Investigation and Remediation

New API Report on Characterizing Releases with MTBE Provides Useful Technical Information But Overlooks Important Regulatory Considerations

As oxygenate usage has grown, so have concerns about the potential impacts of these compounds on groundwater quality. A new American Petroleum Institute (API) report, *Strategies for Characterizing Subsurface Releases of Gasoline Containing MTBE,* publication 4699, uses the principles of risk-informed decision making to guide the assessment of sites affected by MTBE and other oxygenates. In bringing this publication to your attention, however, it is also prudent that we provide a regulatory caveat.

Although non-EPA guidances, such as API's publication 4699 may provide regional and state site managers, as well as the regulated community, with useful technical information, they may not be officially endorsed by EPA in that the agency does not necessarily agree with all their conclusions. In particular, all parties involved should clearly understand that such guidances do not in any way replace current EPA or OSWER guidance or policies addressing the remedy selection and implementation processes.

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During development of this API document, OUST had the opportunity to provide comments. After a comprehensive analysis, OUST staff identified many areas with which they were not entirely comfortable. Of the approximately 20 major concerns expressed to the API authors, about half were satisfactorily addressed.

The unaddressed concerns that appear in the final version remain concerns to OUST. However, OUST is actively involved with the API workgroup developing training based on publication 4699 and is hopeful that the remaining issues will be resolved satisfactorily.

EPA Calls for More Detailed Assessment and Characterization

OUST's primary concern is that the document advocates more cursory levels of assessment and characterization than are warranted by a contaminant that behaves as MTBE does. Instead of going into a point-by-point critique, perhaps it would be more constructive to present excerpts of a January 18, 2000, letter from OUST Acting Director Sammy Ng, recommending that state programs begin to monitor and report MTBE contamination:

> "MTBE and other oxygenates behave differently in the environment than do the aromatic hydrocarbons, such as benzene, toluene, ethylbenzene, and xylene (BTEX). Therefore, conventional or traditional site characterization strategies and techniques designed to assess BTEX plumes may fail to detect MTBE plumes. MTBE is significantly less biodegradable than is BTEX, and MTBE does not sorb to aquifer material. As a result, MTBE moves farther and faster than does BTEX. Plumes tend to move deeper into aquifers as they move away from the source. Because MTBE plumes move farther from the source, MTBE may occur deeper in aquifers than does BTEX. Wells with short screens installed across the water table may fail to sample MTBE plumes. Conversely, wells with long screens may yield greatly diluted samples that mask the presence of MTBE and other contaminants.
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> "To adequately characterize an MTBE plume, the focus must be on identifying its three-dimensional characteristics. Monitoring wells should be "nested" (that is, several wells installed close together with narrow screened intervals). The vertical distribution of hydraulic conductivity should be determined before a nest of permanent monitoring wells are installed at a new location. This can be done by examining core samples, by pressure dissipation tests with a cone penetrometer, or by miniature specific capacity tests in temporary push wells. The screens of permanent monitoring wells should be installed across the depth intervals with the highest hydraulic conductivity. If plumes appear to dive into the aquifer as they move down gradient of the source, the deepest well in the cluster should either be free of MTBE contamination, or be screened in material with low hydraulic conductivity that acts as an effective confining layer for the plume.
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> "Because the potential area of the MTBE plume is much larger than for BTEX, there's an increased probability of encountering preferential migration pathways, such as sand stringers, fractures, and utility conduits. These pathways should be identified as they may provide avenues for plume migration that are either in unanticipated directions or at greatly increased rates over what is commonly expected based on ambient conditions. Monitoring well networks should be organized in transects that are perpendicular to groundwater flow. Well spacing in the transects should be relatively closely spaced to minimize the possibility of the MTBE plume migrating across the transect undetected.
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> "As with most work to identify and solve a problem, the earlier you identify the problem, the easier the solution may be. That sce-

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nario exists with monitoring and identifying MTBE contamination. If you identify the presence of MTBE in the early stages, remediating the site may be less costly and less complex than if you learn of (and remediate) the contamination at later stages."

The Framework of the API Report

Risk-informed decision making considers risk factors related to sources, exposure pathways, and receptors. The centerpiece of this approach is the development of a conceptual site model (CSM). A new decision framework developed by API helps the environmental site assessor to determine an appropriate starting point or an initial level of assessment from which the CSM can be confirmed.

The initial level of assessment is determined by the presence or absence of various risk factors. Sites with greater risk factors require the most intensive assessment of receptors, pathways, and sources. Sites with fewer risk factors warrant a more limited amount of assessment to confirm whether receptors, pathways and sources require further investigation. The level of assessment may be upgraded or downgraded as the CSM is refined. Important risk factors are discussed in the API report, along with descriptions of characterization tasks suggested for various levels of assessment.

The report also covers modern field assessment tools and techniques for rapid, cost-effective characterization and monitoring of MTBE in the subsurface. It describes how current expedited site assessment techniques can be applied to the collection and field analysis of soil, soil gas, and groundwater samples. A comprehensive guide to direct push assessment and monitoring tools, with emphasis on their proper use at MTBE-affected sites, is also provided.

In addition to presenting state-of-the-art strategies for MTBE site assessment, the report is a reference on the chemical and physical properties of oxygenates, their use in gasoline, and behavior in the subsurface environment. Analytical methods appropriate for MTBE detection are also discussed.

The publication, prepared for API by Eric M. Nichols and Steven C. Beadle of LFR Levine-Fricke and Murray D. Einarson of Connor Pacific/EFW, is available for download at www.api.org/mtbe . ■