

The Real Cost of Removing MTBE From A Small Public Water Supply With Activated Carbon

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Abstract

In March of 2002 it was discovered that an elementary school water supply in Northwestern Indiana contained more than 300 ug/l of MTBE. The source of the MTBE was eventually determined to be a retail petroleum facility located approximately 1,800 upgradient of the school's water supply well. Furthermore, in examining records of the School water supply sampling results, it was found that MTBE had been present in the water supply for several years but had been unreported.

When the condition of the School water supply was released to the public, the local community expressed significant concern for the health of their children. The local and State media showed considerable interest in the story and pursued the topic vigorously. Initial public meetings held at the School were highly emotional with heated discussions due to the extreme agitation of some participants. The School ceased use of their water supply well for all purposes and used bottled water exclusively for contact uses and chemical toilets with manual hand washing stations.

The School Board and the State of Indiana requested that a water treatment system be designed as soon as possible to make the School water supply 'safe' for all uses. However, 'safe' in a regulatory sense varied from 'safe' defined by the parents and users of the water supply. A review of existing technologies and experience with treating MTBE in drinking water indicated a real lack of experience and case histories in achieving low (a few parts per billion) MTBE concentrations with a straight-forward system that could be readily operated and maintained at the school. After further evaluation, it was determined that activated carbon, specifically designed to remove MTBE, would be the most cost-effective method of treating the water supply. Design calculations indicated that two vessels, each containing 1,800 lbs of activated carbon, would be adequate to remove MTBE from the drinking water supply to below detectable levels (less than 1 ug/L) with a 100% redundancy safety factor.

The existing school water treatment system and piping, and intermittent nature of water demand during the school-year cycle complicated the initial installation and operation of the carbon treatment system. This presentation will discuss the details involved in bringing the system on line in a real-world environment, the stringent water supply testing program required, and the challenges faced with achieving the design performance under close public scrutiny. Total Costs associated with capital equipment purchase, system installation, monitoring, and operation and maintenance of the system will be summarized.

While the specially-designed activated carbon has proven to be an effective means of removing MTBE from this public water supply, the logistical issues associated with operating and maintaining the system in an environment of significant public scrutiny have caused the total cost of the system to be significantly higher than initially envisioned. As a

result, an alternative clean water supply well is being proposed for future use by the school as the source of the MTBE is being remediated.

Biographical Sketches

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Mr. John Mundell, P.E., L.P.G. has a B.S and M.S. in Civil Engineering from Purdue University. Mr. Mundell has practiced as an environmental consultant since 1981, and has served as a senior consultant and technical expert for major environmental remediation projects throughout the United States and in several foreign countries.

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