Honeywell

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28 May 2020

Ms. Barbara Firebaugh, P.G.
Division of Environmental Remediation
New York State Department of Environmental Conservation
625 Broadway
Albany, New York 12233-7016

Re: Supplemental Remedial Investigation (RI) Task Approval Request
Former Oak Materials Fluorglas Division – John Street (442049)
Village of Hoosick Falls, Rensselaer County, New York
Order on Consent and Administrative Settlement Index Number CO 4-20160415-79

Dear Ms. Firebaugh:

This letter respectfully requests DEC's approval of the following Supplemental Remedial Investigation (RI) Scope of Work tasks:

- **Continued Groundwater Investigation -** Installation of additional soil borings and groundwater monitoring wells to:
  - evaluate the stratigraphic profile at each location;
  - delineate the extent of volatile organic compounds (VOCs) in groundwater present beneath and adjacent to the John Street Site (Site); and
  - confirm the presence of a buried paleo channel that may be influencing local and regional groundwater flow, and further investigate groundwater quality within this paleo channel upgradient (south) of the Site.
- **Groundwater-Surface Water Interaction at Hoosic River -** Installation of temporary well points in the riverbed and other activities to evaluate temperature anomalies identified along the river during the drone infrared survey to determine and characterize areas of potential groundwater discharge to surface water**.**

The activities proposed in this letter work plan will be supported by relevant parts of the following NYSDEC-approved August 2019 John Street Remedial Investigation (RI) documents:

- RI Work Plan (RIWP);
- Community Air Monitoring Plan (CAMP);
- RI Field Sampling and Analysis Plan (FSAP); and
- Quality Assurance Project Plan (QAPP).

The Scopes of Work are described below and summarized in Table 1.

Continued Groundwater Investigation

Near-Site Investigation

The 2019 RI groundwater sampling results indicate VOCs are present in groundwater beneath and to the east of the John Street property. Figure 1 shows the existing groundwater monitoring well network with the proposed new

locations shown in the red circles. The proposed sampling locations may be adjusted in the field as necessary based on the results of subsurface clearance efforts and field observations, in consultation with NYSDEC.

Eleven (11) continuous soil borings are proposed for installation down to the till or bedrock surface (whichever is encountered first) using the rotosonic drilling method. A surface casing will be set and grouted five feet into the clay unit to isolate the overlying shallow sand and gravel water table unit from the deeper sand and gravel unit beneath the clay unit. Soil borings will be logged and field screened using established project procedures specified in the approved project documents. Up to four soil samples may be collected for VOC analysis from the clay and/or deep sand/gravel unit based on depths and field observations/screening with a photoionization detector (PID).

Temporary two-inch diameter groundwater monitoring wells will be constructed of polyvinyl chloride (PVC) in the deep sand/gravel unit beneath the clay at each boring location. The screen intervals will be selected based on the observed stratigraphic column at each location and field observations/PID screening. At a minimum, one temporary well will be installed at each location and screened immediately above the till or bedrock surface (whichever is encountered first). Additional shallower wells may be installed with screen settings based on the aforementioned criteria. Each well will be developed using a nitrogen-driven airlift system and completed with a protective flush-mount roadway box. A New York State-licensed land surveyor will locate and determine elevations for each new well.

After a minimum two-week equilibration period, groundwater samples will be collected from each new well and existing overburden wells at JS-MW-001A-BR (5 wells), 003A-BR (5 wells), 004A-D (4 wells) and 005A (1 well) OS-MW-042B (1 well) and 043A-B (2 wells). All wells will be analyzed for Target Compound List (TCL) VOCs, 1,4-dioxane, per- and polyfluoroalkyl substances (PFAS), total organic carbon (TOC), pH, field[1] and geochemical[2] parameters. The resultant data will be validated and incorporated into the existing RI data set.

Upgradient Investigation

Geologic data (depth to bedrock and lithology) obtained during 2018 - 2019 suggests the potential presence of buried paleo channel upgradient, beneath, and downgradient of the Site that may be influencing local and regional groundwater flow. An upgradient soil boring/monitoring well (OS-B-47) installed during the 2019 RI drilling program confirmed the presence of a lower transmissive sand and gravel unit over 30 feet in thickness at that location.

Figure 2 shows a plan view of the area with bedrock elevations posted next to boring locations associated with the Site, the McCaffrey Street Site, and the First Street Site. The dashed black line indicates the interpreted and likely extent of the paleo channel based on existing information and shows an area of interest with no geologic information. Four (4) additional soil borings/groundwater monitoring well locations are proposed to investigate this area (red circles). Continuous rotosonic soil borings will be installed and sampled using the methods described above to confirm the paleo channel and/or the presence of the lower transmissive sand and gravel unit. Soil samples will not be collected for laboratory analyses.

Groundwater monitoring well screen intervals will be selected based on the observed stratigraphic column at each location and field observations/PID screening. At a minimum, one temporary well will be installed at each location and screened immediately above the till or bedrock surface (whichever encountered first). Additional shallower wells may be installed with screen settings based on the aforementioned criteria. Groundwater monitoring well constructions, completions, development, surveying and sampling will be as described above.

[1] Temperature, Specific Conductance (SpC), pH, Dissolved Oxygen (DO), and Oxidation-Reduction Potential (ORP)
[2] Major Cations (Calcium, Magnesium, Sodium, and Potassium) and Major Anions (Chloride, Carbonate, Bicarbonate and Sulfate)

Groundwater-Surface Water Interaction at Hoosic River

ERM performed a drone infrared survey in December 2019 and identified nine (9) areas with temperature anomalies along the Hoosic River that may represent potential groundwater discharge to surface water. These locations are shown in Figure 3 and were qualified based on the presence of relatively warm temperature signatures along the riverbank or the base of the flood control wall system. Thermal images were compared to high-resolution orthoimages to reduce the possibility of false temperature signatures such as sunlight reflecting off the water surface.

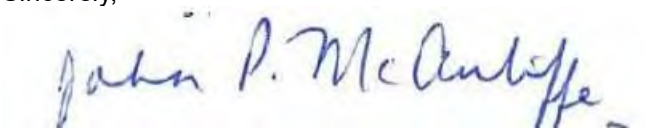
Each location will be evaluated to determine if groundwater discharge is occurring, and if detectable concentrations of VOCs and/or PFAS are present in the groundwater. Those locations where VOCs and/or PFAS are detected in a groundwater sample will be considered for further evaluation to estimate the potential for impacts to the river from groundwater discharge at those locations. Initial evaluation methods proposed below will be completed by walking at the edge of the river. Low river stage conditions and warm ambient temperatures are prerequisites for safe working conditions and good temperature contrast between the river and groundwater. Initial methods will include:

- Scan each area with a hand-held forward-looking infrared (FLIR) camera to determine if a temperature anomaly is present and the extent of the anomaly. Photographs will be recorded.
- Measure and record the ambient river temperature at each anomaly location, and measure and record the depth to water and groundwater temperatures in the nearest water table/shallow groundwater monitoring wells.
- Collect riverbed temperature measurements on a 5-foot grid spacing from an initial area measuring approximately 10 feet by 30 feet at each location using a suitable thermometer and thermocouple probe. The grid at a given location may be expanded if real-time field results indicate a larger area of groundwater discharge is present, and if safe working conditions permit. Temperature will be recorded for the 0 to 12-inch depth interval at each grid node. Riverbed temperatures more similar to local ambient groundwater values than the measured ambient river water temperature would indicate areas of groundwater discharge.
- Install a temporary Solinst 615N (or similar) well point with stainless steel riser pipe to a maximum depth of 3 feet into the river bed at each location using a slide hammer, or similar handheld device. A New York State-licensed surveyor will survey each temporary well point to determine its location and the elevation of the top of casing.
- Measure the groundwater level within the temporary well point and a surface water elevation outside the point from the top of the pipe to determine any measureable difference in head that would indicate a hydraulic gradient at that location. The elevation data for the river surface, groundwater within each temporary piezometer, and nearby monitoring wells to establish hydraulic gradient profiles.
- Collect a groundwater sample from each temporary well point, and a surface water sample immediately adjacent to each temporary well point at a targeted depth of six inches off the riverbed. The groundwater and surface water samples will be analyzed for TCL VOCs, 1,4-dioxane, PFAS, TOC, pH, field and geochemical parameters (see footnotes above).

We appreciate the NYSDEC's continued input and review. Please contact Chris Wenczel at 516-315-8221 or Tim Johnson at 315-414-2029 as soon as possible to discuss any questions or comments.

If the Department concurs, please provide written approval at your earliest convenience. After we receive the Department's approval, we will provide an updated schedule to complete the work.

Sincerely,



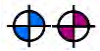
John P. McAuliffe, P.E.
Remediation Director, Design and Construction

Attachments

Cc. Susan Edwards, P.E. (NYSDEC)
Ian Beilby, P.E. (NYSDEC)
Christine Vooris (NYSDOH)
John Morris, P.E. (JJ Morris Environmental Consulting)
Dale Desnoyers (Allen & Desnoyers, LLP)
Ed McTiernan, (Arnold & Porter)
Eric Christodoulatos (Honeywell)
Tim Johnson (Anchor QEA)
James Perazzo, P.G. (ERM)
Maureen Leahy, Ph.D. (ERM)
Chris Wenczel, P.G. (ERM)

TABLE 1

Table 1
Supplemental RI Sampling and Analysis Plan
Former Oak Materials Fluorglas Division - John Street

Sample Matrix	Sampling Location	Methods/Work Scope Summary	Number of Samples (excluding QA/QC)	Analytical Parameters	Sample Type	Sampling Method
Continued Groundwater Investigation - See Figures 1 & 2						
Subsurface Soil 	On-site/Off-site in clay and/or deeper sand and gravel unit	Fifteen (15) continuous soil borings are proposed for installation down to the till or bedrock surface (whichever encountered first) using the rotosonic drilling method. A surface casing will be set and grouted five feet into the clay unit to isolate the overlying shallow sand and gravel water table unit from the deeper sand and gravel unit beneath the clay unit. Soil borings will be logged and field screened using established project procedures specified in the approved project documents. Up to four (4) soil samples may be collected from the 11 soil borings beneath and adjacent to the Site for VOC analyses from the clay and/or deep sand/gravel unit based on depths and field observations/screening with a photoionization detector (PID). No soil samples will be collected for laboratory analyses from the four (4) upgradient soil boring locations.	44+ (Up to 4 per location)	VOCs	One grab sample at each selected depth interval	Rotosonic Drilling Rig
Groundwater In Overburden 	On-site	Temporary two-inch diameter groundwater monitoring wells will be constructed of polyvinyl chloride (PVC) in the deep sand/gravel unit beneath the clay at each boring location. The screen intervals will be selected based on the observed stratigraphic column at each location and field observations/PID screening. At a minimum, one temporary well will be installed at each location and screened immediately above the till or bedrock surface (whichever encountered first). Additional shallower wells may be installed with screen settings based on the aforementioned criteria. Each well will be developed using a nitrogen-driven airlift system and completed with a protective flush-mount roadway box. A New York State-licensed land surveyor will locate and determine elevations for each new well.	2+ (Up to 3 per location)	PFAS (21), TOC, pH, TCL VOCs, 1,4-dioxane, Field and Geochemical Parameters	Overburden Groundwater Grab Sample	Rotosonic Drilling Rig and Low-flow Sampling
	Off-site		13+ (Up to 3 per location)	PFAS (21), TOC, pH, TCL VOCs, 1,4-dioxane, Field and Geochemical Parameters	Overburden Groundwater Grab Sample	Rotosonic Drilling Rig (intermediate and deep) and Low-flow Sampling
	On-site	4 locations: After a minimum two-week equilibration period, gauge and sample all overburden wells at JS-MW-001A-BR (5 wells), 003A-BR (5 wells), 004A-D (4 wells) and 005A (1 well).	15	PFAS (21), TOC, pH, TCL VOCs, 1,4-dioxane, Field and Geochemical Parameters	Overburden & Bedrock Groundwater Grab	Low-flow Sampling
	Off-site	2 locations: After a minimum two-week equilibration period, gauge and sample all overburden wells at OS-MW-042B (1 well) and 043A-B (2 wells).	3	PFAS (21), TOC, pH, TCL VOCs, 1,4-dioxane, Field and Geochemical Parameters	Overburden Groundwater Grab Sample	Low-flow Sampling
Groundwater-Surface Water Interaction at Hoosic River - See Figure 3						
	Off-site At Hoosic River	Scan each area with a hand-held forward-looking infrared (FLIR) camera to determine if a temperature anomaly and its extents are indicated. Photographs will be recorded.	9 Locations	Infrared/Visible Lignt	Photograph	Camera
		Measure and record the ambient river temperature at each anomaly location, and measure groundwater temperatures in the nearest water table/shallow groundwater monitoring wells. Collect riverbed temperature measurements on a 5-foot grid spacing from an initial area measuring approximately 10 feet by 30 feet at each location using suitable thermometer and thermocouple probe. The grid at a given location may be expanded if real-time field results indicate a larger area of groundwater discharge is indicated and safe working conditions permit. Temperature will be recorded for the 0 – 12-inch depth interval at each grid node.		Temperature	Direct Point Reading	Thermometer & Thermocouple Probe
		Install a temporary Solinst 615N (or similar) well point with stainless steel riser pipe to a maximum depth of 3 feet into the river bed at each location using a slide hammer, or similar handheld device. A New York State-licensed surveyor will survey each temporary well point to determine its location and the elevation of the top of casing.		None	None	Slide Hammer or Similar Device
		Measure the groundwater level within the temporary well point and a surface water elevation outside the point from the top of the pipe to determine any measureable difference in head that would indicate a hydraulic gradient at that location.		Elevation	Water Level	Water Level Meter
		Collect a groundwater sample from each temporary well point, and a surface water sample immediately adjacent to each temporary well point.		PFAS (21), TOC, pH, TCL VOCs, 1,4-dioxane, Field and Geochemical Parameters	Groundwater/ Surface Water	Low-flow Sampling

Notes and Abbreviations:
PFAS - Per- and Polyfluoroalkyl Substances
TCL - Target Compound List
VOCs - Volatile Organic Compounds
TOC = Total Organic Carbon by the Lloyd Kahn method
Field Parameters - Specific Conductance (SpC), pH, Dissolved Oxygen (DO), and Oxidation-Reduction Potential (ORP)
Geochemical Parameters - Major Cations Calcium, Magnesium, Sodium, and Potassium) and Major Anions (Chloride, Carbonate, Bicarbonate and Sulfate)

FIGURES

JS-MW-001	Depth (ft)	TPFAS (ng/L)	TVOCs (µg/L)
A	17.5	4,784.70	118.7
B	53	4,479.91	1,644
C	80	421.96	1,072
D	90	722	1,694
BR	137.1	27.42	5.34

OS-TMW-042	Depth (ft)	TPFAS (ng/L)	TVOCs (µg/L)
B	63	376.72	19.29

JS-MW-003	Depth (ft)	TPFAS (ng/L)	TVOCs (µg/L)
A	9.5	237.6	4.49
B	56	1,258.5	44,000
B (DUP)	56	1,257.7	19,000
C	89	2,761.22	74,000
D	138.5	750.8	4.69
BR	181.5	1.19	ND

JS-MW-003	Depth (ft)	TPFAS (ng/L)	TVOCs (µg/L)
B	56	ND	31,086
C	89	ND	120,000
D	138.5	ND	12

OS-TMW-043	Depth (ft)	TPFAS (ng/L)	TVOCs (µg/L)
B	125	3,119.40	15,640

OS-TMW-043	Depth (ft)	TPFAS (ng/L)	TVOCs (µg/L)
B	125	ND	4,904

JS-MW-004	Depth (ft)	TPFAS (ng/L)	TVOCs (µg/L)
A	10.5	294.02	ND
B	63	535.57	127
C	111	4,160.72	ND
D	139.5	3,937.66	ND

JS-MW-005	Depth (ft)	TPFAS (ng/L)	TVOCs (µg/L)
A	12.5	119.62	ND

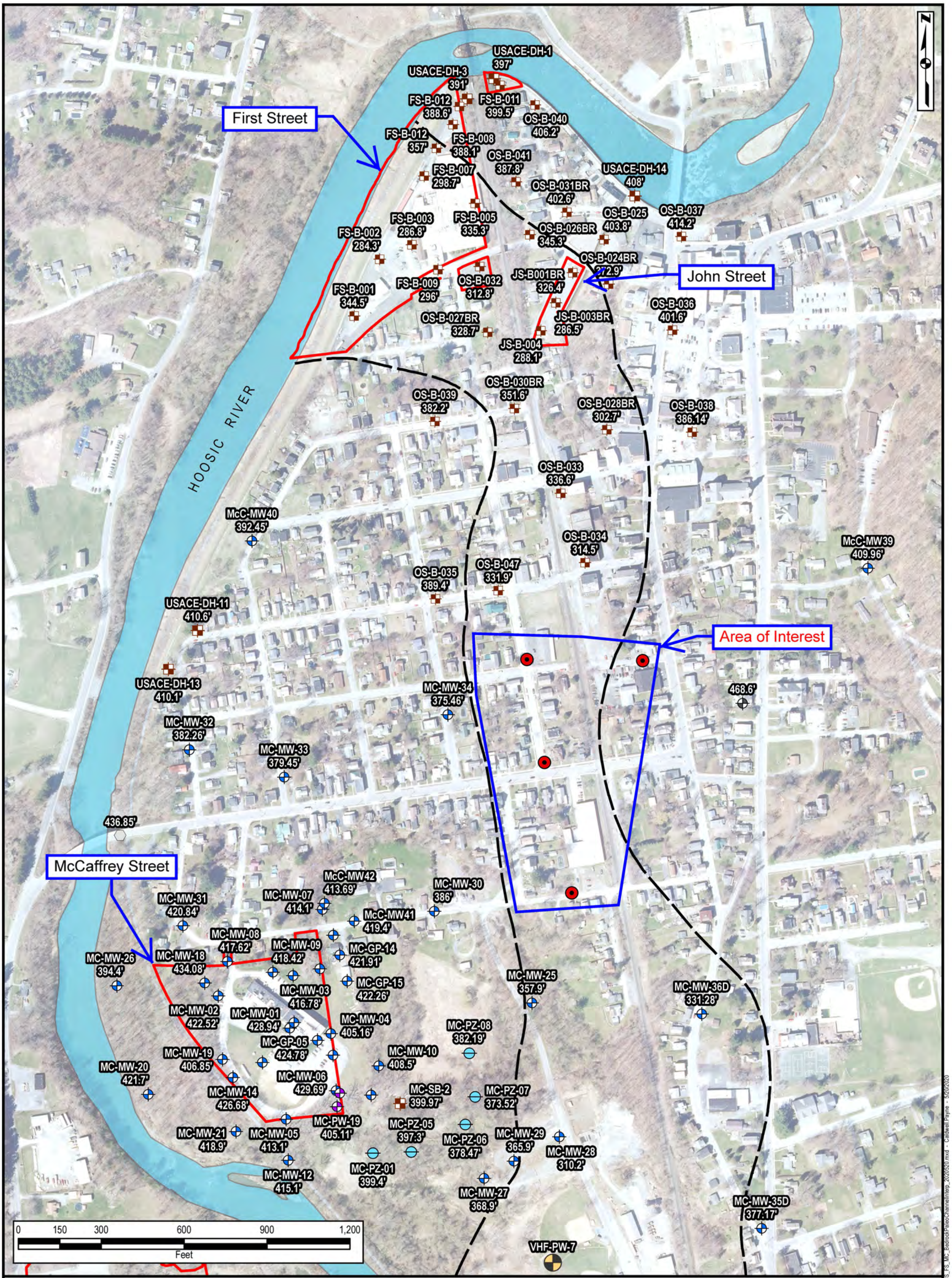
Legend

Well Type

- Overburden Monitoring Well
- Temporary Monitoring Well
- Temporary IRM Monitoring Well
- Bedrock Monitoring Well
- Proposed Soil Boring/Monitoring Well
- Perennial Stream
- Approximate Property Boundaries

Figure 1: John Street Area
Supplemental Monitoring Wells
Village of Hoosick Falls
Town of Hoosick
New York

ERM



Legend

- Monitoring Well
- Production Well
- Piezometer
- Private Well Record
- Soil Boring
- 468.6' Bedrock Surface Elevation
- Bedrock Outcrop
- PW-7 Location
- Approximate Property Boundaries
- Interpreted Potential Bedrock Paleochannel Boundary
- Proposed Soil Boring/Monitoring Well Location

NOTES:
- Elevations are presented in feet above mean sea level (ft asl).

Figure 2: Supplemental Monitoring Wells, Bedrock Surface Elevations and Potential Paleochannel
Village of Hoosick Falls
Town of Hoosick
New York

ERM

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Legend

- Infrared Photo Locations with Direction
- Hoosick Town Boundary
- Temperature Anomaly Location To Be Evaluated For Potential Groundwater Discharge

0 25 50 100 150 200
Feet

Figure 3
Infrared Drone Survey Results
Temperature Anomaly Areas
Village of Hoosick Falls
New York

ERM