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Ohio Senate Agriculture & Natural Resources Committee
Senator Tim Schaffer, Chair
Via e-mail

RE: Testimony on Ohio Senate Bill 171

Sen. Schaffer, Chair and Committee Members,

My name is Dr. Julie Weatherington-Rice and I am an Earth Scientist who has spent my entire career working on the protection and development of drinking water supplies. My schedule is such that I could not come down to testify in person today. The information that I am presenting in written form is critically important because oil and gas drilling brine, in its raw form, has been responsible for extensive pollution of the air, soil and water of the state and health impacts on its citizens. These events are well documented and have been of grave concern since at least the 1960s if not before. Aqua Salina, although considered “refined”, contains many of the chemicals that have caused contamination from the raw brine. It is just as toxic and hazardous as the raw product and should be banned from use, at any level, here in the state. It absolutely should never be released to the general public as you will learn from the testimony of myself and others. To do so would be irresponsible bordering on criminal.

I am presenting written testimony today about dilution. We have all heard the statement “The solution to pollution is dilution” and we know that the earth has a great capacity to absorb toxic and hazardous substances and reduce them to “safe” exposure levels, until they become overwhelming and the earth can no longer keep us safe as we have learned to our detriment with climate change. This bill is about how one company in a particularly irresponsible industry wants

to pass on its waste stream to be buffered by the earth and to make money in the process.

My resume is long, I have documented it in previous testimony that I have presented on this legislation in earlier years so I won't waste time repeating it here. You can read about me in the supporting previous testimony I have included. These days, I spend most of my time lecturing, teaching and writing.

I first learned about the contamination of drinking water by vertical oil and gas drilling brine in Dr. Wayne Pettyjohn's Hydrogeology class at Ohio State, Spring Quarter, 1977. About 1960, Morrow County experienced a major oil and gas drilling boom. There were no strong regulations in place, unlined drilling pits were dug and filled with brine as the wells were drilled. The brine seeped into the groundwater, contaminating many of the drinking water wells in the region and flowed into Alum Creek. The City of Westerville, two counties downstream took their water from Alum Creek and the residents noted that the plants in their yards were turning brown from the salt in the water. Ohio State sent students up to study the situation, Dr. Pettyjohn wrote a paper published in The Ohio Journal of Science documenting the problem. In the intervening years, Alum Creek Reservoir got built and filled. The reservoir is 5.019 square miles, maximum depth 68 feet and holds 134,815 acre-feet of water. There are 325,851 gallons per acre or approximately 44 billion gallons of water in the reservoir. When I met with staff at Westerville's Water Department in 1977, the reservoir had effectively diluted the brine to safe levels. Dilution worked for the surface water. However the groundwater in Morrow County is still contaminated 60 years later and drinking water is supplied by a rural water association. Dilution is still not sufficient to flush out the region's contaminated groundwater

Fast forward to March 2016, Reservoir # 1, Barnesville, Ohio. One night a brine truck hauling less than 5,000 gallons of brine ran off the road and dumped some portion of the load into the headwaters of the reservoir. The reservoir is 24.7 acres in size, holds 90 million gallons of water, about 276 acre-feet. The reservoir was taken off line for more than two months until spring rains flushed the reservoir to safe levels for drinking water. 90 million gallons of water was not enough water to dilute less than 5,000 gallons of brine to safe levels.

Given those two scenarios, do we know if the levels not to be exceeded in the bill are protective of human health and the environment? Do we know if the brine being used by Aqua Salina can meet the limits in the bill? Should we be concerned enough about what is in the brine to not accept this bill? We are told repeatedly that oil and gas brine is natural and exempt from Hazardous and Toxic classifications. That is true, but the elements and compounds that make up the oil and gas waste products are not. They have exposure levels that should not be exceeded if human health and the environment are to be preserved. Looking back over the data that has been collected, we do not have answers to all those questions but we do know enough from the data that has been collected to know that we cannot be certain that the use of this material in an unrestricted, uncontrolled manner is safe. Under its current usage, we cannot prevent it from being spilled into someone's drinking water. If it is classified as a commodity, we cannot prevent it from being tracked into someone's home to expose their pets and children.

I am including a series of attachments that establish what we do know. I am attaching the following documents:

1. The verbiage of SB171 listing the "not to exceed" chemical elemental parameters in the brine.
2. The list of Safe Drinking Water Act Maximum Contaminant Levels (MCL's) for drinking water that would have to be met if this material got into a drinking water supply. You need to pay attention to how many orders of magnitude the brine would have to be diluted before it could meet Safe Drinking Water MCL's for each element on the list.
3. The lists of chemical analyses that Aqua Salina has submitted to ODNR on a yearly basis since 2010. This data was obtained by Ms. Jenny Morgan from ODNR in a file request in early 2019. That cover letter is here included. As you and/or your staff will note, a number of the parameters to be limited have not been tested for. We don't know what those values are. Also, please pay very close attention to the units of measurements for each of the elements and compounds. Three different units are used indiscriminately from sheet to sheet. You will see ug/l which is micrograms per liter, mg/l which is milligrams per liter (1,000 times higher) and grams per liter, g/l, an additional increase of 1,000 times. It's critical to match the measurements.

4. A link to my favorite Periodic Table of the Elements located on the web. This is a very powerful tool and can be used to research isotopes as well as elements. <https://ptable.com/#Properties>

If you take the time to study the data, you will see that it is impossible to make the claim that this is a safe and beneficial use for oil and gas brine based on the existing data. The proponents have not proved their case and we strongly suspect that they cannot do so. We would all be much better served if the brine was returned to the oil and gas fields from which it was extracted to serve as enhanced recovery fluid to increase the production for the fields where it was originally contained.

I have written significant volumes on this topic in previous years. It is my understanding that others will be submitting some of that testimony into the record. I have also included some of it as well. This concludes my testimony. If there are questions I can answer, I will be happy to try to do that now in follow-up documentation.

Respectfully submitted,



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For identification purposes only,

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And

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Attachments