A Case Study: Manufactured Gas Plant Site, Troy, NY

Introduction:

- Former MGP Site in Troy, NY
- 16-acre property located on Hudson River
- Long history of industrial operations (dating back to mid-1800’s) – steel, coke, MGP, MGP by-products recovery, petroleum terminal - which have left the Site impacted with MGP residuals (coal tar, purifier waste) and petroleum.
- Past remediation activities have included investigations, pilot testing, remedy selection, and beginning phases of remedial action.
- Future plans include completion of remedial action followed by redevelopment by the Site owner (City of Troy).

Methodologies:

- Site Investigations (1994 to 1998)
- Remedial Evaluations (1998 to 2002)
- ROD (2003)
- Remedial Evaluations (2004 to 2010)
- Amended ROD (2011)
- Remedial Design (2011 – ongoing)
- Remedial Action:
  - Full-scale remediation (planned 2012 to 2014)

Results:

- Stratigraphy: fill, alluvial deposits, lower sand and gravel, discontinuous glacial deposits, shale beds, impounded.
- Impacts:
  - NAPL (coal tar and petroleum), purifier waste, PAHs, BTEX.
  - Low mobility coal tar (resulting from the intense by-products recovery).
  - Alluvial deposits impact movement of groundwater and NAPL.
  - Groundwater impacts coincident with NAPL (decrease quickly outside NAPL areas).
  - 2003 ROD Remedy: Excavation and ISCO (with eng. and inst. controls)
  - Pre-Design Investigations identified substantial area and volume increases and infeasibility of ISCO.
  - Banter Wall approaches were considered (full and full wall), but eliminated due to concerns about the alluvial layer as a suitable key-in unit.
  - Selected Remedy (2010 Amended ROD): Excavation (27,000 CY) and ISS (69,000 CY)
  - Barrier Wall approaches were considered (partial and full walls), but eliminated due to concerns about the alluvial layer as a suitable key-in unit.

Conclusions:

- Selected Remedy is the result of extensive site investigation and remedy evaluations. A thorough understanding of the Site Geologic Model was developed and the remedy targets the most heavily impacted area that pose the greatest potential for future risks of constituent migration or exposure.
- Planned Remedial Action Activities:
  - Southern Area Remedial Action (Excavation and Cover) 2012-13
  - Northern Area Remedial Action (Excavation, ISS, and Cover) 2013-14
- Main Challenges/Considerations for Remediation:
  - Groundwater contaminants (freons, structures, pipes, debris, slag, utilities).
  - Excavation and ISS adjacent to buildings, structures, railroad
  - Integration with site redevelopment
- Site Redevelopment:
  - Corporate/Commercial
  - City of Troy owns the Site and plans redevelopment of the Site into “Troy Energy Park”
  - City of Troy is in discussions with several companies, including one that uses membrane technology to purify polluted chemical and industrial waste water.
  - One of the redevelopment alternatives was estimated to result in a $70 million investment into the city along with over 100 new jobs.

Abstract

The site of the former MGP Site in Troy, NY, which is situated on the Hudson River less than five miles north of the Albany, NY, has an impressive industrial history. The site was home to iron and steel manufacturing as early as 1847 and was the location of the first American steel manufacturing plant (established in 1864) that employed the Bessemer process, which allowed for mass-production of steel which in turn further fueled the Industrial Revolution. MGP operations involved on a portion of the site to support the steel manufacturing by producing coke and from there evolved into a commercial coke plant and gas works. At its height the MGP was one of the largest in the state and provided gas from its 2,000,000 cubic foot gas holder to communities all over the capital area (west to Amsterdam, north to Glens Falls). In addition to the coke and gas manufacturing, the site also had a by-products recovery and processing operation (and testing laboratory) to capitalize on by-products derived from coal tar (e.g., phenol, napthalene, creosote, pitch), ammonia (e.g., ammonium sulfate fertilizer), and light oils (e.g., benzene, toluene, toluene) generated during the process. In 1956, the MGP was retired and since then the site has been home to a bulk petroleum terminal and distribution center and other small-scale industrial operations.

The past industrial operations have left the site impacted with MGP residuals (coal tar, purifier waste) and petroleum. Initial investigation activities began in 1994, followed by several interim remedial actions, and further investigations. In 2003, the NYSDEC selected a remedy for the site, which consisted of large-size excavation and in-situ chemical oxidation. However, following additional pre-design investigation and treatability testing (conducted in the shadow of the former Water Gas Building), it became clear that the selected remedy would not be able to achieve the remedial objectives for the site. In addition, through these additional investigations, the conceptual model became more refined as more information was developed on the nature and extent of the MGP impacts and the effect the site geology was having on contaminant distribution and mobility.

A revised remedy was developed for the site based on the increased understanding of the hydrogeology and nature and extent of MGP impacts. The revised remedy maintains a substantial excavation component, but now includes an in situ solidification (ISS) component that works in concert with the site geology to provide long-term containment of MGP residuals on-site and permit future site redevelopment. Remedial design is currently ongoing.