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 #: 22-52711
OCTOBER 2022

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

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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 30, 2022, JCB checked the groundwater monitoring wells for the presence of light non-aqueous phase liquid (LNAPL) utilizing a Solinst® Model 122 Product/Water Interface Probe 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	39.65
MW-2	No Product	39.40
MW-3	No Product	39.52

Section No. 3.2: Groundwater Sampling

On August 30, 2022, JCB collected three (3) groundwater samples from the existing groundwater monitoring wells (MW-1, MW-2, and MW-3). 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. 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)**		
	39.65	49.30	9.65		
Time	**Temp (°C)**	**TDS (g/l)**	**DO (%)**	**pH**	**ORP (mV)**
10:40	17.28	0.133	13.20	8.07	16.9
10:45	17.28	0.138	12.35	8.14	26.6
10:50	17.48	0.141	12.00	8.14	49.1
10:55	17.97	0.141	11.76	8.08	58.0
Samples Collected					
MW-2	**DTW (ft)**	**TD (ft)**	**Water Column (ft)**		
	39.40	49.28	9.88		
Time	**Temp (°C)**	**TDS (g/l)**	**DO (%)**	**pH**	**ORP (mV)**
11:15	17.11	0.148	17.21	7.79	44.6
11:20	17.09	0.15	12.50	7.81	54.1
11:25	17.11	0.149	12.08	7.75	61.1
11:30	17.25	0.151	11.75	7.66	62.3
Samples Collected					
MW-3	**DTW (ft)**	**TD (ft)**	**Water Column (ft)**		
	39.52	49.31	9.79		
Time	**Temp (°C)**	**TDS (g/l)**	**DO (%)**	**pH**	**ORP (mV)**
12:05	17.15	0.158	16.51	7.72	42.1
12:10	17.18	0.159	13.56	7.75	54.2
12:15	17.21	0.155	12.64	7.71	55.3
12:20	17.22	0.154	12.30	7.73	59.9
Samples Collected					

Notes:
DTW = Depth to Groundwater Table
TD = Total Depth of Well
Temp = Temperature in degrees Celsius
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	8-30-2022	Monitoring Well No. 1	EPA 8260 + Freon™ EPA 903.0 & EPA 904.0
MW-2	8-30-2022	Monitoring Well No. 2	EPA 8260 + Freon™ EPA 903.0 & EPA 904.0
MW-3	8-30-2022	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^{TM} 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 EPA Method 903.0, and for Radium 228 utilizing EPA Method 904.0. 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 detected VOC analytical results in groundwater:

Table No. 4:
Summary of Groundwater VOCs Samples Detected Analytical Results

Sample ID York ID Sampling Date Client Matrix	NYSDEC TOGS Standards and Guidance Values - GA	MW-1 22H1761-01 8/30/2022 Water		MW-2 22H1761-02 8/30/2022 Water		MW-3 22H1761-03 8/30/2022 Water	
Compound		Result	Q	Result	Q	Result	Q
Volatile Organics, 8260 - Comprehensive	ug/L	ug/L		ug/L		ug/L	
Dilution Factor		1		1		1	
Acetone	50	1.90	J	2.10		2.10	
tert-Butyl alcohol (TBA)	~	1.10		0.790	J	5.60	
Toluene	5	0.690		0.450	J	0.450	J
Trichloroethylene	5	0.210	J	0.200	J	0.200	U

NOTES:
Any Regulatory Exceedences are color coded by Regulation

Q is the Qualifier Column with definitions as follows:
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
~=this indicates that no regulatory limit has been established for this analyte

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 several VOCs; 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 Radium Samples Analytical Results

Client Sample ID	Allowable Standards	MW-1	MW-2	MW-3
Compound	**pCi/L**	**8/30/2022**	**8/30/2022**	**8/30/2022**
Radium 226	3.0	1.26	1.00	2.39
Radium 228	5.0	<0.98	<0.77	2.39

Notes:
pCi/L = picocuries per liter

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

The laboratory analysis results from the groundwater samples submitted from MW-3 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-1 and MW-2 did indicate detectable concentrations of Radium 226; however, the levels reported were below the above referenced guidance values for groundwater. The laboratory analysis results from the groundwater samples submitted from MW-1 and MW-2 did not indicate any detectable concentrations of Radium 228.

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 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

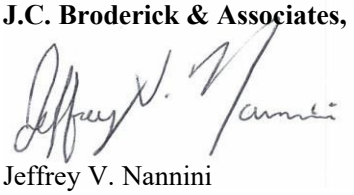
Based on the findings of the current data collected during the subsurface investigation performed and reported to JCB, the following observations are made:

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

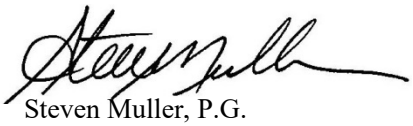
The laboratory analysis results from the groundwater samples submitted did not indicate any elevated concentrations of Radium 226 and Radium 228 above the NYSDEC TOGS 1.1.1 guidance values for groundwater.

Based upon the detected concentrations of VOCs and Radium in the collected groundwater samples it is recommended that periodic groundwater and volatile vapor intrusion (VVI) sampling be continued to monitor site conditions. Radon sampling within the school building is currently scheduled for March 2023.

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

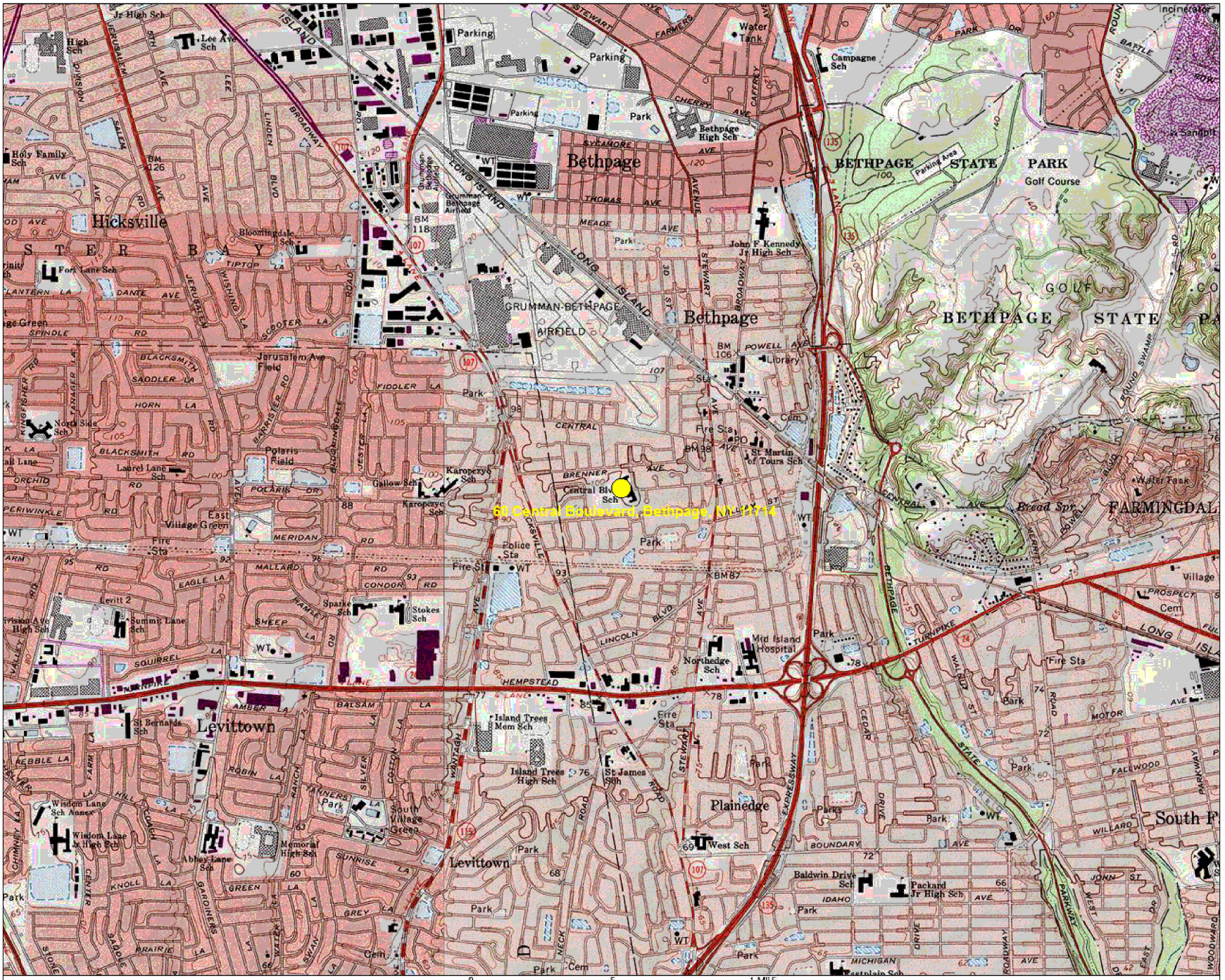


Jeffrey V. Nannini
Environmental Scientist



Steven Muller, P.G.
Director – Subsurface Division

Appendix A
Figures



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Drawing Title

Figure No. 1

Site Location Map

Scale	Project No.	Date
As Noted	22-52711	08-30-2022

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

Drawing No.

1

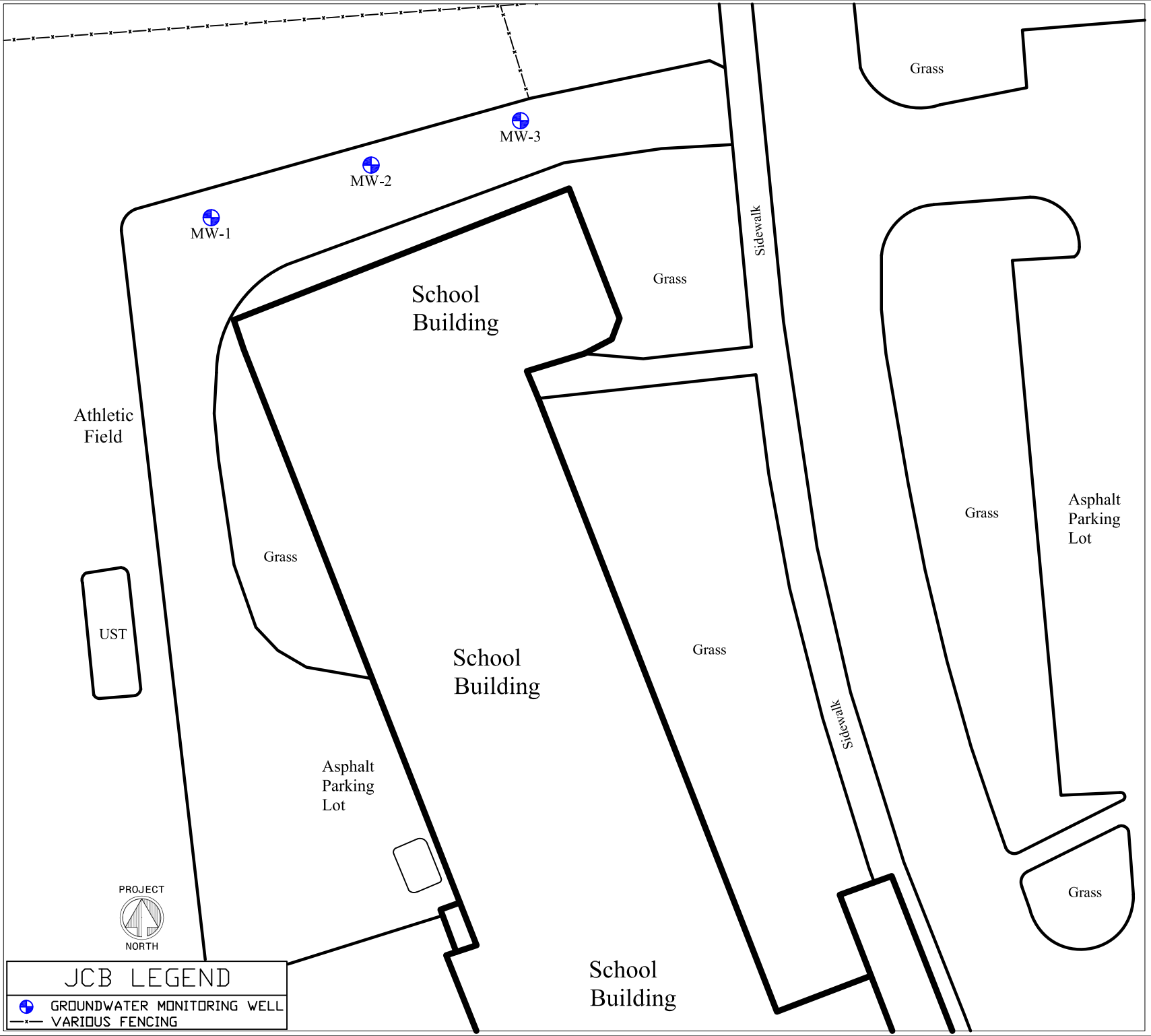

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Figure No. 2

Monitoring Well Locations Map

Scale	Project No.	Date
As Noted	22-52711	08-30-2022

Drawn By	Checked By	Page No.
J.V.N.	S.W.M.	2 of 3

Drawing No.

2

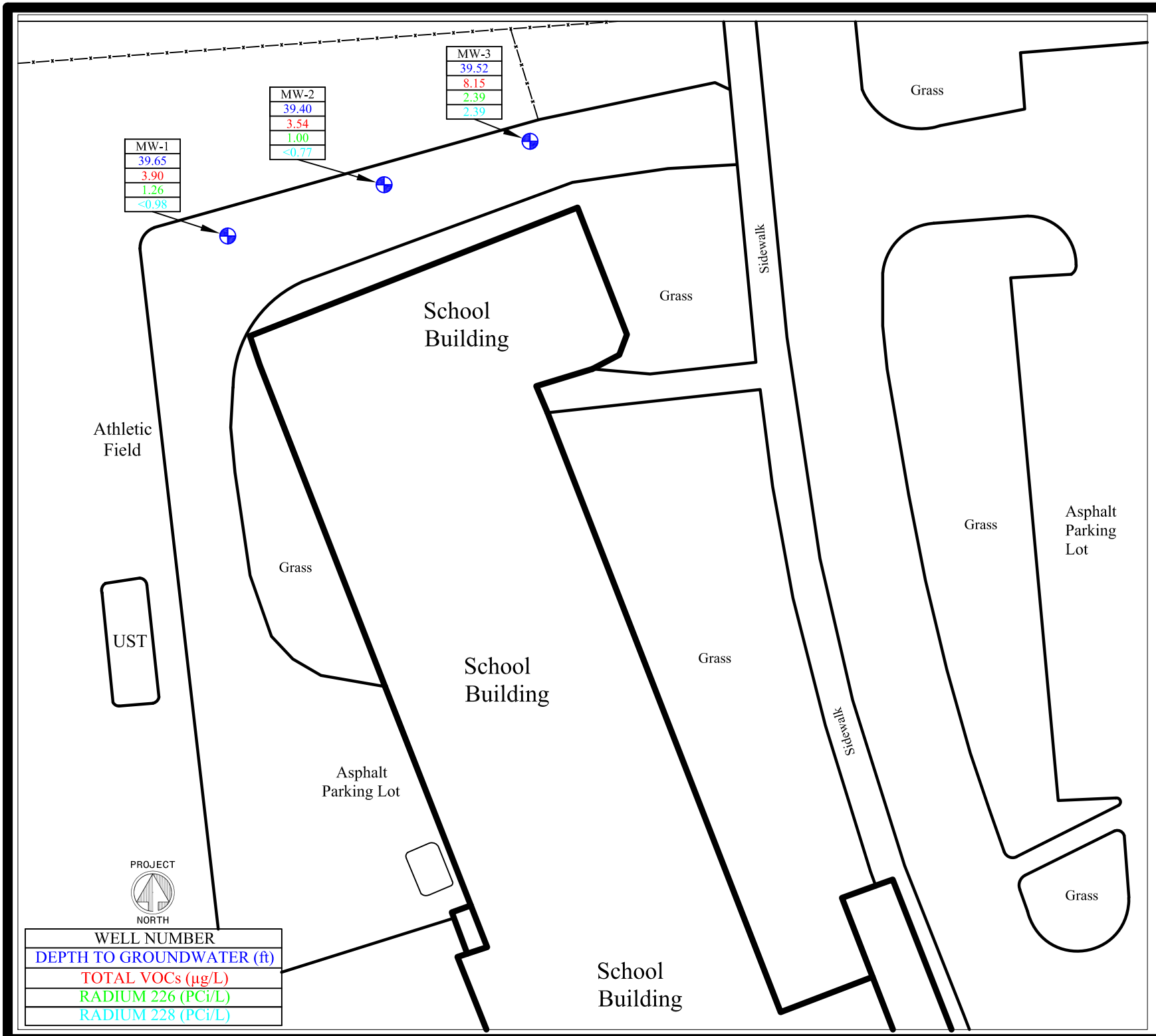

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Figure No. 3

Analytical Results Map

Scale	Project No.	Date
As Noted	22-52711	08-30-2022

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

Drawing No.

3

Appendix B
Field Photograph Logs

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#: 22-52711

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#: 22-52711

Groundwater Monitoring Well Location
MW-3

Field Photograph Log

Groundwater Sampling Report

Central Boulevard Elementary School
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Bethpage, New York 11714

Photo No. 03

JCB#: 22-52711

Groundwater Sampling Equipment

Field Photograph Log

Groundwater Sampling Report

Central Boulevard Elementary School
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Bethpage, New York 11714

Photo No. 04

JCB#: 22-52711

Appendix C
Laboratory Analysis Reports