



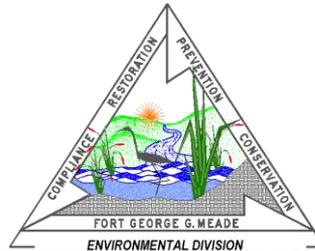
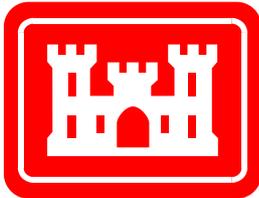
Fort George G. Meade



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Off-Post Groundwater Investigation: Nevada Avenue Area Report

Restoration Advisory Board Meeting
March 20, 2014



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Nevada Avenue Work Plan Overview



Nevada Avenue Groundwater Investigation Work Plan

- Objective: Determine if PCE in Nevada Ave private wells is originating from Fort Meade.
- Activities include:
 - Install 5 deep (Lower Patapsco Aquifer [LPA]) and 2 (optional) shallow (Upper Patapsco Aquifer [UPA]) monitoring wells,
 - Conduct 2 rounds of GW sampling & water level measurements,
 - Perform historical research to identify any other potential sources,
 - Conduct monthly sampling of the three private wells on Nevada Ave
 - Extend bottled water service to Nevada Ave residents
 - Report findings of the investigation.



Nevada Avenue Monthly Sampling - Interim Results

(last 12 months)



Month	<i>Dichloroethene</i> (MCL - 70 µg/L)		<i>Tetrachloroethene</i> (MCL - 5 µg/L)		<i>Trichloroethene</i> (MCL - 5 µg/L)	
	Detections / Samples	Range (µg/L)	Detections / Samples	Range (µg/L)	Detections / Samples	Range (µg/L)
Apr 13	1/3	0.69J	3/3	1.8 – 2.2J	1/3	0.37J
May 13	0/3	ND	0/3	ND	0/0	ND
Jun 13	0/3	ND	3/3	1.5 – 2.4	0/0	ND
Jul 13	3/3	0.72J – 0.73J	3/3	3.8 – 4.3	0/0	ND
Aug 13	0/3	ND	3/3	1.7 – 2.1	0/0	ND
Sep 13	3/3	0.48J – 0.63J	3/3	1.4 – 1.7	0/0	ND
Oct 13	0/3	ND	3/3	1.5 – 1.9	0/0	ND
Nov 13	1/3	0.74J	3/3	1.1 – 1.5	0/0	ND
Dec 13	3/3	0.43J – 0.63J	3/3	1.3 – 2.2	0/0	ND
Jan 14	3/3	0.43J – 0.62J	3/3	5.3 – 5.8	0/0	ND
Feb 14	3/3	0.44J – 0.57J	3/3	1.4 – 2.0	0/0	ND
*Mar 14	3/3	0.48J – 0.69J	3/3	1.4 – 2.1	1/3	0.44J

MCL = Maximum Contaminant Level

µg/L = micrograms per liter

ND = Indicates contaminant not detected above the MDL

Data Qualifiers: **J**= estimated concentration below the method detection limit (MDL)

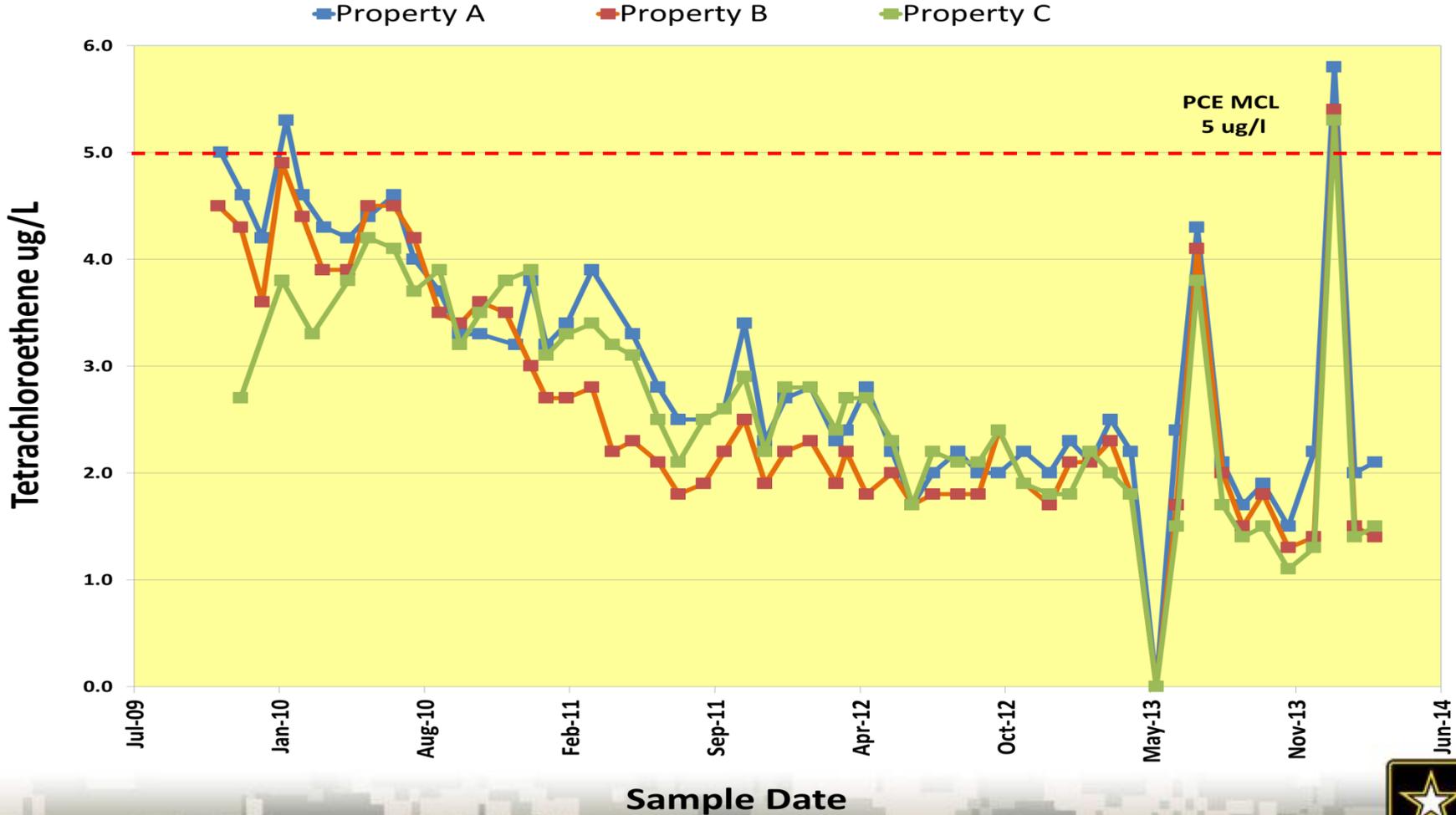
***Data not validated**

BOLD SHADED = MCL exceeded





Summary of Nevada Avenue Monthly Sampling Results – Tetrachloroethene (PCE)





Historical Research



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Environmental Database Review (EDR)

- No evidence of documented PCE releases within one-mile of Nevada Avenue.
- PCE use was identified at a total of 4 active/former dry cleaning businesses located upgradient
 - 1 active permit for PCE use
 - 1 inactive permit for PCE use
 - 2 historical (no permit listed)

No evidence of PCE spill was identified





Historical Research



- Topographic Maps & Aerial Photographs Review
 - Aerial photos dating 1957, 1963, 1970, 1981, 1988, and 2005.
 - Topo maps dating 1907, 1908, 1947, 1949, 1957, 1970, and 1979.
 - In 1947 businesses began to appear along Annapolis Road.
 - No evidence of disposal pits or industrial areas was observed.



Reporting / Historical Research



- FGGM Historical Installation Restoration (IRP) Records
 - Two IRP sites in upgradient area with PCE detections:
 - Solid Waste Management Unit 77: one-time detection of 0.23 $\mu\text{g/L}$ - determined not be migrating off-site.
 - OU-3 Former Nike Site: multiple PCE detections (0.301 - 5.77 $\mu\text{g/L}$). The plume was delineated and is not migrating off-site.
 - None of the IRP sites were determined to be contributing to the PCE contamination in the Nevada Ave Study area.



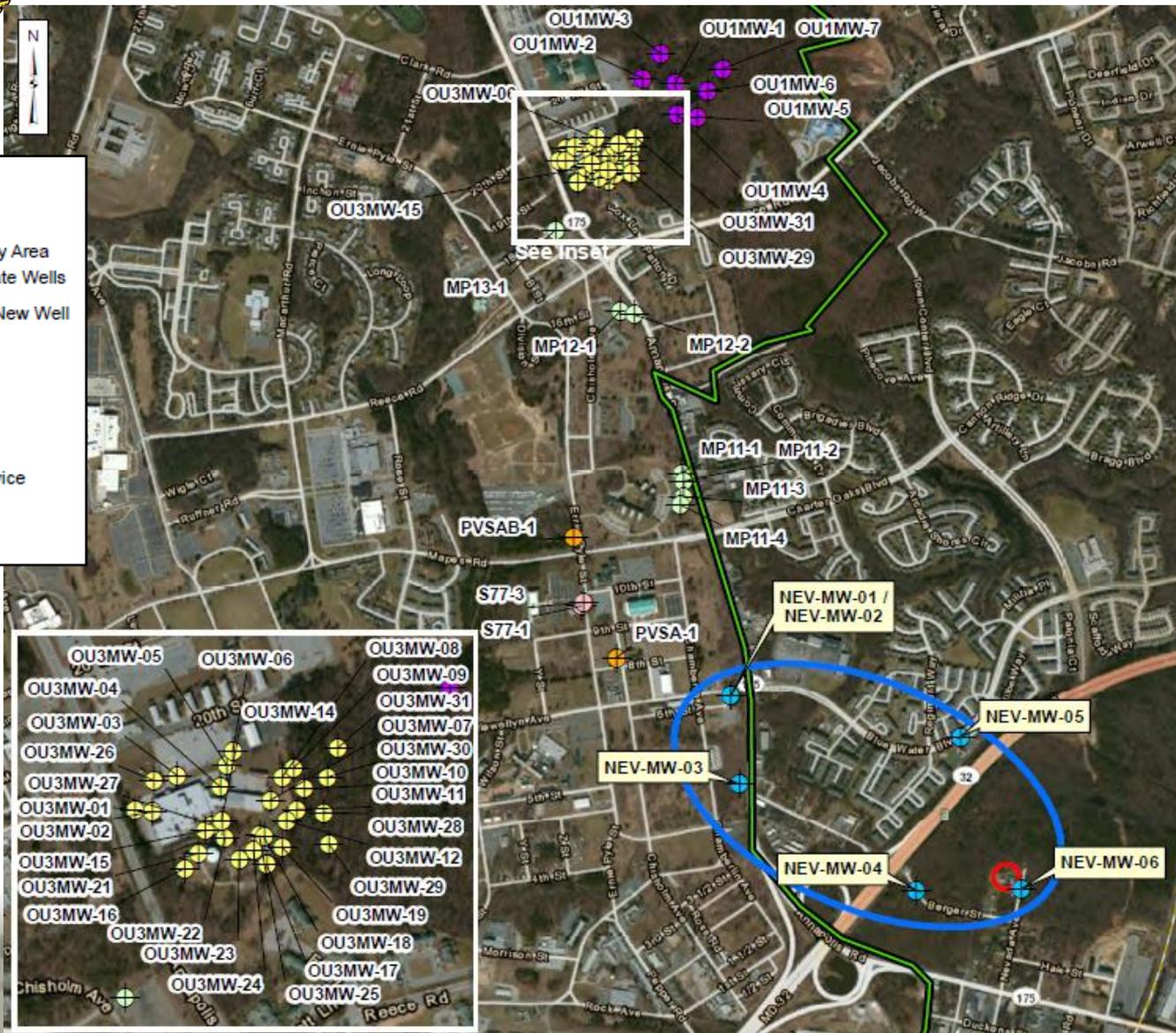
Reporting / Historical Research



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Legend

- FGGM Boundary
- Nevada Avenue Study Area
- Nevada Avenue Private Wells
- Sampling Location - New Well
- Motor Pool Well
- OU-1 Well
- OU-3 Well
- Possible Vehicle Service Area Well
- S77 Well



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Reporting / Historical Research



- MDE Voluntary Cleanup Program (VCP)
 - Hardaway Company with PCE concentrations below the MCL in the surrounding area in 2000-2001
 - Nevada Avenue included in the study area upgradient
 - Land Use Controls were put into place as part of the response action plan
 - Certificate of Completion issued by MDE on 10 January 2006
 - Hardaway determined not to be contributing to the PCE contamination in the Nevada Ave study area



Reporting / Historical Research



- MDE Website File Review and Web Search
 - MDE Website
 - According to a review of available records on the MDE website, no MDE Land Restoration Program sites upgradient of the study area
 - MDE File Review
 - Public Information Act request for data from all MDE divisions in the upgradient addresses on Annapolis Road and Blue Water Blvd that permits for PCE use.
 - Data exists and the file review is scheduled for 24 March 2014



Nevada Avenue Investigation Status Overview



- Nevada Avenue Investigation
 - Field Activities
 - Pre-Well Installation
 - Anne Arundel County Right-of-Way Issued April 2013
 - Public Outreach for the affected community April 2013
 - Well Installation
 - Drilling May 2013 – June 2013
 - Post-Well Installation
 - Round 1 Monitoring Well Gauging of 23 new/existing monitoring wells and Sampling the 6 new monitoring wells July 2013
 - Round 2 Monitoring Well Gauging of 23 new/existing monitoring wells and Sampling the 6 new monitoring wells September 2013
 - Reporting
 - Draft Report for review 19 March 2014



Nevada Avenue Investigation Status Overview



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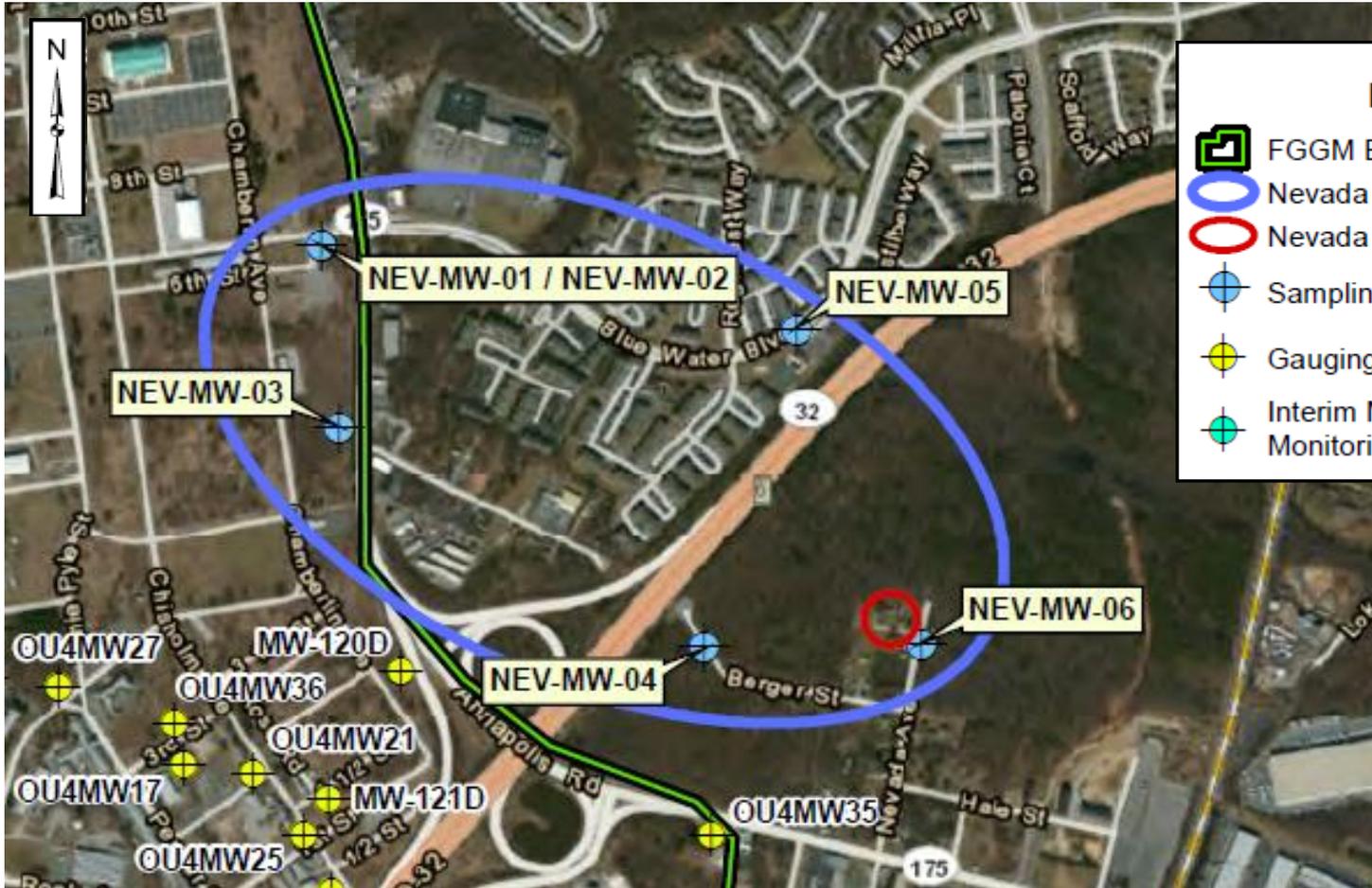




Monitoring Well Locations



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Legend

- FGGM Boundary
- Nevada Avenue Study Area
- Nevada Avenue Private Wells
- Sampling Location - New Well
- Gauging Location
- Interim Measures Monitoring Well





Analytical Sampling Summary of Results



- No PCE detections in on-Post monitoring wells
 - NEV-MW-01, NEV-MW-02, NEV-MW-03
- No PCE detections in Berger St monitoring well
 - NEV-MW-04
- PCE detected above MCL in Blue Water Blvd monitoring well during both sampling rounds
 - NEV-MW-05
- PCE detected below MCL in Nevada Ave monitoring well during both sampling rounds
 - NEV-MW-06



Analytical Sampling Results



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Well	Date Sampled	Compound Detected (MCL)								
		Acetone (NA)	Benzene (5 µg/L)	Bromodi-chloromethane (NA)	Carbon Disulfide (NA)	Chloroform (70 µg/L)	1,2-Dichloro-ethane (5 µg/L)	cis-1,2-Dichloro-ethene (70 µg/L)	PCE (5 µg/L)	TCE (5 µg/L)
NEV-MW-01	7/8/13	ND	ND	3.5	4.0	3.7	ND	ND	ND	ND
	9/9/13	ND	ND	ND	ND	0.26J	ND	ND	ND	ND
NEV-MW-02	7/9/13	ND	ND	ND	ND	ND	ND	ND	ND	ND
	9/9/13	ND	ND	ND	ND	ND	ND	ND	ND	ND
NEV-MW-03	7/9/13	ND	ND	ND	ND	2.4	ND	ND	ND	ND
	9/10/13	ND	ND	ND	ND	0.67J	ND	ND	ND	ND
NEV-MW-04	7/9/13	ND	1.3	ND	ND	0.97J	0.81J	ND	ND	ND
	9/10/13	ND	ND	ND	ND	ND	ND	ND	ND	ND
NEV-MW-05	7/10/13	11.6	ND	ND	ND	ND	ND	5.9	10.5	1.4
	9/11/13	7.8J	ND	ND	ND	ND	ND	6.1	7.8	1.2
NEV-MW-06	7/9/13	ND	ND	ND	ND	1.5	0.75J	ND	4.0	ND
	9/10/13	ND	ND	ND	ND	ND	ND	0.61J	1.5	ND

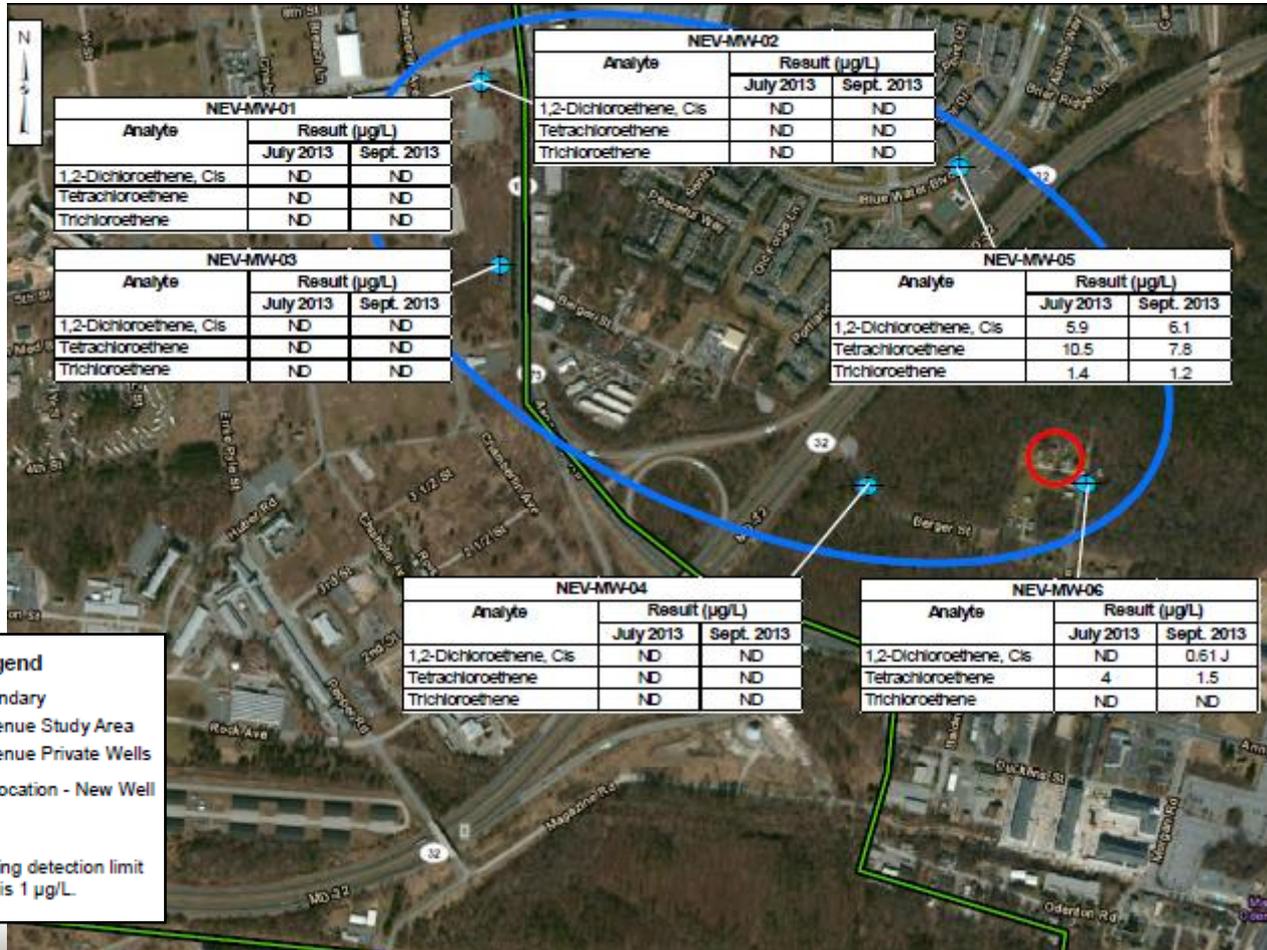




Analytical Sampling Results



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Groundwater Gauging Results



Legend

- FGGM Boundary
- Nevada Avenue Study Area
- Nevada Avenue Private Wells
- Sampling Location - New Well
- LPA Gauging Location
- UPA Gauging Location

Lower Patapsco Aquifer Water Table Elevation Contours

- Water Table Elevation Contour (July 2013)
- Water Table Elevation Contour (September 2013)
- Water Table Elevation Contour Inferred (September 2013)
- Groundwater Flow Direction

LPA Groundwater Elevation (ft)
(July 2013 / Sept. 2013)

(104.96/104.47)





Analytical Sampling Analysis of Results



- PCE is a common dry cleaning fluid typically used as such in the absence of other industrial solvents or petroleum products.
- PCE was also used in degreasers/paint strippers in the automotive repair industry; however, almost always as part of a solvent mixture with other chlorocarbons.
- The contaminant profile in NEV-MW-05, NEV-MW-06 and the Nevada Avenue private wells is consistent with chemicals used in dry cleaning activities.



Summary of Results



- The Environmental Database Review did not reveal any documented releases of PCE upgradient of Nevada Ave. However, it did reveal 4 active/former dry cleaning locations including:
 - 1 active permit for PCE use
 - 1 inactive permit for PCE use, and
 - 2 historical (no permit information)
- One MDE VCP site with historical PCE contamination was identified as closed and downgradient of Nevada Ave.
- An MDE file review of upgradient industrial activities with permits for using PCE is scheduled for 24 March 2014



Summary of Results



- Groundwater gauging results indicate groundwater is flowing in a SE direction.
- On-Post study wells NEV-MW-01, NEV-MW-02, NEV-MW-03 and NEV-MW-04 (Berger St) are not directly upgradient of PCE contaminated study wells (NEV-MW-05, NEV-MW-06 and Nevada Ave private wells).
- NEV-MW-05 is upgradient of both NEV-MW-06 and Nevada Ave private wells.
- The highest concentration of PCE was detected in NEV-MW-05 and exceeded the MCL.
- PCE concentrations in NEV-MW-06 is consistent with PCE concentrations in Nevada Ave private wells.
- Contaminant profile consists of PCE in the absence of other solvents and/or petroleum, which is consistent with dry cleaning activities.

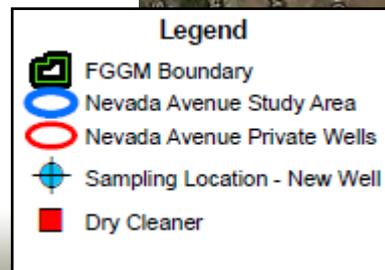


Conclusions



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- The source of the PCE observed in the Nevada Avenue private wells is originating from a location north-northwest of the Nevada Avenue wells, and not from the investigated area of FGGM.
- Other potential sources of PCE exist in the area upgradient of the Nevada Avenue private wells.





Investigation Status / Next Steps

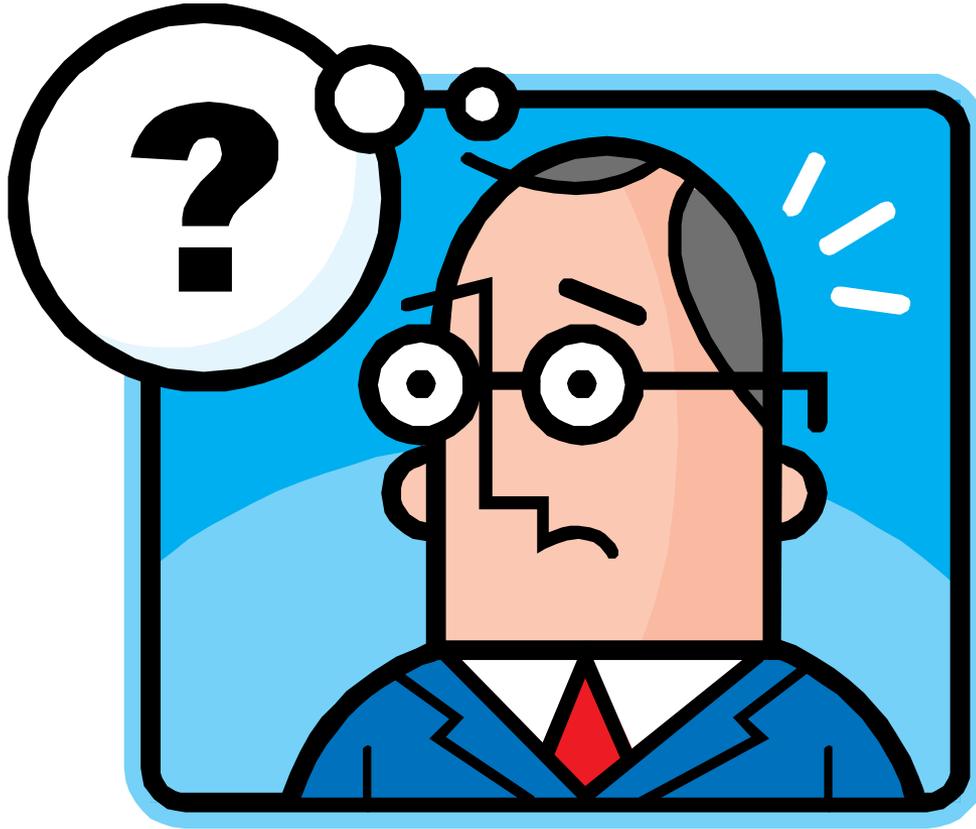


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- Draft Off-Post Groundwater Investigation Report review ends approximately 20 June 2014 (60 calendar days)
- Draft Final Off-Post Groundwater Report, July 2014
- Final Off-Post Groundwater Investigation Report, August 2014
- Army sampling of Nevada Ave private well sampling continues until March 2015



Questions?





Points of Contact



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