NEW YORK STATE | Department of Environmental Conservation

PFAS Assessment Work Plan

MEADOW POND SCHOOL

(SPILL NO. 2100460)

SOUTH SALEM, NY

June 2024

Kathy Hochul, Governor | Sean Mahar, Interim Commissioner

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1.0 BACKGROUND AND PROJECT OBJECTIVES

1.1 AREA OF INTEREST

The Meadow Pond Elementary School is located in the Town of Lewisboro, Hamlet of South Salem in Westchester County. The school property is bounded by Smith Ridge Road to the west, Shady Lane to the south, Deep Well Farms Road to the east, and Deer View Lane to the north. The immediate surrounding area is primarily residential. A topographic map showing the School and surrounding land features is provided on **Figure 1.**

The School property consists of the Meadow Pond Elementary School facilities, parking lots, and athletic fields. The main school building and parking lots are located on the northern half of the property. Immediately south of the school building are the playground and athletic fields. The School's septic system and leach field are located on the southwest corner of the main building and extends beneath the athletic fields. The property overall is relatively flat with the exception of a steep slope on the eastern side of the property which grades towards Deep Well Farms Road. A map showing the School and above-referenced features can be found on **Figure 2**.

1.2 DRINKING WATER SUPPLIES

In accordance with public water supply regulations, sampling for PFOA, PFOS, and 1,4-dioxane of the School's supply well was conducted by the Meadow Pond Elementary School in February 2021. The sampling detected concentrations of per- and polyfluoroalkyl substances (PFAS)—specifically perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS) at levels above New York State's maximum contaminant levels (MCLs) for public drinking water. A subsequent round of testing in March 2021 confirmed the initial results. A "Do Not Drink" advisory was issued subsequently; however, the school has been using bottled water since 2018 for other water quality issues unrelated to PFAS contamination.

While New York State (NYS) does not regulate PFAS in private wells, out of an abundance of caution State and County Departments of Health (DOH) and DEC conducted a private well evaluation near the school. Sampling was conducted within an area of interest proximate to the school. Several homes had concentrations of PFOA and/or PFOS above the NYS MCLs and exposures were addressed by providing residents with an alternate water supply.

1.3 PROJECT OBJECTIVES

The primary objectives of this work plan are to:

1. Resample 7 existing monitoring wells with low flow sampling.
2. Assess overburden soil and groundwater quality on the School property near MW-12, which had the highest concentration of PFAS from work conducted during Phase I.
3. Sample the School's septic system effluent.
4. Assess the effects (or potential connection) of the School's supply well pumping has on overburden groundwater through the deployment of transducers.
5. Evaluate the School's cleaning and wastewater management practices through a pilot study to be conducted in the summer.
6. Determine potential source(s) of contamination impacting the School's supply well and nearby private residential wells.

2.0 INVESTIGATION

All field activities will be completed by NYSDEC staff or NYSDEC's standby contractors in substantial compliance with Department policies, programs, and procedures, as applicable, including, but not limited to: 6 NYCRR Part 375, DER-10, NYSDEC's *Sampling, Analysis, and Assessment of PFAS* guidance document, US EPA Design and Installation of Monitoring Wells Guidance and ASTM D5092.

Field activities will include:

- Installation of soil borings
- Installation of wells
- Environmental sampling (groundwater and soil)
- Wastewater sampling

All samples will be submitted to NYSDEC's standby laboratory for PFAS analysis by EPA Method 1633 and hydrogeochemical parameters, as outlined in **Table 1**. A select set of soil samples will also be analyzed for pH by EPA Method 9045, total organic carbon (TOC) by Lloyd Kahn, and PFAS in leachate generated from the Synthetic Precipitation Leaching Procedure (SPLP) by EPA Method 1312.

Standard chain-of-custody procedures will be followed for all samples collected. Quality assurance/quality control (QA/QC) samples will be collected at the following frequencies: equipment blanks will be collected for PFAS analysis at a minimum frequency of 1 sample per day per media sampled; and field duplicates, matrix spike, and matrix spike duplicates will be collected at a frequency of 1 per 20 field samples. **Table 1** presents the sampling and analytical plan.

2.1 SURVEYS

2.1.1 UTLIITY SURVEY

Prior to the commencement of ground-intrusive activities, a ground-penetrating radar (GPR)/electromagnetic (EM) survey will be conducted, and Dig Safely New York will be contacted to pre-clear all soil boring and monitoring well locations of subsurface utilities and anomalies.

2.1.2 LAND SURVEY

At the conclusion of field activities, a New York State licensed land surveyor will complete a survey of all sample locations including coordinates, ground surface elevations, and monitoring well casing elevations (as applicable).

2.2 CAMP & EXCLUSION ZONES

In accordance with the NYS Department of Health (NYSDOH) Generic Community Air Monitoring Plan (CAMP), air monitoring for fugitive dust and organic vapors will be conducted during all ground intrusive activities. Two CAMP stations will be utilized: one upwind and one downwind of the work zone.

Additionally, a mobile exclusion zone will be set up 50 feet around the drill rig consisting of signage, traffic cones and a visual barrier consisting of snow fencing and/or caution tape (or something similar). Field staff will be present at all times during active drilling to ensure that the exclusion zone is not compromised and that unauthorized personnel do not enter.

2.3 OVERBURDEN CHARACTERIZATION

2.3.1 SOIL SAMPLING

Soil samples will be collected at 8 locations using direct-push drilling technology or hand augers. Each location, where direct-push technology is used, will be hand-cleared to a depth of 5-feet below ground surface (bgs) to ensure that subsurface utilities are avoided. Soil cores will be continuously collected, characterized, and screened with a

handheld photo-ionization detector (PID) until terminal depth is reached. Terminal depth is defined as refusal due to bedrock or at least 10-feet into the upper groundwater bearing unit, unless otherwise specified by field personnel. Soil samples will be collected at 3 locations from each soil boring and analyzed for PFAS: 0”-2” below vegetative cover, 2”-12”, and a sample from approximately 1 foot above the groundwater table. Soil samples collected from the 2”-12” interval will also be analyzed for pH, TOC, and SPLP. Additional samples may be collected if evidence of contamination is identified (i.e. PID, olfactory, visual, etc). Proposed locations are shown on **Figure 3.** Sample locations may be adjusted or added based on field conditions. **Figure 4** shows sample locations from Phase I activities.

2.3.2 MONITORING WELL CONSTRUCTION

Up to 2 soil boring locations will be over-drilled and converted to permanent overburden monitoring wells using hollow-stem auger drilling methods. Overburden monitoring wells are anticipated to be constructed of 2-inch Schedule 40 PVC casings with 5-10 feet sections of 0.010-inch slotted screen. A #00 morie sand filter pack will be placed in the annulus to approximately 1 foot above the screen, followed by 2 feet of hydrated bentonite, and then grouted to the surface. Final screen length and slot-size will be dependent on field observations and depth of water encountered. Each monitoring well will be completed as a flush-mount well with a concrete pad. Monitoring wells will be constructed in accordance with US EPA Design and Installation of Monitoring Wells Guidance and ASTM D5092, as applicable.

2.3.3 MONITORING WELL DEVELOPMENT

Each monitoring well will be developed using over-pumping and surging techniques to help remove fines from the well screen and to establish a hydraulic connection with the aquifer. Groundwater quality parameters will be collected prior to development, after the removal of each well volume, and at the conclusion of development. Development will be considered complete once turbidity is measured at or below 50 nephelometric turbidity units (NTU), after 1 hour of development, or after the removal of three well volumes, whichever comes first.

2.3.4 TRANSDUCER DEPLOYMENT

Transducers were deployed in all overburden monitoring wells installed during Phase I activities from March to April 2023. The purpose was to assess the effects of the School’s bedrock supply well pumping has on overburden groundwater. The results from each well will be plotted and analyzed accordingly.

2.3.5 GROUNDWATER SAMPLING

At least one round of synoptic water levels will be collected from the newly installed and existing monitoring wells. Groundwater samples will be collected using low-flow sampling techniques in accordance with the most current NYSDEC PFAS sampling guidelines. Groundwater parameters including pH, conductivity, oxidation-reduction potential (ORP), dissolved oxygen (DO), temperature, and turbidity will be recorded on groundwater sampling logs. All samples will be analyzed for PFAS using EPA Method 1633. Additional analyses may include but are not limited to: hydrogeochemical analyses and artificial sweeteners.

2.3.5 WASTEWATER SAMPLING

NYSDEC will work with the School to collect representative samples of wastewater derived from the floor cleaning, stripping, and waxing process. Water used during the cleaning process will be verified in advance to be PFAS-free through laboratory analysis or certification. This study is being conducted to evaluate the potential presence of PFAS is current or historic floor-applied products that may enter into the environment thorough the discharge of wastewater via the septic system.

A rinsate sample of raw gym floor pieces may also be collected to determine if the newly installed luxury vinyl title gym floor contains a coating or raw material that may contain PFAS compounds.

2.6 INVESTIGATION DERIVED WASTE & DECONTAMINATION

Soil cuttings, decontamination water, and purged water will be managed in accordance with DER-10 Section 3.3(e), as applicable. Any disposable personal protective equipment and sampling equipment will be placed in sealed garbage bags and disposed of as municipal solid waste.

Decontamination of any non-dedicated equipment (e.g., water level meters, drill rods, etc) will be performed using a standard non-phosphate detergent (e.g., Alconox®) wash and potable water rinse between all sample locations. Equipment will be allowed to air dry before reuse.

3.0 REPORTING

The laboratory will provide Category B laboratory reports and NYS electronic data deliverables to NYSDEC. A field activities summary report will be generated and will summarize historical information, field activities, local geology and hydrogeology, and analytical results. Figures, tables, and field logs will be included as part of the report.

4.0 References

ASTM standard D5092, Design and Installation of Ground Water Monitoring Wells.

NYSDEC. 2021. Sampling, Analysis, and Assessment of Per- and Polyfluoroalkyl Substances (PFAS). https://www.dec.ny.gov/docs/remediation_hudson_pdf/pfassampanaly.pdf

NYSDEC. 2006. 6 NYCRR Part 375, Environmental Remediation Programs, Subparts 375-1 to 375-4 & 375-6. https://www.dec.ny.gov/docs/remediation_hudson_pdf/part375.pdf

USEPA. 2018. Design and Installation of Monitoring Wells. https://www.epa.gov/sites/default/files/2016-01/documents/design_and_installation_of_monitoring_wells.pdf

FIGURES

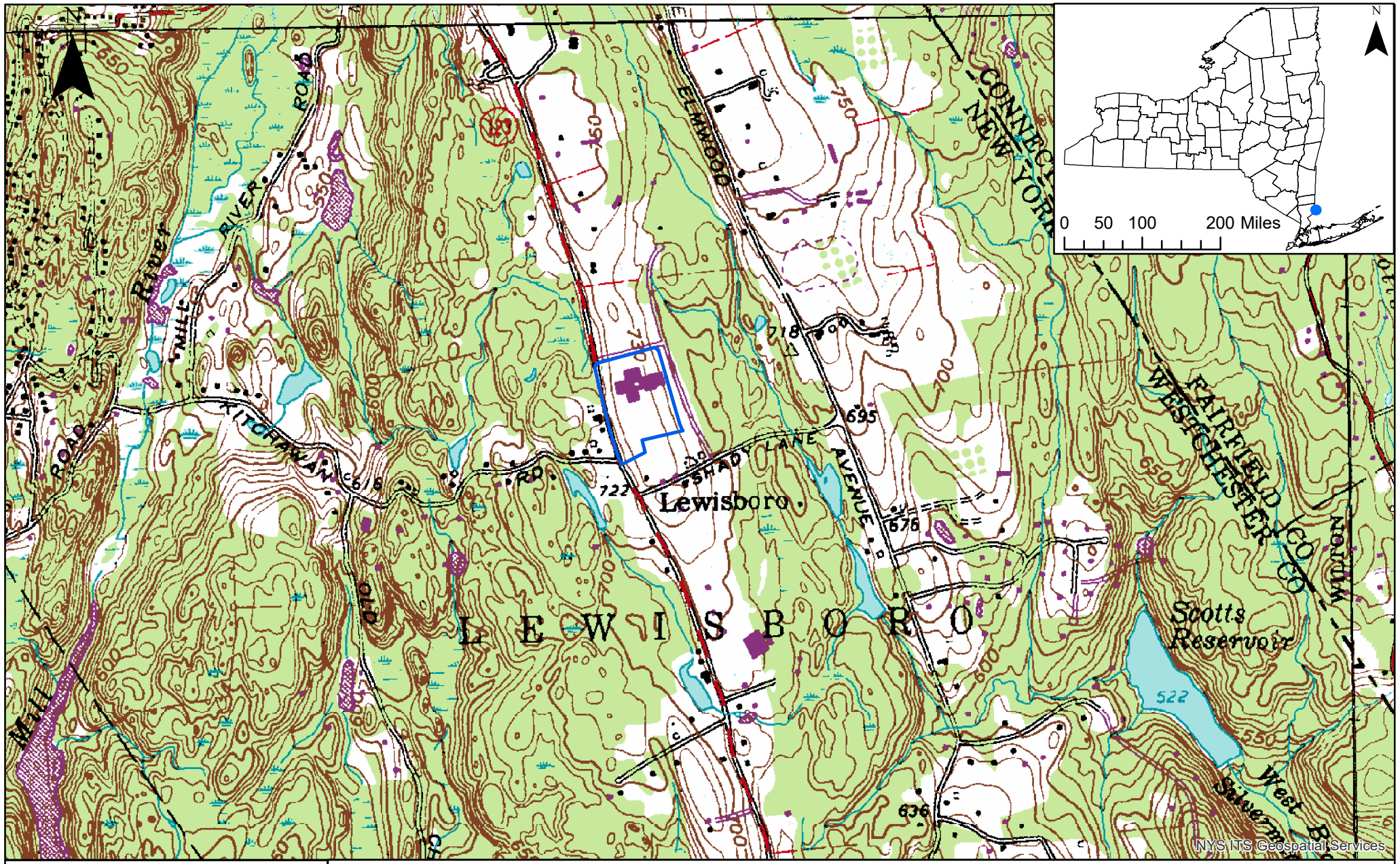

Figure 1

Meadow Pond School
Topographic Map

Meadow Pond
Elementary School
Spill # 2100460

Legend

Meadow Pond Elementary

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Figure 2

Meadow Pond School Property Boundary

Meadow Pond Elementary School Spill # 2100460

Legend

Meadow Pond Elementary

Local Streets

0 250 500 1,000 Feet

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Figure 3

Meadow Pond School
Phase II
Sample Locations

Meadow Pond
Elementary School
Spill # 2100460

Legend

- Meadow Pond Elementary
- Septic Field
- Local Streets
- Public Supply Well
- Overburden Monitoring Well
- Soil Boring

0 125 250 500 Feet

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Figure 4

Meadow Pond School
Phase I Sample
Locations

Meadow Pond
Elementary School
Spill # 2100460

Legend

- Meadow Pond Elementary
- Septic Field
- Local Streets
- Public Supply Well
- Soil Boring
- Catch Basin
- Overburden Monitoring Well

0 125 250 500 Feet

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TABLES

Table 1
Phase II SAP

Analyte	Method	Normal Samples	Field Duplicates	MS	MSD	Equipment Blanks	Total
Soil							
PFAS	EPA Method 1633	26	2	2	2	1	33
pH	EPA Method 9045	8	1	-	-	-	9
TOC	Lloyd Kahn	8	1	-	-	-	9
SPLP PFAS	EPA Method 1312/Method 1633	8	1	-	-	-	9
Groundwater							
PFAS	EPA Method 1633	10	1	1	1	1	14
Ammonia	EPA Method 350.1	10	1	1	1	-	13
Chemical Oxygen Demand	5220B/C/D	10	1	1	1	-	13
Biochemical Oxygen Demand	EPA Method 5210B	10	1	1	1	-	13
Total Organic Carbon	EPA Method 9060A	10	1	1	1	-	13
Total Dissolved Solids	SM-2540C	10	1	1	1	-	13
Sulfate	EPA Method 300	10	1	1	1	-	13
Alkalinity	SM- 2320B	10	1	1	1	-	13
Chloride	EPA Method 300	10	1	1	1	-	13
Bromide	EPA Method 300	10	1	1	1	-	13
Hardness	EPA Method 200.7	10	1	1	1	-	13
Nitrate	EPA Method 300	10	1	1	1	-	13
Nitrite	EPA Method 300	10	1	1	1	-	13
Phosphorus All Forms	EPA Method 365	10	1	1	1	-	13
Phosphate	EPA Method 300	10	1	1	1	-	13
Total Kjeldahl Nitrogen	EPA Method 351.2	10	1	1	1	-	13
pH	EPA Method 9040	10	1	1	1	-	13
Bicarbonate	Calculation from Alkalinity and pH	10	1	1	1	-	13
Carbonate	Calculation from Alkalinity and pH	10	1	1	1	-	13
Calcium	EPA Method 6010D	10	1	1	1	-	13
Magnesium	EPA Method 6010D	10	1	1	1	-	13
Potassium	EPA Method 6010D	10	1	1	1	-	13
Sodium	EPA Method 6010D	10	1	1	1	-	13
Boron	EPA Method 6010D	10	1	1	1	-	13
Tritium	University of Utah	10	1	-	-	-	11
Artificial Sweeteners	L221	10	1	-	-	-	11
Wastewater							
PFAS	EPA Method 1633	8	1	1	1	2	13