

## **Removal Characteristics of MTBE and BTEX by Cometabolic Air Sparging**

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### **ABSTRACT**

Soil and groundwater contaminant plumes from recent accidental gasoline releases often contain the fuel oxygenate MTBE(methyl *tert*-butyl ether) together with BTEX(benzene, toluene, ethylbenzene, xylenes) compounds. In situ cometabolic air sparging process involving the injection of air and substrate such as propane into contaminated aquifer could possibly treat contaminant source areas trapped within water-saturated and capillary zones, remediate dissolved contaminant plumes, or provide barriers to dissolved contaminant plume migration. It is accepted that the injected air and substrate provides a source of oxygen and substrate to facilitate aerobic biodegradation, as well as providing a means to strip volatile chemicals from the saturated zone, such as MTBE and BTEX. For application of this technique to remediate MTBE and BTEX which are strippable and biodegradable compounds, air sparging has been cometabolic air sparging. The experiment was carried out using 2-D lab-scale air sparging setup. And the biodegradation rate of MTBE and BTEX was evaluated as function of air and propane injection rate and pattern. Optimal condition of air injection rate and patterns were as air injection rate of 1000mL/min and pulsed air injection(10min on, 10min off) in our 2D experimental setup. And propane injection rate and patterns were as propane injection rate of 200mL/min and 30min injection. Minimal oxygen and propane supply and pulsed air injection pattern could effectively enhance MTBE and BTEX removal in saturated zone.

Key words: Cometabolic air sparging, MTBE, BTEX, Propane utilizing bacteria