

**REMEDIAL INVESTIGATION REPORT
INDUSTRIAL OVERALL SERVICES
SITE # 360109**

WORK ASSIGNMENT NO. D007619-07

Prepared for:

**New York State Department of Environmental Conservation
Albany, New York**

Prepared by:

**MACTEC Engineering and Consulting, P.C.
Portland, Maine**

MACTEC: 3612112221

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3.5.1 Evaluation of Groundwater Gradients

Vertical hydraulic gradients are variable across the study area based on water level measurements documented since 2012, as shown in Table 3.2. Upgradient from the Site and located on a topographical high (MW-26/B), the hydraulic gradient between overburden and bedrock is downward. In the immediate vicinity of the Site, vertical hydraulic gradients are variable, ranging from downward (MW-25/25B), to flat in the Site building (PZ-15/23), and finally to upward gradients, moving along the interpreted bedrock trough (MW-23/BR-102). Monitoring wells downgradient of the Site (MW-1/MW-1B and PZ-14/MW-28B), located topographically lower and within the interpreted bedrock trough, show relatively flat vertical hydraulic gradients. As groundwater gets closer to its potential discharge area, Burling Brook the vertical hydraulic gradient between the overburden and bedrock will likely be upward as bedrock groundwater is anticipated to discharge to New Rochelle Harbor in the Long Island Sound.

3.5.2 Evaluation of Groundwater Elevation and Slug Test Data

Overburden Groundwater. Figure 3.5 presents interpreted overburden groundwater contours from synoptic water levels measurements collected in March 2015. Overburden groundwater flows southwest, following the interpreted geologic valley and underlying bedrock trough. Overburden groundwater is present at the Site ranging between 0.2 (beneath the Site building) to ten feet bgs. Groundwater in the overburden flows southwest, following an apparent bedrock trough towards the New Rochelle Harbor.

Calculated K values in overburden ranges between 1.1 feet per day and 2.9 feet per day, with mean value estimated at 1.8 feet per day. Based on a horizontal gradient of 0.031 feet per foot and an assumed overburden porosity of 0.25, the seepage velocity for overburden groundwater was calculated to be approximately 80 feet per year.

Bedrock Groundwater. Figure 3.6 presents interpreted bedrock groundwater contours from synoptic water levels measurements collected in March/April 2015. Shallow bedrock groundwater also flows to the southwest, following the same trough feature. The trough is expressed at the ground surface as a

5.4 CONTAMINANT MIGRATION

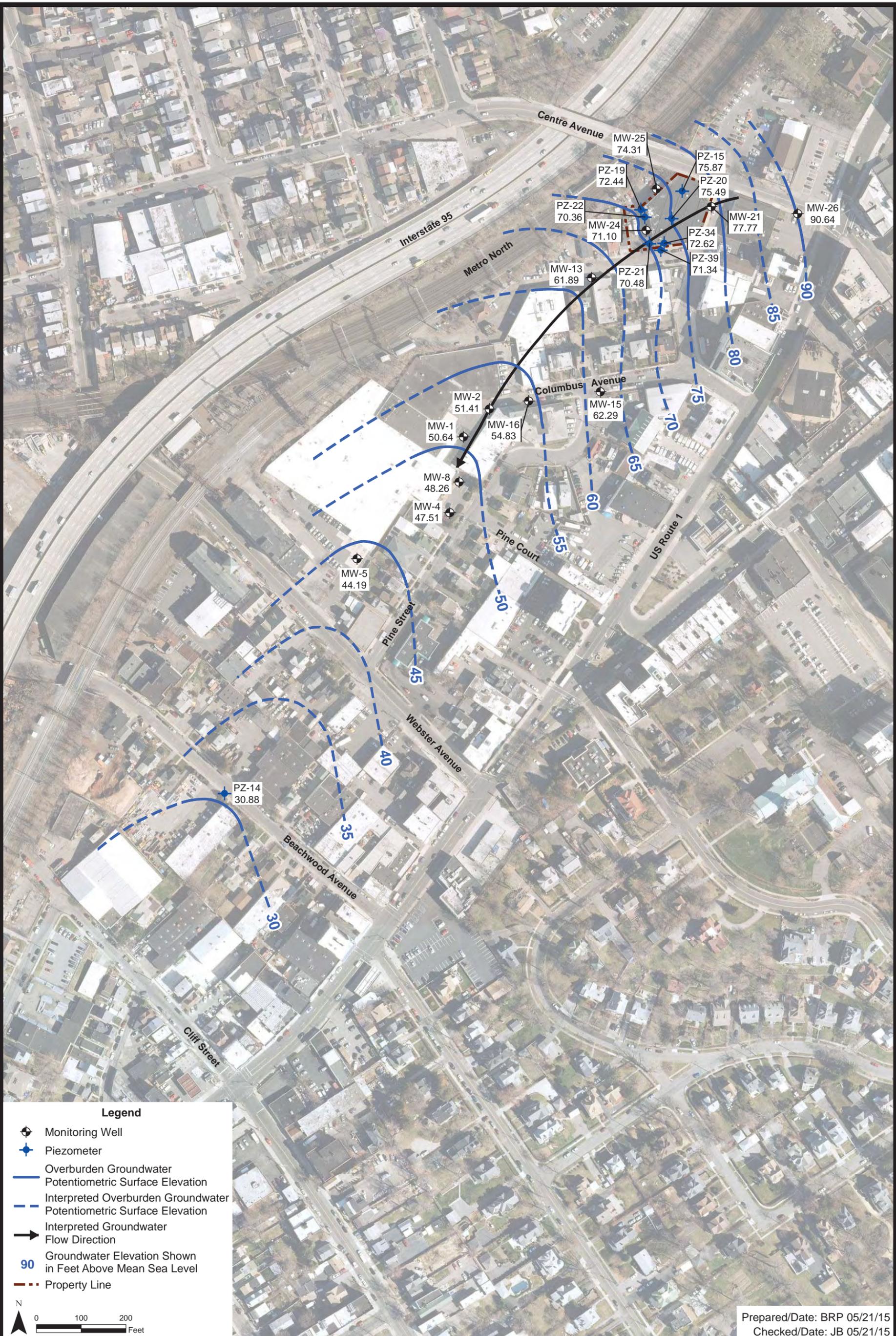
Mapping of the potentiometric surface in the overburden and bedrock was completed and is shown on Figure 3.5 and Figure 3.6. These figures indicate that groundwater is following a subtle topographic valley that was once occupied by a stream. The stream is now contained in a culvert, estimated to be five feet in diameter, and re-appears as Burling Brook, about one mile downgradient of the Site. The overburden groundwater contours southwest of MW-5 suggests that the culvert system may be moving a substantial amount of groundwater (Figure 3.5). The vertical hydraulic gradient between the overburden and bedrock aquifers changes across the area investigated from downward upgradient of the Site to variable at the Site and changing to upward downgradient of the Bakers Pride site.

The downgradient extent of PCE and/or its breakdown products in the overburden and bedrock have been identified. Pore water samples collected at Burling Brook do not indicate the presence of Site-related contaminants. The furthest downgradient detection of Site-related contaminants was at the well pair PZ-14 and MW-28B. Both wells contained low-levels (less than 10 ug/L) of PCE, TCE and cis-1,2-DCE. These wells are approximately 1,900 feet downgradient of the source area. MW-26 cliff, located another 500 feet downgradient, was non-detect Site related COCs (Figures 4.2 to 4.5).

Upgradient nested wells (i.e., overburden/bedrock) indicate a low concentration of TCE (4.4 µg/l) in the bedrock well (MW-26B). Chlorinated solvents were not detected in the upgradient overburden well (MW-26). The vertical hydraulic gradient between the overburden and bedrock is downward at the MW-26/26B well pair. The presence of low-level TCE contamination is potentially the result of an upgradient source that has contaminated the bedrock aquifer; the presence of TCE in MW-26B does not appear to be related to the Site.

Surface soil samples collected in a drainage pathway on an adjacent Residential Use Property showed PCE at a concentration of 46 mg/kg at less than a foot in depth. This contamination was likely the result of soil migration through transportation from the debris disposal areas located on the Site and MNR properties. The presence of PCE at this concentration in surface soil presented a potential for direct contact to residents of the property, and indicate that discharge of PCE to the environment may still be on-going. An IRM was conducted in 2014 to remove the soil exceeding the Residential SCO and re-grade the Site to prevent future transport of contaminants via surface run-off from the debris areas onto the Residential Use Property.

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Legend

- Monitoring Well
- Piezometer
- Overburden Groundwater Potentiometric Surface Elevation
- Interpreted Overburden Groundwater Potentiometric Surface Elevation
- Interpreted Groundwater Flow Direction
- Groundwater Elevation Shown in Feet Above Mean Sea Level
- Property Line



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Table 4.1: Background Groundwater VOCs Results

Area		Centre Avenue							
Location		MW-026	MW-026	MW-026	MW-26B	MW-26B	MW-26B	MW-27BA	MW-27BA
Sample Date		7/25/2012	1/9/2013	5/22/2014	7/25/2012	1/9/2013	5/22/2014	1/14/2014	5/22/2014
Sample ID		360109-MW026007	360109-MW026007	360109-MW026007	360109-MW26B025	360109-MW26B025	360109-MW26B025	360109-MW27B030	360109-MW27B030
Screen Interval (ft bgs)		5 - 10	5 - 10	5 - 10	18 - 28	18 - 28	18 - 28	29.9 - 30.4	29.9 - 30.4
Aquifer		Overburden	Overburden	Overburden	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock
Sample Method		Low flow							
Qc Code		FS							
Parameter	GA GW								
Site Related Contaminates of Concern									
Tetrachloroethene	5	1 U	1 U	1 U	2.1	1 U	1 U	1.1	1 U
Trichloroethene	5	1 U	1 U	4	1 U	4.4	2	1 U	1 U
Other VOCs									
1,1-Dichloroethane	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethene	5	1 U	1 U	3	1 U	1 U	1	1 U	1 UJ
Chloroform	7	1 U	1 U	1 U	1 U	0.91 J	1 U	2	2

Notes: See Table 4A

Results are reported in micrograms per liter (ug/L)