

## **Leveraging a Robust Microbial Profile for an MTBE Sorptive Biobarrier**

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**Background/Objectives.** A novel injectable sorptive biobarrier was installed downgradient of a service station site to retard and treat a methyl tertiary-butyl ether (MTBE) and tertiary butyl alcohol (TBA) plume. The service station had petroleum impacts and MTBE/TBA constituents in groundwater and was previously remediated using biosparging, taking advantage of a robust microbial environment. The remedy deployed for the biobarrier was injection of PlumeStop<sup>®</sup> Liquid Activated Carbon. The product was injected to address off-site migration and concentrations of MTBE/TBA in groundwater greater than 10 milligrams per liter (mg/L). Retarding the migration of the plume toward a municipal water well within 600 feet of the site was one of two key goals of the approach, with reduction of the MTBE/TBA concentrations to below 2 mg/L for eight consecutive quarters the second goal.

**Approach/Activities.** Direct push technology and injection wells were combined to deliver the amendment in a series of barrier rows arrayed across the length of the plume. Knowledge gained from the remediation project completed at the service station was used to develop the off-site remedy. This included on-site/off-site microbial profiling of MTBE/TBA-degrading bacteria and gene functions coding for biodegradation and use of in-well microcosms evaluating amendments, plume geochemistry, and stable isotope probing (SIP) using radio-labelled MTBE to differentiate incorporation of <sup>13</sup>C into biomass and dissolved inorganic carbon as evidence of biodegradation of MTBE/TBA. Off-site activities included a sorption bench test and field pilot testing of the injection approach. Following an initial injection, two supplement injection events were completed to advance the remediation.

**Results/Lessons Learned.** After five years at full scale, the biobarrier achieved the objectives and reached regulatory closure. The most impacted achieved concentrations of MTBE/TBA below 10 micrograms per liter. In addition to performance data, this presentation will look at field challenges during this unique, successful remediation project.