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Looking Under Fracking's Surface: Part 2

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Naturally occurring radioactive material ("NORM") contains low-level radioactive constituents, which are present in the environment. It exists in the materials used to build homes and offices, the food we eat, the ground under our feet or the air we breathe.

Many geological formations within the U.S. that contain oil and gas deposits also contain higher levels of NORM. These concentrations of low-activity radioactive constituents that exist naturally in the ground can be brought to the Earth's surface during oil and gas exploration and excavation activities. Such activities associated with the recovery of oil and gas may further concentrate NORM in various waste streams (e.g., drilling mud, sludge, scale and recycling water). When radionuclide concentrations are increased as a result of such activities, the resulting materials are known as technologically enhanced, naturally occurring radioactive material ("TENORM").[1]

With the recent boom in domestic oil and gas production, both the industry and states are increasingly faced with the issue of TENORM waste disposal. Indeed, the U.S. Environmental Protection Agency indicates that each year the petroleum industry produces roughly 260,000 metric tons of waste in varying forms and that an estimated "30 percent of domestic oil and gas wells produce some TENORM."

States have wrestled with how to appropriately regulate the disposal of low-activity radioactive drilling waste and byproduct typically associated with oil and gas operations. Two regulatory models have emerged: (1) science-driven regulation, relying on comprehensive research studies and epidemiological data to guide disposal practices and (2) politically driven disposal restrictions that adopt either actual or de facto disposal bans. These two paths highlight the distinction between regulations based on science and those based on politics.

Science-Driven Regulation

In recent years, states such as Pennsylvania have seen a dramatic boom in oil and gas operations and a commensurate rise in generation of industrial wastes. For example, in 2012, the Pennsylvania Department of Environmental Protection estimated that 1.3 million tons of oil and gas wastes were deposited in state landfills. In response, one year later, the PADEP initiated a comprehensive

TENORM study to evaluate the radioactive nature of these wastes and assess the handling, transport and disposal of such wastes in Pennsylvania.

On Jan. 15, 2015, the PADEP released its TENORM study report, which was one of the most comprehensive assessments of the naturally occurring levels of radioactivity in byproducts associated with oil and natural gas development. The PADEP had gathered samples from 38 different well sites (covering five distinct operational phases), 10 wastewater treatment plants, 51 landfills, 18 gas distribution and end-use locations and 32 roadways treated with oil and gas brine. It had analyzed all types of media, including soil and liquid wastes, ambient air, and gaseous emissions and utilized different instruments to detect alpha, beta and/or gamma radiation.

In its report, the PADEP concluded that "[t]here is little or limited potential for radiation exposure to workers and the public from the development, completion, production, transmission, processing, storage, and end use of natural gas." The TENORM report also concluded that there is little potential exposure to workers or the public from nearly all types of sites investigated in the TENORM study. As such, the TENORM report did not recommend any new or increased regulation. Rather, the PADEP merely advised that TENORM continue to be studied.

In addition to Pennsylvania's TENORM study, the North Dakota Department of Health recently commissioned Argonne National Laboratories to set a scientifically based TENORM disposal limit for landfills that would be safe for people and the environment. The North Dakota study took 119 samples from oil and natural gas extraction byproducts of greatest concern for TENORM, including scale, filter cakes and filter socks. In November 2014, Argonne released its report, which concluded that North Dakota could allow disposal of TENORM-containing wastes with radiation levels up to 50 pCi/g without compromising the health of active landfill workers (who are potentially at highest risk). By December 2014, the NDDoH proposed new rules that would raise radiation limits from its current 5 pCi/g to 50 pCi/g, consistent with the North Dakota study's empirically supported recommendations.

Similarly, in August 2014, the Michigan Department of Environmental Quality assembled its own TENORM advisory panel to consider whether its 50 pCi/g limit should be revised. On Feb. 13, 2015, the Michigan panel released a white paper that concluded "50 pCi/g is safe for public health and the environment." The white paper also cited the TENORM report and North Dakota study in support of its additional recommendations relating to cleanup regulations, TENORM placement within landfills, landfill annual volume limits, leachate and groundwater monitoring, types of landfills and the potential regulatory consideration of an additional radionuclide (Lead-210).

Political Regulation

That said, other states have taken more restrictive positions on TENORM management without undertaking technical studies to better inform their waste disposal regulations. Purportedly based on TENORM concerns, Vermont banned the treatment, disposal or storage of hydraulic fracturing waste. In August 2014, Connecticut Gov. Dannel Malloy signed a bill imposing a three-year moratorium on the disposal of fracking waste in Connecticut. In New Jersey, proposed bans have reached Gov. Chris Christie's desk twice, the latest of which was vetoed in 2014. New York recently declined to pass a four-bill package introduced by Senate Democrats that would, in part, ban the treatment or disposal of such waste. Massachusetts likewise put up a bill that would impose similar bans.

As production has grown, so too have the amounts of waste needing to be disposed of, and regulators and communities are faced with the questions of who should shoulder the potential risk — those

regions producing the energy or those consuming the energy. This sentiment was recently echoed by Gov. Malloy in discussing his state's moratorium when he indicated that "[i]t also makes sure that those states that are benefiting from tax revenue or other revenues from fracking, if that's the decision that they have made, then don't push to us the handling of these materials."[2] Faced with practical realities and economies such as these, along with other factors such as population density and proximity to potential waste sites, states' responses to disposal will inevitably be colored accordingly.

Conclusions

Many states have been forced to address the issue of TENORM disposal. Some have sought guidance from the science, investigating hazardous thresholds to human health and the environment. Others have fallen back on politics, garnering public support by proclaiming that their states will not serve as dumping grounds for other states' dangerous wastes. These divergent approaches are intrinsically linked to the overarching debate over fracking. As such, those larger policies are likely to determine whether TENORM disposal regulation will be based on fear or fact.

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[1] U.S. Environmental Protection Agency, Radiation Protection: Oil and Gas Production Wastes (Feb. 2, 2015), http://www.epa.gov/radiation/tenorm/oilandgas.html.

[2] Samantha Schoenfeld, New Fracking Waste Ban Signed, FOXCT (Aug. 19, 2014), http://foxct.com/2014/08/19/new-fracking-waste-ban-signed/.
