

Mobility of contaminants in waste fluids applied to dirt and gravel roads for dust suppression

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The use of chemical dust suppressants makes up a large part of dust control methods used by communities with dirt and gravel roads¹. In states with oil and gas (O&G) development, produced water from wells can be a low-cost chemical dust suppressant, making it an economical choice for communities with low budgets. However, in addition to the high total dissolved solids that make these O&G brines effective dust suppressants, heavy metals, naturally occurring radium and diesel range organics (DRO) may also be present². These potential contaminants may pose health risks or cause environmental degradation, depending on how mobile they are after application to the road. Radium and chloride in particular may be of the most concern².

Oil and gas brines used for dust suppression, along with potential waste fluid alternatives for use as dust suppressants such as soybean oil, water treatment softening sludge, paper mill wastewater and treated oil and gas brine have been collected from sources in Pennsylvania and Ohio. Dirt and gravel road aggregate materials will be treated with the waste fluids. Conventional dust suppressants (calcium chloride, magnesium chloride) will be used as well. Prior to the treatment, both waste fluids and road aggregates will be chemically characterized to determine background concentrations and to identify potential contaminants of concern. Treated road aggregates will be leached using a modified EPA SPLP procedure, and both the leachate and select size fractions of leached road aggregate will be analyzed for radium, lead, and DRO concentrations to determine the potential for contamination following rain on a treated road.

Citations

[1] USEPA, *Potential Environmental Impacts of Dust Suppressants: "Avoiding Another Times Beach"*; USEPA: Las Vegas Nevada, 2002. [2] Tasker, T.L., et. al., Environmental and human health impacts of spreading oil and gas wastewater on roads. *Environmental Science & Technology* (2017). Manuscript in review.