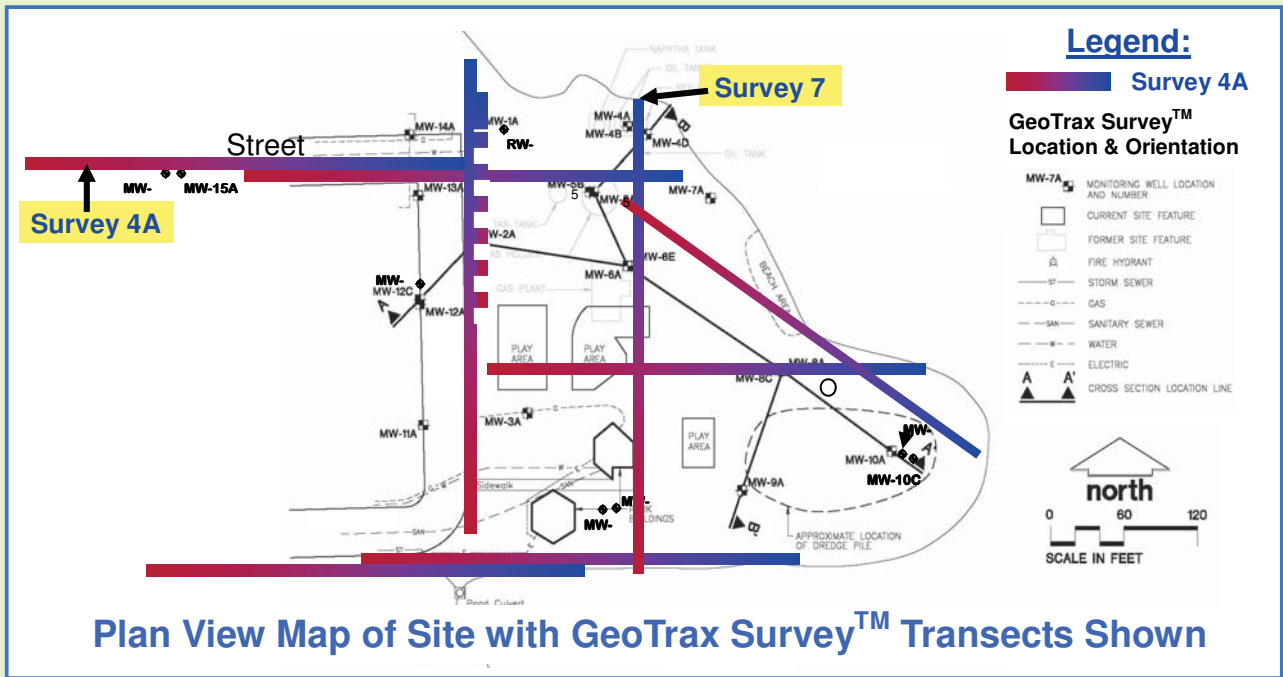




Locating DNAPLs in Hard Rock at Former MGP Site

GeoTrax Survey™ Case Study (Page 1 of 3)



Plan View Map of Site with GeoTrax Survey™ Transects Shown

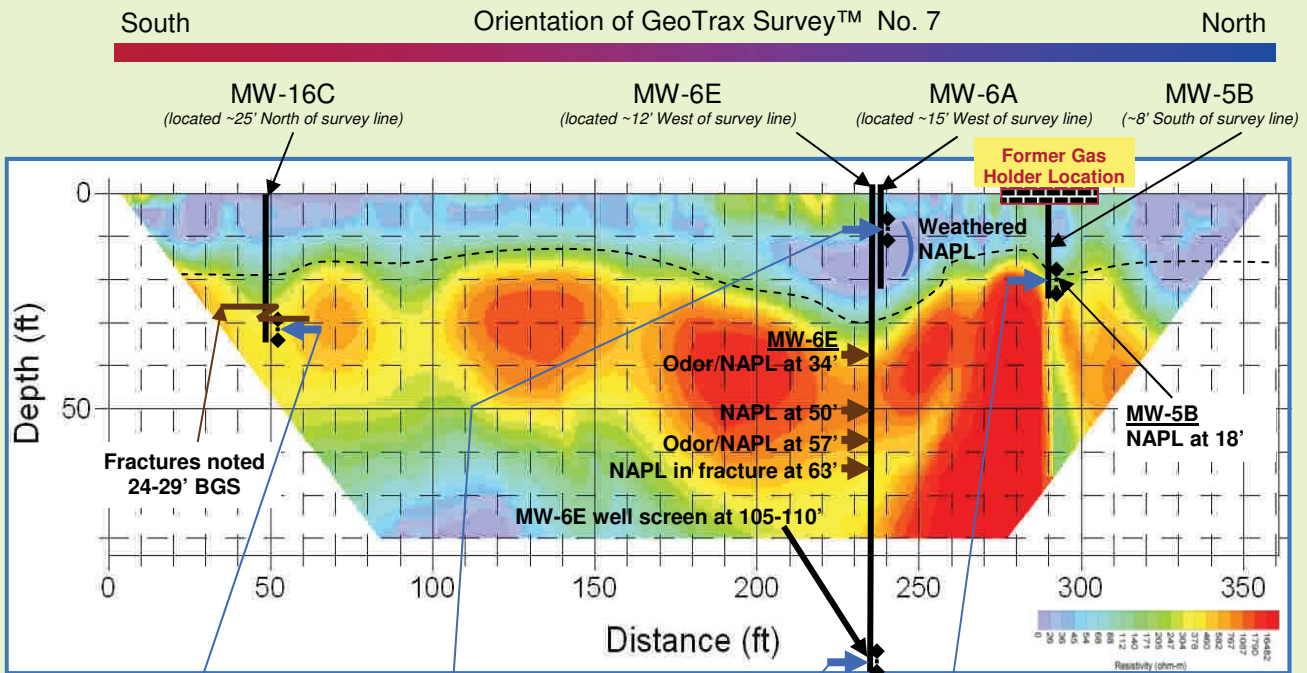
Project Overview:

- Former Manufactured Gas Plant (MGP) Site is now neighborhood playground
- Coal tar and other DNAPL contamination exists in subsurface
- Utility company tasked with remediating site
- Geology consists of silts/sands/clays to approximately 20 feet BGS; underlain by fractured dolomite and sandstone (fractured rock)
- Aestus called in to image subsurface to locate zones containing contamination and focus additional site characterization work and remediation work
- Aestus work was performed without disturbing playground



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MW-16C	
Sample Date	9/06
Units	µg/L
Benzene	180
Toluene	<40
Ethylbenzene	470
Xylene	320
Total PAH	3,688
Benzo(a)Pyrene	12

MW-6A	
VOCs in Groundwater (ug/L)	
Sample Date	9/1/2004
MTBE	<20
Benzene	3,500
Toluene	1,400
Ethylbenzene	3400
Total Xylenes	4900
1,2 - Dichloroethane	62
Total Naphthalene	5600

MW-6E	
VOCs in Groundwater (ug/L)	
Sample Date	9/1/2004
MTBE	<0.30
Benzene	0.45
Toluene	<0.40
Ethylbenzene	<0.30
Total Xylenes	<0.70
1,2 - Dichloroethane	<0.40
Total Naphthalene	0.73

MW-5B	
VOCs in Groundwater (ug/L)	
Sample Date	11/11/2003
MTBE	<20
Benzene	31,000
Toluene	11,000
Ethylbenzene	3300
Total Xylenes	3600
1,2 - Dichloroethane	<15
Total Naphthalene	8900

Bottom Line:

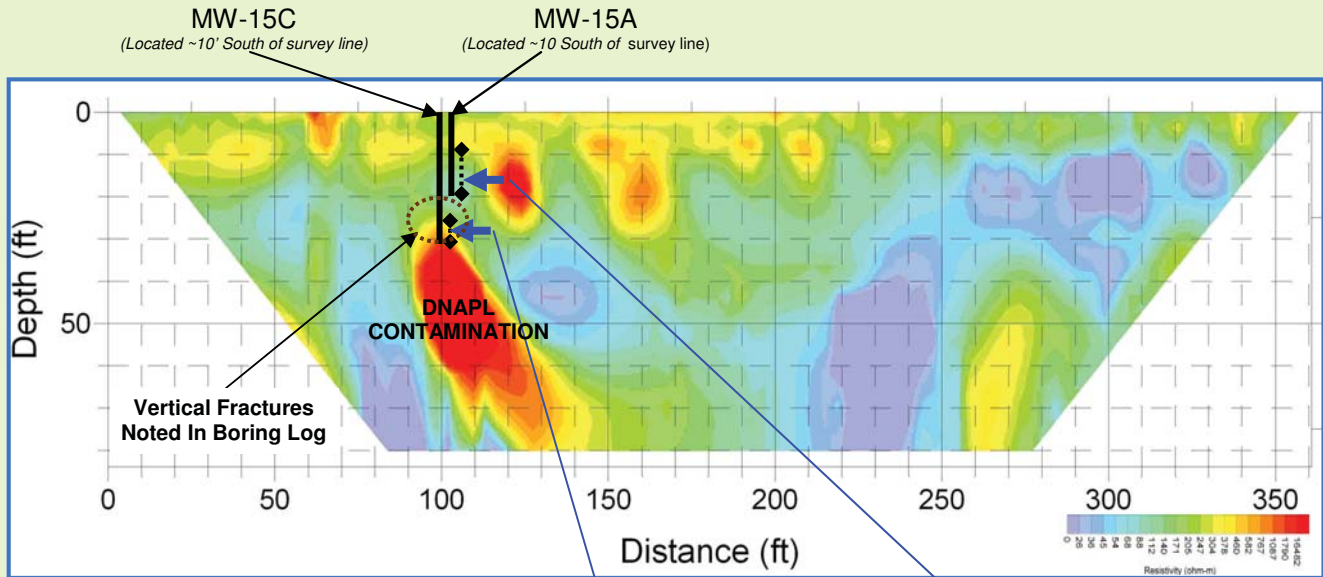
- Survey image generally shows difference in alluvial geology in upper ~20 feet with more conductive silts/clays (light blue zones) versus underlying fractured dolomite rock with higher resistivities (green-yellow zones)
- Image shows anomalous zones especially below the former gas holder location where a strong vertical resistive signature indicates likely presence of DNAPL contamination (red zones); DNAPL confirmed at this location by borehole for monitoring well MW-5B
- DNAPL contamination confirmed in borehole for MW-6E in zones coincident with higher resistivity (i.e., red/orange zones)
- Image implies that resistive zones extend below the bottom of the image; Monitoring well MW-6E confirms presence of groundwater contamination at 105-110 feet BGS.
- Highly conductive anomaly coincident with noted presence of weathered NAPL in alluvium soil boring (purple zone at borehole for monitoring well MW-6A)



Locating DNAPLs in Hard Rock at Former MGP Site

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West Orientation of GeoTrax Survey™ No. 4A East



MW-15C		MW-15A	
Sample Date	9/06	Sample Date	9/06
Units	µg/L	Units	µg/L
Benzene	190	Benzene	<0.40
Toluene	<4.0	Toluene	<0.40
Ethylbenzene	73	Ethylbenzene	<0.50
Xylene	34	Xylene	<1.5
Total PAH	555	Total PAH	0
Benzo(a)Pyrene	4.9	Benzo(a)Pyrene	<0.019

Bottom Line:

- DNAPL contamination was confirmed anomalous zone (highly resistive red blob-shaped anomaly) via drilling (Monitoring Well 15C)
- Clean zone (anomaly free) above this contamination was confirmed via drilling (Monitoring Well 15A)
- Image implies that other relatively small pockets of contamination may exist as shown by presence of more resistive anomalous zones
- Other anomalous zones exist (both resistive and conductive anomalies) that likely represent discrete pockets in shallow alluvium and deeper bedrock zones.