

Good Day, My name is Justin Nobel. I have a dual master's degree in earth and environmental science and journalism, write regularly on issues of science and the environment for US magazines and investigative sites, recently published a lengthy story for Rolling Stone magazine entitled, "America's Radioactive Secret" on the issue of the radioactivity brought to the surface in oil and gas production and the many different pathways of contamination posed to the industry's workers, the public and communities, and the environment, and I am presently writing a book on this topic to be published with Simon & Schuster. Ladies and gentleman, it is pathetic that a journalist for a music magazine has been forced to break news that the America's oil and gas industry has known full-well for four decades.

I quote, "Almost all materials of interest and use to the petroleum industry contain measurable quantities of radionuclides that reside finally in process equipment, product streams, or waste. In addition, groundwater used for waterflood and brine solutions from operating wells contain biologically significant quantities of Radium 226 and Radon 222." These lines do not come from a research scientist at some eastern university far removed from the oil patch, they do not come the newsletter of some environmental action group which may have a vested interest in halting oil and gas production. These lines, in fact, come from a 1982 report of the Department of Medicine and Biology, of the American Petroleum Institute. Apparently, the New Mexico Energy, Minerals and Natural Resources Department and the Oil Conservation Commission are unaware of this vital research by the nation's foremost oil and gas industry experts. The American Petroleum Industry report goes on to describe the radioactivity risks of the industry's waste, quote, "Radium 226 is a potent source of radiation exposure, both internal and external...Radon 222 and its daughters cause the most severe impact to the public health."

The 1982 American Petroleum Institute report also invalidates the Department's plan, as laid out in this proposed rule, to, quote, "encourage the recycling or re-use of produced water." Again, I quote from the American Petroleum Institute report, "Any control methodology proposed for radioactive materials must recognize the fact that radioactivity can not be modified or made inert by chemical means. It also must recognize that radioactivity dissipates at fixed rates through fixed sequences or series. Decay to daughter products cannot be guaranteed to reduce the hazard..." And just a few lines later the American Petroleum Institute report points out that any attempt to remove radioactivity is merely transforming, quote, "a very dilute source of radioactive materials into a very concentrated source of radioactivity." So your proposed rule, encouraging the treatment of this complex radioactive waste stream, is nothing more than a free pass for industry to contaminate uninformed and inappropriately protected oil and gas workers, ie, human beings, ie, men and women, mothers and fathers.

And members of the Department and Commission, this one damning 1982 American Petroleum Institute paper is not alone. I read you the first two lines of a 1993 article published by the Journal of Petroleum Technology, which is produced by the oil and gas industry's flagship professional society, the Society of Petroleum Engineers, quote, "Contamination of oil and gas facilities with naturally occurring radioactive materials (NORM) is widespread. Some contamination may be sufficiently severe that maintenance and other personnel may be exposed to hazardous concentrations." Later in this report it states, quote, "Much of the material wastes from a facility contaminated with NORM must be handled as low-level radioactive waste and disposed of accordingly."

So, the idea that this issue is not a big problem, or only a problem in the Marcellus shale play or back East, is not just absurd, this ignorance puts the lives and safety of the workers and communities of this great state in peril. And just to prove the point, from the opening lines of a 63-page report produced in 1991 by the esteemed petroleum geologist John B. Comer, of the Bureau of Economic Geology at the University of Texas at Austin, quote, "The Upper Devonian Woodford Formation is an organic-rich petroleum source rock that extends throughout West Texas and southeastern New Mexico and...is very radioactive."

Your rule makes no mention of this highly dangerous radioactivity, and it makes no mention of how you will protect the workers and residents of New Mexico from this contamination. While the present New Mexico regulatory agencies and commissions have unfortunately taken scant interest in assessing and monitoring radioactive elements inevitable in the oil and gas industry's waste streams, such as radium, a bone-seeking human carcinogen known to have pronounced effects in children with swiftly growing bones, that does not mean your workers and residents cannot be affected by radium, or any of the other well-known carcinogenic radioactive elements common to oil and gas waste such as produced water.

Quote, "There is no threshold of exposure below which low levels of ionizing radiation can be demonstrated to be harmless...The health risks – particularly the development of solid cancers in organs – rise proportionally with exposure." This from Harvard epidemiologist and committee chair of the National Academy of Sciences 2006 Biologic Effects of Ionizing Radiation report, known among radiation experts as the BEIR VII report.

Just because you do not believe the science or know the science or care to read a few research papers to understand the science does not mean the science doesn't exist, and does not mean the science won't eventually lead to lethal cancers in the residents you are charged with protecting. I sincerely hope the Department and Commission reconsiders this ridiculous science-starved rule and makes a complete about-face on the topic of oil and gas waste.

But either way, your paltry regulations have already enabled an easily traceable trail of contamination to be spilled across the great state of New Mexico, and quite literally, deposited in the bones and bodies of its people. Radium, again, as anyone in the medical community well-knows, is a "bone seeker," mistaken for calcium, and incorporated into our skeleton. And as cases during the 1980s and 1990s from the Mississippi and Louisiana oil patches have shown, these exposures may not just lead to cancer and disease in oil and gas workers, workers bring contamination home on their clothes and bodies and their family members can and will be contaminated as well. There is no reason to think that the science of exposure will operate any differently in New Mexico workers and residents in 2020 than it did in Louisiana and Mississippi workers and residents 30 and 40 years ago.

As Dr. Harrison Martland, one of the great founders of the field of occupational radiation safety, lays out in his seminal 1931 paper on the "Radium Girls" in the American Journal of Cancer, the bombardment of radioactivity given off by these women—who unknowingly digested radium in their use of radioactive paints in the painting of watch and clock dials—, quote, "will last, for an indefinite period. For instance in the year 3491 A.D., the skeleton will still be giving off 185,000

alpha particles per second.” End quote. So the contamination you enable to be spread, spilled, and sloppily treated across this awesome Land of Enchantment is not going anywhere. Your carelessness will be recorded indefinitely on the land and in the bodies of its people, and myself and my colleagues and the scientific experts—and the many, many, attorneys of the future—will find your victims, and we will expose the catastrophe you have unleashed.

Please find all sources cited and linked or attached in full. Thank you.

Justin Nobel

SOURCES

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