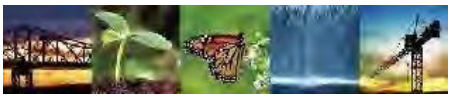

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October 23, 2020
Project Number 05.0046589.01

Mr. Robert H. Skinner
Chief Administrative Officer
Canton Town Hall
P.O. Box 168
4 Market Street
Collinsville, CT 06019

Attn: Mr. Robert H. Skinner

Re: Soil and Groundwater Investigation
Historical AFFF Discharge at Cherry Brook Primary School
4 Barbourtown Road, Canton, Connecticut

Dear Mr. Skinner:

GZA GeoEnvironmental, Inc. (GZA) is pleased to provide this letter report to the Town of Canton, presenting subsurface investigation data related to historic releases of fire training Aqueous Film Forming Foam (AFFF) containing Per- and Polyfluorinated Alkyl Substances (PFAS), at the Cherry Brook Primary School located at 4 Barbourtown Road in Canton, CT. These subsurface investigations were completed in accordance with our contract, dated November 25, 2019 and our subsequent Change Order #1, dated June 8, 2020. . The location of the Site is shown on Figure 1. The conclusions of this letter report are subject to the Limitations included as Appendix A.

Background

Historic fire training drills, using AFFF fire-fighting foams, were performed at two locations on the grounds of the Cherry Brook Primary School. These locations include: 1) the grassy field area between the school's parking lot and Barbourtown Road (referred to as the "Eastern Field"); and 2) a grassy field south of the school building and north of a playscape (referred to as the "Southern Field").

Because of the historic application of these fire-fighting foams, the Connecticut Department of Energy and Environmental Protection (CTDEEP) and the Connecticut Department of Public Health (DPH) requested that the Town of Canton investigate adjacent private potable water supplies (including the school's wells) and evaluate potential soil and groundwater impacts to the environment where these foams were discharged.

This letter provides a summary of the environmental findings to date. A more comprehensive site characterization report will be provided following further site characterization, as requested by the CTDEEP.

Executive Summary

These investigations indicated that the application of the firefighting foams resulted in the following findings:

- All private potable water supply wells sampled reported concentrations below the DPH drinking water action levels.

- Shallow (surface) and deep soil samples collected reported concentrations below DEEP's direct exposure/contact criteria.
- Shallow and deep soil samples reported concentrations greater than the DEEP's pollutant mobility leaching criteria indicating the soil's potential to impact groundwater.
- Groundwater data identified concentrations greater than the DEEP's groundwater protection criteria.

Based upon these findings, additional soil and groundwater investigation will be required by the DEEP to define the nature and extent of the PFAS contamination. Those soils identified greater than the leaching criteria will require soil remediation/excavation to remove the PFAS source contributing to the groundwater impacts.

1. Regulatory Framework

The AFFF application, at the Cherry Brook Primary School, was applied directly to the fields. These released PFAS compounds were either sorbed onto the soil and/or infiltrated to the underlying groundwater. In accordance to the Connecticut Environmental Conditions Online database (CTECO), the CTDEEP has identified that the groundwater beneath the site as designated as "GA", indicating that is suitable for drinking without treatment. The adjacent Cherry Brook (located east and south of the Eastern Field) has been designated as a Class A surface water body. Class A surface waters include habitat for fish and other aquatic life and wildlife; potential drinking water supplies; recreation; navigation; and water supply for industry and agriculture.

CTDEEP has established Remediation Standard Regulations (RSRs) which defines various regulatory criteria to compare site characterization data to determine if there is an exceedance that would either require further evaluations or potentially remedial actions. In the case of PFAS, the CTDEEP has included these compounds under the Additional Polluting Substance (APS) criteria which have not been promulgated but are required to be considered when conducting site assessments. In addition, the DPH has established a health advisory for drinking water, at 70 nano grams per Liter (ng/L), for the sum of 5-PFAS compounds. The criteria which the site characterization data is compared, are as follows:

- Groundwater is compared to the Groundwater Protection Criteria (GWPC) of 70 ng/L for the sum of 5-PFAS compounds.
- Soil is compared to either the direct exposure criteria (soil contact), for those soil within the upper 15-feet or the pollutant mobility criteria – PMC (potential for the contaminant to leach into the underlying groundwater) for those soil above the groundwater. In the case of GA classified zones, the PMC is evaluated to the low seasonal groundwater condition. The soil criteria applicable to the Cherry Brook Primary School include:
    - Residential Direct Exposure Criteria (R-DEC) = 1,350 micro grams per kilogram (µg/Kg)
    - GA Pollutant Mobility Criteria (GA-PMC) = 1.4 µg/Kg
- An alternative pollutant mobility criteria that can be considered through the application of the RSRs (RCSA 22a-133k-2(C)(2)(c)), is to compare the results of a leachability method (i.e., Synthetic Precipitation Leaching Procedure-SPLP) to ten-times the GWPC or 700 ng/L.

This summary compares the data to these criteria.

2. Potable Water Supply Sampling

CTDEEP/DPH requested that the Town of Canton sample private potable water supply wells within a 500-foot radius of the school's property. The Town and the Farmington Valley Health Department sent letters to 11 property owners within the 500-foot radius requesting permission to collect potable water supply well samples. Only six property owners granted permission to collect these samples.

On March 16, 2020, GZA collected potable water supply samples from those six private potable water supply wells where homeowner permission was granted (18 Barbourtown Road, 203-, 210-, 214-, and 221 Cherry Brook Road, and 4 West Mountain Road). The samples were collected prior to any filtration system and after the system was purged, to collect a representative well water sample. These samples were collected in laboratory provided PFAS free sampling containers and were analyzed by EPA's drinking water Method 537.1. A total of 18 PFAS compounds were analyzed including the five regulated compounds (compounds listed in the attached summary tables). The location of the properties within the 500-foot radius are shown on Figure 2 and a summary of the analytical data is provided on Table 1.

These data reported concentrations below the DPH criteria of 70 ng/L at all potable water supplies sampled. All analyses were reported as non-detect, except of one sample collected at 210 Cherry Brook Road, where a trace concentration of 0.9 ng/L of PFOA was reported. These results were reported previously to the individual property owners, the Town of Canton, the Farmington Valley Health Department, and the CTDEEP/DPH. Analytical laboratory reports of letters are not included in this report

3. Soil Sampling

GZA submitted a work plan to the DEEP/DPH and the Town of Canton to collect soil samples based upon recommendations by DEEP/DPH. This plan was approved and included 1) the collection of shallow soil samples (0-3-inches and 0-2 feet) to evaluate potential R-DEC impacts, 2) deeper soil samples to assess if the PFAS has migrated downward deeper into the soil profile and 3) the installation of monitoring wells and collection of groundwater samples. All samples collected followed GZA's strict PFAS sampling protocols to reduce the potential for false positives. Samples were collected as follows:

3.1. On February 17, 2020, GZA collected twelve (12) shallow soil samples (7 from the Eastern Field and 5 from the Southern Field). The shallow soil samples collected were submitted for total PFAS analyses using a Modified EPA Method 537.1.

3.2. On March 26 & 31, 2020: Twelve shallow and/or deep samples were collected (9 from the Eastern Field and 3 from the Southern Field). The shallow and/or deep soil samples collected were submitted for total PFAS analyses using a Modified EPA Method 537.1.

3.3. On July 16, 2020, GZA collected an additional 23 shallow and/or deep samples (14 from the Eastern Field and 9 from the Southern Field). The shallow and deep soil samples collected were submitted for total and/ or SPLP PFAS analyses using a Modified EPA Method 537.1.

3.4. On August 24, 2020, GZA collected an additional 14 shallow and/or deep samples (13 from the Eastern Field and 1 from the Southern Field). The shallow and deep soil samples collected were submitted for total and/ or SPLP PFAS analyses using a Modified EPA Method 537.1.

A summary of the analytical data in comparison to the regulatory criteria are reported on Table 2 for the Eastern Field and Table 3 for the Southern Field. The following provides a summary of the data collected. The associated figures provide a depiction of the sum of the five PFAS compounds as concentration isopleths.

a) The total mass isopleth concentrations of PFAS in the shallow soils are depicted on Figure 3. The total mass analysis is required for a direct comparison to the R-DEC. However, either the results of a total massanalysis can be compared to the GA-PMC or an alternative comparison can be made by comparing the results of an SPLP analysis to ten times (10 times) the GWPC. This assessment evaluates only a direct comparison based on total mass.

i) In both the Southern and Eastern Fields, the shallow soil data has indicated that all total mass concentrations were reported below the R-DEC of 1,350 µg/Kg. The greatest concentrations were reported in the Eastern Field at sample GZ-1 (0 to 3-inches) with a reported concentration of 332.6 µg/Kg.
ii) The shallow soil data indicates that the total mass concentrations exceeded the GA-PMC of 1.4 µg/Kg as follows:
(1) In the Eastern Field, all results were greater than the GA-PMC, and
(2) In the Southern Field, four of the nine shallow samples were greater than the GA-PMC.

b) The SPLP isopleth concentrations of PFAS in the shallow soil are depicted on Figure 3A. The results from the SPLP analyses were compared to 10 x the GWPC.
i) In the Southern Field, no shallow SPLP soil analyses exceeded 10 x the GWPC. As such, the SPLP data in the Southern Field is not depicted on Figure 3A.
ii) In the Eastern Field, 5 out of 26 shallow SPLP soil analyses exceeded 10 x the GWPC of 0.7 µg/L. The greatest concentration was reported at GZ-33 (0.5 to 2.0 feet) with a reported PFAS concentration of 3.89 µg/L. This location is generally beneath where the greatest total mass concentration was detected in the shallow soil.

c) The total mass isopleth concentrations of PFAS in the deep soils are depicted on Figure 4. The total mass analysis is required for a direct comparison to the R-DEC. However, either the results of a total mass analysis can be compared to the GA-PMC or an alternative comparison can be made by comparing the results of an SPLP analysis to ten times (10 times) the GWPC. This assessment evaluates only a direct comparison based on total mass.
i) In both the Southern and Eastern Fields, all deep soil results were reported below the R-DEC of 1,350 µg/Kg. The greatest concentration was detected at GZ-D-5 (3 to 5 feet) with a reported concentration of 337.7 µg/Kg.
ii) The data indicates that the total mass concentrations exceeded the GA-PMC of 1.4 µg/Kg as follows:
(1) In the Eastern Field, three of twelve deep samples were greater than the GA-PMC.
(2) In the Southern Field, two of six deep samples were greater than the GA-PMC.

d) The SPLP isopleth concentrations of PFAS in the deep soil are depicted on Figure 4A. The results from the SPLP analyses is compared to 10 x the GWPC.
i) In the Southern Field, no shallow SPLP soil analyses exceeded 10 x the GWPC. As such, the SPLP data for the Southern Field is not depicted on Figure 4A.
ii) In the Eastern Field, 2 out of 12 deep SPLP soil analyses exceeded 10 x the GWPC of 0.7 µg/L. The greatest deep soil concentration was reported at GZ-D-33 (3 to 5 feet) with a reported PFAS concentration of 1.25 µg/L. This location is generally beneath where the greatest total mass concentration was detected in the shallow soil.

4. Monitoring Well Installation and Groundwater Sampling

On July 31, 2020, GZA installed four groundwater monitoring wells (GZ-1 to GZ-4). One well (GZ-1) was installed downgradient of the Southern Field and three monitoring wells (GZ-2, GZ-3, and GZ-4) were installed in the Eastern Field. These wells were installed to depths ranging from approximately 14.5 to 20 feet below ground surface. All monitoring wells were screened across the groundwater table. No deep wells were installed.

On August 4, 2020, GZA developed these wells to remove accumulated silt from well construction and to provide proper communication between the aquifer and the well so that a representative groundwater sample can be

collected. These wells were surveyed to a temporary reference Site datum of 100 feet. Elevation data was collected at the tops of the PVC monitoring well casings.

On August 14, 2020, GZA measured the depth to groundwater from the referenced elevation at each well. The depth to groundwater was subtracted from the referenced elevation to calculate a groundwater elevation. These data were used to determine the groundwater flow direction. Well construction, elevation survey data and depth to groundwater measurements are presented in Table 4. Figure 5 depict a groundwater contour map that indicates groundwater flow in a southeasterly direction, towards Cherry Brook.

On August 14, 2020, GZA collected groundwater samples from the four monitoring wells (GZ-1 through GZ-4) using low-flow techniques and procedures to reduce the potential for cross-contamination either from the sampler or equipment. These samples were analyzed using a laboratory Modified EPA Method 537.1. The results of the laboratory analyses are summarized in Table 5 and a concentration isopleth contour map for the sum for the five PFAS compounds is depicted on Figure 6. A summary of the groundwater data is as follows:

A. The groundwater data did not identify concentrations above the GWPC of 70 ng/L, downgradient of the Southern Field.
B. Elevated concentration exceeding the GWPC were reported at the three wells installed in the Eastern Field. The greatest concentration (16,810 ng/L) was reported at well GZ-2 located in the central portion of the AFFF release area.
C. Concentrations above the GWPC were also reported to the east of well GZ-2, at well GZ-3 (160 ng/L). While groundwater flow is to the southeast, Cherry Brook is also located east of the site given the alignment of Cherry Brook.
D. Monitoring well GZ-4 is located downgradient of the release area, based upon groundwater flow direction. At this location, the concentration (2,600 ng/L) was reported above the GWPC.

5. Regulatory Compliance

These investigations have identified that soil and groundwater have been impacted by the application of historic fire-fighting foams. A summary of data compared to the regulatory criteria is presented below:

A. Residential Direct Exposure Criteria (R-DEC)
    i. No shallow or deep soil exceedances were reported above the R-DEC in either the Southern or Eastern Fields.
    ii. GA-Pollutant Mobility Criteria (GA-PMC)
    iii. As discussed in Section 1, there are alternative RSR methods that can be used when comparing the data to the GA-PMC. On October 8, 2020, the DEEP concurred "that the applicability of the regulations (RCSA 22a-133k-2(C)(2)(c)), using SPLP results greater than 10 x the GWPC, to address the highest levels of PFAS contaminated soil". Applying the 10 x GWPC to the soil data, the following is applicable:
        i. In the Southern Field, no shallow or deep soil samples were reported with concentrations above the 10 x GWPC. Therefore, no remediation actions would be required based on the available data set.
        ii. In the Eastern Field, shallow and deep soil samples reported concentrations above the 10 x GWPC. The areal extent of SPLP data above 10 x GWPC in the shallow soil (0 to 2 feet) is reported greater than the deeper (4 to 6 feet) soil samples. The total volume, that might require remedial action, to comply with the 10 x GWPC, has been estimated at approximately 2,500 cubic yards.
B. Groundwater Protection Criteria (GWPC)
    i. In the Southern Field, monitoring wells GZ-1, reported concentrations below the GWPC.

ii. In the Eastern Field, monitoring wells GZ-1, GZ-2, and GZ-3 reported concentrations above the GWPC.

To determine the extent of PFAS plume, additional delineation would be required, as requested by DEEP.

Recommendation

The data collected as of the issuance of this letter has identified that soil and groundwater exceedances are present in the Eastern Field from the application of the historic fire-fighting foams. GZA recommends that limited additional soil sampling be completed to further define the limits of 10 x GWPC exceedance. The goal would be to reduce the areal extent that may require remedial actions. With respects to groundwater, the DEEP/DPH has requested additional groundwater delineation. This would include the installation of additional monitoring wells to define background conditions and the extent of PFAS concentrations exceeding the GWPC as the PFAS plume migrates towards Cherry Brook, east and south of the release. These recommendations will be submitted to the Town of Canton under a separate proposal.

If you have any questions of wish to discuss this report, please do not hesitate to contact GZA.

Very truly yours,

GZA GEOENVIRONMENTAL, INC.

Richard J. Desrosiers, LEP, PG
Associate Principal/Hydrogeologist P.E.

David Rusczyk, PE
Consultant/Reviewer

Benjamin D. Rach
Project Manager

Attachments:
Table 1 – Summary of Potable Water Supply Analytical Results
Table 2 – Eastern Field – Soil Sampling Data
Table 3 - Southern Field – Soil Sampling Data
Table 4 – Well Construction Details
Table 5 –Summary of Groundwater Analytical Results
Figure 1 – Site Locus
Figure 2 – Potable Water Supply Properties
Figure 3 – Shallow (0-2') Soil PFAS Sample Results (Total Mass Analysis in ppb)
Figure 3A – Shallow (0-2') Soil PFAS Sample Results (SPLP Analysis in ppb)
Figure 4 – Deep (4-6') Soil PFAS Sample Results (Total Mass Analysis in ppb)
Figure 4A – Deep (4-6') Soil PFAS Sample Results (SPLP Analysis in ppb)
Figure 5 – Groundwater Flow Direction
Figure 6 – PFAS Groundwater Plume

TABLES

Table 1
Summary of Potable Water Supply Analytical Results

Town of Canton
4 Barbourtown Road
Canton, CT

Well Water Supply Samples																								
Property Address			**18 Barbourtown Road**		**203 Cherry Brook Road**		**210 Cherry Brook Road**		**214 Cherry Brook Road**				**221 Cherry Brook Road**		**4 West Mountain Road**		**QA/QC Samples**							
Parameters	**Units**	**CTDPH / RSR Criteria**	**Sample IDs and Date Sampled**																					
			18 Barbourtown Road		203 Cherry Brook Road		210 Cherry Brook Road		214 Cherry Brook Road		214 Cherry Brook Road DUP		221 Cherry Brook Road		4 West Mountain Road		Field Blank-031620		Field Blank-033120		Trip Blank-031620	
CT DPH Drinking Water Action Level			3/16/2020		3/16/2020		3/16/2020		3/16/2020		3/16/2020		3/26/2020		3/16/2020		3/16/2020		3/31/2020		3/16/2020	
Perfluorooctanoic acid (PFOA)	ng/L	SUM of - 5 Compounds	< 3.4	U	< 3.5	U	0.9	J	< 3.4	U	< 3.5	U	< 3.4	U	< 3.3	U	< 4.1	U	< 3.9	U	< 4.5	U
Perfluorooctanesulfonic acid (PFOS)	ng/L		< 3.4	U	< 3.5	U	< 3.4	U	< 3.4	U	< 3.5	U	< 3.4	U	< 3.3	U	< 4.1	U	< 3.9	U	< 4.5	U
Perfluorononanoic acid (PFNA)	ng/L		< 3.4	U	< 3.5	U	< 3.4	U	< 3.4	U	< 3.5	U	< 3.4	U	< 3.3	U	< 4.1	U	< 3.9	U	< 4.5	U
Perfluoroheptanoic acid (PFHpA)	ng/L		< 3.4	U	< 3.5	U	< 3.4	U	< 3.4	U	< 3.5	U	< 3.4	U	< 3.3	U	< 4.1	U	< 3.9	U	< 4.5	U
Perfluorohexanesulfonic acid (PFHxS)	ng/L		< 3.4	U	< 3.5	U	< 3.4	U	< 3.4	U	< 3.5	U	< 3.4	U	< 3.3	U	< 4.1	U	< 3.9	U	< 4.5	U
Sum of PFAS Compounds	**ng/L**	**70**	**ND**		**ND**		**0.9**	**J**	**ND**		**ND**		**ND**		**ND**		**ND**		**ND**		**ND**	
Other Non-Regulated PFAS Compounds																						
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	ng/L	NC	< 6.8	U	< 6.9	U	< 6.8	U	< 6.8	U	< 6.9	U	< 6.9	U	< 6.7	U	< 8.3	U	< 7.8	U	< 8.9	U
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	ng/L	NC	< 6.8	U	< 6.9	U	< 6.8	U	< 6.8	U	< 6.9	U	< 6.9	U	< 6.7	U	< 8.3	U	< 7.8	U	< 8.9	U
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	ng/L	NC	< 6.8	U	< 6.9	U	< 6.8	U	< 6.8	U	< 6.9	U	< 6.9	U	< 6.7	U	< 8.3	U	< 7.8	U	< 8.9	U
Hexafluoropropylene oxide dimer acid (GenX)	ng/L	NC	< 6.8	U	< 6.9	U	< 6.8	U	< 6.8	U	< 6.9	U	< 6.9	U	< 6.7	U	< 8.3	U	< 7.8	U	< 8.9	U
N-ethylperfluoro-1-octanesulfonamidoacetic acid (NetFOSAA)	ng/L	NC	< 6.8	U	< 6.9	U	< 6.8	U	< 6.8	U	< 6.9	U	< 6.9	U	< 6.7	U	< 8.3	U	< 7.8	U	< 8.9	U
N-methylperfluoro-1-octanesulfonamidoacetic acid (NMeFOSAA)	ng/L	NC	< 6.8	U	< 6.9	U	< 6.8	U	< 6.8	U	< 6.9	U	< 6.9	U	< 6.7	U	< 8.3	U	< 7.8	U	< 8.9	U
Perfluorobutanesulfonic acid (PFBS)	ng/L	NC	< 3.4	U	< 3.5	U	< 3.4	U	< 3.4	U	< 3.5	U	< 3.4	U	< 3.3	U	< 4.1	U	< 3.9	U	< 4.5	U
Perfluorodecanoic acid (PFDA)	ng/L	NC	< 3.4	U	< 3.5	U	< 3.4	U	< 3.4	U	< 3.5	U	< 3.4	U	< 3.3	U	< 4.1	U	< 3.9	U	< 4.5	U
Perfluorododecanoic acid (PFDoA)	ng/L	NC	< 3.4	U	< 3.5	U	< 3.4	U	< 3.4	U	< 3.5	U	< 3.4	U	< 3.3	U	< 4.1	U	< 3.9	U	< 4.5	U
Perfluorohexanoic acid (PFHxA)	ng/L	NC	< 3.4	U	< 3.5	U	< 3.4	U	< 3.4	U	< 3.5	U	< 3.4	U	< 3.3	U	< 4.1	U	< 3.9	U	< 4.5	U
Perfluorotetradecanoic acid (PFTA)	ng/L	NC	< 6.8	U	< 6.9	U	< 6.8	U	< 6.8	U	< 6.9	U	< 6.9	U	< 6.7	U	< 8.3	U	< 7.8	U	< 8.9	U
Perfluorotridecanoic Acid (PFTriA)	ng/L	NC	< 3.4	U	< 3.5	U	< 3.4	U	< 3.4	U	< 3.5	U	< 3.4	U	< 3.3	U	< 4.1	U	< 3.9	U	< 4.5	U
Perfluoroundecanoic Acid (PFUnA)	ng/L	NC	< 3.4	U	< 3.5	U	< 3.4	U	< 3.4	U	< 3.5	U	< 3.4	U	< 3.3	U	< 4.1	U	< 3.9	U	< 4.5	U

Notes:

1. CT DPH - Department of Public Health
2. RSR - Remediation Standard Regulations
3. Bold cell - exceedance of Drinking Water Action Level
4. ng/L - nano-gram per liter (parts per Trillions)
5. NC - No established criteria
6. U - Not detected, below Method Detection LimitA red cell indicates Residential Direct Exposure Criterion Exceedance
7. J - Estimated value
8. QA/QC - Quality Assurance/Quality Control Samples

Table 2
Eastern Field - Soil Sampling Data
Cherry Brook Elementary School
Canton, Connecticut

Parameters	RSR - APS Criteria					Shallow & Deep Co-Located Samples				GZ D-3 (deep) Located between GZ-2 & GZ-3 (shallow)				Shallow & Deep Co-Located Samples		GZ D-2 (deep) Located between GZ-5 & GZ-6 (shallow)			Shallow & Deep Co-Located Samples	
					Location															
					Sample ID	GZ-1	GZ-1R	GZ-1R	GZ-D-5	GZ-2	GZ-D-3	GZ-3	GZ-3	GZ-4	GZ-D-1	GZ-5	GZ-D-2	GZ-6	GZ-7	GZ-D-4
					Depth Interval	GZ-1 (0-3")	GZ-1R (0.5-2')	GZ-1R (0.5-2')	GZ-D-5 (3-5')	GZ-2 (0-3")	GZ-D-3 (3-5')	GZ-3 (0-3")	GZ-3 (0-3") DUP	GZ-4 (0-3")	GZ-D-1 (3-5')	GZ-5 (0-3")	GZ-D-2 (3-5')	GZ-6 (0-3")	GZ-7 (0-3")	GZ-D-4 (3-5')
	R-DEC	I/C-DEC	GA-PMC	10X GWPC	Date Sampled	02/17/2020	07/16/2020	07/16/2020	03/31/2020	02/17/2020	03/26/2020	02/17/2020	02/17/2020	02/17/2020	03/26/2020	02/17/2020	03/26/2020	02/17/2020	02/17/2020	03/26/2020
	Total Mass	Total Mass	Total Mass	SPLP	Units	ug/Kg	ug/Kg	ug/L	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg
CT DEEP Additional Polluting Substances (APS) for PFAS	µg/Kg	µg/Kg	µg/Kg	µg/L	Analysis Type	N	N	SPLP	N	N	N	N	N	N	N	N	N	N	N	N
Perfluorooctanoic acid (PFOA)						5.7	2.77	0.0904	2.7	5	1 J	1.9	2	0.29 J	0.22 J	0.81 J	< 0.95 U	1.8	4.1	1.5
Perfluorooctanesulfonic acid (PFOS)	Sum of 5-PFAS Compounds	Sum of 5-PFAS Compounds	Sum of 5-PFAS Compounds	Sum of 5-PFAS Compounds		230	88.6	0.684	270	21	10	5.8	5.5	1.4	0.24 J	1.2	0.19 J	5.3	89	7.2
Perfluorononanoic acid (PFNA)						59	8.77	0.203	45	11	3.4	4.1	3.5	0.48 J	< 1.2 U	2	< 0.95 U	3.8	19	6.7
Perfluoroheptanoic acid (PFHpA)						4.9	3.79	0.146	2	1.9	0.38 J	0.71 J	0.76 J	< 1.3 U	< 1.2 U	0.33 J	< 0.95 U	0.7 J	3.8	1.3
Perfluorohexanesulfonic acid (PFHxS)						33	13.6	0.455	18	1.9	0.37 J	0.35 J	0.31 J	< 1.3 U	< 1.2 U	< 1.2 U	< 0.95 U	< 1.3 U	15	0.8 J
Sum of PFAS Compounds	**1,350**	**41,000**	**1.4**	**0.70**		**332.60**	**117.53**	**1.58**	**337.70**	**40.80**	**15.15**	**12.86**	**12.07**	**2.17**	0.46	**4.34**	0.19	**11.60**	**130.90**	**17.50**
Other PFAS Compounds Not on APS List																				
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	NC	NC	NC	NC		< 2.8 U	< 1.1 U	< 0.00181 U	< 2.4 U	< 2.7 U	< 2.3 U	< 2.3 U	< 2.5 U	< 2.7 U	< 2.4 U	< 2.4 U	< 1.9 U	< 2.7 U	< 2.7 U	< 2.3 U
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	NC	NC	NC	NC		< 2.8 U	< 1.1 U	< 0.00181 U	< 2.4 U	< 2.7 U	< 2.3 U	< 2.3 U	< 2.5 U	< 2.7 U	< 2.4 U	< 2.4 U	< 1.9 U	< 2.7 U	< 2.7 U	< 2.3 U
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	NC	NC	NC	NC		< 2.8 U	< 1.1 U	< 0.00181 U	< 2.4 U	< 2.7 U	< 2.3 U	< 2.3 U	< 2.5 U	< 2.7 U	< 2.4 U	< 2.4 U	< 1.9 U	< 2.7 U	< 2.7 U	< 2.3 U
Hexafluoropropylene oxide dimer acid (GenX)	NC	NC	NC	NC		< 5.6 U	< 11 U	< 0.0453 U	< 4.9 U	< 5.4 U	< 4.6 U	< 4.6 U	< 5 U	< 5.4 U	< 4.7 U	< 4.8 U	< 3.8 U	< 5.4 U	< 5.4 U	< 4.6 U
N-ethylperfluoro-1-octanesulfonamidoacetic acid (NetFOSAA)	NC	NC	NC	NC		< 1.4 U	< 1.1 U	< 0.00181 U	< 1.2 U	< 1.4 U	< 1.1 U	< 1.2 U	< 1.3 U	< 1.3 U	< 1.2 U	< 1.2 U	< 0.95 U	< 1.3 U	< 1.3 U	< 1.1 U
N-methylperfluoro-1-octanesulfonamidoacetic acid (NMeFOSAA)	NC	NC	NC	NC		< 1.4 U	< 1.1 U	< 0.00181 U	< 1.2 U	< 1.4 U	< 1.1 U	< 1.2 U	< 1.3 U	< 1.3 U	< 1.2 U	< 1.2 U	< 0.95 U	< 1.3 U	< 1.3 U	< 1.1 U
Perfluorobutanesulfonic acid (PFBS)	NC	NC	NC	NC		0.65 J	< 1.1 U	0.0197	0.33 J	< 1.4 U	< 1.1 U	< 1.2 U	< 1.3 U	< 1.3 U	< 1.2 U	< 1.2 U	< 0.95 U	< 1.3 U	0.5 J	< 1.1 U
Perfluorodecanoic acid (PFDA)	NC	NC	NC	NC		19	13.4	0.13	6.1	7.5	0.81 J	1.8	2.1	0.43 J	< 1.2 U	0.66 J	< 0.95 U	3.5	17	1.4
Perfluorododecanoic acid (PFDoA)	NC	NC	NC	NC		6.1	4.7	0.00398	0.91 J	1.4	< 1.1 U	0.3 J	0.34 J	< 1.3 U	< 1.2 U	< 1.2 U	< 0.95 U	0.44 J	4.4	0.26 J
Perfluorohexanoic acid (PFHxA)	NC	NC	NC	NC		3.9	2.84	0.119	2.1	0.97 J	0.27 J	0.59 J	0.67 J	< 1.3 U	< 1.2 U	0.31 J	< 0.95 U	0.5 J	2.9	0.97 J
Perfluorotetradecanoic acid (PFTA)	NC	NC	NC	NC		1.4	1.69	< 0.00181 U	< 1.2 U	0.28 J	< 1.1 U	< 1.2 U	< 1.3 U	< 1.3 U	< 1.2 U	< 1.2 U	< 0.95 U	< 1.3 U	1.1 J	< 1.1 U
Perfluorotridecanoic Acid (PFTrIA)	NC	NC	NC	NC		32	13.2	0.00633	3.8	1.1 J	< 1.1 U	0.26 J	0.25 J	< 1.3 U	< 1.2 U	< 1.2 U	< 0.95 U	0.41 J	4.5	0.25 J
Perfluoroundecanoic Acid (PFUnA)	NC	NC	NC	NC		140	24.7	0.0772	16	9.4	0.56 J	2.1	2.5	0.57 J	< 1.2 U	0.79 J	< 0.95 U	4.1	19	1.2

Parameters	RSR - APS Criteria					Shallow & Deep Co-Located Samples		Shallow & Deep Co-Located Samples				Shallow	Shallow	Shallow & Deep Co-Located Samples				Shallow & Deep Co-Located Samples			
					Location																
					Sample ID	GZ-13	GZ-D-6	GZ-17	GZ-17	GZ-D-13	GZ-D-13	GZ-14	GZ-15	GZ-19	GZ-19	GZ-D-15	GZ-D-15	GZ-18	GZ-18	GZ-D-14	GZ-D-14
					Depth Interval	GZ-13 (0-0.25')	GZ-D-6 (3-5')	GZ-17 (0.5-2')	GZ-17 (0.5-2')	GZ-D-13(4-6')	GZ-D-13(4-6')	GZ-14 (0-0.25')	GZ-15 (0-0.25')	GZ-19 (0.5-2')	GZ-19 (0.5-2')	GZ-D-15(4-6')	GZ-D-15(4-6')	GZ-18 (0.5-2')	GZ-18 (0.5-2')	GZ-D-14(4-6')	GZ-D-14(4-6')
	R-DEC	I/C-DEC	GA-PMC	10X GWPC	Date Sampled	03/26/2020	03/26/2020	07/16/2020	07/16/2020	07/16/2020	07/16/2020	03/26/2020	03/26/2020	07/16/2020	07/16/2020	07/16/2020	07/16/2020	07/16/2020	07/16/2020	07/16/2020	07/16/2020
	Total Mass	Total Mass	Total Mass	SPLP	Units	ug/Kg	ug/Kg	ug/Kg	ug/L	ug/Kg	ug/L	ug/Kg	ug/Kg	ug/Kg	ug/L	ug/Kg	ug/L	ug/Kg	ug/L	ug/Kg	ug/L
CT DEEP Additional Polluting Substances (APS) for PFAS	µg/Kg	µg/Kg	µg/Kg	µg/L	Analysis Type	N	N	N	SPLP	N	SPLP	N	N	N	SPLP	N	SPLP	N	SPLP	N	SPLP
Perfluorooctanoic acid (PFOA)						8.4	6.7	1.97	0.0524	1.85	0.0595	2.6	0.56 J	< 1.11 U	0.0218	< 1.1 U	0.0237	< 1.13 U	0.0205	1.11	0.0368
Perfluorooctanesulfonic acid (PFOS)	Sum of 5-PFAS Compounds	Sum of 5-PFAS Compounds	Sum of 5-PFAS Compounds	Sum of 5-PFAS Compounds		4.7	3	18.4	0.13	4.64	0.0543	6.5	1.3 J	1.29	0.0038	< 1.1 U	0.00521	1.57	0.00283	< 1.05 U	0.0144
Perfluorononanoic acid (PFNA)						24	24	4.08	0.0694	2.78	0.0711	5.2	1.6	2.16	0.0192	< 1.1 U	0.00732	2.17	0.0157	< 1.05 U	0.0232
Perfluoroheptanoic acid (PFHpA)						4.7	6	1.8	0.0656	1.52	0.0596	2.7	< 1.6 U	< 1.11 U	0.017	< 1.1 U	0.0401	< 1.13 U	0.0153	< 1.05 U	0.0309
Perfluorohexanesulfonic acid (PFHxS)						< 1.5 U	< 1.2 U	2.38	0.0742 F	< 1.01 U	0.0256 F	2.5	< 1.6 U	< 1.11 U	0.00403	< 1.1 U	0.00356 F	< 1.13 U	0.00496 F	1.12	0.0416
Sum of PFAS Compounds	**1,350**	**41,000**	**1.4**	**0.70**		**41.80**	**39.70**	**28.63**	0.39	**10.79**	0.27	**19.50**	**3.46**	**3.45**	0.07	0.00	0.08	**3.74**	0.06	**2.23**	0.15
Other PFAS Compounds Not on APS List																					
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	NC	NC	NC	NC		< 3 U	< 2.4 U	< 1.09 U	< 0.00174 U	< 1.01 U	< 0.005 U	< 3.4 U	< 3.1 U	< 1.11 U	< 0.00177 U	< 1.1 U	< 0.00177 U	< 1.13 U	< 0.00175 U	< 1.05 U	< 0.00182 U
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	NC	NC	NC	NC		< 3 U	< 2.4 U	< 1.09 U	< 0.00174 U	< 1.01 U	< 0.005 U	< 3.4 U	< 3.1 U	< 1.11 U	< 0.00177 U	< 1.1 U	< 0.00177 U	< 1.13 U	< 0.00175 U	< 1.05 U	< 0.00182 U
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	NC	NC	NC	NC		< 3 U	< 2.4 U	< 1.09 U	< 0.00174 U	< 1.01 U	< 0.005 U	< 3.4 U	< 3.1 U	< 1.11 U	< 0.00177 U	< 1.1 U	< 0.00177 U	< 1.13 U	< 0.00175 U	< 1.05 U	< 0.00182 U
Hexafluoropropylene oxide dimer acid (GenX)	NC	NC	NC	NC		< 5.9 U	< 4.8 U	< 10.9 U	< 0.0434 U	< 10.1 U	< 0.125 U	< 6.8 U	< 6.3 U	< 11.1 U	< 0.0443 U	< 11 U	< 0.0442 U	< 11.3 U	< 0.0437 U	< 10.5 U	< 0.0456 U
N-ethylperfluoro-1-octanesulfonamidoacetic acid (NetFOSAA)	NC	NC	NC	NC		< 1.5 U	< 1.2 U	< 1.09 U	< 0.00174 U	< 10.1 U	< 0.005 U	< 1.7 U	< 1.6 U	< 1.11 U	< 0.00177 U	< 11 U	< 0.00177 U	< 1.13 U	< 0.00175 U	< 11 U	< 0.00182 U
N-methylperfluoro-1-octanesulfonamidoacetic acid (NMeFOSAA)	NC	NC	NC	NC		< 1.5 U	< 1.2 U	< 1.09 U	< 0.00174 U	< 10.1 U	< 0.005 U	< 1.7 U	< 1.6 U	< 1.11 U	< 0.00177 U	< 11 U	< 0.00177 U	< 1.13 U	< 0.00175 U	< 11 U	< 0.00182 U
Perfluorobutanesulfonic acid (PFBS)	NC	NC	NC	NC		< 1.5 U	< 1.2 U	< 1.09 U	0.00537	< 1.01 U	< 0.005 U	< 1.7 U	< 1.6 U	< 1.11 U	< 0.00177 U	< 1.1 U	< 0.00177 U	< 1.13 U	< 0.00175 U	< 1.05 U	0.00276
Perfluorodecanoic acid (PFDA)	NC	NC	NC	NC		14	6.6	7.17	0.0398	1.03	0.0107	2.8	0.63 J	< 1.11 U	< 0.00177 U	< 1.1 U	< 0.00177 U	< 1.13 U	< 0.00175 U	< 1.05 U	0.00302
Perfluorododecanoic acid (PFDoA)	NC	NC	NC	NC		2.2	0.49 J	1.41	< 0.00174 U	< 1.01 U	< 0.005 U	0.68 J	< 1.6 U	< 1.11 U	< 0.00177 U	< 1.1 U	< 0.00177 U	< 1.13 U	< 0.00175 U	< 1.05 U	< 0.00182 U
Perfluorohexanoic acid (PFHxA)	NC	NC	NC	NC		2.1	2.2	1.28	0.0523	1.3	0.0501	1.4 J	< 1.6 U	< 1.11 U	0.0129	< 1.1 U	0.0251	< 1.13 U	0.0123	< 1.05 U	0.0264
Perfluorotetradecanoic acid (PFTA)	NC	NC	NC	NC		0.51 J	< 1.2 U	< 1.09 U	< 0.00174 U	< 1.01 U	< 0.005 U	< 1.7 U	< 1.6 U	< 1.11 U	< 0.00177 U	< 1.1 U	< 0.00177 U	< 1.13 U	< 0.00175 U	< 1.05 U	< 0.00182 U
Perfluorotridecanoic Acid (PFTrIA)	NC	NC	NC	NC		1.4 J	0.27 J	2.37	< 0.00174 U	< 1.01 U	< 0.005 U	4.9	< 1.6 U	< 1.11 U	< 0.00177 U	< 1.1 U	< 0.00177 U	< 1.13 U	< 0.00175 U	< 1.05 U	< 0.00182 U
Perfluoroundecanoic Acid (PFUnA)	NC	NC	NC	NC		13	2.7	11.2	0.0149	1.23	< 0.005 U	7.9	1.1 J	< 1.11 U	< 0.00177 U	< 1.1 U	< 0.00177 U	1.48	< 0.00175 U	< 1.05 U	< 0.00182 U

Notes

> RDEC: Residential Direct Exposure Criterion
> I/C DEC: Industrial/Commercial Direct Exposure Criterion
> GA-PMC: GA Pollutant Mobility Criterion
> 10x GWPC - 10 times the Groundwater Pollution Criteria
> NC-No Criteria
> µg/Kg- micro-grams per kilogram or parts per billion (ppb)
> µg/L - micro-grams per kilogram or parts per billion (ppb)

> Bold - Green cells indicates exceedance of GA-PMC and 10X GWPC
> A red cell indicates Residential Direct Exposure Criterion Exceedance
> A highlighted cell indicates Industrial/ Commerical Direct Exposure Criterion Exceedance
> Bold - Blue Cell indicates exceedance of the 10X GWPC
> J- Estimated value
> U- Not detected, below Method Detection Limit
> N - total mass analyses
> SPLP - Synthetic Precipitation Leaching Procedure

Table 2
Eastern Field - Soil Sampling Data
Cherry Brook Elementary School
Canton, Connecticut

Parameters	RSR - APS Criteria R-DEC	RSR - APS Criteria I/C-DEC	RSR - APS Criteria GA-PMC	RSR - APS Criteria 10X GWPC	Location	Shallow		Shallow & Deep Co-Located Samples			
					Sample ID	GZ-16	GZ-16	GZ-20	GZ-20	GZ-D-16	GZ-D-16
					Depth Interval	GZ-16 (0.5-2')	GZ-16 (0.5-2')	GZ-20 (0.5-2')	GZ-20 (0.5-2')	GZ-D-16(4-6')	GZ-D-16(4-6')
	R-DEC	I/C-DEC	GA-PMC	10X GWPC	Date Sampled	07/16/2020	07/16/2020	07/16/2020	07/16/2020	07/16/2020	07/16/2020
	Total Mass	Total Mass	Total Mass	SPLP	Units	ug/Kg	ug/L	ug/Kg	ug/L	ug/Kg	ug/L
CT DEEP Additional Polluting Substances (APS) for PFAS	µg/Kg	µg/Kg	µg/Kg	µg/L	Analysis Type	N	SPLP	N	SPLP	N	SPLP
Perfluorooctanoic acid (PFOA)	Sum of 5-PFAS Compounds	Sum of 5-PFAS Compounds	Sum of 5-PFAS Compounds	Sum of 5-PFAS Compounds		< 1.1 U	0.0254	4.48	0.128	4.98	0.182
Perfluorooctanesulfonic acid (PFOS)						1.66	0.00713	39.6	0.291	4.77	0.0762
Perfluorononanoic acid (PFNA)						1.3	0.0166	16.8	0.308	15.2	0.441
Perfluoroheptanoic acid (PFHpA)						< 1.1 U	0.0149	2.07	0.0848	3.15	0.131
Perfluorohexanesulfonic acid (PFHxS)						< 1.1 U	0.0106	2.6	0.0869 F	1.52	0.0536 F
Sum of PFAS Compounds	**1,350**	**41,000**	**1.4**	**0.70**		**2.96**	0.07	**65.55**	**0.90**	**29.62**	**0.88**
Other PFAS Compounds Not on APS List											
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	NC	NC	NC	NC		< 1.1 U	< 0.00185 U	< 1.1 U	< 0.00182 U	< 0.97 U	< 0.005 U
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	NC	NC	NC	NC		< 1.1 U	< 0.00185 U	< 1.1 U	< 0.00182 U	< 0.97 U	< 0.005 U
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	NC	NC	NC	NC		< 1.1 U	< 0.00185 U	< 1.1 U	< 0.00182 U	< 0.97 U	< 0.005 U
Hexafluoropropylene oxide dimer acid (GenX)	NC	NC	NC	NC		< 11 U	< 0.0463 U	< 11 U	< 0.0454 U	< 9.7 U	< 0.125 U
N-ethylperfluoro-1-octanesulfonamidoacetic acid (NetFOSAA)	NC	NC	NC	NC		< 1.1 U	< 0.00185 U	< 1.1 U	< 0.00182 U	< 9.7 U	< 0.005 U
N-methylperfluoro-1-octanesulfonamidoacetic acid (NMeFOSAA)	NC	NC	NC	NC		< 1.1 U	< 0.00185 U	< 1.1 U	< 0.00182 U	< 9.7 U	< 0.005 U
Perfluorobutanesulfonic acid (PFBS)	NC	NC	NC	NC		< 1.1 U	< 0.00185 U	< 1.1 U	0.00369	< 0.97 U	< 0.005 U
Perfluorodecanoic acid (PFDA)	NC	NC	NC	NC		< 1.1 U	< 0.00185 U	5.78	0.0317	1.43	0.0162
Perfluorododecanoic acid (PFDoA)	NC	NC	NC	NC		< 1.1 U	< 0.00185 U	< 1.1 U	< 0.00182 U	< 0.97 U	< 0.005 U
Perfluorohexanoic acid (PFHxA)	NC	NC	NC	NC		< 1.1 U	0.013	1.52	0.0672	1.77	0.0765
Perfluorotetradecanoic acid (PFTA)	NC	NC	NC	NC		< 1.1 U	< 0.00185 U	< 1.1 U	< 0.00182 U	< 0.97 U	< 0.005 U
Perfluorotridecanoic Acid (PFTriA)	NC	NC	NC	NC		< 1.1 U	< 0.00185 U	7.26	0.0026	< 0.97 U	< 0.005 U
Perfluoroundecanoic Acid (PFUnA)	NC	NC	NC	NC		< 1.1 U	< 0.00185 U	60.2	0.0534	4.24	0.00735

Parameters	Shallow & Deep Co-Located Samples				Shallow & Deep Co-Located Samples			
Sample ID	GZ-21	GZ-21	GZ-D-17	GZ-D-17	GZ-22	GZ-22	GZ-D-18	GZ-D-18
Depth Interval	GZ-21 (0.5-2')	GZ-21 (0.5-2')	GZ-D-17(4-6')	GZ-D-17(4-6')	GZ-22 (0.5-2')	GZ-22 (0.5-2')	GZ-D-18(4-6')	GZ-D-18(4-6')
Date Sampled	07/16/2020	07/16/2020	07/17/2020	07/17/2020	07/16/2020	07/16/2020	07/20/2020	07/20/2020
Units	ug/Kg	ug/L	ug/Kg	ug/L	ug/Kg	ug/L	ug/Kg	ug/L
Analysis Type	N	SPLP	N	SPLP	N	SPLP	N	SPLP
Perfluorooctanoic acid (PFOA)	4.88	0.109	< 1.06 U	0.0284	< 0.988 U	0.0132	1.33	0.0373
Perfluorooctanesulfonic acid (PFOS)	30	0.122	15.8	0.157	1.86	0.0091	1.1	0.00707
Perfluorononanoic acid (PFNA)	9.62	0.116	3.63	0.0634	< 0.988 U	0.0162	< 1.01 U	0.0101
Perfluoroheptanoic acid (PFHpA)	1.89	0.063	< 1.06 U	0.022	< 0.988 U	0.00743	< 1.01 U	0.0242
Perfluorohexanesulfonic acid (PFHxS)	1.71	0.0445 F	< 1.06 U	0.016 F	< 0.988 U	0.0029 F	< 1.01 U	0.00942
Sum of PFAS Compounds	**48.10**	0.45	**19.43**	0.29	**1.86**	0.05	**2.43**	0.09
Other PFAS Compounds Not on APS List								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	< 1.18 U	< 0.00185 U	< 1.06 U	< 0.00179 U	< 0.988 U	< 0.00182 U	< 1.01 U	< 0.00177 U
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	< 1.18 U	< 0.00185 U	< 1.06 U	< 0.00179 U	< 0.988 U	< 0.00182 U	< 1.01 U	< 0.00177 U
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	< 1.18 U	< 0.00185 U	< 1.06 U	< 0.00179 U	< 0.988 U	< 0.00182 U	< 1.01 U	< 0.00177 U
Hexafluoropropylene oxide dimer acid (GenX)	< 11.8 U	< 0.0463 U	< 10.6 U	< 0.0447 U	< 9.88 U	< 0.0456 U	< 10.1 U	< 0.0442 U
N-ethylperfluoro-1-octanesulfonamidoacetic acid (NetFOSAA)	< 1.18 U	< 0.00185 U	< 1.06 U	< 0.00179 U	< 0.988 U	< 0.00182 U	< 1.01 U	< 0.00177 U
N-methylperfluoro-1-octanesulfonamidoacetic acid (NMeFOSAA)	< 1.18 U	< 0.00185 U	< 1.06 U	< 0.00179 U	< 0.988 U	< 0.00182 U	< 1.01 U	< 0.00177 U
Perfluorobutanesulfonic acid (PFBS)	< 1.18 U	0.00209	< 1.06 U	< 0.00179 U	< 0.988 U	< 0.00182 U	< 1.01 U	< 0.00177 U
Perfluorodecanoic acid (PFDA)	4.62	0.0165	1.16	0.00802	< 0.988 U	0.00348	< 1.01 U	< 0.00177 U
Perfluorododecanoic acid (PFDoA)	< 1.18 U	< 0.00185 U	< 1.06 U	< 0.00179 U	< 0.988 U	< 0.00182 U	< 1.01 U	< 0.00177 U
Perfluorohexanoic acid (PFHxA)	< 1.18 U	0.0428	< 1.06 U	0.0158	< 0.988 U	0.00578	< 1.01 U	0.0172
Perfluorotetradecanoic acid (PFTA)	< 1.18 U	< 0.00185 U	< 1.06 U	< 0.00179 U	< 0.988 U	< 0.00182 U	< 1.01 U	< 0.00177 U
Perfluorotridecanoic Acid (PFTriA)	1.31	< 0.00185 U	< 1.06 U	< 0.00179 U	< 0.988 U	< 0.00182 U	< 1.01 U	< 0.00177 U
Perfluoroundecanoic Acid (PFUnA)	7.58	0.00544	1.11	< 0.00179 U	< 0.988 U	< 0.00182 U	< 1.01 U	< 0.00177 U

Parameters	RSR - APS Criteria R-DEC	RSR - APS Criteria I/C-DEC	RSR - APS Criteria GA-PMC	RSR - APS Criteria 10X GWPC	Location	Shallow & Deep Co-Located Samples		Shallow & Deep Co-Located Samples		Shallow & Deep Co-Located Samples	
					Sample ID	GZ-30	GZ-D-30	GZ-31	GZ-D-31	GZ-32	GZ-D-32
					Depth Interval	GZ-30 (0.5-2.0')	GZ-D-30 (4-6')	GZ-31 (0.5-2.0')	GZ-D-31 (4-6')	GZ-32 (0.5-2.0')	GZ-D-32 (5-7')
	R-DEC	I/C-DEC	GA-PMC	10X GWPC	Date Sampled	08/24/2020	08/24/2020	08/24/2020	08/24/2020	08/24/2020	08/24/2020
	Total Mass	Total Mass	Total Mass	SPLP	Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
CT DEEP Additional Polluting Substances (APS) for PFAS	µg/Kg	µg/Kg	µg/Kg	µg/L	Analysis Type	SPLP	SPLP	SPLP	SPLP	SPLP	SPLP
Perfluorooctanoic acid (PFOA)	Sum of 5-PFAS Compounds	Sum of 5-PFAS Compounds	Sum of 5-PFAS Compounds	Sum of 5-PFAS Compounds		0.0975	0.00215	0.0516	0.0051	0.013	0.00405
Perfluorooctanesulfonic acid (PFOS)						0.103	0.0364	0.00683	0.00331	0.00464	0.0224
Perfluorononanoic acid (PFNA)						0.028	0.0111	0.0702	0.00461	0.0217	< 0.00179 U
Perfluoroheptanoic acid (PFHpA)						0.154	0.00311	0.0346	0.0119	0.0138	0.00623
Perfluorohexanesulfonic acid (PFHxS)						0.225	0.00595	0.00779	0.00347	0.026	0.036
Sum of PFAS Compounds	**1,350**	**41,000**	**1.4**	**0.70**		0.61	0.06	0.17	0.03	0.08	0.07
Other PFAS Compounds Not on APS List											
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	NC	NC	NC	NC		< 0.00191 U	< 0.0019 U	< 0.00184 U	< 0.00182 U	< 0.0019 U	< 0.00179 U
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	NC	NC	NC	NC		< 0.00191 U	< 0.0019 U	< 0.00184 U	< 0.00182 U	< 0.0019 U	< 0.00179 U
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	NC	NC	NC	NC		< 0.00191 U	< 0.0019 U	< 0.00184 U	< 0.00182 U	< 0.0019 U	< 0.00179 U
Hexafluoropropylene oxide dimer acid (GenX)	NC	NC	NC	NC		< 0.0477 U	< 0.0475 U	< 0.046 U	< 0.0456 U	< 0.0474 U	< 0.0448 U
N-ethylperfluoro-1-octanesulfonamidoacetic acid (NetFOSAA)	NC	NC	NC	NC		< 0.00191 U	< 0.0019 U	< 0.00184 U	< 0.00182 U	< 0.0019 U	< 0.00179 U
N-methylperfluoro-1-octanesulfonamidoacetic acid (NMeFOSAA)	NC	NC	NC	NC		< 0.00191 U	< 0.0019 U	< 0.00184 U	< 0.00182 U	< 0.0019 U	< 0.00179 U
Perfluorobutanesulfonic acid (PFBS)	NC	NC	NC	NC		< 0.00191 U	< 0.0019 U	< 0.00184 U	< 0.00182 U	< 0.0019 U	0.00687
Perfluorodecanoic acid (PFDA)	NC	NC	NC	NC		< 0.00191 U	< 0.0019 U	0.00386	< 0.00182 U	< 0.0019 U	< 0.00179 U
Perfluorododecanoic acid (PFDoA)	NC	NC	NC	NC		< 0.00191 U	< 0.0019 U	< 0.00184 U	< 0.00182 U	< 0.0019 U	< 0.00179 U
Perfluorohexanoic acid (PFHxA)	NC	NC	NC	NC		0.139	0.00372	0.0207	0.00485	0.0134	0.0142
Perfluorotetradecanoic acid (PFTA)	NC	NC	NC	NC		< 0.00191 U	< 0.0019 U	< 0.00184 U	< 0.00182 U	< 0.0019 U	< 0.00179 U
Perfluorotridecanoic Acid (PFTriA)	NC	NC	NC	NC		< 0.00191 U	< 0.0019 U	< 0.00184 U	< 0.00182 U	< 0.0019 U	< 0.00179 U
Perfluoroundecanoic Acid (PFUnA)	NC	NC	NC	NC		< 0.00191 U	< 0.0019 U	< 0.00184 U	< 0.00182 U	< 0.0019 U	< 0.00179 U

Parameters	Shallow & Deep Co-Located Samples		Shallow & Deep Co-Located Samples		Shallow & Deep Co-Located Samples		Shallow
Sample ID	GZ-33	GZ-D-33	GZ-34	GZ-D-34	GZ-35	GZ-D-35	GZ-36
Depth Interval	GZ-33 (0.5-2.0')	GZ-D-33 (4-5.5')	GZ-34 (0.5-2.0')	GZ-D-34 (4-6')	GZ-35 (0.5-2.0')	GZ-D-35 (4-6')	GZ-36 (0.5-2.0')
Date Sampled	08/24/2020	08/24/2020	08/24/2020	08/24/2020	08/24/2020	08/24/2020	08/24/2020
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/Kg
Analysis Type	SPLP	SPLP	SPLP	SPLP	SPLP	SPLP	N
Perfluorooctanoic acid (PFOA)	0.0756	0.0217	0.128	0.00742	0.0587	0.0261	4.35
Perfluorooctanesulfonic acid (PFOS)	3.09	0.951	2.66	0.254	1.04	0.148	2.23 F
Perfluorononanoic acid (PFNA)	0.23	0.12	0.298	0.0137	0.231	0.0452	< 1.03 U
Perfluoroheptanoic acid (PFHpA)	0.0888	0.0227	0.121	0.00734	0.0526	0.0267	5.38
Perfluorohexanesulfonic acid (PFHxS)	0.404	0.138	0.277	0.0484	0.0957	0.0297	4.18 F
Sum of PFAS Compounds	**3.89**	**1.25**	**3.48**	0.33	**1.48**	0.28	**16.14**
Other PFAS Compounds Not on APS List							
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	< 0.00188 U	< 0.00182 U	< 0.0019 U	< 0.00178 U	< 0.0175 U	< 0.0019 U	< 1.03 U
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	< 0.00188 U	< 0.00182 U	< 0.0019 U	< 0.00178 U	< 0.0175 U	< 0.0019 U	< 1.03 U
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	< 0.00188 U	< 0.00182 U	< 0.0019 U	< 0.00178 U	< 0.0175 U	< 0.0019 U	< 1.03 U
Hexafluoropropylene oxide dimer acid (GenX)	< 0.0471 U	< 0.0456 U	< 0.0476 U	< 0.0445 U	< 0.437 U	< 0.0476 U	< 10.3 U
N-ethylperfluoro-1-octanesulfonamidoacetic acid (NetFOSAA)	< 0.00188 U	< 0.00182 U	< 0.0019 U	< 0.00178 U	< 0.0175 U	< 0.0019 U	< 1.03 U
N-methylperfluoro-1-octanesulfonamidoacetic acid (NMeFOSAA)	< 0.00188 U	< 0.00182 U	< 0.0019 U	< 0.00178 U	< 0.0175 U	< 0.0019 U	< 10.3 U
Perfluorobutanesulfonic acid (PFBS)	0.00741	0.00466	0.00226	< 0.00178 U	< 0.0175 U	< 0.0019 U	< 1.03 U
Perfluorodecanoic acid (PFDA)	0.0685	0.0272	0.0295	< 0.00178 U	< 0.0175 U	< 0.0019 U	< 1.03 U
Perfluorododecanoic acid (PFDoA)	< 0.00188 U	< 0.00182 U	< 0.0019 U	< 0.00178 U	< 0.0175 U	< 0.0019 U	< 1.03 U
Perfluorohexanoic acid (PFHxA)	0.106	0.0261	0.0819	0.0067	0.0406	0.0263	5.29
Perfluorotetradecanoic acid (PFTA)	< 0.00188 U	< 0.00182 U	< 0.0019 U	< 0.00178 U	< 0.0175 U	< 0.0019 U	< 1.03 U
Perfluorotridecanoic Acid (PFTriA)	< 0.00188 U	< 0.00182 U	< 0.0019 U	< 0.00178 U	< 0.0175 U	< 0.0019 U	< 1.03 U
Perfluoroundecanoic Acid (PFUnA)	0.00603	0.00704	0.00443	< 0.00178 U	< 0.0175 U	< 0.0019 U	< 1.03 U

Notes

> RDEC: Residential Direct Exposure Criterion
> I/C DEC: Industrial/Commercial Direct Exposure Criterion
> GA-PMC: GA Pollutant Mobility Criterion
> 10x GWPC - 10 times the Groundwater Pollution Criteria
> NC-No Criteria
> µg/Kg- micro-grams per kilogram or parts per billion (ppb)
> µg/L - micro-grams per kilogram or parts per billion (ppb)

> Bold - Green cells indicates exceedance of GA-PMC
> A red cell indicates Residential Direct Exposure Criterion Exceedance
> A highlighted cell indicates Industrial/ Commerical Direct Exposure Criterion Exceedance
> Bold - Blue Cell indicates exceedance of the 10X GWPC
> J- Estimated value
> U- Not detected, below Method Detection Limit
> N - total mass analyses
> SPLP - Synthetic Precipitation Leaching Procedure

Table 3
Southern Field - Soil Sampling Data
Cherry Brook Elementary School
Canton, Connecticut

Parameters	RSR - APS Criteria				Location	Shallow & Deep Co-Located Samples												Shallow & Deep Co-Located Samples												Shallow		Shallow & Deep Co-Located Samples											
					Sample ID	GZ-8		GZ-D-9		GZ-D-12		GZ-D-12		GZ-9		GZ-D-7		GZ-10		GZ-11		GZ-D-10		GZ-D-10		GZ-12		GZ-12R		GZ-12R		GZ-D-8	
					Depth Interval	GZ-8 (0-3')		GZ-D-9 (3-5')		GZ-D-12(4-6')		GZ-D-12(4-6')		GZ-9 (0-3")		GZ-D-7 (3-5')		GZ-10 (0-3")		GZ-11 (0-3")		GZ-D-10(4-6')		GZ-D-10(4-6')		GZ-12 (0-3')		GZ-12R (0.5-2")		GZ-12R (0.5-2")		GZ-D-8 (3-5')	
	R-DEC	I/C-DEC	GA-PMC	10X GWPC	Date Sampled	02/17/2020		03/31/2020		07/16/2020		07/16/2020		02/17/2020		03/31/2020		02/17/2020		02/17/2020		07/16/2020		07/16/2020		02/17/2020		07/16/2020		07/16/2020		03/31/2020	
	Total Mass	Total Mass	Total Mass	SPLP	Units	ug/Kg		ug/Kg		ug/Kg		ug/L		ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/L		ug/Kg		ug/Kg		ug/L		ug/Kg	
CT DEEP Additional Polluting Substances (APS) for PFAS	µg/Kg	µg/Kg	µg/Kg	µg/L	Analysis Type	N		N		N		SPLP		N		N		N		N		N		SPLP		N		N		SPLP		N	
Perfluorooctanoic acid (PFOA)						< 1.3	U	0.74	J	< 1.08	U	0.0111		0.34	J	0.41	J	< 1.2	U	0.4	J	< 1	U	0.0133		0.58	J	< 0.982	U	< 0.005	U	< 1.1	U
Perfluorooctanesulfonic acid (PFOS)	Sum of	Sum of	Sum of	Sum of		< 1.3	U	< 1.3	U	< 1.2	U	0.00913		< 1.2	U	0.66	J	< 1.2	U	0.38	J	< 1	U	0.00984		1.8		< 0.982	U	0.0056	J	< 1.1	U
Perfluorononanoic acid (PFNA)	5-PFAS	5-PFAS	5-PFAS	5-PFAS		< 1.3	U	0.48	J	< 1.08	U	< 0.005	U	0.35	J	< 1.2	U	< 1.2	U	0.33	J	< 1	U	< 0.005	U	0.52	J	< 0.982	U	< 0.005	U	< 1.1	U
Perfluoroheptanoic acid (PFHpA)	Compounds	Compounds	Compounds	Compounds		< 1.3	U	0.28	J	< 1.08	U	< 0.005	U	< 1.3	U	< 1.2	U	< 1.2	U	< 1.3	U	< 1	U	< 0.005	U	0.28	J	< 0.982	U	< 0.005	U	< 1.1	U
Perfluorohexanesulfonic acid (PFHxS)						< 1.3	U	< 1.3	U	< 1.08	U	< 0.005	U	< 1.3	U	< 1.2	U	< 1.2	U	< 1.3	U	< 1	U	< 0.005	U	< 1.3	U	< 0.982	U	< 0.005	U	< 1.1	U
Sum of PFAS Compounds	**1,350**	**41,000**	**1.4**	**0.70**		**1.10**		**2.80**		**1.42**		0.02		**1.89**		**1.07**		0.38		**1.34**		0.00		0.02		**2.98**		0.00		0.01		0.00	
Other PFAS Compounds Not on APS List																																	
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	NC	NC	NC	NC		< 2.7	U	< 2.5	U	< 1.08	U	< 0.005	U	< 2.6	U	< 2.4	U	< 2.3	U	< 2.6	U	< 1	U	< 0.005	U	< 2.6	U	< 0.982	U	< 0.005	U	< 2.3	U
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	NC	NC	NC	NC		< 2.7	U	< 2.5	U	< 1.08	U	< 0.005	U	< 2.6	U	< 2.4	U	< 2.3	U	< 2.6	U	< 1	U	< 0.005	U	< 2.6	U	< 0.982	U	< 0.005	U	< 2.3	U
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	NC	NC	NC	NC		< 2.7	U	< 2.5	U	< 1.08	U	< 0.005	U	< 2.6	U	< 2.4	U	< 2.3	U	< 2.6	U	< 1	U	< 0.005	U	< 2.6	U	< 0.982	U	< 0.005	U	< 2.3	U
Hexafluoropropylene oxide dimer acid (GenX)	NC	NC	NC	NC		< 5.3	U	< 5	U	< 10.8	U	< 0.125	U	< 5.1	U	< 4.8	U	< 4.7	U	< 5.1	U	< 10	U	< 0.125	U	< 5.2	U	< 9.82	U	< 0.125	U	< 4.6	U
N-ethylperfluoro-1-octanesulfonamidoacetic acid (NEtFOSAA)	NC	NC	NC	NC		< 1.3	U	< 1.3	U	< 1.08	U	< 0.005	U	< 1.3	U	< 1.2	U	< 1.2	U	< 1.3	U	< 1	U	< 0.005	U	< 1.3	U	< 0.982	U	< 0.005	U	< 1.1	U
N-methylperfluoro-1-octanesulfonamidoacetic acid (NMeFOSAA)	NC	NC	NC	NC		< 1.3	U	< 1.3	U	< 1.08	U	< 0.005	U	< 1.2	U	< 1.2	U	< 1.2	U	< 1.3	U	< 1	U	< 0.005	U	< 1.3	U	< 0.982	U	< 0.005	U	< 1.1	U
Perfluorobutanesulfonic acid (PFBS)	NC	NC	NC	NC		< 1.3	U	< 1.3	U	< 1.08	U	< 0.005	U	< 1.3	U	< 1.2	U	< 1.2	U	0.24	J	< 1	U	< 0.005	U	< 1.3	U	< 0.982	U	< 0.005	U	< 1.1	U
Perfluorododecanoic acid (PFDoA)	NC	NC	NC	NC		0.45	J	0.43	J	< 1.08	U	< 0.005	U	0.38	J	< 1.2	U	< 1.2	U	0.37	J	< 1	U	< 0.005	U	0.51	J	< 0.982	U	< 0.005	U	< 1.1	U
Perfluorotetradecanoic acid (PFTA)	NC	NC	NC	NC		< 1.3	U	0.28	J	< 1.08	U	< 0.005	U	< 1.3	U	< 1.2	U	< 1.2	U	< 1.3	U	< 1	U	< 0.005	U	< 1.3	U	< 0.982	U	< 0.005	U	< 1.1	U
Perfluorohexanoic acid (PFHxA)	NC	NC	NC	NC		< 1.3	U	0.33	J	< 1.08	U	0.00508		< 1.3	U	< 1.2	U	< 1.2	U	< 1.3	U	< 1	U	< 0.005	U	< 1.3	U	< 0.982	U	< 0.005	U	< 1.1	U
Perfluorotetradecanoic acid (PFTA)	NC	NC	NC	NC		< 1.3	U	< 1.3	U	< 1.08	U	< 0.005	U	< 1.3	U	< 1.2	U	< 1.2	U	< 1.3	U	< 1	U	< 0.005	U	< 1.3	U	< 0.982	U	< 0.005	U	< 1.1	U
Perfluorotridecanoic Acid (PFTrDA)	NC	NC	NC	NC		< 1.3	U	< 1.3	U	< 1.08	U	< 0.005	U	< 1.3	U	< 1.2	U	< 1.2	U	< 1.3	U	< 1	U	< 0.005	U	< 1.3	U	< 0.982	U	< 0.005	U	< 1.1	U
Perfluoroundecanoic Acid (PFUnA)	NC	NC	NC	NC		< 1.3	U	0.28	J	< 1.08	U	< 0.005	U	0.32	J	< 1.2	U	< 1.2	U	0.34	J	< 1	U	< 0.005	U	0.26	J	< 0.982	U	< 0.005	U	< 1.1	U

Parameters	RSR - APS Criteria				Location	Deep				Shallow				Shallow				Shallow	Southern Field
					Sample ID	GZ-D-11	GZ-D-11	GZ-D-11	GZ-D-11	GZ-23	GZ-23	GZ-23	GZ-23	GZ-24	GZ-24	GZ-24	GZ-24	GZ-37	GZ-37
					Depth Interval	GZ-D-11(4-6')	GZ-D-11(4-6')	GZ-D-11(4-6')	GZ-D-11(4-6')	GZ-23 (0.5-2)	GZ-23 (0.5-2)	GZ-23 (0.5-2)	GZ-23 (0.5-2)	GZ-24 (0.5-2)	GZ-24 (0.5-2)	GZ-24 (0.5-2)	GZ-24 (0.5-2)	GZ-37 (1.0-2.0)	GZ-37
	R-DEC	I/C-DEC	GA-PMC	10X GWPC	Date Sampled	07/16/2020	07/16/2020	07/16/2020	07/16/2020	07/16/2020	07/16/2020	07/16/2020	07/16/2020	07/16/2020	07/16/2020	07/16/2020	07/16/2020	08/24/2020	08/24/2020
	Total Mass	Total Mass	Total Mass	SPLP	Units	ug/Kg	ug/Kg	ug/L	ug/L	ug/Kg	ug/Kg	ug/L	ug/L	ug/Kg	ug/Kg	ug/L	ug/L	ug/Kg	ug/Kg
CT DEEP Additional Polluting Substances (APS) for PFAS	µg/Kg	µg/Kg	µg/Kg	µg/L	Analysis Type	N	N	SPLP	SPLP	N	N	SPLP	SPLP	N	N	SPLP	SPLP	N	N
Perfluorooctanoic acid (PFOA)						< 1.05	U	0.00948		< 1.01	U	< 0.005	U	< 1.1	U	0.0188		< 1.07	U
Perfluorooctanesulfonic acid (PFOS)	Sum of	Sum of	Sum of	Sum of		< 1.05	U	0.0134		< 1.01	U	< 0.005	U	2.82		0.00955		2.06	F
Perfluorononanoic acid (PFNA)	5-PFAS	5-PFAS	5-PFAS	5-PFAS		< 1.05	U	< 0.005	U	< 1.01	U	< 0.005	U	< 1.1	U	0.00909		< 1.07	U
Perfluoroheptanoic acid (PFHpA)	Compounds	Compounds	Compounds	Compounds		< 1.05	U	< 0.005	U	< 1.01	U	< 0.005	U	< 1.1	U	0.0105		< 1.07	U
Perfluorohexanesulfonic acid (PFHxS)						< 1.05	U	< 0.005	U	< 1.01	U	< 0.005	U	< 1.1	U	< 0.005	U	< 1.07	U
Sum of PFAS Compounds	**1,350**	**41,000**	**1.4**	**0.70**		0.00		0.02		0.00		0.00		**2.82**		0.05		**2.06**	
Other PFAS Compounds Not on APS List																			
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	NC	NC	NC	NC		< 1.05	U	< 0.005	U	< 1.01	U	< 0.005	U	< 1.1	U	< 0.005	U	< 1.07	U
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	NC	NC	NC	NC		< 1.05	U	< 0.005	U	< 1.01	U	< 0.005	U	< 1.1	U	< 0.005	U	< 1.07	U
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	NC	NC	NC	NC		< 1.05	U	< 0.005	U	< 1.01	U	< 0.005	U	< 1.1	U	< 0.005	U	< 1.07	U
Hexafluoropropylene oxide dimer acid (GenX)	NC	NC	NC	NC		< 10.5	U	< 0.125	U	< 10.1	U	< 0.125	U	< 11	U	< 0.125	U	< 10.7	U
N-ethylperfluoro-1-octanesulfonamidoacetic acid (NEtFOSAA)	NC	NC	NC	NC		< 1.05	U	< 0.005	U	< 1.01	U	< 0.005	U	< 1.1	U	< 0.005	U	< 1.07	U
N-methylperfluoro-1-octanesulfonamidoacetic acid (NMeFOSAA)	NC	NC	NC	NC		< 1.05	U	< 0.005	U	< 1.01	U	< 0.005	U	< 1.1	U	< 0.005	U	< 1.07	U
Perfluorobutanesulfonic acid (PFBS)	NC	NC	NC	NC		< 1.05	U	< 0.005	U	< 1.01	U	< 0.005	U	< 1.1	U	< 0.005	U	< 1.07	U
Perfluorododecanoic acid (PFDoA)	NC	NC	NC	NC		< 1.05	U	< 0.005	U	< 1.01	U	< 0.005	U	< 1.1	U	< 0.005	U	< 1.07	U
Perfluorotetradecanoic acid (PFTA)	NC	NC	NC	NC		< 1.05	U	< 0.005	U	< 1.01	U	< 0.005	U	< 1.1	U	< 0.005	U	< 1.07	U
Perfluorotridecanoic Acid (PFTrDA)	NC	NC	NC	NC		< 1.05	U	< 0.005	U	< 1.01	U	< 0.005	U	< 1.1	U	< 0.005	U	< 1.07	U
Perfluoroundecanoic Acid (PFUnA)	NC	NC	NC	NC		< 1.05	U	< 0.005	U	< 1.01	U	< 0.005	U	< 1.1	U	< 0.005	U	< 1.07	U

Notes

> RDEC: Residential Direct Exposure Criterion
> I/C DEC: Industrial/Commerical Direct Exposure Criterion
> GA-PMC: GA Pollutant Mobility Criterion
> 10x GWPC - 10 times the Groundwater Pollution Criteria
> NC-No Criteria
> µg/Kg- micro-grams per kilogram or parts per billion (ppb)
> µg/L - micro-grams per kilogram or parts per billion (ppb)

> Bold - Green cells indicates exceedance of GA-PMC
> A red cell indicates Residential Direct Exposure Criterion Exceedance
> A highlighted cell indicates Industrial/ Commerical Direct Exposure Criterion Exceedance
> Bold - Blue Cell indicates exceedance of the 10X GWPC
> J- Estimated value
> U- Not detected, below Method Detection Limit
> N - total mass analyses
> SPLP - Synthetic Precipitation Leaching Procedure

Table 4

Well Construction Details

Well	Screen Length	Screen Interval	Depth to Top of Screen	Depth to Bottom of Screen	Reference Elev. (feet)	Grade Elev. (feet)	Top of Screen, Elev. (feet)	Bot Screen, Elev. (feet)	Depth to Water (feet)	GW Elevation (feet)
GZ-1	13	7.0-20.0	7.0	20.0	102.58 Canton CT	103.26	96.26	83.26	9.02	93.56
GZ-2	13	4.5-17.5	4.5	17.5	99.51	99.82	95.32	82.32	5.53	93.98
GZ-3	15	4.3-19.3	4.3	19.3	98.34	99.39	95.09	80.09	5.20	93.14
GZ-4	10	4.5-14.5	4.5	14.5	98.28	98.76	94.26	84.26	5.33	92.95

Notes:

1. Depth to water was measured on the above dates using an electric water level meter.
2. Elevations presented are relative to a selected datum at an assumed elevation of 100 feet, based on a survey completed by GZA on August 3, 2020.
3. The depth to groundwater in Site monitoring wells was measured relative to the top of the PVC riser pipe on August 20, 2020.
4. Monitoring wells are constructed of 2-inch diameter schedule 40 PVC well screen and riser.
5. Depth to groundwater is relative to the top of the PVC riser of the well.

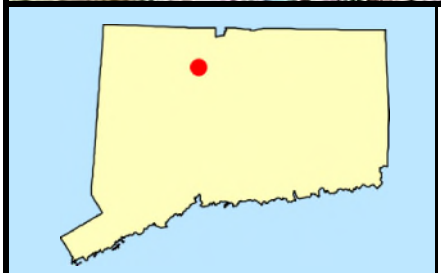
Table 5
Summary of Groundwater Analytical Results
Cherry Brook Elementary School
Canton, Connecticut

Parameter	RSR Criteria	Units	Eastern Field						Southern Field	
			GZ-2		GZ-3		GZ-4		GZ-1	
CT DEEP Additional Polluting Substances (APS) for PFAS	**GWPC**		8/14/2020		8/14/2020		8/14/2020		8/14/2020	
Perfluorooctanoic acid (PFOA)	SUM of - 5 Compounds	ng/L	810		14		260		< 3.8	U
Perfluorooctanesulfonic acid (PFOS)		ng/L	7,800		68		820		1.50	J
Perfluorononanoic acid (PFNA)		ng/L	2,900		24		300		1.40	J
Perfluoroheptanoic acid (PFHpA)		ng/L	1,100		21		320		< 3.8	U
Perfluorohexanesulfonic acid (PFHxS)		ng/L	4,200		33		900		< 3.8	U
Sum of PFAS Compounds	70	ng/L	**16,810**		**160**		**2,600**		3	
Other PFAS Compounds Not on APS List										
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	NC	ng/L	< 7.5	U	< 7.7	U	< 7.7	U	< 7.5	U
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	NC	ng/L	< 7.5	U	< 7.7	U	< 7.7	U	< 7.5	U
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	NC	ng/L	< 7.5	U	< 7.7	U	< 7.7	U	< 7.5	U
Hexafluoropropylene oxide dimer acid (GenX)	NC	ng/L	< 7.5	U	< 7.7	U	< 7.7	U	< 7.5	U
N-ethylperfluoro-1-octanesulfonamidoacetic acid (NetFOSAA)	NC	ng/L	< 7.5	U	< 7.7	U	< 7.7	U	< 7.5	U
N-methylperfluoro-1-octanesulfonamidoacetic acid (NMeFOSAA)	NC	ng/L	< 7.5	U	< 7.7	U	< 7.7	U	< 7.5	U
Perfluorobutanesulfonic acid (PFBS)	NC	ng/L	200		2.30	J	58		< 3.8	U
Perfluorodecanoic acid (PFDA)	NC	ng/L	220		1.40	J	3.50	J	4.10	
Perfluorododecanoic acid (PFDoA)	NC	ng/L	1.00	J	< 3.8	U	< 3.8	U	< 3.8	U
Perfluorohexanoic acid (PFHxA)	NC	ng/L	1,200		29		350		< 3.8	U
Perfluorotetradecanoic acid (PFTA)	NC	ng/L	< 3.8	U	< 3.8	U	< 3.8	U	< 3.8	U
Perfluorotridecanoic Acid (PFTriA)	NC	ng/L	< 3.8	U	< 3.8	U	< 3.8	U	< 3.8	U
Perfluoroundecanoic Acid (PFUnA)	NC	ng/L	110		< 3.8	U	1.10	J	< 3.8	U

Notes:

1. GWPC: Groundwater Protection Criteria
2. Bold cells indicate exceedance of GWPC
3. J- Estimated value
4. U- Not detected, below Method Detection Limit
5. ng/L - nanograms per liter
6. NC-No Criteria

FIGURES



SOURCE : USGS TOPOGRAPHIC QUADRANGLES SCANNED BY THE NATIONAL GEOGRAPHIC SOCIETY & I-CUBED, COPYRIGHT 2011

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SCALE IN FEET

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GZA	PROJ. MGR.: RJD DESIGNED BY: RJD REVIEWED BY: RJD OPERATOR: MJT DATE: 12-10-2019	SITE LOCUS CHERRY BROOK SCHOOL 4 BARBOURTOWN RD CANTON, CONNECTICUT	JOB NO. 05.0046589.00 FIGURE NO. 1

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SCALE IN FEET

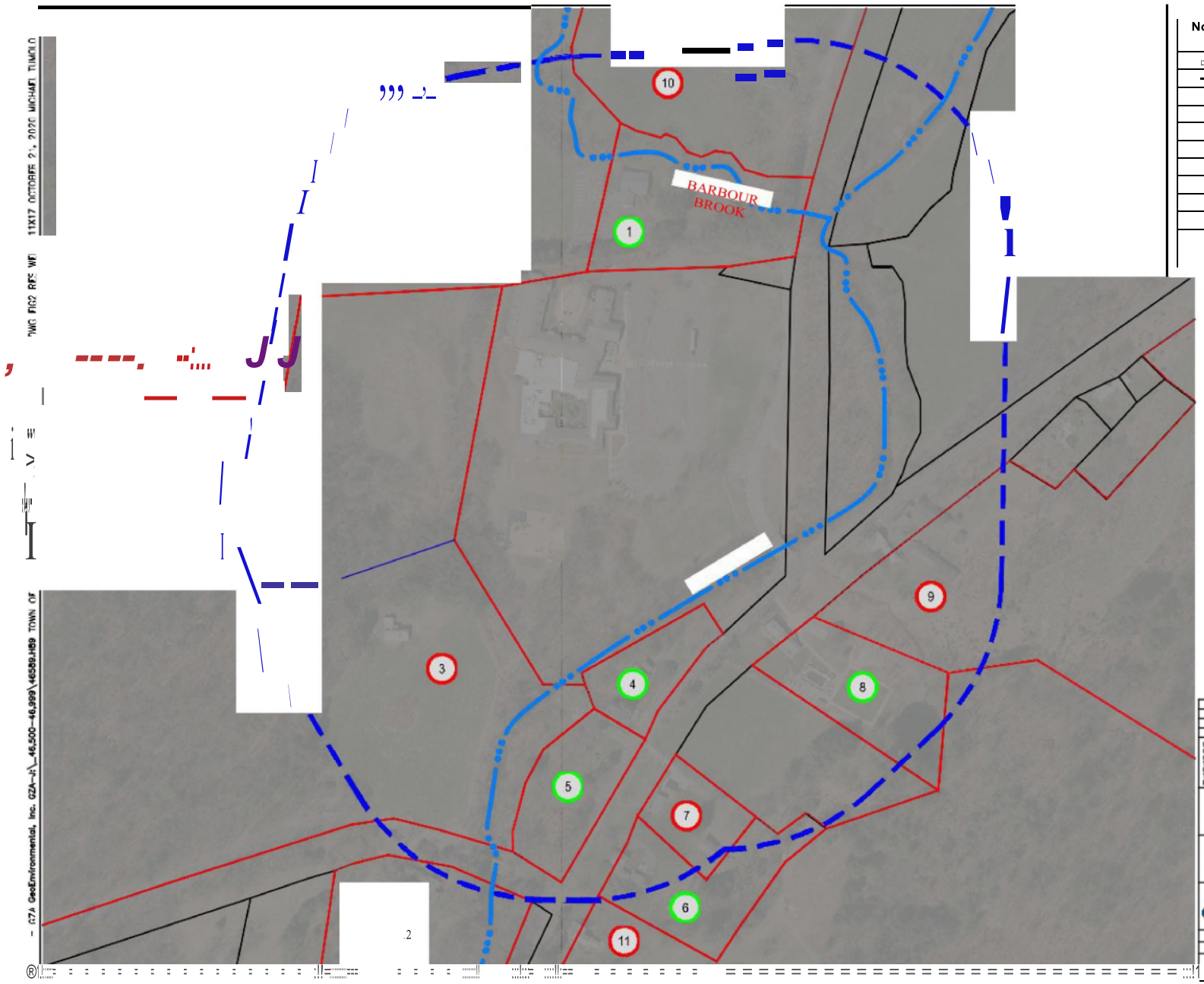
CHERRY BROOK PRIMARY SCHOOL

POTABLE WATER SUPPLY PROPERTIES

PREPARED BY:
GZAGeoEnvironmental, Inc.
Engineers and Scientists
www.gza.com

PREPARED FOR:
TOWN OF CANTON

PROJ MGR: RJD REVIEWED BY: CHECKED BY: RJD FIGURE



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4	214	Che rrv Brook Rd
8	221	Cherry Brook Rd
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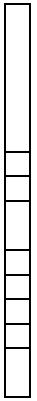

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SCALE IN FEET

CHERRY BROOK PRIMARY SCHOOL

SHALLOW (0 TO 2') SOIL PFAS SAMPLE RESULTS (TOTAL MASS ANALYSIS IN ppb)

CHERRY BROOK

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Engineers and Scientists
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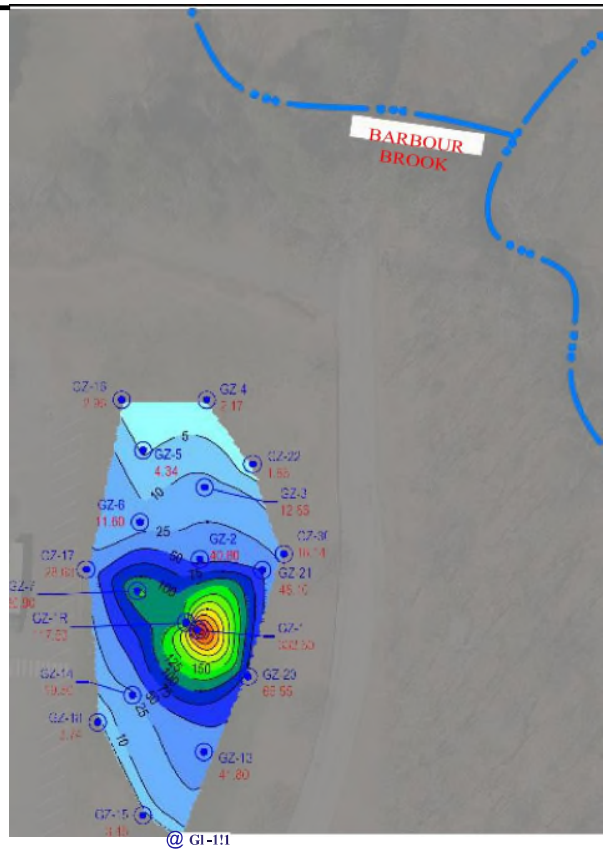
PREPARED FOR:
TOWN OF CANTON

PROJ MGR: RJD REVIEWED BY: CHECKED BY: RJD FIGURE



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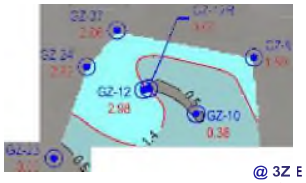

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DATE:

PROJECT NO. 05.0046589.01

REVISION NO.

SHEET NO. 1 OF 1

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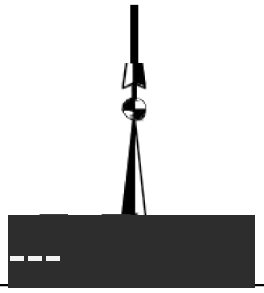

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SCALE IN FEET

CHERRY BROOK PRIMARY SCHOOL

SHALLOW (0-2') SOIL PFAS SAMPLE RESULTS (SPLP ANALYSIS IN ppb)

CHERRY BROOK

SHALLOW CONTOURS

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Engineers and Scientists
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TOWN OF CANTON

PROJ MGR: RJD REVIEWED BY: CHECKED BY: RJD

FIGURE
3A

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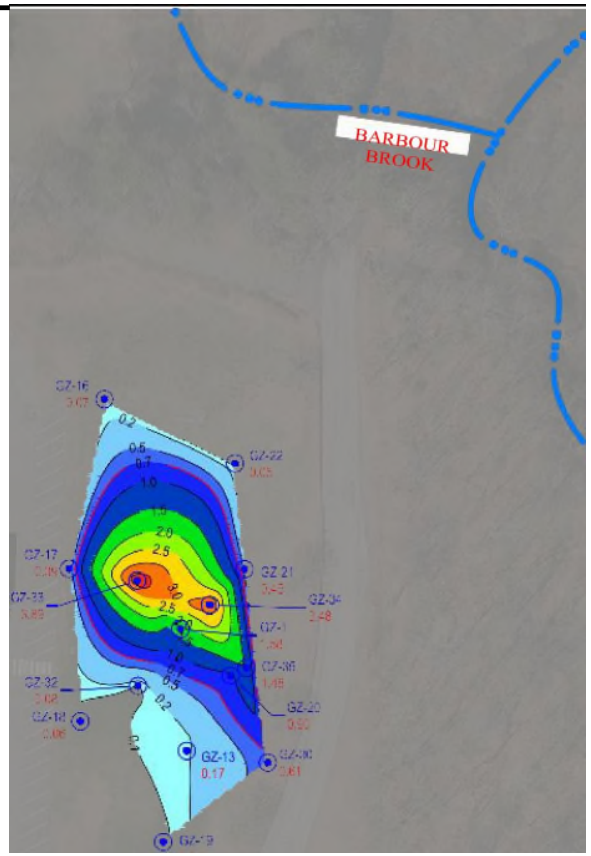

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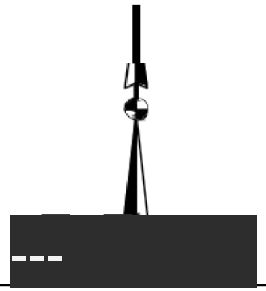

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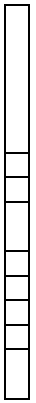
DEEP CONTOURS



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SCALE IN FEET

CHERRY BROOK PRIMARY SCHOOL

DEEP (4' TO 6') SOIL PFAS SAMPLE RESULTS (TOTAL MASS ANALYSIS IN PPB)

CHERRY BROOK

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Engineers and Scientists
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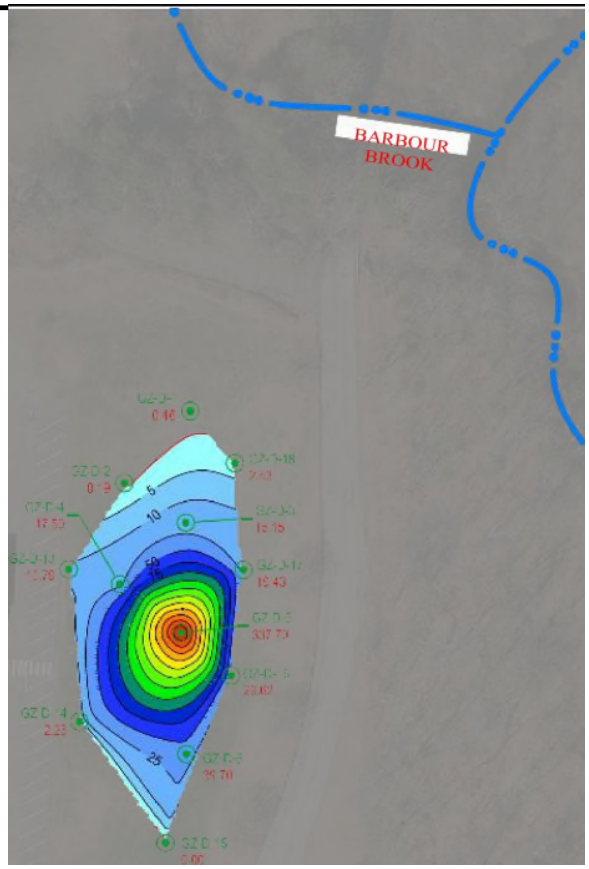
PREPARED FOR:
TOWN OF CANTON

PROJ MGR: RJD REVIEWED BY: CHECKED BY: RJD FIGURE



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DATE: PROJECT NO. REVISION
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SHET NO. 1 OF 1

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8-24-2020


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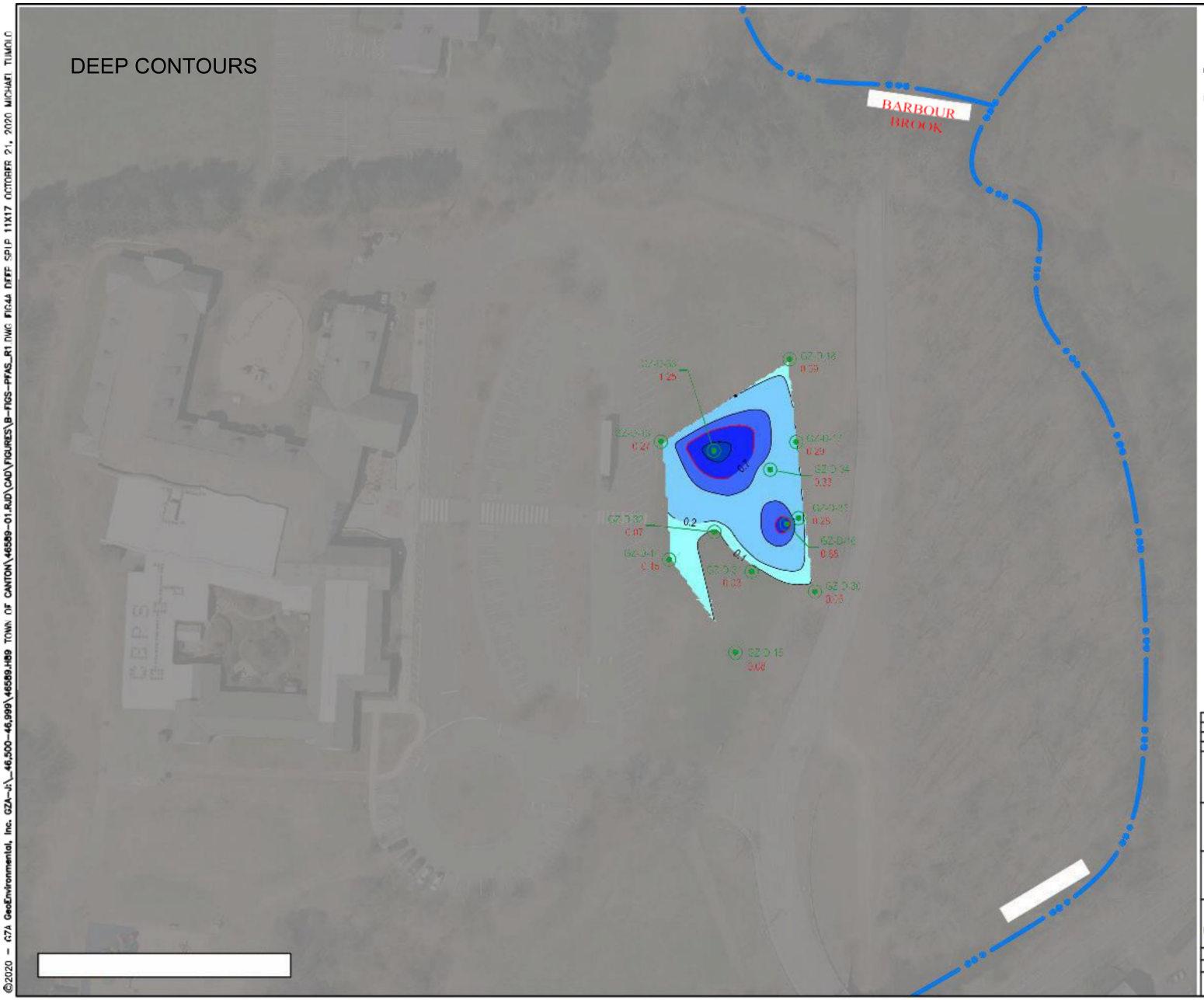
SCALE IN FEET
CHERRY BROOK PRIMARY SCHOOL
DEEP (4'-6') SOIL PFAS SAMPLE RESULTS
(SPLP ANALYSIS IN PPB)
CHERRY BROOK
PREPARED BY:
GZAGeoEnvironmental, Inc.
Engineers and Scientists
www.gza.com
PREPARED FOR:
TOWN OF CANTON
PROJ MGR: RJD
REVIEWED BY:
CHECKED BY: RJD
FIGURE

DEEP CONTOURS



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DEEP SOIL SAMPLES

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DESIGNED BY: DRAWN BY: MJT SCALE: AS SHOWN

DATE: PROJECT NO. 05.0046589.01 REVISION NO.

SHEET NO. 1 OF 1

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NOTES:

1. COLORED CONTOURS REPRESENT THE SUM OF 5-PFAS COMPOUNDS DETECTED IN SOIL IN PARTS PER BILLION (UG/KG). VALUES EXCEEDING 0.7 UG/L ARE GREATER THAN 10X THE GWPC.
2. THE PURPOSE OF THIS DRAWING IS TO LOCATE, DESCRIBE, AND REPRESENT THE POSITIONS OF SOIL BORING AND MONITORING WELL LOCATIONS IN RELATION TO THE SUBJECT SITE. THIS DRAWING IS NOT CONSIDERED A LAND SURVEY.
3. 2016 AERIAL PHOTO OBTAINED FROM CT ECO ONLINE DATABASE
4. LOCATION, ELEVATIONS, DEPTHS AND/OR CONTOURS OF CONTAMINANTS ARE BASED ON DATA FROM WIDELY SPACED EXPLORATIONS AND MAY NOT REFLECT ACTUAL SUBSURFACE CONDITIONS.

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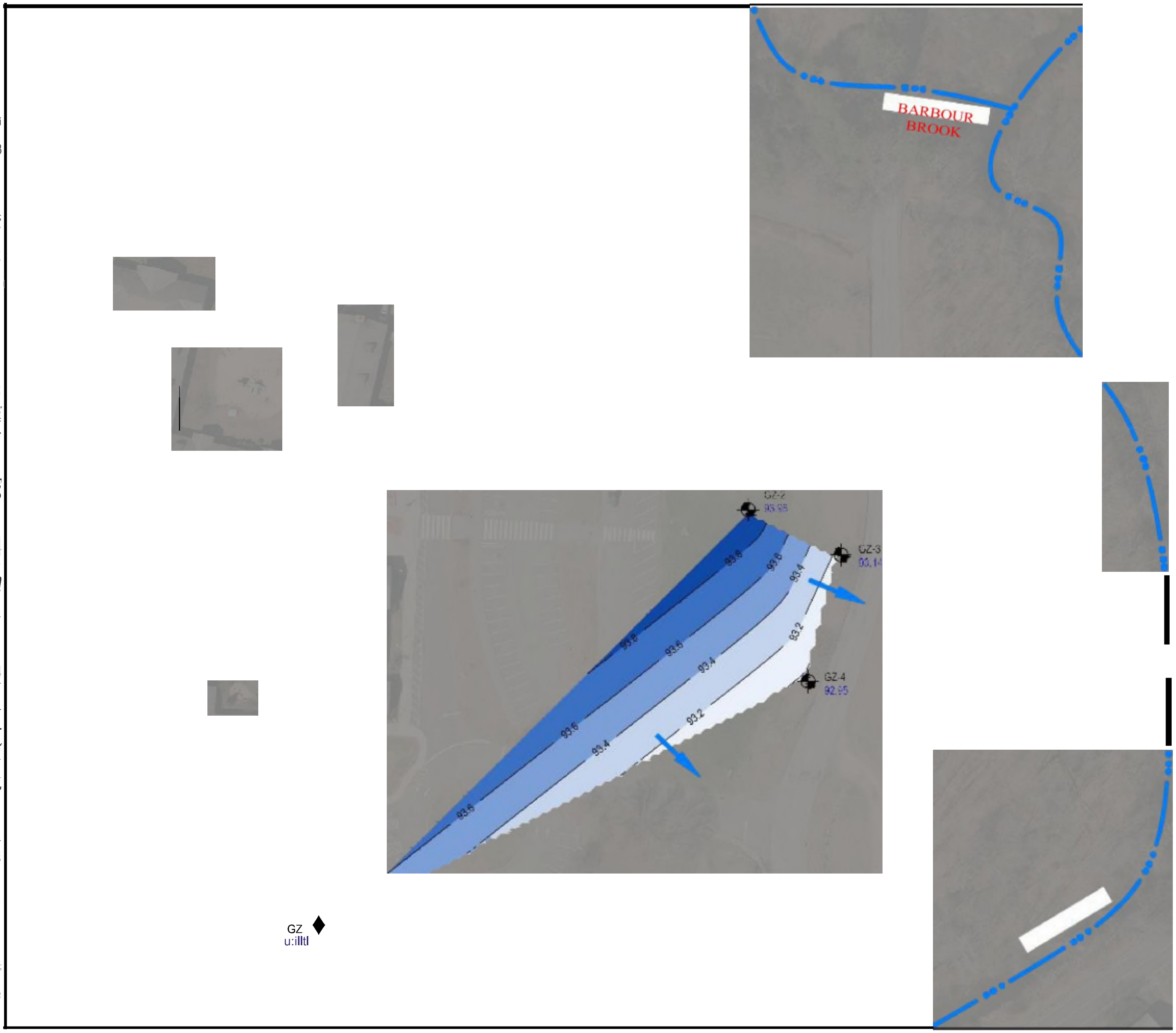
SCALE IN FEET
CHERRY BROOK PRIMARY SCHOOL
CHERRY BROOK
GROUNDWATER FLOW DIRECTION
PREPARED BY:
GZAGeoEnvironmental, Inc.
Engineers and Scientists
www.gza.com
PREPARED FOR:
TOWN OF CANTON
PROJ MGR: RJD
REVIEWED BY:
CHECKED BY: RJD
FIGURE



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CHERRY BROOK PRIMARY SCHOOL

PFAS GROUNDWATER PLUME

CHERRY BROOK

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TOWN OF CANTON

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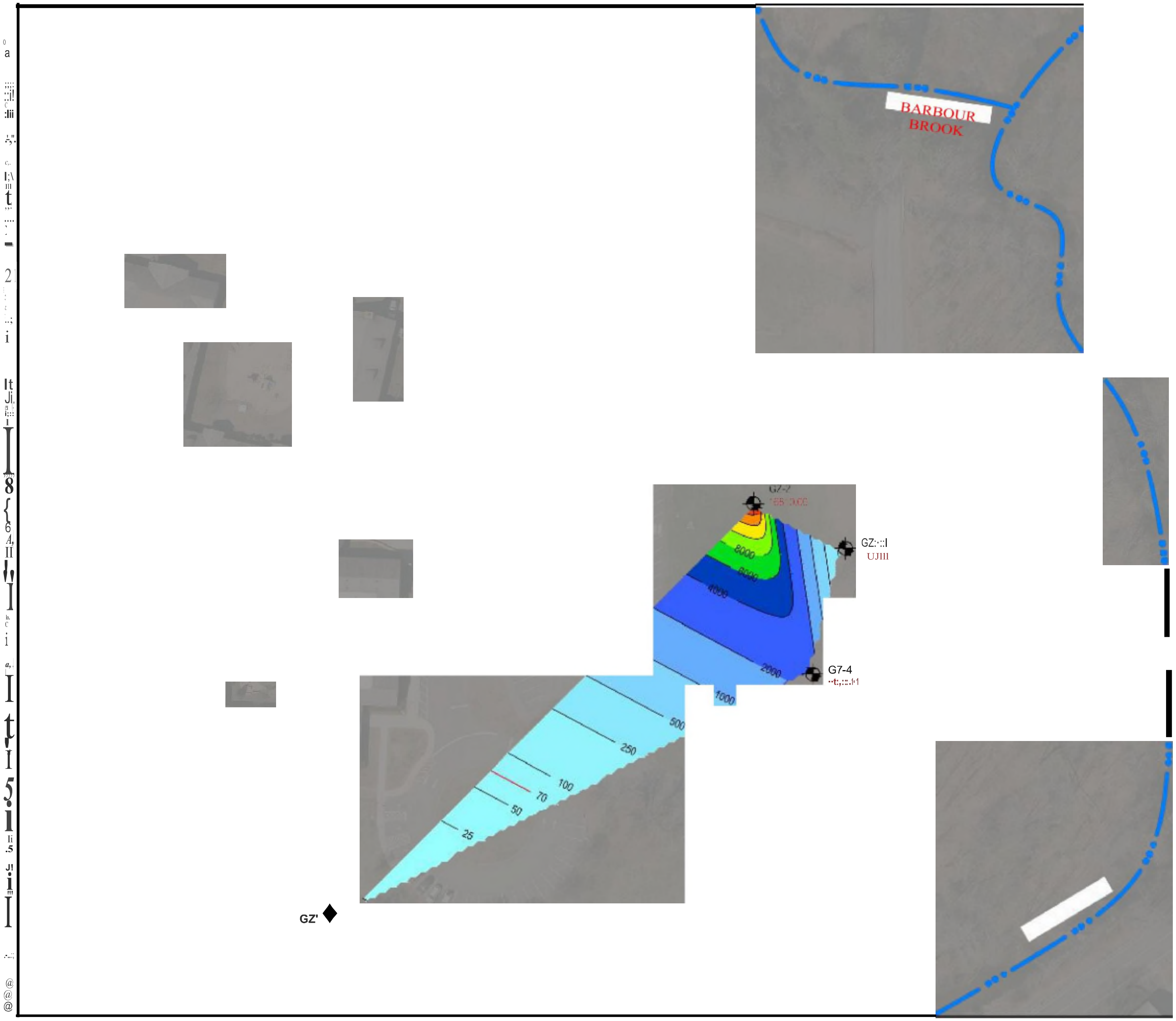

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DATE: PROJECT NO. 05.0046589.01 REVISION SHEET NO. 1 OF 1

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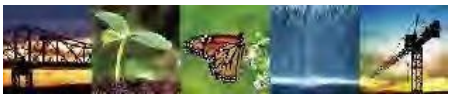

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F: 860.633.5699
www.gza.com

October 26, 2020
File N0. 05.P000250.21

Mr. Robert H. Skinner
Chief Administrative Officer
Canton Town Hall, P.O. Box 168
4 Market Street
Collinsville, CT 06019

RE: Additional Soil & Groundwater Delineation – Change Order No. 02
Cherry Brook Primary School, 4 Barbourtown Road, Canton

Dear Mr. Skinner,

GZA GeoEnvironmental, Inc. (GZA) is pleased to submit this Change Order to the Town of Canton to provide supplemental environmental subsurface investigations to further delineate the extent of a historic fire training release of Aqueous Film Forming Foam (AFFF) containing Per- and Polyfluorinated Alkyl Substances (PFAS) at the Cherry Brook Primary School. These additional services are in response to a Connecticut Department of Energy and Environmental Protection (DEEP) e-mail dated October 8, 2020 requesting that further site characterization, including groundwater investigations be completed. GZA is proposing the following Scope-of-Work:

1) Collection of additional shallow soil samples to further delineate the extent of contamination in the Southern Field. The current data has identified increased concentrations west of the suspected fire-fighting foam release area.
2) Collection of additional shallow and deep soil samples to delineate the extent of soil removal within the Eastern Field. The goal is to further define those limits exceeding a regulatory limit to reduce the volume of soil to be removed. These soil data will also be used to predetermine the excavation limits and avoid the collection of confirmatory soil samples, typically required during remedial excavation activities. From a safety perspective, this will limit the amount of time the excavation is open during the remediation.
3) Installation of groundwater monitoring wells to further define the nature and extent of the groundwater contamination.
4) Collection of surface water samples downgradient of the groundwater plume.
5) Collection of a potable water supply sample from the 225 Cherry Brook Road property, pending permission.
6) Comparing the data to the Remediation Standard Regulations (RSRs) that include Additional Polluting Substance (APS) where criteria for PFAS are listed (Combined, referred to as the RSRs).
7) Collection of hydrogeologic data to develop a Monitored Natural Attenuation remedial approach to the groundwater contamination.
8) Submit a summary report of the subsurface investigations.
9) Develop a remedial action plan and remedial cost estimate.

Background

Historic fire training drills, using AFFF, were performed at two locations at the Cherry Brook Primary School. These locations include: 1) the grassy field area between the school's parking lot and Barbourtown Road (referred to as the "Eastern Field"); and 2) a grassy field south of the school building and north of a playscape (referred to as the "Southern Field").

In DEEP's e-mail (October 8, 2020), the Department concurred with GZA's opinion that soil remedial actions can be limited to those concentrations reported above the GA Pollutant Mobility Criteria (GA-PMC) using an alternative leaching method (SPLP) rather than remediating to a total mass analysis based criteria. The GA-PMC alternative (SPLP analysis) would be 10 x the Groundwater Protection Criteria (GWPC) of 70 ng/L or 700 ng/L (0.7 parts per billion – ppb). Application of this alternative remedial approach has the potential for reducing the volume of excavation from approximately 10,000 cubic yards (cys) to approximately 2,500 cys. This alternative methodology will reduce the overall remedial cost.

Our investigations to date have indicated the following:

1. No potable water supply well sampled, within a 500-foot radius of the school grounds, detected PFAS concentrations above the Department of Public Health's drinking water action limit of 70 parts per trillion (ng/L). One potable water supply well (210 Cherry Brook Road) had a trace PFAS concentration detection of 0.9 ng/L.
2. In the Southern Field, the results from the SPLP analyses were below the 0.7 ppb criteria for both the shallow and deep soil samples. While, this would indicate no future characterization or that remedial action may not be required, the results from the total mass analysis have indicated an increasing trend of concentrations to the northwest, outside the limits where fire-fighting foams were reportedly used. Therefore, this scope will further assess the shallow soil to the west/northwest where increasing concentrations have been reported. The goal of this sampling is to confirm that the firefighting foams were not applied further west than reported.
3. In the Eastern Field, the results from the SPLP analyses were above the 0.7 ppb criteria in both the shallow and deep soil samples. Currently, GZA has estimated approximately 2,500 cubic yards (3,250 tons) of soil may have to be excavated.
4. Groundwater concentrations beneath and down gradient of the Eastern Field release were above the RSR Groundwater Protection Criteria (GWPC) of 70 ng/L. DEEP has requested that additional monitoring wells be installed to delineate the nature and extent of the PFAS plume.
5. Groundwater concentrations downgradient of the Southern Field were below the GWPC.
6. No surface water samples have been collected. However, because of the downgradient concentrations detected in groundwater in the Eastern Field, surface water samples are recommended.

The goals of these investigations are: 1) further delineate the nature and extent of the groundwater contamination, 2) further delineate the soil limits greater than the GA-PMC in an effort to reduce the volume of soil to be removed, 3) provide a sufficient number of soil samples so that during the PFAS excavation no confirmation sampling would be required on side walls and bottom of the excavation, and 4) to develop a strong hydrogeologic conceptual site model (CSM) to support a monitored natural attenuation (MNA) approach to groundwater remediation after completion of the soil remedial excavation program.

Our initial groundwater CSM presumes that the release of the PFAS to the Eastern Field has migrated into the underlying glacial outwash valley deposits which are recharged from the surrounding hills groundwater. As the groundwater recharges these deposits, it likely upwells and discharges into Cherry Brook. Therefore, it is possible that the groundwater contamination identified may be limited to the upper groundwater profile due to vertical upward groundwater flow, if present. Provided that PFAS concentrations in the deep groundwater are not above the GWPC, then any recharge to the underlying bedrock would be from groundwater below the PFAS criteria, limiting potential

impacts to adjacent bedrock potable water supply wells. Regional recharge to the bedrock may be from a bedrock fault located approximately 350-feet to the east of the intersection of Cherry Brook Road and Barbourtown Road. The proposed groundwater investigation will be used to further refine this CSM. In addition, select wells will be subsequently incorporated into the post remediation groundwater program, as required in the RSRs.

SCOPE OF SERVICES

GZA has developed a phased exploration program as follows:

Task 1. Additional Soil Delineations

A. Southern Field

Sampling data identified elevated concentrations of PFAS (below 10 x GWPC) west of the reported application area where fire-fighting foams were used. Figure 1 shows proposed sampling locations and the rationale for sampling is summarized in Table 1.0.

Table 1.0
Southern Field – Proposed Soil Sampling

Soil Boring Location	Depth (feet)	Rationale
GZ-101 & GZ-101D GZ-102 GZ-103	0-2 & 4-6 0-2 0-2	The Town fire department indicated that foams were applied in the vicinity of GZ-10. However, the data suggests increased concentration west of GZ-37 and GZ-24. GZA proposes 3-additional shallow and 1-deep soil samples. These samples will be analyzed for total PFAS. These are being collected in an abundance of precaution because this is an elementary school.

All soil and quality control samples will be analyzed for total and SPLP PFAS using a laboratory modified EPA Method 537.1 revision 2 as shown on Table 6.0.

B. Eastern Field

Sampling data identified elevated concentrations of PFAS above 10 x GWPC in both the shallow and deep soil samples. The proposed borings in this area will be used to further delineate the limits of the potential soil excavation. GZA will recommend within the Remedial Action Plan (RAP) that no confirmation soil sampling be collected due to the level of this investigation. This will make the excavation and backfilling more efficient especially given that the proposed remedial actions will be conducted at the elementary school. Our goal is to limit the time that the excavation (potentially to 7-feet deep) is open.

The other option is to leave the excavation open for 2-weeks waiting for laboratory confirmation analyses before backfilling. Alternative one to this option is to expedite the analysis (3-days from laboratory receipt of the samples) which would include a 100% surcharge on each soil sample or approximately $500 per sample analysis. Alternative two would be to collect the samples, backfill the excavation and if there is an exceedance re-excavate and remove additional soil. Figures 2 & 3 show proposed shallow and deep sampling locations and the rationale for sampling is summarized in Tables 2.0 and 3.0.

Table 2.0 Eastern Field – Shallow Soil Borings		
Soil Boring Location	Depth (feet)	Rationale
GZ-104 GZ-105 GZ-106	0-2 0-2 0-2	These borings are intended to define the eastern extent of the SPLP data exceeding 10 x the GWPC of 0.7 ppb, north of GZ-30 and south of GZ-36, along Barbourtown Road.
Table 3.0 Eastern Field – Shallow Soil Borings		
GZ-107 GZ-108 GZ-109 GZ-110 GZ-111	4-6 4-6 4-6 4-6 4-6	These borings are intended to further delineate the boundary of concentrations greater than 10 x the GWPC of 0.7 ppb. The goal is to reduce the excavation footprint and these data will be used in-leu of post-excavation samples.

All soil and quality control samples will be analyzed for total and SPLP PFAS using a laboratory modified EPA Method 537.1 revision 2 as shown on Table 6.0.

Task 2. Additional Groundwater Sampling

The initial placement of the monitoring wells was to assess if PFAS concentrations in groundwater were present beneath and downgradient of the release area and to assess the local groundwater flow direction. Based upon the surrounding surface water bodies, groundwater flow could potentially flow to the north towards a small tributary of Cherry Brook (Barbour Brook), to the east towards Cherry Brook or to the south towards Cherry Brook where Cherry Brook makes a 90-degree turning to the southwest. Groundwater measurements indicated that groundwater flow is towards the south-southeast and toward Cherry Brook, just northeast of the intersection of Barbourtown Road and Cherry Brook Road.

The groundwater data collected from the recent site investigations identified the sum of the 5-PFAS compound concentrations greater than the GWPC, at all three monitoring wells that were installed across the water table in the Eastern Field. The greatest concentration was reported directly beneath the most elevated soil concentrations with a groundwater concentration of 16,810 ng/L. Downgradient of this location, groundwater concentrations were reported at 2,600 ng/L, approximately 250-feet upgradient of Cherry Brook. In addition, elevated concentration (160 ng/L) were reported east of the release and approximately 250-feet west of Cherry Brook, along Barbourtown Road.

Additional plume delineation is required to comply with the DEEP Site Characterization Guidance Document. Because surface water surrounds the release area on three sides, these supplemental investigations will focus on defining the nature and extent of the PFAS plume. Upgradient wells will be installed because the school is served by potable water supply wells. Figure 4 show the locations of the proposed monitoring wells and Table 4 provides the rationale for their installation. GZA understands that the Town of Canton owns these properties where these wells are proposed. An effort will be made to keep monitoring wells off the playing fields or if necessary, buried beneath a minimum of 6 inches of topsoil to prevent injuries should a player fall on the monitoring wells protective casing.

The initial borings encountered large cobbles and small boulders inhibiting the advancement of the GeoProbe™ drill rig to approximately 10 to 12 feet below grade. A larger auger rig was brought on-site to get past these natural deposits; however, auger refusal was encountered at GZ-4. To avoid having to remobilize multiple drill rigs, GZA has proposed to use a RotoSonic drill rig. While more expensive, this rig will achieve the monitoring well depths outlines outlined in Table 4.0. Based upon the mapped local geologic deposits, large cobbles/small boulders would be anticipated with depth beyond 14-feet which can be managed with this drilling technique.

Upon completion of the monitoring well installation, GZA will develop these wells to remove fines and to ensure good communication between the aquifer and the well screen. One week following well development, GZA will sample the new wells for PFAS.

Table 4.0
Monitoring Wells

Well Location	Depth (feet)	Rationale
GZ-2I	25 to 30	These wells will be co-located at GZ-2. The goal is to define the vertical extent and to determine vertical hydraulic gradient with depth.
GZ-2D	40 to 45	
GZ-4I	25 to 30	These wells will be co-located at GZ-4. The goal is to define the vertical extent and to determine vertical hydraulic gradient with depth.
GZ-4D	40 to 45	
GZ-5	5 to 15	Shallow upgradient well located between the release and the on-site potable water supply wells.
GZ-6	5 to 15	Shallow upgradient well near the stream to the north.
GZ-7	5 to 15	Well cluster to define the migration of PFAS to the northeast to demonstrate regulatory compliance levels. There is likely a radial flow component from the release due to the alignment of the stream.
GZ-7I	25 to 30	
GZ-8	5 to 15	Well cluster to define the migration of PFAS to east, adjacent to the stream to demonstrate regulatory compliance levels. There is likely a radial flow component from the release due to the alignment of the stream.
GZ-8I	25 to 30	
GZ-9	5 to 15	Well cluster to delineate the boundary between GZ-2 and GZ-1 (southern Field). PFAS plumes are typically long and narrow.
GZ-9I	25 to 30	
GZ-10	5 to 15	This well is to define the southern extent of the plume
GZ-11	5 to 15	These cluster wells are located to define the southern concentration upgradient of the stream. These wells will also be used to assess vertical gradients. GZ-11 cluster is approximately hydraulically downgradient of GZ-2.
GZ-11I	25 to 30	

All groundwater and quality control samples will be analyzed for total PFAS using EPA Method 537.1 revision 2, as shown on Table 6.0.

Task 3. Surface Water Sampling

No surface water samples have been collected to date; however, the most downgradient monitoring well has reported PFAS concentrations 37 x the GWPC which is located approximately 250-feet upgradient of Cherry Brook. While DEEP does not have a Surface Water Protection Criteria (SWPC), they are in the process of developing a criterion. These proposed sampling locations will assess 1) upgradient background concentrations, 2) potential discharge concentrations east and south of the release, and 3) downgradient of the plume after mixing with the surface water of Cherry Brook. Figure 5 shows the locations of the proposed surface water samples and Table 5.0 provides a rationale for the collection of the samples. Surface water sampling will be completed only after the groundwater analyses have been reviewed.

Table 5.0
Surface Water Sampling Locations

Well Location	Depth (feet)	Rationale
S - 1	mid-stream	Background of Barbour Brook at the Barbourtown Road culvert
S - 2	mid-stream	Impact of the plume migrating to the east of GZ-3, near GZ-8/GZ-8I
S - 3	mid-stream	Downgradient sample from the core of the plume, near GZ-11/GZ-11I
S - 4	mid-stream	Downgradient sample outside the suspected plume discharge
S - 5	mid-stream	Downgradient sample at the culvert on West Mountain Road

All surface water and quality control samples will be analyzed for total PFAS using EPA Method 537.1 revision 2, as shown on Table 6.0.

Task 4. Potable Water Supply Sample

Provided that the Town of Canton receives permission to sample the potable water supply well at 225 Cherry Brook Road, GZA will collect a tap water sample before any filtration systems. This sample will be analyzed by EPA Method 537.1, revision 2.

Task 5. Quality Control

Because PFAS is regulated in the parts per trillion and there is the potential for false positives during sampling activities, GZA will adhere to strict quality control procedures. During field sampling, our staff will follow GZA's stringent standard operation procedures (SOP). To ensure data quality and repeatability, quality control analyses will include field duplicates, trip blanks, field and equipment blanks, and internal laboratory MS/MSD samples. Table 6.0 identifies the various media and quality control samples to be collected.

Table 6.0
Sample and Quality Control Analyses

Location	Shallow Soil Total Mass	Shallow Soil By SPLP	Deep Soil Total Mass	Deep Soil By SPLP	GW	SW	Quality Control Samples				
							Field Duplicate	Field Blanks	Trip Blanks	Equipment Blanks	MS/ MSD
Southern Field	4		1				1	1	1	1	2
Eastern Field	3	3	5	5							
Groundwater					16		1	2	2	1	2
Surface Water						5	1	1			2
Potable Water					1		1	1	1		
Totals	7	3	6	5	17	5	4	5	4	2	6

GW = groundwater; SW = surface water

Task 6. Hydrogeologic Analysis

The monitoring wells will be used to: 1) evaluate the nature and extent of the PFAS plume, 2) evaluate the vertical and horizontal hydraulic gradient, and 3) estimate the hydraulic conductivity (slug tests) of the subsurface soils and to calculate a seepage velocity. These hydraulic analyses will be used to assess if a groundwater MNA remedial remedy can be proposed rather than having to actively remediate the groundwater, after the soil remediation action is implemented.

A MNA solution would be preferred since there are limited groundwater treatment options such as long-term pump using treat using granular activated carbon, ion exchange or injection of a carbon substrate into the aquifer to temporarily reduce/retard the discharge of the plume into Cherry Brook. These active solutions would take years to achieve compliance and may not provide any additional environmental protection over an MNA approach.

To evaluate the hydrogeology, GZA proposes:

A. Measure groundwater water levels in each of the monitoring wells during one comprehensive event. These data will be collected in conjunction with the slug tests (see "C" below).
B. Based upon groundwater levels, calculate vertical and horizontal hydraulic gradients, and develop a groundwater contour map for each of the vertical intervals.

C. Conduct up to two days of slug tests to collect data to evaluate hydraulic conductivity, at select wells. GZA has estimated that approximately 6 to 10 monitoring wells will be evaluated. Slug tests will be completed after the groundwater samples have been collected to avoid any potential cross-contamination.
D. Once the slug test data have been compiled, GZA will calculate various hydraulic conductivities for the well screen intervals and will calculate a seepage velocity for each of the vertical intervals.

Task 7. Survey

GZA will subcontract a licensed surveyor to locate all soil, groundwater, and surface sampling locations. These data will be needed to define the limits for the soil remediation and to calculate volumes of soil to be removed. Based upon these estimated volumes, GZA will calculate a remedial cost estimate, see Task 9B.

Task 8. Characterization Report

Upon the completion of the proposed multimedia sampling, GZA will develop a subsurface investigation report that will form the basis of developing the soil remediation plan. This will include summaries of analytical results compared to regulatory criteria, concentration graphics depicting areas above and below the regulatory criteria, development of a groundwater contour map, hydraulic calculations including hydraulic conductivity, seepage velocities, and vertical direction of groundwater flow.

A separate report will be provided for the potable water supply well sample.

Task 9. Remedial Action Plan

A. Subcontractor Bid Request

In conjunction with the development of a RAP, GZA will evaluate the soil data collected to estimate the volume of soil exceeding the alternative GA-PMC of 10 x GWPC. GZA will work with at least three contractors and or disposal facilities to estimate the remedial cost that will be included in the RAP. These costs will include: 1) securing the proposed excavation area and developing traffic patterns to minimize interruptions to the school, 2) excavation of the soil contaminant area greater than the alternative GA-PMC limits, 3) transportation and disposal of the PFAS soil to either a landfill or incinerator, 4) backfill and compaction of select materials including topsoil, and 5) final regrading and seeding.

B. Remedial Action Plan

GZA will develop a RAP to be submitted to both the DEEP and DPH for their approval prior to implementing any remedial action. The remedial action plan will define those soils to be removed based upon the regulatory action levels. GZA will also develop a rationale as to why no final soil confirmation will be proposed during the excavation. The rationale will include health and safety considerations, ability to backfill the excavation the same day, and that PFAS analyses take 10-days for analysis or pay a significant surcharge to receive the samples in 24 to 72 hours.

The RAP would include a series of construction drawings which will depict the vertical and lateral limits of the excavation. For instance, based upon the SPLP data, the area of the greatest excavation will be in the shallow soils from 0 to 3 or 4 feet below grade. At depth, the SPLP data suggest that the areal impact is less and concentrated directly below those shallow soils with the greatest PFAS impacts.

Under the DEEP remedial guidelines, in a GA classified groundwater zone, soils will be excavated to the seasonal low water table. Currently, Connecticut is undergoing a drought situation where the existing groundwater may be at the

seasonal low water table. However, GZA will evaluate adjacent USGS groundwater monitoring wells to determine if there are any variability between the site groundwater conditions and low seasonal groundwater conditions observed at a proximate USGS monitoring well. These data will be used to determine the final excavation depth. The goal would be to limit any excavation dewatering to achieve the seasonal low groundwater condition required or soil excavation.

As part of the RAP, GZA will estimate the cost for remediating the soils to the seasonal low water table. These costs will assume a 1.3 times estimation to convert from cubic yards to tons. However, the final disposal cost will be based upon the actual weight calculated at either the landfill or incinerator facility. These costs will also account for those factors listed in Section 5 above that include clean backfill material, the compaction of this material, and final grading with topsoil and seeding.

Task 10. Communications - Meeting & Calls

GZA will provide periodic discussions with the Town of Canton (including updating the Board of Selectman), its insurance company, and the regulatory agencies of DEEP and DPH. This scope includes participation of one Town meeting to discuss the site characterization data collected, potential remediation and costs.

RESPONSIBILITIES OF CLIENT

To complete the investigations outlined above, GZA will require the following from the Town:

- Provide a utility map in the areas of the proposed investigations.
- Access to the school and Town owned property will be coordinated by the Town.
- Access to the 225 Cherry Brook Road property will be coordinated by the Town.
- Several of the proposed investigations will be located on the Town owned property across the street from the school between Barbourtown Road and Cherry Brook. GZA requests that the Town of Canton review the proposed locations to ensure that they are on Town owned lands.
- The Town would be responsible for the disposal of any investigation derived wastes (IDW). At this time, GZA would propose to incorporate any soil removed during these investigations into the proposed soil remedial action. As part of the groundwater assessment, drums of purge water will be generated. GZA can manage the IDW for the Town under a separate change order once the total number of drums is known. GZA has not included waste disposal in this change order.

SCHEDULE

GZA is prepared to commence the work upon authorization. GZA understands that the Town would like to resolve these issues and GZA will work closely with the Town, its insurance and DEEP/DPH to complete this work, as quickly as possible.

A tentative schedule from authorization, is as follows, subject to the availability of drillers.

Task		Weeks after Authorization									
		1	2	3	4	5	6	7	8	9	10
1	Additional Soil Delineation										
	Laboratory Analyses										
2	Monitoring Well Installation										
	Monitoring Well Development										
	Groundwater sampling										
	Laboratory Analyses										
3	SW Sampling										
	Laboratory Analyses										
4	Potable Well Sampling										
	Laboratory Analyses										
6	Hydrogeologic Assessment (Water Level)										
	Hydrogeologic Assessment (Slug Test)										
	Hydrogeologic Analysis										
7	Survey										
8	Characterization Report										
9	Subcontractor Bid Request										
	RAP										
10	Communication										
			Field Activities			Laboratory analyses			Analysis and Reporting		

The schedule can be expedited by requesting a quicker turn-around time from the laboratory; however, that would require a premium surcharge. GZA will work to expedite the schedule without the laboratory surcharge where possible.

COST AND BASIS OF BILLING

GZA has estimated the cost of the Scope-of-Work at $129,750 on a time and material basis in accordance with the attached fee schedule (this price includes approximately $15,000 of analytical and $56,000 in drilling costs). The estimated cost is based upon GZA using a preferred qualified laboratory and a 5-day turn-around from receipt of the samples at their laboratory. The labor fees are consistent with our DAS contract. Direct and out-of-pocket expenses and subcontractor expenses will be subject to a 5% mark-up and assumes as a municipality all services will be tax exempt (tax exempt letter will be required by subcontractors).

GZA costs are broken out as follows:

Tasks	Costs
1) Additional Soil Delineation	$10,750
2) Additional Groundwater Sampling	$82,500
3) Surface Water Sampling	$3,250
4) Potable Water Supply Sampling	$1,750
5) Quality Control	Costs included in Tasks 1 - 4
6) Hydrogeologic Analysis	$7,500
7) Survey	$5,000
8) Characterization Report	$10,000
9) Remedial Action Plan	$8,500
10) Communications – Meetings & Calls	$5,500
Total	**$134,750**

GZA's cost estimate is based on the anticipated scope of services outlined above, which represent our present judgment as to the level of service that will be needed. The Town of Canton will be notified of any conditions

requiring a change in the level of effort or the scope of work and any resultant change in budget if such becomes evident.

Progress invoices will be issued approximately every four weeks. Payment is due within 30 days of receipt. Interest charges may be applied on past due balances.

Invoices are the responsibility of Client. Invoices will be sent to the Town of Canton care of Mr. Robert H. Skinner at the above address. Should the billing information change, please provide that information on the last page of this agreement.

PROJECT COMMUNICATION PLAN

GZA is committed to providing its clients consistent input on project performance, budget, and schedule, but recognizes each client wants this information delivered in a way that best meets his or her needs. Typically, we rely on regular scheduled phone calls, emails or letter reports which can be weekly, bi-weekly, or monthly. To establish the Communication Plan that works best for you, GZA's Principal-in-Charge (Mr. Richard J. Desrosiers, LEP, PG) will contact you directly upon our receipt of the signed contract or other authorization to proceed.

CONDITIONS OF ENGAGEMENT AND ACCEPTANCE

GZA is submitting this change order with the belief that we will be able to fulfill the scope requirements during this COVID-19 Pandemic crisis. If performance is rendered impossible because of the impacts of COVID-19, GZA will notify Client of that Force Majeure event. Conditions of engagement are described in the Contract dated November 26, 2019. This Proposal for Services and the Terms and Conditions shall constitute the entire agreement between GZA and The Town of Canton. This change order may be accepted by signing in the appropriate spaces below and returning one copy along with the retainer to GZA. Issuance of a purchase order implicitly acknowledges acceptance of our Terms and Conditions.

Consultant is not responsible for delays caused by factors beyond Consultant's reasonable control, including but not limited to pandemics, epidemics, frustration, strikes, lockouts, work slowdowns, or work stoppages (whether by Client or by government action); accidents or acts of God; failure of governmental or other regulatory authorities to act in a timely manner; shutdown of governmental or other regulatory authorities; or failure of the Client to furnish timely information, review comments, in a timely manner. When such delays beyond Consultant's reasonable control occur, the Client agrees that Consultant is not responsible for damages, nor will Consultant be deemed to be in default of this Contract. If the performance of this Agreement is affected by the Force Majeure Event Consultant shall undertake reasonable measures to make up for the time lost through delay and Consultant shall be compensated for delays including but not limited to demobilization and mobilization, increased staffing, multiple shifts, additional materials and equipment. If performance by Consultant is delayed due to a Force Majeure Event, the Schedule will be extended for a period of time reasonably necessary to overcome the effect of the delay, subject to Purchaser's right to terminate this Agreement in whole or in part.

Thank you for the opportunity to provide these services to the Town of Canton. If you have any questions, please call Richard Desrosiers at 1-860-858-3130.

Very truly yours,

GZA GEOENVIRONMENTAL, INC.

Richard J. Desrosiers, LEP, PG
Associate Principal, Hydrogeologist

David Rusczyk, P.E.
Associate Principal

Attachments: Figure 1 – Proposed Soil Samples (Southern Field)
Figure 2 – Proposed Soil Samples (Eastern Field – Shallow)
Figure 3 – Proposed Soil Samples (Eastern Field- Deep)
Figure 4 – Proposed Monitoring Wells
Figure 5 – Proposed Surface Water Samples

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This Proposal and the Terms and Conditions (08/08-Edition 05-9010) is hereby accepted and executed by a duly authorized signatory, who by execution hereof, warrants that he/she has full authority to act for, in the name, and on behalf of Client.

Town of Canton, Connecticut

By:_____ Its: _____

Printed Name:_____ Date: _____

Billing Address (if different from above): _____

_____

CHERRY BROOK PRIMARY SCHOOL

PROPOSED SOIL SAMPLES (SOUTHERN FIELD)

PREPARED BY:
GZAGeoEnvironmental, Inc.
Engineers and Scientists
www.gza.com

PREPARED FOR:
TOWN OF CANTON

PROJ MGR: RJD REVIEWED BY: CHECKED BY: RJD

DESIGNED BY: DRAWN BY: MJT SCALE: AS SHOWN

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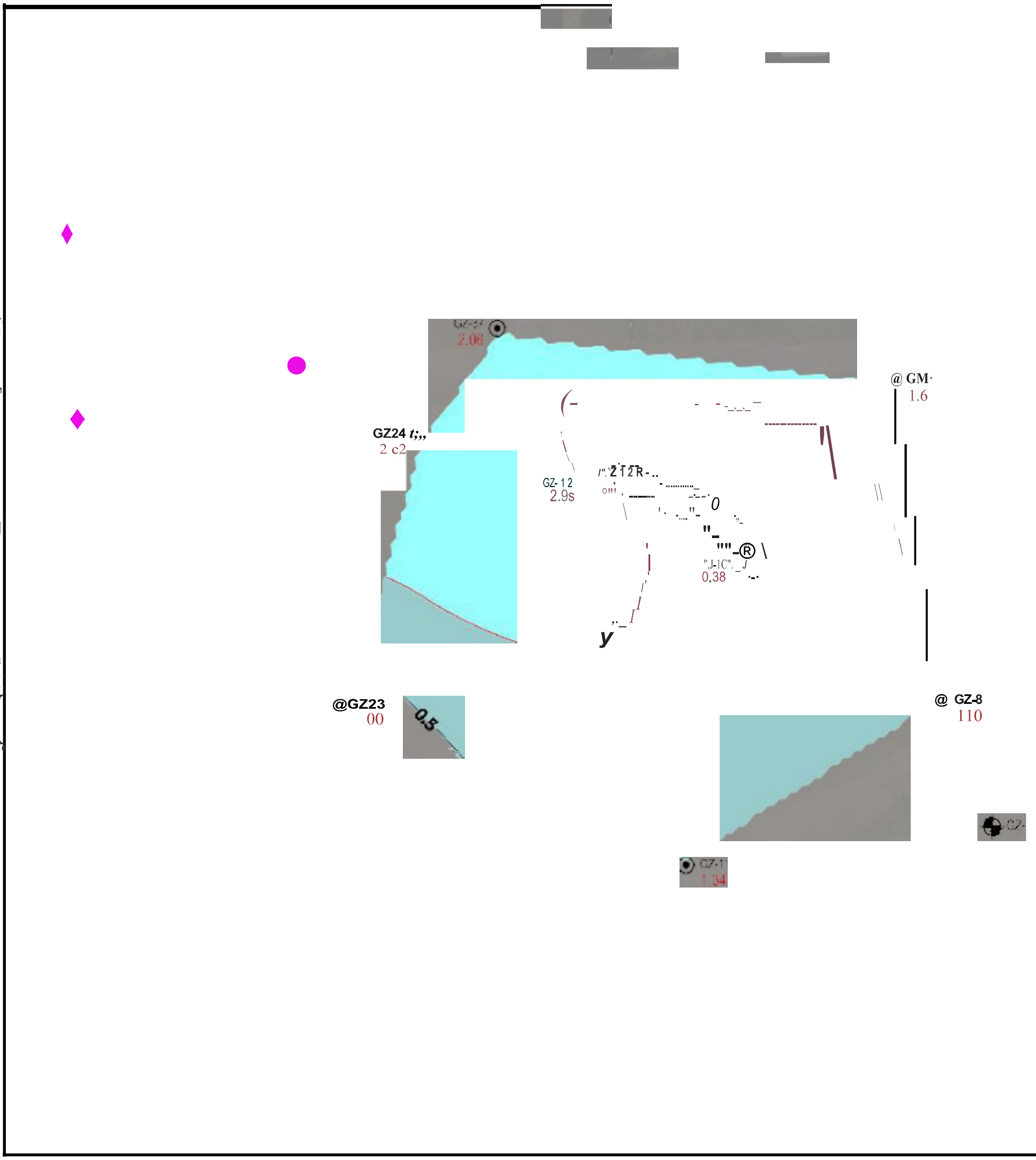

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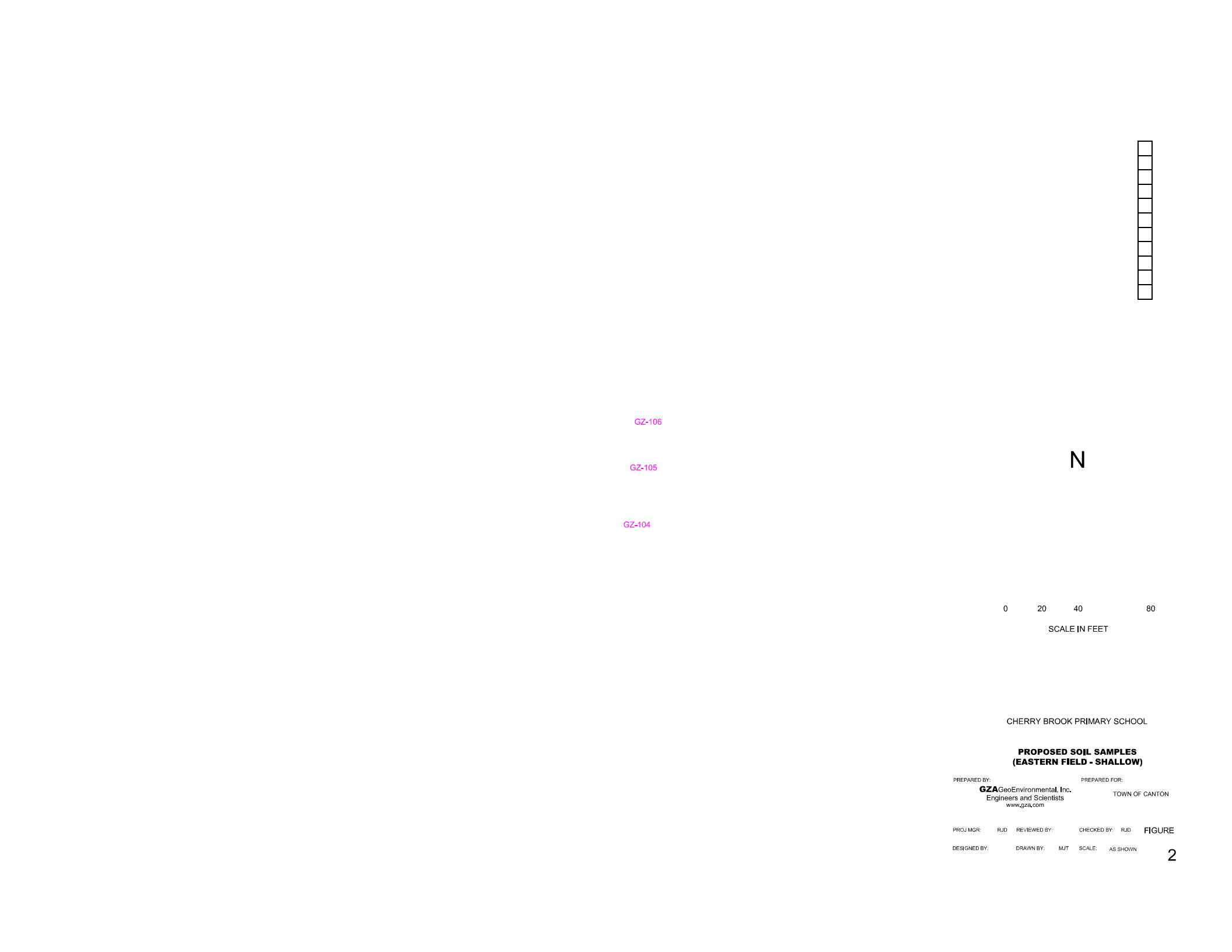

CHERRY BROOK PRIMARY SCHOOL

PROPOSED SOIL SAMPLES
(EASTERN FIELD - SHALLOW)

PREPARED BY:
GZAGeoEnvironmental, Inc.
Engineers and Scientists
www.gza.com

PREPARED FOR:
TOWN OF CANTON

PROJ MGR: RJD REVIEWED BY: CHECKED BY: RJD

DESIGNED BY: DRAWN BY: MJT SCALE: AS SHOWN

FIGURE
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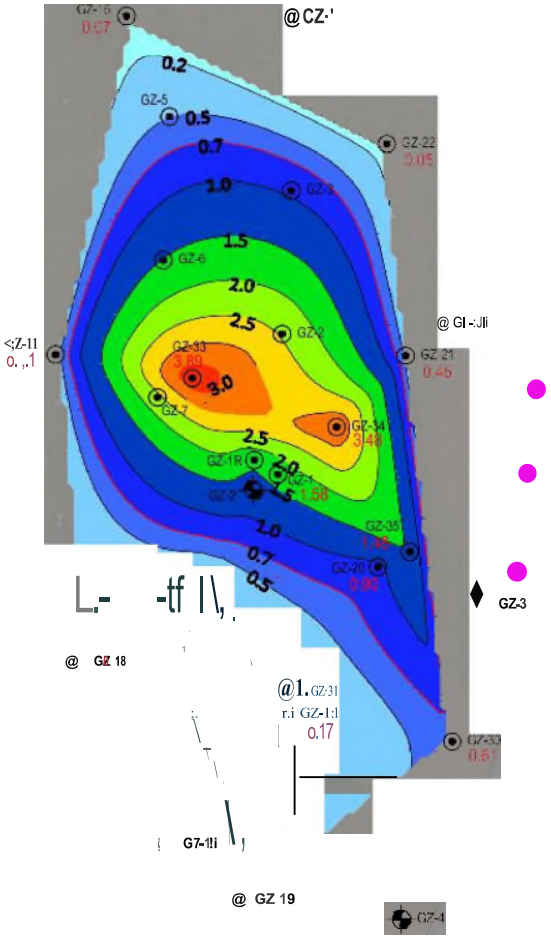

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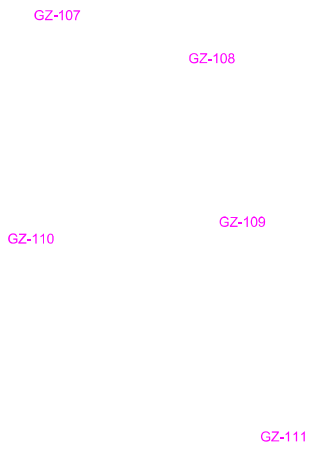
UNLESS SPECIFICALLY STATED BY WRITTEN AGREEMENT, THIS DRAWING IS THE SOLE PROPERTY OF GZA GEOENVIRONMENTAL, INC. (GZA). THE INFORMATION SHOWN ON THE DRAWING IS SOLELY FOR USE BY GZA'S CLIENT OR THE CLIENT'S DESIGNATED REPRESENTATIVE FOR THE SPECIFIC PROJECT AND LOCATION IDENTIFIED ON THE DRAWING. THE DRAWING SHALL NOT BE TRANSFERRED, REUSED, COPIED, OR ALTERED IN ANY MANNER FOR USE AT ANY OTHER LOCATION OR FOR ANY OTHER PURPOSE WITHOUT THE PRIOR WRITTEN CONSENT OF GZA. ANY TRANSFER, REUSE, OR MODIFICATION TO THE DRAWING BY THE CLIENT OR OTHERS, WITHOUT THE PRIOR WRITTEN EXPRESS CONSENT OF GZA, WILL BE AT THE USER'S SOLE RISK AND WITHOUT ANY RISK OR LIABILITY TO GZA.

10-12-2020



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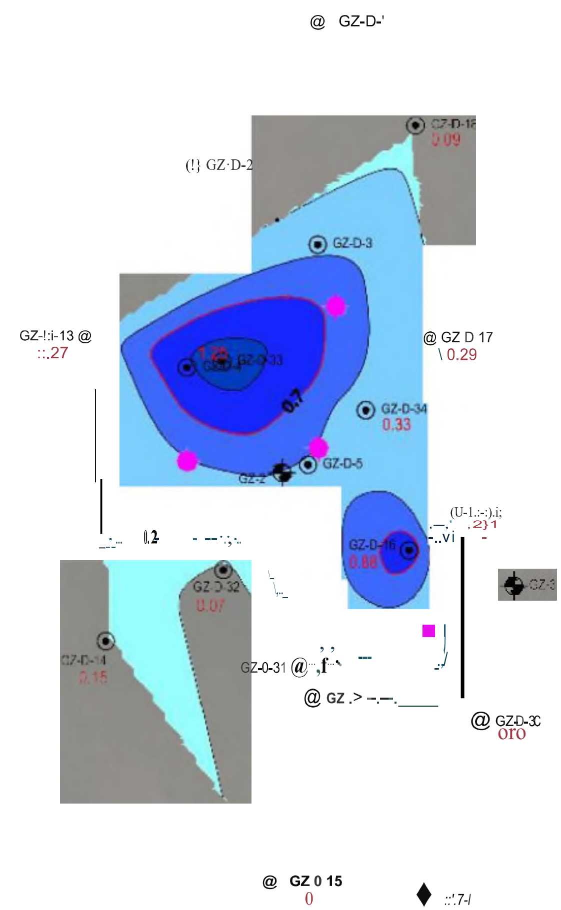
CHERRY BROOK PRIMARY SCHOOL

PROPOSED SOIL SAMPLES (EASTERN FIELD DEEP)

PREPARED BY:
GZAGeoEnvironmental, Inc.
Engineers and Scientists
www.gza.com

PREPARED FOR:
TOWN OF CANTON

PROJ MGR: RJD REVIEWED BY: CHECKED BY: RJD FIGURE



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SCALE IN FEET

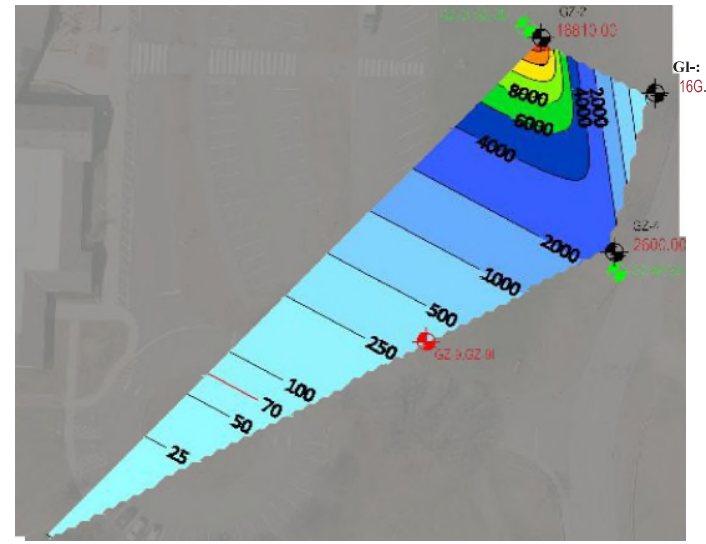
CHERRY BROOK PRIMARY SCHOOL

PROPOSED MONITORING WELLS

PREPARED BY:
GZAGeoEnvironmental, Inc.
Engineers and Scientists
www.gza.com

PREPARED FOR:
TOWN OF CANTON

PROJ MGR: RJD REVIEWED BY: CHECKED BY: RJD FIGURE



-$- GZ-6

COLOR SCALE

DESIGNED BY

DATE:

PROPOSED CLUSTER WELL
5TO 15 - FEET
25TO30FEET (I)

PROPOSED CLUSTER WELL
25TO 30 FEET (J
40 0 45 FEET (D)

NOTES:

1. CONTOURS REPRESENT THE SUM OF 5-PFAS FOR GROUNDWATER IN NANOGRAMS PER LITER. (NG/L) - VALUES EXCEEDING THE GWPCL.
2. LOCATE, DESCRIBE, AND REPRESENT THE POSITIONS OF SOIL BORING AND MONITORING WELL LOCATIONS IN RELATION TO THE SUBJECT SITE. THIS DRAWING IS NOT CONSIDERED A LAND SURVEY.
3. 2016 AERIAL PHOTO OBTAINED FROM ESRI ONLINE DATABASE
4. LOCATION, ELEVATIONS, DEPTHS AND/OR CONTOURS OF GROUNDWATER ARE BASED ON DATA FROM WIDELY SPACED EXPLORATIONS AND MAY NOT REFLECT ACTUAL SUBSURFACE CONDITIONS.

NO.	ISSUE/DESCRIPTION	BY	DATE

10-12-2020

0 100 200 400

SCALE IN FEET

CHERRY BROOK PRIMARY SCHOOL

PROPOSED SURFACE WATER SAMPLES

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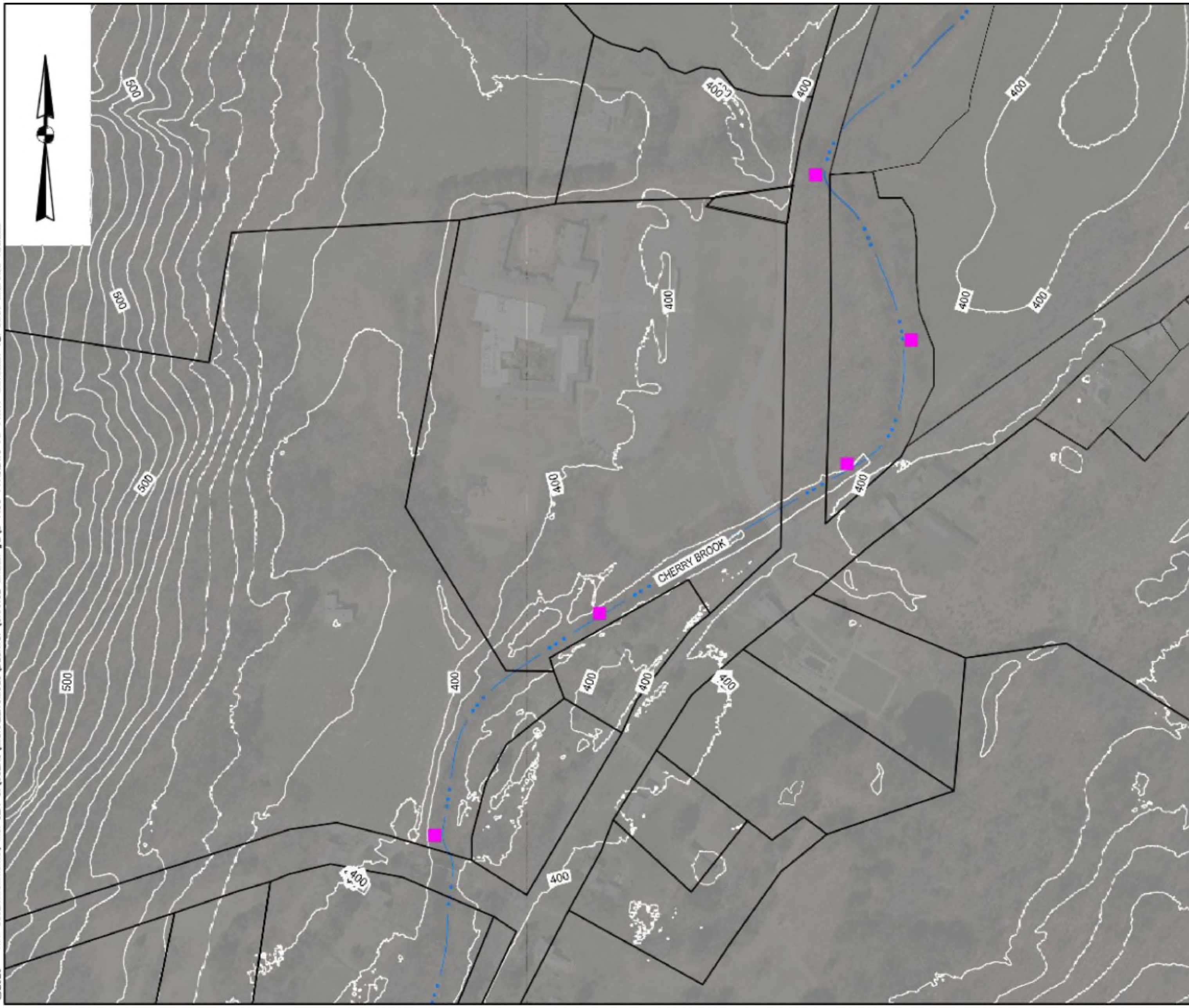

EG N

DESIGNED BY ■ (iil)l@SED BhtRCi!!c,,iil(//,Tiifs LE LOCA ON

DATE:

PROJECT NO. 05.0046589.01

REVISION NO.

SHEET NO. 1 OF 1

NOTES:

1. 20'16 AERIAL PHOTO OBTAINED RO,1CT COONLI E DA.TAB.ASE
2. I-'AttLt:I. tlUUNUAt<II=. Ut-1 N t-KUM i.;1 Uc 1-' U NI. IN t: ·1 DA.TABASE AN ARE APPROXI tA.TE.
3. OtH 0 URv.AND C NTOU ELEVA IONS D I ED F 01\201 DIGITAL ELEVATION MODEL (DEM) DATA OBT rt D FROM THE CONJECTICUT ENVIRONMENTAL CONDITIONS ot LI E (CT CO DATABASE AN IS APPROXIMATE.

[redacted]

NO.	ISSUE/DESCRIPTION	BY	DATE

10-12-2020