

Julie Weatherington-Rice, PhD, CPG, CPSS
298 W. New England Ave.
Worthington, Ohio 43085
614-436-5248
jweatherington.rice@gmail.com

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Rep. Al Landis, Chair
Ohio House of Representatives Energy and Natural Resources Committee
Via email

RE: House Bill 422 / Senate Bill 165, Establish specifications for the sale of brine as a commodity

Dear Chairman Al Landis and members of this Committee;

My name is Dr. Julie Weatherington-Rice. I am an Earth Scientist. I am the Senior Scientist for the firm of Bennett & Williams Environmental Consultants Inc. in Westerville, Ohio. I serve as a scientific advisor to the Ohio Environmental Council, as a member of the national Advisory Board to the Southwest Pennsylvania Environmental Health Project and, in 1986-87, as a member of the Ohio Governor's Oil and Gas Regulatory Review Commission. I am a former Adjunct Professor to the Dept. of Food, Agricultural and Biological Engineering, The Ohio State University and have served on Advisory Boards to the Ohio Department of Health and the six State Agencies charged with the protection of Ohio's water. I have spent my lifetime working to protect the air, soil and water of Ohio so that it is safe for the people of Ohio to use.

I first prepared this testimony last September (2017) for the Senate version of this bill. I am resubmitting it to this committee so there will be information in the record from a highly qualified scientist that not only is this use of conventional brine as a road deicer a really bad idea, but that we have known that it is a really bad idea for more than 30 years and therefore, by agreeing to this application, the State of Ohio opens itself up to being a party to any physical harm to humans and the environment that will occur from their exposure to these materials. We know the materials are toxic and hazardous. The State of Ohio paid for the initial risk analysis study in the mid-1980s. We know that it kills; the technical OSU Cooperative Extension resource engineer to the Ohio Dept. of Health died from his exposures to conventional brine used for deicing and dust control of his road. We understand that this version of the bill contains a section on page four that states:

“(9)(a) Brine processed to remove free oil, dissolved volatile organic compounds (VOCs), metals and other contaminants in accordance with an order or permit issued under division (C) of this section is a commodity”.

I am well aware that people drafting Ohio legislation are not hired for their rigorous scientific training. If they were, they would never have crafted that statement. Not only do you have to be concerned with the VOCs, you probably should be even more concerned with the

semi-volatile organic compounds because they are more likely to stay in the environment and cause harm. If these materials are going to be removed, how are they going to be removed? How are those materials going to be disposed of? Will the methods of disposal put Ohioans and our environment in danger? And most importantly, removing metals? All metals? If that is the case, you have removed half the components that make up the salts which I am assuming are the product that you want to keep. Last time I checked, sodium and calcium, major cations in salt formation, are both metals. They combine with chlorine to form salts.

At this point, given more than 30 years of information created here, in Ohio, for anyone to assume that this use of traditional drilling brines is a good idea either has not been paying attention, has not bothered to look, is lying through their teeth or simply does not care about the health and welfare of the people and the environment of Ohio. Do not pass this bill.

Oil & Gas brines are toxic and hazardous

In 1986, the Oil & Gas Regulatory Review Commission arranged to have Dr. Gerald Poje, Environmental Toxicologist, conduct an evaluation of the heavy metal and hydrocarbon constituents of oil and gas drilling brines. Dr. Poje was living in Ohio at that time, teaching at Miami University at Oxford and working with the Ohio Environmental Council on soil, water and air contamination issues. The report was titled "*Toxicological Analysis of Ohio Brine Constituents and their Potential Impact on Human Health*". This review of then available toxicological data bases was an early version of a US EPA Risk Assessment, It reviewed each commonly noted hydrocarbon and heavy metal found in oil and gas brines, determined the various forms of toxicological impacts and the routes of exposures. It did not compare the synergistic impacts of the mixtures. Among other findings, the report noted that exposures to the oil and gas brines can trigger cancers over time. The entire report is available on line at the Damascus (PA) Citizens for Sustainability's web site:

<http://www.damascuscitizensforsustainability.org/wp-content/uploads/2012/02/Tox-Analysis-Ohio-Brine-part-1.pdf>, <http://www.damascuscitizensforsustainability.org/wp-content/uploads/2012/02/Tox-Analysis-Ohio-Brine-part-2A.pdf>, <http://www.damascuscitizensforsustainability.org/wp-content/uploads/2012/02/Tox-Analysis-Ohio-Brine-part-3.pdf>, <http://www.damascuscitizensforsustainability.org/wp-content/uploads/2012/02/Tox-Analysis-Ohio-Brine-part-4.pdf>, and <http://www.damascuscitizensforsustainability.org/wp-content/uploads/2012/02/Tox-Analysis-Ohio-Brine-part-5A.pdf>. The document was contributed to their organization by James Cowden who taught and researched Public and Environmental Health at Kent State and then Hiram College for many years. Mr. Cowden was one of the individuals responsible for the convening of the Ohio Governor's Commission. He placed my name in nomination to the Commission. The full Commission report can be found in the State Library of Ohio's collection at <http://eds.a.ebscohost.com/eds/detail/detail?vid=4&sid=d928d969-e900-46aa-83c0-c600ba495689%40sessionmgr4009&bdata=JkF1dGhUeXBIPWlwLGNvb2tpZSZzaXRIPWVkc y1saXZl#AN=state.b1217553&db=cat02748a>. A short biography of Dr. Gerald Poje can be found at The Grant Group's web site, <http://www.thegrantgroup-llc.com/our-team/gerald-poje/>. Please note, this report was produced in 1986, documenting the toxic and hazardous nature of oil and gas brine. To the best of my knowledge, no Ohio agency has ever used the information in this report to establish public health and safety exposure precautions for Ohio citizens. While

many additional studies with similar findings have been completed since this one, this study, a generation old, was commissioned and paid for by the State of Ohio to protect the health and welfare of her citizens.

Brine exposure has killed Ohioans, Ohio does not track these deaths, other states do

In the 1990s, two neighbors living on a gravel township road in Licking County near Granville developed a rare form of lymphoma and both subsequently died. One of the neighbors was Dr. Melvin Palmer, Professor in the Department of Agricultural Engineering at The Ohio State University and OSU Extension appointment to the Ohio Department of Health, Private Water and Wastewater Section. Dr. Palmer was assigned to train staff from all the health departments in the State of Ohio on the best current technologies for assuring safe private water and wastewater systems and to further the research to improve Ohio's programs. As a dedicated advocate of Public Health, when his doctors at the James Cancer Hospital informed him that his cancer was environmentally triggered by long term exposures to heavy metals and hydrocarbons' Dr. Palmer set out to identify the source(s) and routes of exposure(s) to prevent anyone else in his family and community from also developing this life-ending cancer.

With assistance from his colleagues at The Ohio State University, he undertook the sampling and testing of all logical contaminated sources. This testing included the well water at his neighbor's home and his home, the water as it passed through the home plumbing, the soil in the vegetable gardens, the water in the nearby creek, etc. He finally found a reservoir of heavy metals and residual hydrocarbons in the dust of his gravel road in front of his house. The township had, for years, used oil and gas brine for deicing and dust control. Over time, the positively charged heavy metals had attached themselves to the negatively charged clay minerals which mixed into the gravel of the roadbed. Residual hydrocarbons were also bound into the dust. The route of exposure was air bourn. As traffic would travel along the gravel road, dust would rise up and be blown into the yards, fields, pastures, gardens and wood lots along the road. The dust carried the heavy metals with it. Once air bourn, the dust could come into skin contact, be breathed in or fall on garden plots to be taken up by vegetation and eaten by the families growing the produce. The common factor between Dr. Palmer and his neighbor, a woman at least ten years his junior, was that they both had the family chore of mowing their large rural yards. In the summer, they would come in covered with windblown dust on their bodies, having also breathed in some of the dust while mowing the yards.

They both died but not before Dr. Palmer had made certain to tell as many people as he could about his findings. I worked with him as he researched the exposure routes, providing him with a copy of Dr. Poje's report once Dr. Palmer suspected the brine spreading on his gravel road. How many other Ohioans have died from similar exposure? Tens, hundreds, thousands? We have no idea because Ohio does not track illnesses and deaths attributable to oil and gas exposures. Other states do, including our neighbor to the east, Pennsylvania.

The Pennsylvania and Ohio Public Health Partnership

As can be expected after more than 30 years, Ohioans have grown tired of waiting for the State of Ohio to decide to protect their public health from the toxic and hazardous nature of the

production, transport and waste streams of the oil and gas industry. For whatever reasons, Ohio's State government has decided that it is more important to protect the oil and gas industry than it is to protect its citizens. Pennsylvania has taken a different position and through their Public Health Districts, has set up a mechanism for collecting the health histories of individuals who have had their health impacted by the oil and gas industry. These health histories are collected into a data base and are used to expand health surveys and outreach education in communities where impacts have been noted. The premise is that if one individual has been impacted, there may be more. Health Districts in Pennsylvania have the ability to reach out across state lines and work with regional partners assuming that there is a local organization willing to maintain day to day operations and that there are health professionals in the adjacent states to act as health history collectors.

Citizens in Ohio have formed such collaboration with the Southwest Pennsylvania Environmental Health Project. Day to day coordination in Ohio will be provided by the Ohio Environmental Council and Ohio health professionals have already received training at the Project headquarters in Pennsylvania. Minimal funding is being sought at this point in time in hopes that we can begin collecting health histories here in Ohio by 2018. The data will be stored in Pennsylvania as there is currently no interest to undertake such a study by any Ohio agencies.

Ohio oil and gas brine is toxic and hazardous in it's raw state

There are possible commercial applications for oil and gas brine but it first must be stripped of its heavy metals and hydrocarbons to get to the basic salt water. That is not an inexpensive undertaking and it generates waste streams of heavy metals and hydrocarbons that must be safely disposed of. There are cheaper, easier ways to obtain basic sodium chloride in Ohio. Sodium chloride is not the best deicer and dust control measure available. Calcium chloride and sugar beet juice has far less environmental impacts. There is a serious question as to the economic viability of conversion of oil and gas brines to safe commercial uses, assuming careful and safe disposal of the processing waste products.

At this point in time, I cannot recommend the application of the toxic and hazardous oil and gas brine into Ohio's environment without extensive processing. To disregard the more than 30 years of information that has been gathered on the potential public and environmental health impacts of uncontrolled uses of oil and gas brine at this point in time is irresponsible.

If you need further information and/or have additional questions, please feel free to contact me by phone at 614-436-5248 or by email at jweatherington.rice@gmail.com. Thank you for this opportunity to document the history of oil and gas brine toxilogical research here in Ohio.

Respectfully submitted,

Julie Weatherington-Rice, PhD

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