cooler for storage and were transported to the laboratory. Samples were maintained between 0°C and 8°C.

Section No. 6.0: Conclusions and Recommendations

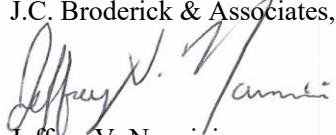
Based on the findings of the current data collected during the subsurface investigation performed and reported to JCB, the following observations are made:

The laboratory analysis results from the groundwater samples submitted did not indicate elevated concentrations of any VOCs above the NYSDEC TOGS 1.1.1 guidance values for groundwater.

The laboratory analysis results from the groundwater samples submitted did not indicate detectable concentrations of Radium 226 and Radium 228 above the NYSDEC TOGS 1.1.1 guidance values for groundwater.

Based upon the detected concentrations of VOCs and Radium in the collected samples it is recommended that periodic groundwater and volatile vapor intrusion sampling be continued to monitor site conditions.

Sincerely,
J.C. Broderick & Associates, Inc.



Jeffrey V. Nannini
Environmental Scientist



Steven Muller, P.G.
Director – Subsurface Division

Appendix A

Figures



J.C. BRODERICK

& Associates

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Notes:

Central Boulevard
Elementary School
60 Central Boulevard
Bethpage, NY 11714

Drawing Title

Figure No. 1

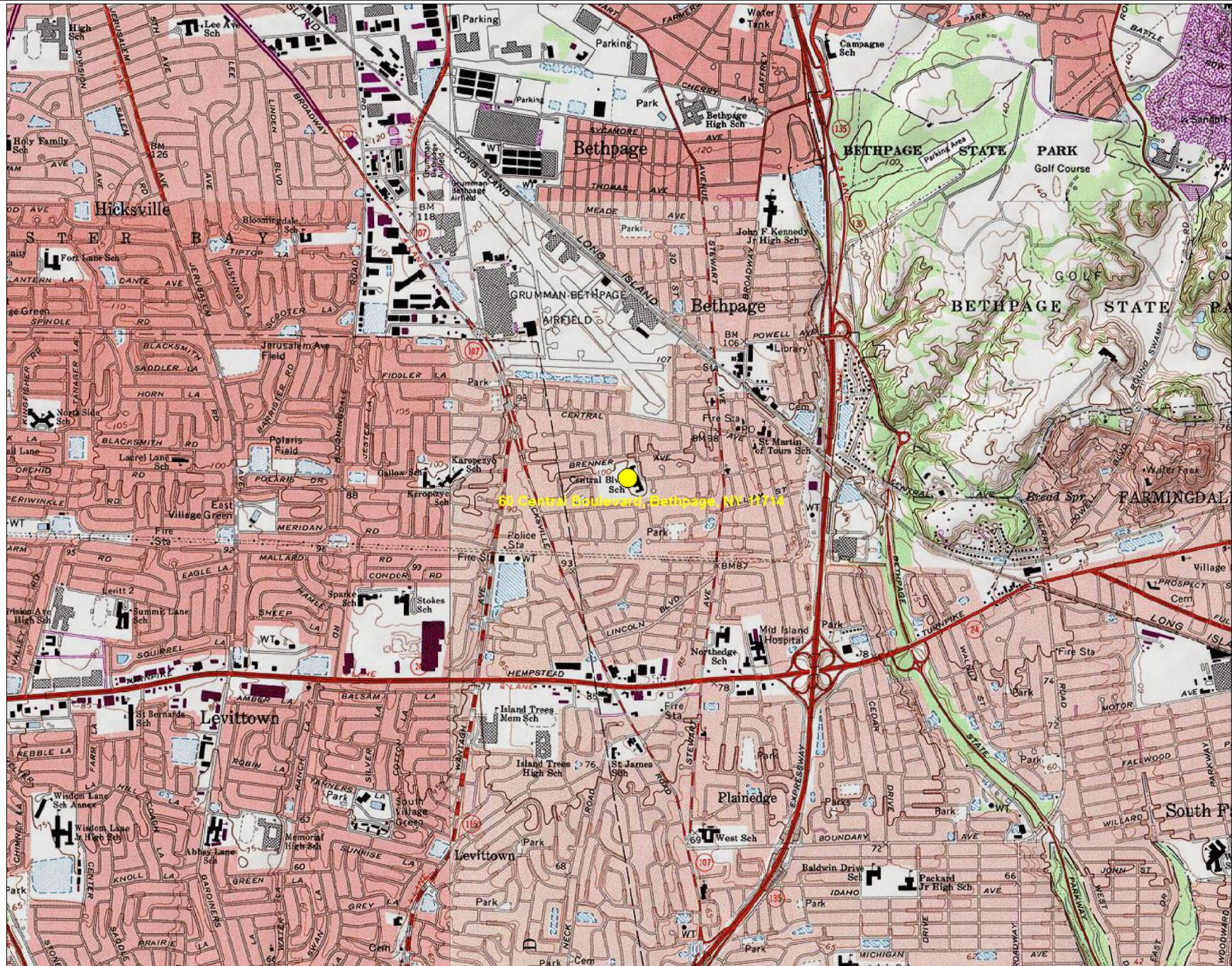
Site Location Map

Scale Project No. Date
As Noted 18-40900 08-23-18

Drawn By Checked By Page No.
J.V.N. S.W.M. 1 of 3

Drawing No.

1

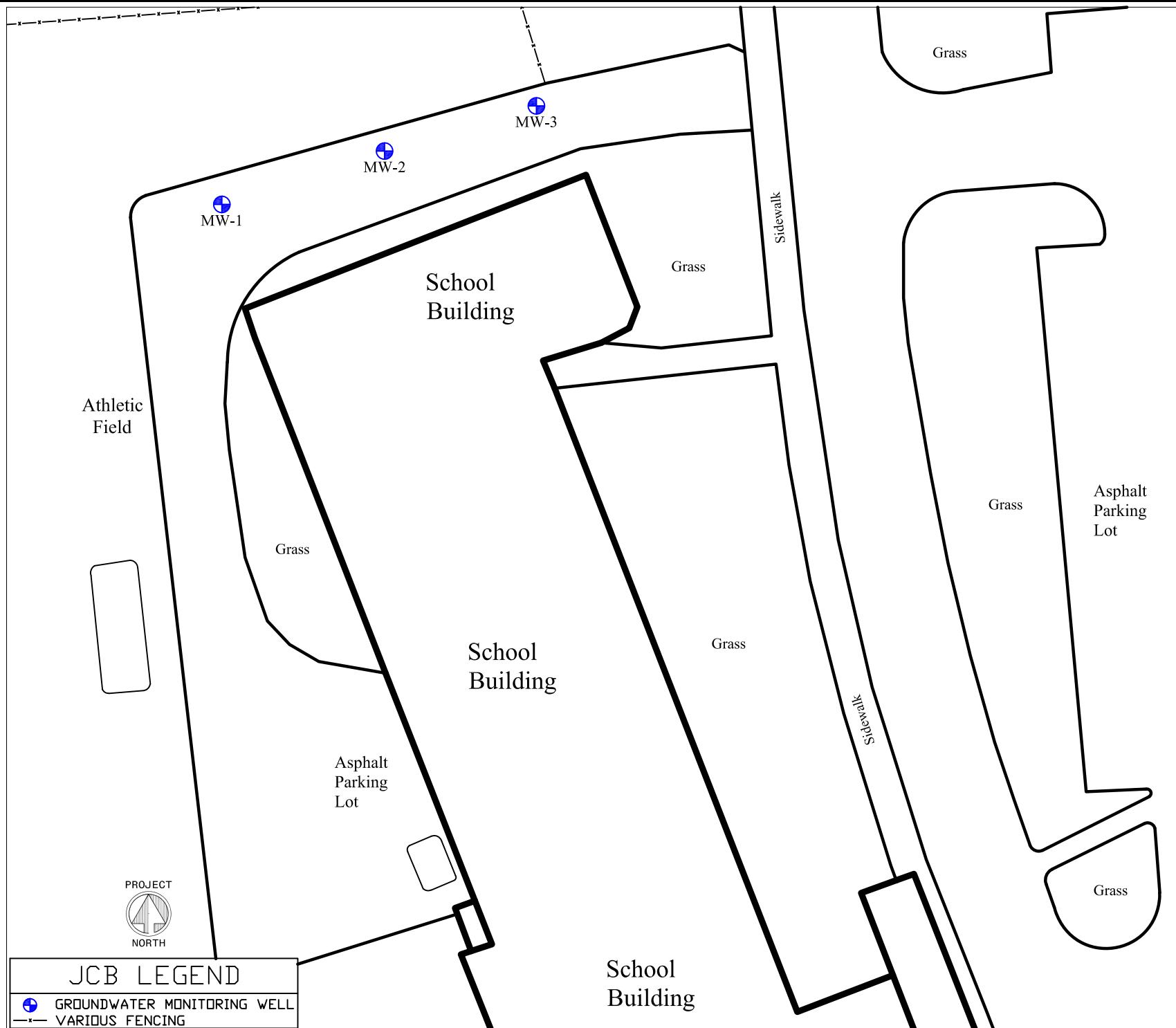


JCB LEGEND

■ SUBJECT SITE

Map created with TOPO!® ©2002 National Geographic (www.nationalgeographic.com/topo)

0 1000 FEET 0 500 1 MILE
0 1000 METERS



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Notes:

Central Boulevard
Elementary School
60 Central Boulevard,
Bethpage, NY 11714

Drawing Title

Figure No. 2

**Monitoring Well
Locations
Map**

Scale As Noted	Project No. 18-40900	Date 08-23-18
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Drawn By J.V.N.	Checked By S.W.M.	Page No. 2 of 3
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Drawing No.

2



J.C. BRODERICK

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Notes:

Central Boulevard
Elementary School
60 Central Boulevard,
Bethpage, NY 11714

Drawing Title

Figure No. 3

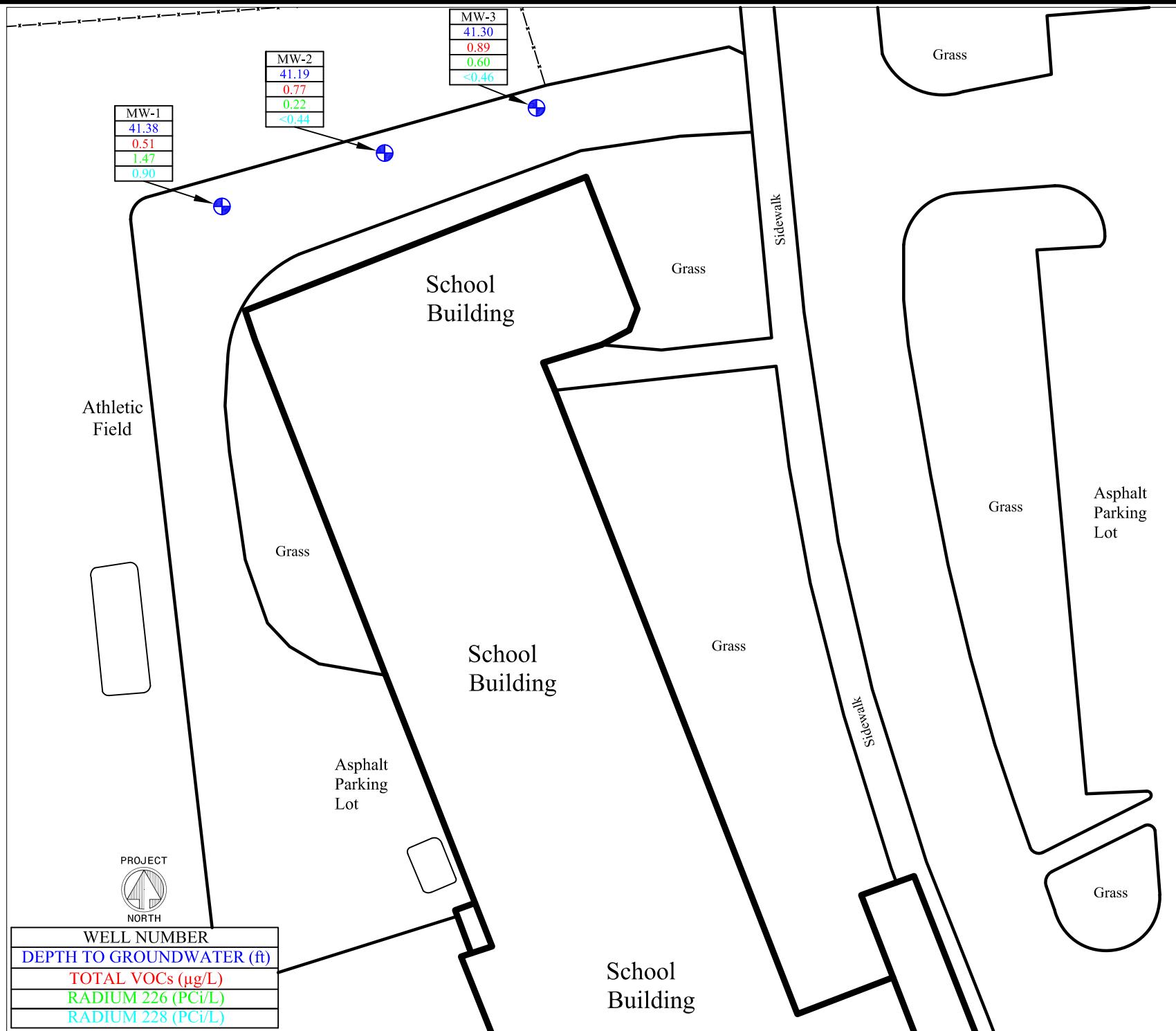
Analytical Results
Map

Scale Project No. Date
As Noted 18-40900 08-23-19

Drawn By Checked By Page No.
J.V.N. S.W.M. 3 of 3

Drawing No.

3



Appendix B

Photo Log

**Groundwater Monitoring Well Location
MW-1**



Field Photograph Log

Groundwater Sampling Report

**Central Boulevard Elementary School
60 Central Boulevard
Bethpage, New York 11714**

Photo No. 01

JCB#: 18-40900

**Groundwater Monitoring Well Location
MW-2**



Field Photograph Log

Groundwater Sampling Report

**Central Boulevard Elementary School
60 Central Boulevard
Bethpage, New York 11714**

Photo No. 02

JCB#: 18-40900

**Groundwater Monitoring Well Location
MW-3**



Field Photograph Log

Groundwater Sampling Report

**Central Boulevard Elementary School
60 Central Boulevard
Bethpage, New York 11714**

Photo No. 03

JCB#: 18-40900

Groundwater Sampling Method



Field Photograph Log

Groundwater Sampling Report

Central Boulevard Elementary School
60 Central Boulevard
Bethpage, New York 11714



Photo No. 04

JCB#: 18-40900

Appendix C

Laboratory Analysis Report



Technical Report

prepared for:

J.C. Broderick
1775 North Express Drive
Hauppauge NY, 11788
Attention: Steven Muller

Report Date: 08/30/2018
Client Project ID: 18-40900
York Project (SDG) No.: 18H1138

CT Cert. No. PH-0723

New Jersey Cert. No. CT005 and NY037



New York Cert. Nos. 10854 and 12058

PA Cert. No. 68-04440

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RICHMOND HILL, NY 11418
ClientServices@yorklab.com

Report Date: 08/30/2018
Client Project ID: 18-40900
York Project (SDG) No.: 18H1138

J.C. Broderick
1775 North Express Drive
Hauppauge NY, 11788
Attention: Steven Muller

Purpose and Results

This report contains the analytical data for the sample(s) identified on the attached chain-of-custody received in our laboratory on August 24, 2018 and listed below. The project was identified as your project: **18-40900**.

The analyses were conducted utilizing appropriate EPA, Standard Methods, and ASTM methods as detailed in the data summary tables.

All samples were received in proper condition meeting the customary acceptance requirements for environmental samples except those indicated under the Sample and Analysis Qualifiers section of this report.

All analyses met the method and laboratory standard operating procedure requirements except as indicated by any data flags, the meaning of which are explained in the Sample and Data Qualifiers Relating to This Work Order section of this report and case narrative if applicable.

The results of the analyses, which are all reported on dry weight basis (soils) unless otherwise noted, are detailed in the following pages.

Please contact Client Services at 203.325.1371 with any questions regarding this report.

<u>York Sample ID</u>	<u>Client Sample ID</u>	<u>Matrix</u>	<u>Date Collected</u>	<u>Date Received</u>
18H1138-01	MW-1	Water	08/23/2018	08/24/2018
18H1138-02	MW-2	Water	08/23/2018	08/24/2018
18H1138-03	MW-3	Water	08/23/2018	08/24/2018

General Notes for York Project (SDG) No.: 18H1138

1. The RLs and MDLs (Reporting Limit and Method Detection Limit respectively) reported are adjusted for any dilution necessary due to the levels of target and/or non-target analytes and matrix interference. The RL(REPORTING LIMIT) is based upon the lowest standard utilized for the calibration where applicable.
2. Samples are retained for a period of thirty days after submittal of report, unless other arrangements are made.
3. York's liability for the above data is limited to the dollar value paid to York for the referenced project.
4. This report shall not be reproduced without the written approval of York Analytical Laboratories, Inc.
5. All analyses conducted met method or Laboratory SOP requirements. See the Sample and Data Qualifiers Section for further information.
6. It is noted that no analyses reported herein were subcontracted to another laboratory, unless noted in the report.
7. This report reflects results that relate only to the samples submitted on the attached chain-of-custody form(s) received by York.
8. Analyses conducted at York Analytical Laboratories, Inc. Stratford, CT are indicated by NY Cert. No. 10854; those conducted at York Analytical Laboratories, Inc., Richmond Hill, NY are indicated by NY Cert. No. 12058.

Approved By:



Date: 08/30/2018

Benjamin Gulizia
Laboratory Director





Sample Information

<u>Client Sample ID:</u> MW-1	<u>York Sample ID:</u> 18H1138-01			
<u>York Project (SDG) No.</u> 18H1138	<u>Client Project ID</u> 18-40900	<u>Matrix</u> Water	<u>Collection Date/Time</u> August 23, 2018 3:00 pm	<u>Date Received</u> 08/24/2018

Volatile Organics, 8260 List - Low Level

Sample Prepared by Method: EPA 5030B

Log-in Notes:

Sample Notes:

CAS No.	Parameter	Result	Flag	Units	Reported to LOD/MDL	LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
142-28-9	1,3-Dichloropropane	ND		ug/L	0.20	0.50	1	EPA 8260C Certifications: NELAC-NY10854,NELAC-NY12058,NJDEP,PAE	08/28/2018 14:00	08/29/2018 07:56	LL
106-46-7	1,4-Dichlorobenzene	ND		ug/L	0.20	0.50	1	EPA 8260C Certifications: CTDOH,NELAC-NY10854,NELAC-NY12058,NJ	08/28/2018 14:00	08/29/2018 07:56	LL
594-20-7	2,2-Dichloropropane	ND		ug/L	0.20	0.50	1	EPA 8260C Certifications: NELAC-NY10854,NELAC-NY12058,NJDEP,PAE	08/28/2018 14:00	08/29/2018 07:56	LL
78-93-3	2-Butanone	ND		ug/L	0.20	0.50	1	EPA 8260C Certifications: CTDOH,NELAC-NY10854,NELAC-NY12058,NJ	08/28/2018 14:00	08/29/2018 07:56	LL
95-49-8	2-Chlorotoluene	ND		ug/L	0.20	0.50	1	EPA 8260C Certifications: CTDOH,NELAC-NY10854,NELAC-NY12058,NJ	08/28/2018 14:00	08/29/2018 07:56	LL
591-78-6	2-Hexanone	ND		ug/L	0.20	0.50	1	EPA 8260C Certifications: CTDOH,NELAC-NY10854,NELAC-NY12058,NJ	08/28/2018 14:00	08/29/2018 07:56	LL
106-43-4	4-Chlorotoluene	ND		ug/L	0.20	0.50	1	EPA 8260C Certifications: CTDOH,NELAC-NY10854,NELAC-NY12058,NJ	08/28/2018 14:00	08/29/2018 07:56	LL
108-10-1	4-Methyl-2-pentanone	ND		ug/L	0.20	0.50	1	EPA 8260C Certifications: CTDOH,NELAC-NY10854,NELAC-NY12058,NJ	08/28/2018 14:00	08/29/2018 07:56	LL
67-64-1	Acetone	ND		ug/L	1.0	2.0	1	EPA 8260C Certifications: CTDOH,NELAC-NY10854,NELAC-NY12058,NJ	08/28/2018 14:00	08/29/2018 07:56	LL
71-43-2	Benzene	ND		ug/L	0.20	0.50	1	EPA 8260C Certifications: CTDOH,NELAC-NY10854,NELAC-NY12058,NJ	08/28/2018 14:00	08/29/2018 07:56	LL
108-86-1	Bromobenzene	ND		ug/L	0.20	0.50	1	EPA 8260C Certifications: NELAC-NY10854,NELAC-NY12058,NJDEP,PAE	08/28/2018 14:00	08/29/2018 07:56	LL
74-97-5	Bromochloromethane	ND		ug/L	0.20	0.50	1	EPA 8260C Certifications: NELAC-NY10854,NELAC-NY12058,NJDEP,PAE	08/28/2018 14:00	08/29/2018 07:56	LL
75-27-4	Bromodichloromethane	ND		ug/L	0.20	0.50	1	EPA 8260C Certifications: CTDOH,NELAC-NY10854,NELAC-NY12058,NJ	08/28/2018 14:00	08/29/2018 07:56	LL
75-25-2	Bromoform	ND		ug/L	0.20	0.50	1	EPA 8260C Certifications: CTDOH,NELAC-NY10854,NELAC-NY12058,NJ	08/28/2018 14:00	08/29/2018 07:56	LL
74-83-9	Bromomethane	ND		ug/L	0.20	0.50	1	EPA 8260C Certifications: CTDOH,NELAC-NY10854,NELAC-NY12058,NJ	08/28/2018 14:00	08/29/2018 07:56	LL
75-15-0	Carbon disulfide	ND		ug/L	0.20	0.50	1	EPA 8260C Certifications: CTDOH,NELAC-NY10854,NELAC-NY12058,NJ	08/28/2018 14:00	08/29/2018 07:56	LL
56-23-5	Carbon tetrachloride	ND		ug/L	0.20	0.50	1	EPA 8260C Certifications: CTDOH,NELAC-NY10854,NELAC-NY12058,NJ	08/28/2018 14:00	08/29/2018 07:56	LL
108-90-7	Chlorobenzene	ND		ug/L	0.20	0.50	1	EPA 8260C Certifications: CTDOH,NELAC-NY10854,NELAC-NY12058,NJ	08/28/2018 14:00	08/29/2018 07:56	LL
75-00-3	Chloroethane	ND		ug/L	0.20	0.50	1	EPA 8260C Certifications: CTDOH,NELAC-NY10854,NELAC-NY12058,NJ	08/28/2018 14:00	08/29/2018 07:56	LL
67-66-3	Chloroform	ND		ug/L	0.20	0.50	1	EPA 8260C Certifications: CTDOH,NELAC-NY10854,NELAC-NY12058,NJ	08/28/2018 14:00	08/29/2018 07:56	LL
74-87-3	Chloromethane	ND		ug/L	0.20	0.50	1	EPA 8260C Certifications: CTDOH,NELAC-NY10854,NELAC-NY12058,NJ	08/28/2018 14:00	08/29/2018 07:56	LL



Sample Information

Client Sample ID: MW-1

York Sample ID:

18H1138-01

York Project (SDG) No.

18H1138

Client Project ID

18-40900

Matrix

Water

Collection Date/Time

August 23, 2018 3:00 pm

Date Received

08/24/2018

Volatile Organics, 8260 List - Low Level

Sample Prepared by Method: EPA 5030B

Log-in Notes:

Sample Notes:

CAS No.	Parameter	Result	Flag	Units	Reported to LOD/MDL	LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
156-59-2	cis-1,2-Dichloroethylene	ND		ug/L	0.20	0.50	1	EPA 8260C Certifications: CTDOH,NELAC-NY10854,NELAC-NY12058,NJ	08/28/2018 14:00	08/29/2018 07:56	LL
10061-01-5	cis-1,3-Dichloropropylene	ND		ug/L	0.20	0.50	1	EPA 8260C Certifications: CTDOH,NELAC-NY10854,NELAC-NY12058,NJ	08/28/2018 14:00	08/29/2018 07:56	LL
124-48-1	Dibromochloromethane	ND		ug/L	0.20	0.50	1	EPA 8260C Certifications: CTDOH,NELAC-NY10854,NELAC-NY12058,NJ	08/28/2018 14:00	08/29/2018 07:56	LL
74-95-3	Dibromomethane	ND		ug/L	0.20	0.50	1	EPA 8260C Certifications: NELAC-NY10854,NELAC-NY12058,NJDEP,PAE	08/28/2018 14:00	08/29/2018 07:56	LL
75-71-8	Dichlorodifluoromethane	ND		ug/L	0.20	0.50	1	EPA 8260C Certifications: NELAC-NY10854,NELAC-NY12058,NJDEP,PAE	08/28/2018 14:00	08/29/2018 07:56	LL
100-41-4	Ethyl Benzene	ND		ug/L	0.20	0.50	1	EPA 8260C Certifications: CTDOH,NELAC-NY10854,NELAC-NY12058,NJ	08/28/2018 14:00	08/29/2018 07:56	LL
87-68-3	Hexachlorobutadiene	ND		ug/L	0.20	0.50	1	EPA 8260C Certifications: NELAC-NY10854,NELAC-NY12058,NJDEP,PAE	08/28/2018 14:00	08/29/2018 07:56	LL
98-82-8	Isopropylbenzene	ND		ug/L	0.20	0.50	1	EPA 8260C Certifications: CTDOH,NELAC-NY10854,NELAC-NY12058,NJ	08/28/2018 14:00	08/29/2018 07:56	LL
1634-04-4	Methyl tert-butyl ether (MTBE)	ND		ug/L	0.20	0.50	1	EPA 8260C Certifications: CTDOH,NELAC-NY10854,NELAC-NY12058,NJ	08/28/2018 14:00	08/29/2018 07:56	LL
75-09-2	Methylene chloride	ND		ug/L	1.0	2.0	1	EPA 8260C Certifications: CTDOH,NELAC-NY10854,NELAC-NY12058,NJ	08/28/2018 14:00	08/29/2018 07:56	LL
91-20-3	Naphthalene	ND		ug/L	1.0	2.0	1	EPA 8260C Certifications: NELAC-NY10854,NELAC-NY12058,NJDEP,PAE	08/28/2018 14:00	08/29/2018 07:56	LL
104-51-8	n-Butylbenzene	ND		ug/L	0.20	0.50	1	EPA 8260C Certifications: CTDOH,NELAC-NY10854,NELAC-NY12058,NJ	08/28/2018 14:00	08/29/2018 07:56	LL
103-65-1	n-Propylbenzene	ND		ug/L	0.20	0.50	1	EPA 8260C Certifications: CTDOH,NELAC-NY10854,NELAC-NY12058,NJ	08/28/2018 14:00	08/29/2018 07:56	LL
95-47-6	o-Xylene	ND		ug/L	0.20	0.50	1	EPA 8260C Certifications: CTDOH,NELAC-NY10854,NELAC-NY12058,PA	08/28/2018 14:00	08/29/2018 07:56	LL
179601-23-1	p- & m- Xylenes	ND		ug/L	0.50	1.0	1	EPA 8260C Certifications: CTDOH,NELAC-NY10854,NELAC-NY12058,PA	08/28/2018 14:00	08/29/2018 07:56	LL
105-05-5	* p-Diethylbenzene	ND		ug/L	0.20	0.50	1	EPA 8260C Certifications:	08/28/2018 14:00	08/29/2018 07:56	LL
622-96-8	* p-Ethyltoluene	ND		ug/L	0.20	0.50	1	EPA 8260C Certifications:	08/28/2018 14:00	08/29/2018 07:56	LL
99-87-6	p-Isopropyltoluene	ND		ug/L	0.20	0.50	1	EPA 8260C Certifications: CTDOH,NELAC-NY10854,NELAC-NY12058,NJ	08/28/2018 14:00	08/29/2018 07:56	LL
135-98-8	sec-Butylbenzene	ND		ug/L	0.20	0.50	1	EPA 8260C Certifications: CTDOH,NELAC-NY10854,NELAC-NY12058,NJ	08/28/2018 14:00	08/29/2018 07:56	LL
100-42-5	Styrene	ND		ug/L	0.20	0.50	1	EPA 8260C Certifications: CTDOH,NELAC-NY10854,NELAC-NY12058,NJ	08/28/2018 14:00	08/29/2018 07:56	LL
98-06-6	tert-Butylbenzene	ND		ug/L	0.20	0.50	1	EPA 8260C Certifications: CTDOH,NELAC-NY10854,NELAC-NY12058,NJ	08/28/2018 14:00	08/29/2018 07:56	LL



Sample Information

Client Sample ID:	MW-2	York Sample ID:	18H1138-02
York Project (SDG) No.	18H1138	Client Project ID	18-40900

Volatile Organics, 8260 List - Low Level

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA 5030B

CAS No.	Parameter	Result	Flag	Units	Reported to LOD/MDL	LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
75-01-4	Vinyl Chloride	ND		ug/L	0.20	0.50	1	EPA 8260C	08/28/2018 14:00	08/29/2018 08:24	LL
1330-20-7	Xylenes, Total	ND		ug/L	0.60	1.5	1	EPA 8260C	08/28/2018 14:00	08/29/2018 08:24	LL
Certifications: CTDOH,NELAC-NY10854,NELAC-NY12058,NJ											
Surrogate Recoveries	Result	Acceptance Range									
17060-07-0	<i>Surrogate: 1,2-Dichloroethane-d4</i>	103 %			69-130						
2037-26-5	<i>Surrogate: Toluene-d8</i>	93.8 %			81-117						
460-00-4	<i>Surrogate: p-Bromofluorobenzene</i>	107 %			79-122						

Sample Information

Client Sample ID:	MW-3	York Sample ID:	18H1138-03
York Project (SDG) No.	18H1138	Client Project ID	18-40900

Volatile Organics, 8260 List - Low Level

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA 5030B

CAS No.	Parameter	Result	Flag	Units	Reported to LOD/MDL	LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
630-20-6	1,1,1,2-Tetrachloroethane	ND		ug/L	0.20	0.50	1	EPA 8260C	08/28/2018 14:00	08/29/2018 08:51	LL
71-55-6	1,1,1-Trichloroethane	ND		ug/L	0.20	0.50	1	EPA 8260C	08/28/2018 14:00	08/29/2018 08:51	LL
79-34-5	1,1,2,2-Tetrachloroethane	ND		ug/L	0.20	0.50	1	EPA 8260C	08/28/2018 14:00	08/29/2018 08:51	LL
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND		ug/L	0.20	0.50	1	EPA 8260C	08/28/2018 14:00	08/29/2018 08:51	LL
79-00-5	1,1,2-Trichloroethane	ND		ug/L	0.20	0.50	1	EPA 8260C	08/28/2018 14:00	08/29/2018 08:51	LL
75-34-3	1,1-Dichloroethane	ND		ug/L	0.20	0.50	1	EPA 8260C	08/28/2018 14:00	08/29/2018 08:51	LL
75-35-4	1,1-Dichloroethylene	ND		ug/L	0.20	0.50	1	EPA 8260C	08/28/2018 14:00	08/29/2018 08:51	LL
563-58-6	1,1-Dichloropropylene	ND		ug/L	0.20	0.50	1	EPA 8260C	08/28/2018 14:00	08/29/2018 08:51	LL
87-61-6	1,2,3-Trichlorobenzene	ND		ug/L	0.20	0.50	1	EPA 8260C	08/28/2018 14:00	08/29/2018 08:51	LL
96-18-4	1,2,3-Trichloropropane	ND		ug/L	0.20	0.50	1	EPA 8260C	08/28/2018 14:00	08/29/2018 08:51	LL
95-93-2	* 1,2,4,5-Tetramethylbenzene	ND		ug/L	0.20	0.50	1	EPA 8260C	08/28/2018 14:00	08/29/2018 08:51	LL



Volatile Analysis Sample Containers

Lab ID	Client Sample ID	Volatile Sample Container
18H1138-01	MW-1	40mL Clear Vial (pre-pres.) HCl; Cool to 4° C
18H1138-02	MW-2	40mL Clear Vial (pre-pres.) HCl; Cool to 4° C
18H1138-03	MW-3	40mL Clear Vial (pre-pres.) HCl; Cool to 4° C



Sample and Data Qualifiers Relating to This Work Order

- QL-02 This LCS analyte is outside Laboratory Recovery limits due the analyte behavior using the referenced method. The reference method has certain limitations with respect to analytes of this nature.
- J Detected below the Reporting Limit but greater than or equal to the Method Detection Limit (MDL/LOD) or in the case of a TIC, the result is an estimated concentration.
- CCV-E The value reported is ESTIMATED. The value is estimated due to its behavior during continuing calibration verification (>20% Difference for average Rf or >20% Drift for quadratic fit).

Definitions and Other Explanations

*	Analyte is not certified or the state of the samples origination does not offer certification for the Analyte.
ND	NOT DETECTED - the analyte is not detected at the Reported to level (LOQ/RL or LOD/MDL)
RL	REPORTING LIMIT - the minimum reportable value based upon the lowest point in the analyte calibration curve.
LOQ	LIMIT OF QUANTITATION - the minimum concentration of a target analyte that can be reported within a specified degree of confidence . This is the lowest point in an analyte calibration curve that has been subjected to all steps of the processing/analysis and verified to meet defined criteria. This is based upon NELAC 2009 Standards and applies to all analyses.
LOD	LIMIT OF DETECTION - a verified estimate of the minimum concentration of a substance in a given matrix that an analytical process can reliably detect. This is based upon NELAC 2009 Standards and applies to all analyses conducted under the auspices of EPA SW-846.
MDL	METHOD DETECTION LIMIT - a statistically derived estimate of the minimum amount of a substance an analytical system can reliably detect with a 99% confidence that the concentration of the substance is greater than zero. This is based upon 40 CFR Part 136 Appendix B and applies only to EPA 600 and 200 series methods.
Reported to	This indicates that the data for a particular analysis is reported to either the LOD/MDL, or the LOQ/RL. In cases where the "Reported to" is located above the LOD/MDL, any value between this and the LOQ represents an estimated value which is "J" flagged accordingly. This applies to volatile and semi-volatile target compounds only.
NR	Not reported
RPD	Relative Percent Difference
Wet	The data has been reported on an as-received (wet weight) basis
Low Bias	Low Bias flag indicates that the recovery of the flagged analyte is below the laboratory or regulatory lower control limit. The data user should take note that this analyte may be biased low but should evaluate multiple lines of evidence including the LCS and site-specific MS/MSD data to draw bias conclusions. In cases where no site-specific MS/MSD was requested, only the LCS data can be used to evaluate such bias.
High Bias	High Bias flag indicates that the recovery of the flagged analyte is above the laboratory or regulatory upper control limit. The data user should take note that this analyte may be biased high but should evaluate multiple lines of evidence including the LCS and site-specific MS/MSD data to draw bias conclusions. In cases where no site-specific MS/MSD was requested, only the LCS data can be used to evaluate such bias.
Non-Dir.	Non-dir. flag (Non-Directional Bias) indicates that the Relative Percent Difference (RPD) (a measure of precision) among the MS and MSD data is outside the laboratory or regulatory control limit. This alerts the data user where the MS and MSD are from site-specific samples that the RPD is high due to either non-homogeneous distribution of target analyte between the MS/MSD or indicates poor reproducibility for other reasons.

If EPA SW-846 method 8270 is included herein it is noted that the target compound N-nitrosodiphenylamine (NDPA) decomposes in the gas chromatographic inlet and cannot be separated from diphenylamine (DPA). These results could actually represent 100% DPA, 100% NDPA or some combination of the two. For this reason, York reports the combined result for n-nitrosodiphenylamine and diphenylamine for either of these compounds as a combined concentration as Diphenylamine.

If Total PCBs are detected and the target aroclors reported are "Not detected", the Total PCB value is reported due to the presence of either or both Aroclors 1262 and 1268 which are non-target aroclors for some regulatory lists.

2-chloroethylvinyl ether readily breaks down under acidic conditions. Samples that are acid preserved, including standards will exhibit breakdown. The data user should take note.

Certification for pH is no longer offered by NYDOH ELAP.



Semi-Volatile and Volatile analyses are reported down to the LOD/MDL, with values between the LOD/MDL and the LOQ being "J" flagged as estimated results.

For analyses by EPA SW-846-8270D, the Limit of Quantitation (LOQ) reported for benzidine is based upon the lowest standard used for calibration and is not a verified LOQ due to this compound's propensity for oxidative losses during extraction/concentration procedures and non-reproducible chromatographic performance.

**EMSL Analytical, Inc.**

200 Route 130 North, Cinnaminson, NJ 08077

Phone/Fax: (800)220-3675 / (856)786-0327

<http://www.emsl.com> cinnaminsonradonlab@emsl.com

EMSL Order #: 781804942

Customer ID: JCBR50

Customer PO:

Attn: **Steven Muller**
J.C. Broderick & Associates
1775 Expressway Drive North, Suite 1
Hauppauge, NY 11788

Phone: 631-584-5492

Fax: Not Available

Project: **Central Blvd ES**

Collected: 9/26/2018

Received: 10/1/2018

NELAC Certification #: 03036

Analytical Report**Sample Identification: MW-1****Lab Sample #: 781804942-0001****Date/Time Collected: 9/26/2018 02:15 PM**

Test Parameter	Result pCi/L	Uncertainty pCi/L	SDWA DL pCi/L	Start Count Date/ Time	Analyst	Status Count	Method
Radium 226	1.47	0.15	0.15	11/6/18 11:00 AM	JW	First Count	EPA 903.0
Radium 228	0.90	0.20	0.41	10/11/18 1:25 PM	JW	First Count	EPA 904.0

* All analysis met quality control acceptance criteria unless otherwise specified.

Report Date

11/8/2018

Report Revision

R0

Revision Comments

Initial Report

Joulian Wilmer, Analyst

Dominic Gehret, Radiological Laboratory Manager

In no event shall EMSL be liable for indirect, special, consequential, or incidental damages, including, but not limited to, damages for loss of profit or goodwill regardless of the negligence (either sole or concurrent) of EMSL and whether EMSL has been informed of the possibility of such damages, arising out of or in connection with EMSL's services thereunder or the delivery, use, reliance upon or interpretation of test results by client or any third party. We accept no legal responsibility for the purposes for which the client uses the test results. In no event shall EMSL be liable to a client or any third party, whether based upon theories of tort, contract or any other legal or equitable theory, in excess of the amount paid to EMSL by client thereunder. The test results meets all NELAC requirements unless otherwise specified.

**EMSL Analytical, Inc.**

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EMSL Order #: 781804943

Customer ID: JCBR50

Customer PO:

Attn: **Steven Muller**
J.C. Broderick & Associates
1775 Expressway Drive North, Suite 1
Hauppauge, NY 11788

Phone: 631-584-5492
Fax: Not Available

Project: **Central Blvd. ES**

Collected: 9/26/2018
Received: 10/1/2018

NELAC Certification #: 03036

Analytical Report**Sample Identification: MW-2****Lab Sample #: 781804943-0001****Date/Time Collected: 9/26/2018 01:15 PM**

Test Parameter	Result pCi/L	Uncertainty pCi/L	SDWA DL pCi/L	Start Count Date/ Time	Analyst	Status Count	Method
Radium 226	0.22	0.06	0.15	11/6/18 11:00 AM	JW	First Count	EPA 903.0
Radium 228	<0.44	0.17	0.44	10/11/18 1:25 PM	JW	First Count	EPA 904.0

* All analysis met quality control acceptance criteria unless otherwise specified.

Report Date

11/8/2018

Report Revision

R0

Revision Comments

Initial Report

Joulian Wilmer, Analyst

Dominic Gehret, Radiological Laboratory Manager

In no event shall EMSL be liable for indirect, special, consequential, or incidental damages, including, but not limited to, damages for loss of profit or goodwill regardless of the negligence (either sole or concurrent) of EMSL and whether EMSL has been informed of the possibility of such damages, arising out of or in connection with EMSL's services thereunder or the delivery, use, reliance upon or interpretation of test results by client or any third party. We accept no legal responsibility for the purposes for which the client uses the test results. In no event shall EMSL be liable to a client or any third party, whether based upon theories of tort, contract or any other legal or equitable theory, in excess of the amount paid to EMSL by client thereunder. The test results meets all NELAC requirements unless otherwise specified.

**EMSL Analytical, Inc.**

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EMSL Order #: 781804944

Customer ID: JCBR50

Customer PO:

Attn: **Steven Muller**
J.C. Broderick & Associates
1775 Expressway Drive North, Suite 1
Hauppauge, NY 11788

Phone: 631-584-5492
Fax: Not Available

Project: **Central Blvd. ES**

Collected: 9/26/2018
Received: 10/1/2018

NELAC Certification #: 03036

Analytical Report**Sample Identification: MW-3****Lab Sample #: 781804944-0001****Date/Time Collected: 9/26/2018 12:25 PM**

Test Parameter	Result pCi/L	Uncertainty pCi/L	SDWA DL pCi/L	Start Count Date/ Time	Analyst	Status Count	Method
Radium 226	0.60	0.10	0.17	11/6/18 11:00 AM	JW	First Count	EPA 903.0
Radium 228	<0.46	0.18	0.46	10/11/18 1:25 PM	JW	First Count	EPA 904.0

* All analysis met quality control acceptance criteria unless otherwise specified.

Report Date

11/8/2018

Report Revision

R0

Revision Comments

Initial Report

Joulian Wilmer, Analyst

Dominic Gehret, Radiological Laboratory Manager

In no event shall EMSL be liable for indirect, special, consequential, or incidental damages, including, but not limited to, damages for loss of profit or goodwill regardless of the negligence (either sole or concurrent) of EMSL and whether EMSL has been informed of the possibility of such damages, arising out of or in connection with EMSL's services thereunder or the delivery, use, reliance upon or interpretation of test results by client or any third party. We accept no legal responsibility for the purposes for which the client uses the test results. In no event shall EMSL be liable to a client or any third party, whether based upon theories of tort, contract or any other legal or equitable theory, in excess of the amount paid to EMSL by client thereunder. The test results meets all NELAC requirements unless otherwise specified.



EMSL ANALYTICAL, INC.
LABORATORY • PRODUCTS • TRAINING

Radiochemical Analysis Chain of Custody

EMSL Order Number (Lab Use Only):

781804 -

Contact Name:	Steven Muller		Bill To Company:	Same		Sampled By (Sign):	
Company Name:	J.C. Broderick & Associates, Inc.		Attention To:			Sampled By (Name): Steven Muller	
Address: 1775 Expressway Drive, N			Address:			Total # of Samples: 3	
City: Hauppauge	State: New York	Zip Code: 11788	City:	State:	Zip Code:	Date of Shipping: 9/28/19	
Telephone #: 631-584-5495	Fax : 631-584-3395		Telephone #:		Fax :	Sample State/ Zip Code: NY 11788	
Email: smuller@jcbroderick.com			Project Name:			Purchase Order:	

Turn Around

Time: 4 weeks (Standard) Client Specific: 48 Hours 96 Hours 1 week 2 weeks 3 Weeks

Field Use - All Information Required!					Analytes												
Client Sample ID	Lab ID (For Lab Use only)	Matrix	Size (mL, g)	Date/Time	Gross Alpha		Gross Beta	Ra-228	Ra-226	Total Uranium	Gamma Emitters	Actinides (U, Th, Pu, Am)	Sr-89, Sr-90	I-131	Radon	Tritium 66Tc	Note
					NJ 48 Hrs	EPA 900											
MW-1	- 942	GW	1,000 ml	9/26/18 1415			X	X								OC50 (24)	
MW-2	- 943	GW	1,000 ml	9/26/18 1315			X	X								66Tc +	
MW-3	- 944	GW	1,000 ml	9/26/18 1225			X	X								OC50 (24)	RECEIVED 10 OCT - 1 PM 7:32 EMSL HANSON, NJ

Report Requirement*: Level One Level Two Level Three

Relinquished by:	Date/ Time	Received by:	Date/ Time	Note
Steven Muller	9/28/18	<i>Guilford</i> <i>Guilford counter</i>	10/1/18 12:30pm 10/1/18 TEP	Central Blvd. ES

*Level One =Results only; Level Two = Results and QC; Level Three = Results, QC, Logs, Worksheets, Printout/Spectrum and Calibrations

MW-1/16.6C 17.8C

MW-2/15.6C 15.0C

MW-3/16.2C 17.2 C

MW4/18.4C 17.4C

MW5/20.2C 19.8C

MW6/20.6C 20.1C

RECEIVED
EMSL
CINNABINSON, N.J.

2018 OCT -1 PM 7:32