NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

7167 Route 353 Property Treatment System and Site Characterization

Site Number: 905041

October 2015

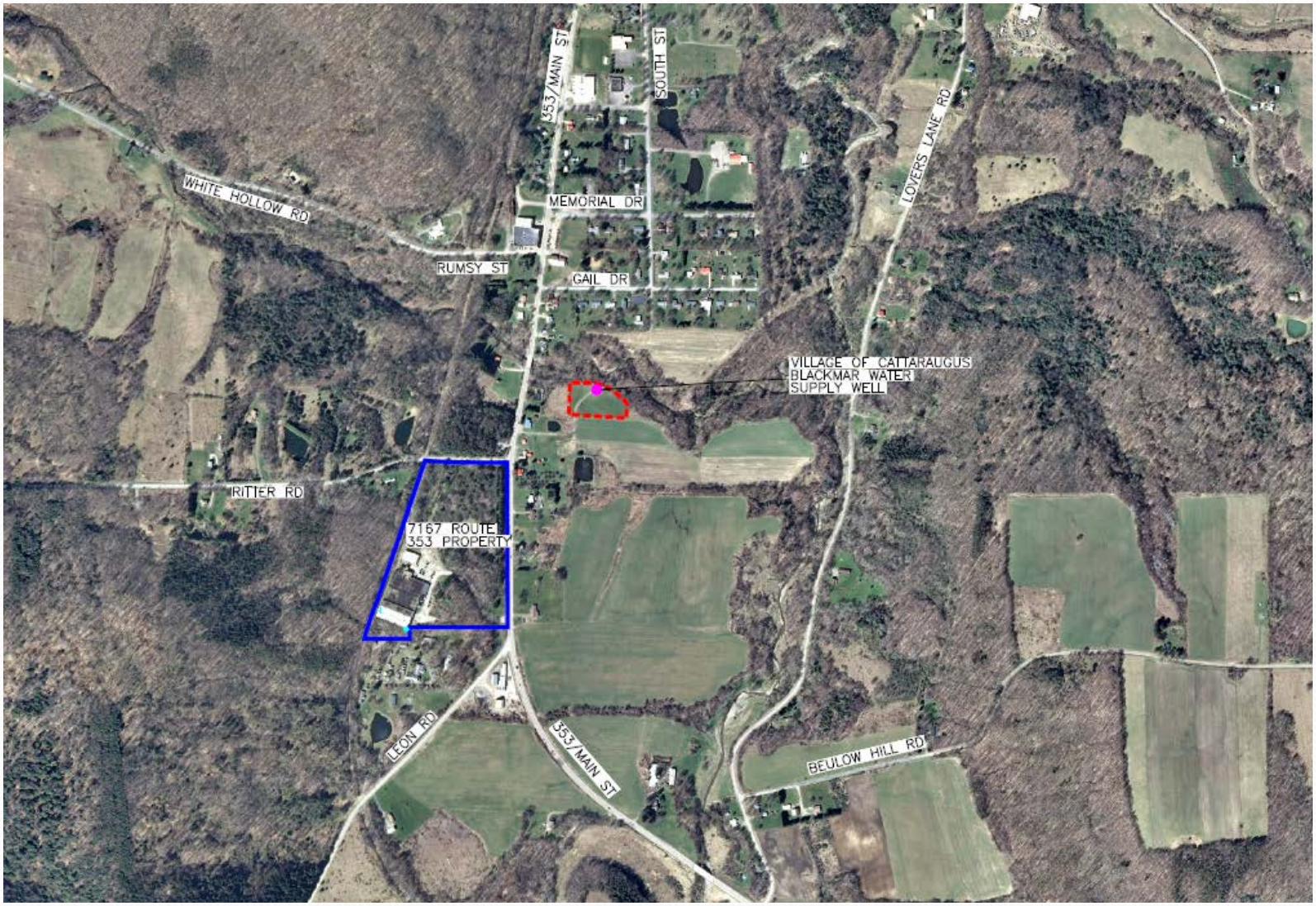
Presentation Outline

- Area Geology and Contamination Background
- Site Characterization Activities
- Analytical Results
- Temporary Treatment System IRM
- Current Status of Plume
- Questions/Additional Information

Area Geology

- The Village of Cattaraugus is located in a north to south trending valley with 100- to 300-foot-thick glacial and glaciolacustrine deposits overlying bedrock.
- Two overburden aquifer zones were identified beneath the 7167 Route 353 site separated by 60- to 90-foot aquitard of lower permeability fine sands, silts, and clays.
- The upper aquifer extends from the ground surface to about 20 to 25 below ground surface (bgs).
- The lower aquifer is comprised of various silt, sand, and gravel layers that are generally located 80 to 140 feet bgs. The aquifer is about 40 to 50 feet thick on the hillsides slopes, but thins to about 20 feet thick toward the center of the valley.

7167 Route 353 Site



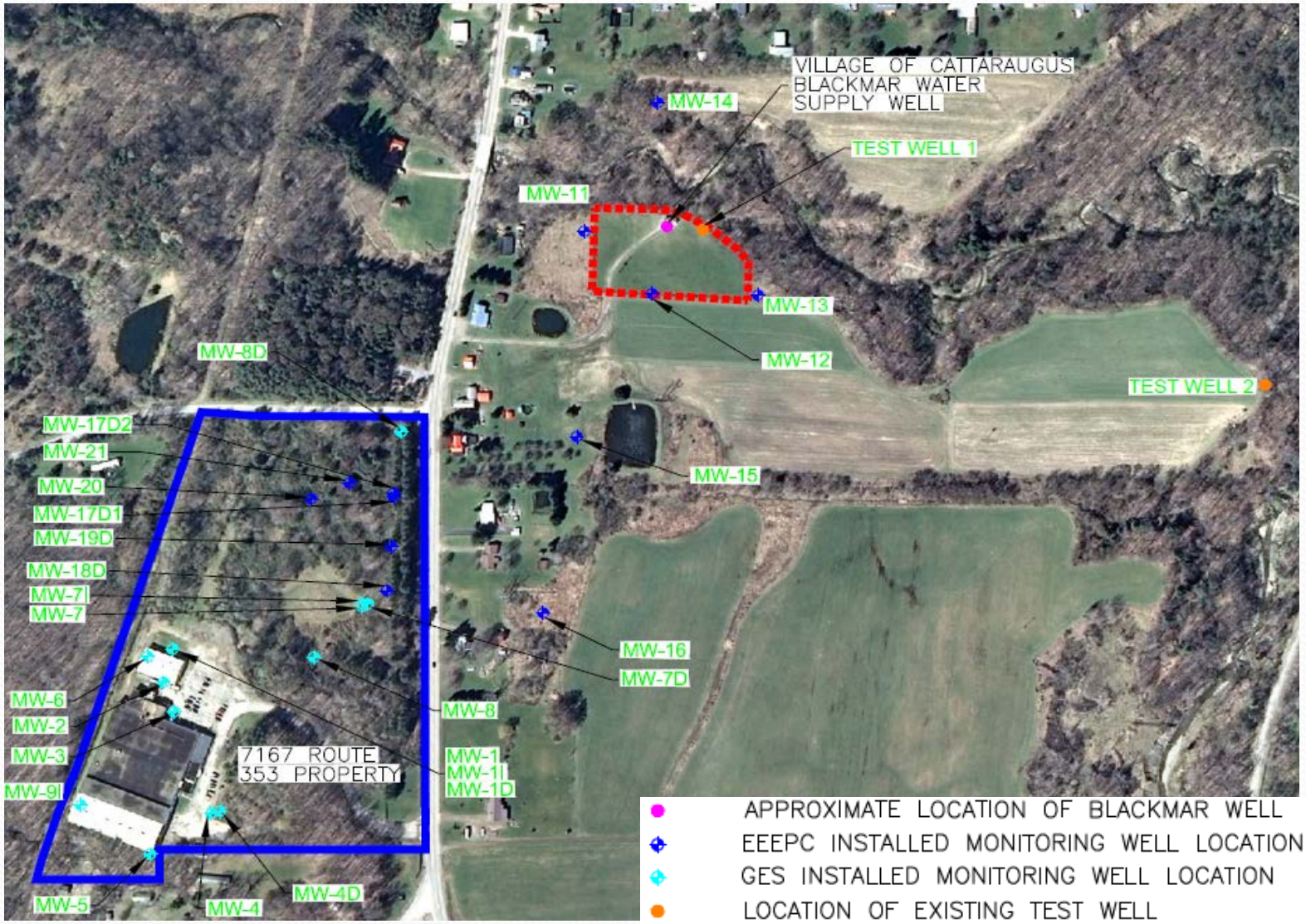
Contamination Background

- The backup water supply well was drilled to approximately 140 feet bgs in April 1992. A 280-gpm pump was installed that typically ran at 200 gpm under normal operation.
- Methylene chloride was first detected in the well at 2.0 parts per billion (ppb) during public drinking water supply sampling in August 2008.
- In late 2012, the NYSDEC was informed that the methylene chloride levels exceeded the NYS drinking water standard of 5.0 ppb and the well was taken out of service on October 12, 2012.
- In March 2013, methylene chloride concentration in the backup water supply well was 15 ppb. The source of the plume was unknown, but the 7167 Route 353 property was identified as a potential source.

Site Characterization Activities

- In January 2013, Groundwater Environmental Services (GES) dug seven test pits, drilled 22 soil borings and installed 15 monitoring wells to investigate the soil and groundwater quality on the 7167 Route 353 site.
- Methylene chloride was only identified in one of the 15 GES monitoring wells on the property.
- Ecology and Environment (EEEPC) drilled and installed a total of 12 monitoring wells during three phases over the next year:
  - Six wells around and south of the backup well in July/August 2013;
  - Four wells on the 7167 Route 353 property in November 2013; and
  - Two wells on the 7167 Route 353 property in June 2014.

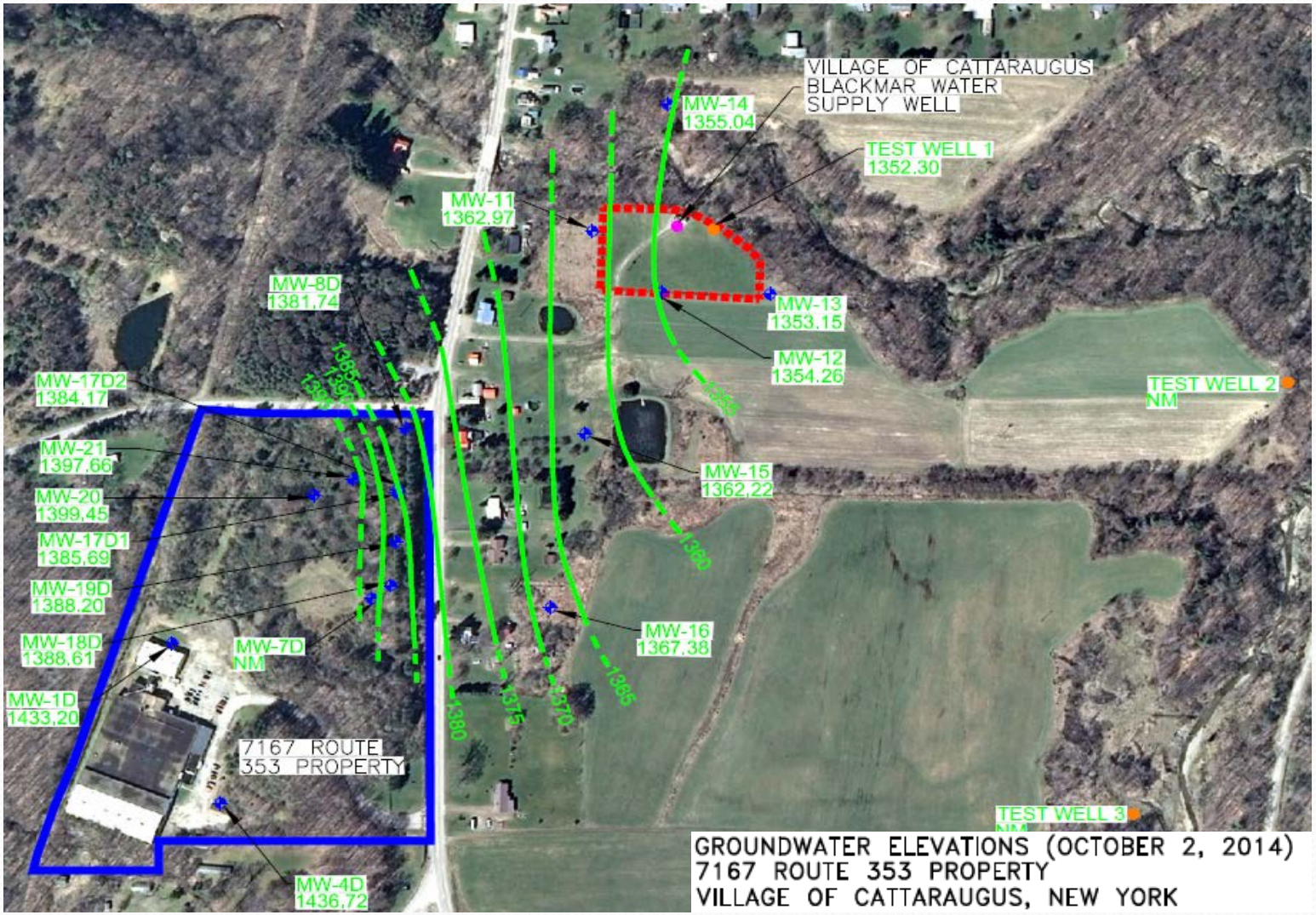
7167 Route 353 Monitoring Wells



Site Characterization Activities

- The first phase of drilling/wells identified the source of the methylene chloride contamination was likely located either west or southeast of monitoring well MW-15.
- The second phase determined a narrow plume of methylene chloride contamination is migrating off the northeastern area of the 7167 Route 353 property.
- The third phase attempted to locate the source of the methylene chloride contamination on the 7167 Route 353 property.
- Groundwater flow direction generally flows eastward off the hillside/7167 Route 353 property and then flows to the northeast about 200 feet east of Route 353.

7167 Route 353 Monitoring Wells



Analytical Results

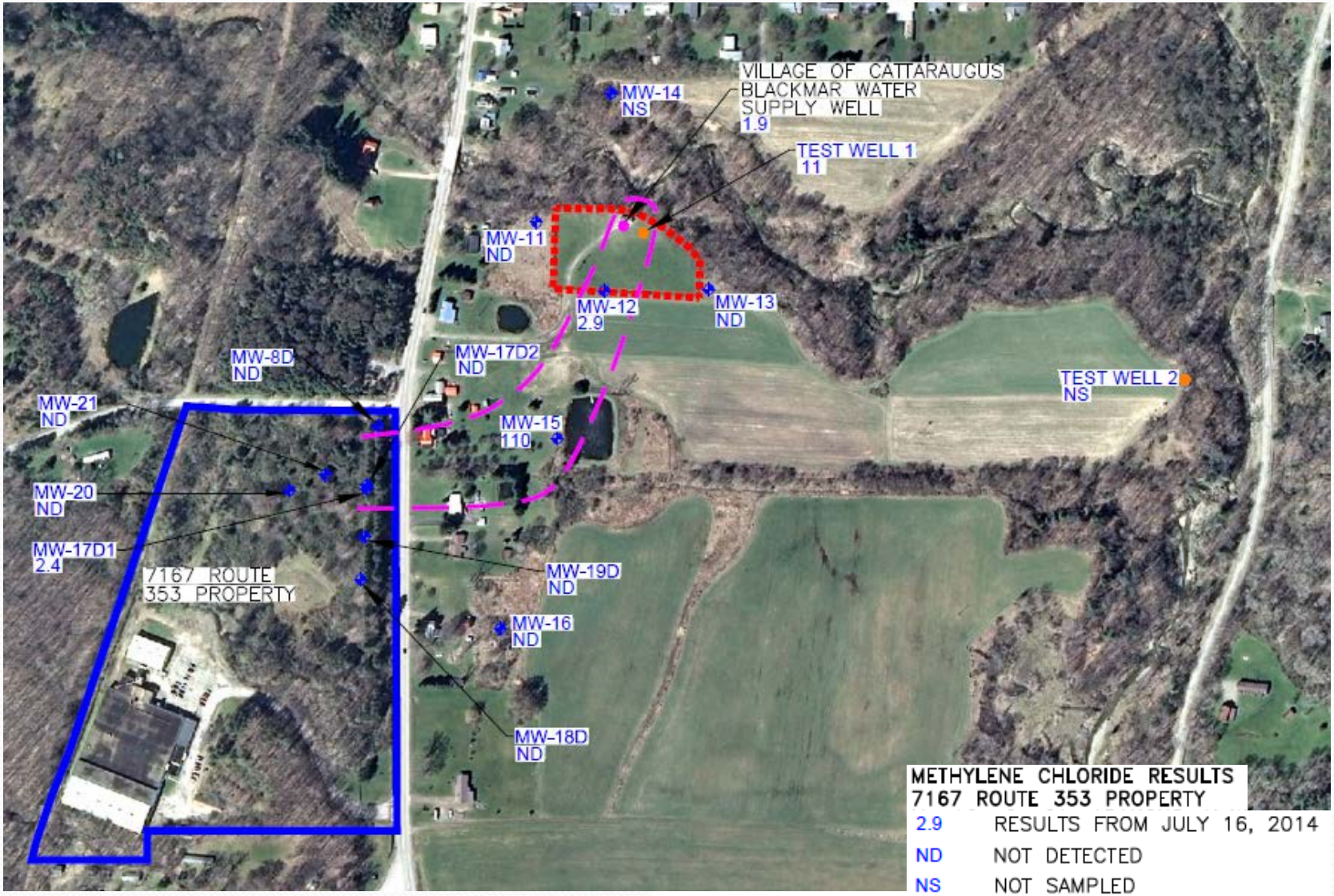
- Eight rounds of groundwater samples have been collected from site monitoring wells (two low-flow events and 6 passive diffusion bag [PDB] events).
- Besides methylene chloride, a total of 15 other volatile organic compounds (VOCs) have been detected.
- Besides the backup water supply well, methylene chloride contamination was detected in six monitoring wells:

Test Well #1	MW-8D
MW-12	MW-15
MW-17D1	MW-18D

Analytical Results

- The highest level of methylene chloride contamination was found while drilling MW-17D1 (170 ppb).
- The highest methylene chloride concentration detected in the backup water supply well was 16 ppb (June 2013). Methylene chloride concentrations in the well have decreased since June 2013 and has not been detected in either of last 2 sample events (October 2014 & June 2015).
- The methylene chloride plume leaving the 7167 Route 353 property is relatively narrow (less than 400 feet) and appears to naturally flow east-northeast across the valley about 400 to 500 feet south of the backup water supply well.

Analytical Results



Temporary Treatment System IRM

- EEEPC was tasked to design an interim remedial measure (IRM) to treat methylene chloride concentrations of 50 ppb to less than 1 ppb at a flow rate of 250 gpm by July 15, 2013.
- EEEPC designed a shallow tray air stripper system housed in a cargo container. The village DPW requested the system be designed to run using the Village's telemetry equipment.
- Because the IRM treatment system wasn't ready until August, NYSDEC worked with the Village DPW to repair the spring boxes and transmission lines from five springs in July 2013 as a backup water supply measure.
- As a result of the springs, the Blackmar water supply well has not been needed in 2013, 2014, or 2015.

Temporary Treatment System IRM

- The commissioning run was performed on September 11, 2013, and the final completed works approval was received on September 17. However, flow rate surges occurred when water was delivered into the distribution system.
- Wiring, system control logic programing changes, and the discharge valve on the transfer pump was throttled back to fix the problem and the system was winterized.
- The treatment system was run at a steady flow to the DPW's satisfaction on June 10, 2014. However, it was identified during the test the Village's backup generator was not working properly, so the DEC diagnosed and repaired the generator for the village in August.

Temporary Treatment System IRM

- In July 2014, the village DPW informed the DEC the village's telemetry system was damaged by lightning and requested the system be reprogramed to run in manual mode.
- Programming changes were made to the treatment trailer in September for the system to automatically run when the well pump was started in hand mode, but it was identified the treatment system pumps no longer automatically adjusts to match the influent flow from the well pump.
- The system was winterized in November 2014 with the idea to develop programing changes to allow the treatment trailer to automatically adjust flows in manual mode.

Current Status of Plume

- A downward vertical hydraulic gradient is present on the 7167 Route 353 property and methylene chloride is denser than water, so contamination is expected to sink and move from the surface/upper aquifer into the lower aquifer.
- The methylene chloride plume source was not identified on the 7167 Route 353 property and is likely no longer present since methylene chloride concentrations in monitoring wells on that property have generally decreased and the highest concentrations have moved down gradient from MW-17D1 to MW-15.

Current Status of Plume

Last 3 Rounds of Methylene Chloride Groundwater Results (ppb)			
Well ID	Sample Collection Date		
	07/16/14	10/02/14	06/10/15
Village Well	**1.9**	ND	ND
TEST WELL 1	**11**	**5.0**	**2.8**
MW-8D	ND	ND	ND
MW-11	ND	ND	ND
MW-12	**2.9**	ND	ND
MW-13	ND	ND	ND
MW-15	**110**	**20**	**35**
MW-16	ND	ND	ND
MW-17D1	**2.4**	**10**	**14**
MW-17D2	ND	ND	ND
MW-18D	ND	ND	**1.1**
MW-19D	ND	ND	ND
MW-20	ND	ND	ND
MW-21	ND	ND	ND

Current Status of Plume

- Since the village backup water supply well has not operated since 2012, it appears the well is no longer pulling the methylene chloride plume towards itself.
- The five springs added in July 2013 adds approximately 50 to 60 gpm to the village water supply system in the dryer months. As a result, the backup water supply well was not needed in 2013, 2014, or 2015.
- If non-use of the village well continues for a few more years, it is possible the methylene chloride plume will move beyond the capture zone of the well and the temporary treatment system will no longer be required.

Questions/Additional Information

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