

As EPA Backs E15, New Study Highlights Heightened Contamination Fears

New studies by EPA and other researchers are highlighting long-standing fears that blending ethanol in gasoline may exacerbate contamination normally associated with fuel spills while also increasing the presence of explosive methane, concerns that are increasing after EPA approved the first application to produce a 15-percent ethanol fuel blend (E15).

One recent study, conducted by Cheri Adair and John Wilson, researchers in EPA's National Risk Management Research Laboratory, found that the presence of ethanol in gasoline slows degradation of benzene and related compounds while increasing levels of methane. The findings generally confirm similar studies dating back to 2002, when Congress banned the use of MTBE as an oxygenate and replaced it with ethanol.

"If ethanol is present, the concentration of its degradation products will be high enough to inhibit the biodegradation of benzene," Adair and Wilson said in slides describing their study, which they presented March 20 to the National Tanks Conference in St. Louis. *Relevant documents are available on InsideEPA.com. (Doc. ID: 2395017)*

The researchers say this could be especially harmful should water become contaminated with fuel containing ethanol because, "if ethanol is available in the water, the fermentation of ethanol can produce so much hydrogen and acetate that the fermentation of benzene is not possible."

A spokeswoman for the Renewable Fuels Association downplayed concerns about contamination due to ethanol, saying that blending of ethanol in gasoline reduces the amount of benzene in the fuel, so a spill of ethanol-blended fuel would have less of the harmful chemical than a spill without ethanol.

The EPA findings mark the latest environmental quality challenge as policymakers continue efforts to blend increasing volumes of the biofuel into gasoline supplies to enhance domestic energy production and to ensure transportation fuels are cleaner burning.

EPA is required by law to set increasingly higher volumes of ethanol and other biofuels that must be blended into the nation's fuel supply under the renewable fuel standard (RFS). In addition, EPA has granted a request from ethanol producers to waive the Clean Air Act to allow fuel producers to raise the concentration levels of ethanol in fuel from 10 percent by volume (E10) to E15, though environmentalists and some industry groups are challenging the waiver.

The agency April 2 also announced that it had approved the first application — from 20 manufacturers — for producing an E15 blend for nationwide sale, calling it a "significant step" in E15's production, sale, and use in model year 2001 and newer vehicles.

The agency's decision means 20 companies, including agribusiness giants Archer-Daniels-Midland Co. and Cargill Inc., approval to produce the fuel — one of the final steps before the fuel can be sold. In an April 2 statement, EPA says the Obama Administration is moving on a separate track to install 10,000 blender pumps to give consumers the choice of blending E15.

The registration decision drew criticism from refiners and others, who said that EPA may be moving too quickly, without completing tests to determine whether the fuel, which may be more corrosive than conventional gasoline, may damage vehicle engines and fuel infrastructure.

It is not clear, though, how widely the fuel will be distributed at first in part because of concerns from retailers and petroleum marketers that their fuel infrastructure will not withstand E15's increased corrosivity relative to E10, resulting in more leaks and fuel spills. Many are concerned that EPA's upcoming revisions to its underground storage tank rules do not provide sufficient liability assurances in the event of a spill.

And House lawmakers recently introduced legislation giving fuel retailers additional liability safeguards to alleviate their concerns about E15. Retailers and marketers say without the liability safeguards they would not be willing to blend the fuel or risk the expense of new equipment outlays.

As concerns grow over increased spills due to ethanol, state regulators and EPA researchers say that the increased presence of ethanol in fuel can exacerbate contamination and other risks.

Valerie Garrett, a regulator with Missouri's Department of Natural Resources and a member of the Interstate Technology and Regulatory Council's (ITRC) Biofuels Team, who also presented at the tanks conference, says leaked biofuels move differently than regular petroleum, and so pose different challenges for assessments and clean ups.

When fuel blended with ethanol moves into groundwater, the leak usually spreads farther than fuels made with some other constituents, Garrett says. And while ethanol breaks down faster than some other fuel constituents, that it biode-

grades into methane, an explosive gas, is something else regulators must consider, she says.

Similarly, Mark Toso, a hydrogeologist with the Minnesota Pollution Control Agency, who responds to fuel spills, told the tanks conference that transportation of E95 from corn-producing states in the Midwest to the coasts for blending can result in even greater risks of methane.

When an accident leads to a spill of E95, larger concentrations of methane can be produced, causing both vapor intrusion and explosion risks. Toso says methane “has no odor so there’s no indication that there’s a problem.”

In guidance issued last September, ITRC, a group of state and other regulators that works to promote technically sound innovative solutions to environmental challenges, said that because of a host of scientific uncertainties, regulators faced with ethanol fuel spills should conduct site-specific assessments to determine whether to select active remedies or monitored natural attenuation or land-use controls. While attenuation and land-use controls may be appropriate in some cases, the group warned that regulators should be cautious of potential methane explosions.

“Methane production from biofuel biodegradation, however, may require special attention when [attenuation] is used as it could pose an explosive hazard risk. Additionally, because of the potential lag time before methane may be generated, long-term monitoring and/or [engineering controls] should be evaluated as part of the response strategy,” the guidance said.

For active remediation technologies, the group said that “few case studies for involving active remediation for biofuels currently exist,” and instead analyzed a host of remediation technologies “that have been used or are likely to be used” in future cases.

The group concluded that in most cases, “chronic, small total volume releases impact fewer stakeholders unless the situation is not addressed for an extended period of time. However, the other extreme of sudden catastrophic, large total volume releases can be of immediate and enduring concern to stakeholders.” — *David Reynolds*
