

## BOS® 200 Injection in Decatur, AL

### ABSTRACT

The subject site is a former retail petroleum station in Decatur, Alabama. Following removal of nine USTs in 2010, two phases of site investigation were performed to delineate the extent of petroleum hydrocarbon impacts in soil and groundwater. BTEX constituents and MtBE were detected in groundwater at concentrations exceeding Site Specific Target Levels (SSTLs). A Corrective Action Plan consisting of excavation and groundwater remediation by natural attenuation was implemented in June 2013. Due to a significant increase of benzene in a groundwater sample collected in June 2017, an alternate form of remediation was determined to be warranted. The selected technology was injection of BOS 200® within a 1,600 ft<sup>2</sup> (149 m<sup>2</sup>) treatment area. Four post-injection progress analysis sampling events were performed following completion of the injection. Based on the findings that no wells produced groundwater samples that exceeded SSTLs during the progress analysis sampling events, ADEM issued a No Further Action (NFA) letter in July 2019.

### PROJECT SNAPSHOT

- Key Dates
  - Remedial excavations: 2,590 tons of petroleum contaminated soil – June 2013, August 2014
  - Significant increase of benzene detected during groundwater monitoring – June 2017
  - Full-scale injection of 4,800 lbs (2,177 kgs) of BOS 200® in 64 injection points – June 2018
  - No Further Action (NFA) With Conditions determination by ADEM – July 2019
- Treatment Area (Figure 1): 1,600 ft<sup>2</sup> (149 m<sup>2</sup>)
- The impacted groundwater resided within shallow silty clay soil. Average depth to groundwater was approximately 6 to 8 ft (1.8 to 2.4 m) bgs
- Contaminants: The pre-treatment maximum concentration of benzene above regulatory limits was 4.700 mg/L
- Implementation Method: Direct push injection

### CHALLENGES

The primary challenges were injection at the relatively shallow depth of 6 ft (1.8 m) bgs without daylighting and attaining groundwater remedial goals within one month of injection in the remedial progress monitoring well (MW-19).

### APPROACH

The BOS 200® injection design was developed based on existing site data with the goal to achieve cleanup standards less than 4 weeks from the time of injection. A total of 480 injections were completed within 64 points on 5 ft (1.5 m) centers in June 2018. The treatment area was approximately 1,600 ft<sup>2</sup> (149 m<sup>2</sup>), with a targeted treatment interval of 6 to 20 ft (1.8 to 6.1 m) bgs. A total of 4,800 lbs (2,177 kgs) of BOS 200® was mixed with 4,320 gal (16,353 L) of water and injected as a slurry.

### RESULTS

Following four post-injection groundwater sampling events demonstrating that cleanup goals had been achieved, the ADEM closed the site and issued a No Further Action With Conditions letter to the responsible party on July 17, 2019.

Figure 1. BOS® 200 Injection Area Map  
 2220 Beltline Road SW  
 Decatur, AL

