ALTERNATIVE AIR SPARGE TEST METHOD USING SF6

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A former petroleum terminal was evaluated for remedial alternatives and air sparge (AS) was identified as a potentially effective remedy. A pilot study was conducted that focused on determining parameters to maximize the effective radius of influence (ROI) and distribution of oxygen in the subsurface. Study infrastructure included an AS injection point and 32 monitoring points installed at varying depths and distances from the injection point. Several test methods were used to evaluate ROI, including dissolved oxygen (DO) monitoring, and injection of sulfur hexafluoride (SF6) as a tracer to simulate DO.

SF6 is a chemically inert compound that is widely used in heating, ventilation, and air conditioning industries as a tracer gas. SF6 has a low solubility, mimicking that of DO in groundwater, but unlike DO, SF6 has no natural demand to overcome. Due to these properties, use of SF6 as an AS tracer gas was further evaluated as a cost-effective substitute for traditional long-term DO monitoring tests. While the SF6 AS tracer technique is not new, limited information was available for practical field applications. Although SF6 is recognized as a potent greenhouse gas, carbon footprint calculations indicate that SF6 AS tests have comparable emissions to traditional DO monitoring tests.

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