Proponent Testimony
For
House Bill 282
From
William Rish, Ph.D.
Before the
House Energy and Natural Resources Committee
On
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Chairman Stephens, Vice Chair Stewart, Ranking Minority Member Weinstein and members of the House Energy & Natural Resources Committee thank you for the opportunity to provide proponent testimony today on HB 282.

My qualifications

My name is Dr. Bill Rish and I am a Principal Engineer at ToxStrategies, an advanced toxicology and risk assessment consulting firm. I have 40 years of experience in environmental risk assessment and have prepared hundreds of human health risk assessments, with 30 years of practice in Ohio.

- I was co-coordinator of the development of the Voluntary Action Program (VAP) generic cleanup standards and the risk assessment procedures rule. I have served on the 5-year review work group numerous times for those rules.
- As a Certified Professional under the VAP, I prepared 14 No Further Action Letters on behalf of Ohio EPA and obtained Covenants Not to Sue from Ohio EPA for all 14 sites.
- I also prepared and obtained 10 Urban Setting Designations for groundwater at cities throughout the state of Ohio.
- All of these No Further Actions and Urban Setting Designations required evaluating ecological and human health risks and potential exposure pathways.
- I have prepared numerous human health risk assessments for commercial and consumer products, including peer-reviewed publications on the risks associated with brine wastewaters on drinking water and the risks associated with beneficial use of solid waste containing technologically enhanced natural occurring radioactive material.
- I am currently a member of the North America steering committee for the Society of Toxicology and Chemistry (SETAC) Human Health Risk Assessment Group.

What I was asked to do

Nature's Own and Duck Creek Energy asked me to:

1. Present a scientific assessment of the environmental and human health risks associated with the application of AquaSalina on roads for deicing;
2. Determine the significance of the potential risks by comparison to state and federal regulatory agency risk-protective standards and natural background levels; and
3. Propose screening criteria which will ensure that the use of AquaSalina for road deicing is safe and acceptable.

How the potential risks were assessed

1. I began by reviewing published studies of third party and independent certification agencies and academic institutions where they compared the environmental impacts and ecological risks across alternative deicing materials, including AquaSalina. These studies used good protocols to compare different products used for deicing, and I agree with their conclusions that environmental impacts and

ecological risks associated with AquaSalina are low and significantly less than alternatives, such as using rock salt.

2. AquaSalina has been sampled and subjected to laboratory analysis by both Duck Creek Energy and the Ohio Department of Natural Resources (ODNR) and the dataset is robust. All riks assessments discussed herein used the maximum detected concentrations of metals, organics, and radionuclides and some very conservative assumptions to quantitatively assess potential environmental and human health risks from the use of AquaSalina.

3. I assessed the potential for metals in AquaSalina to runoff into soils along the road being deiced. The predicted upper bound soil concentrations are very low when compared to natural background concentrations in a county (Montgomery County) with among the lowest background levels measured by Ohio EPA. Calculations show that it would take tens of thousands or more of AquaSalina applications to contribute enough metals to the soil to equal natural background concentrations, even conservatively assuming that the runoff spreads only 1 meter laterally away from the road. Therefore, exposure to metals (heavy or otherwise) that may runoff into soil from application of AquaSalina for deicing poses an acceptably low level of risk, well below natural background levels.

4. I assessed the potential for metals in AquaSalina after 0.1 inch ice melt to runoff into surface water directly through stormwater conveyances assuming no additional dilution from other sources of stormwater. These worst case estimated levels of metals in direct AquaSalina deicing runoff were orders of magnitude below the most protective Ohio standards set to protect aquatic species and humans consuming exposed fish. It is notable that, of the fourteen metals for which there are surface water criteria, four were below detection limits in AquaSalina (antimony, beryllium, cadmium, and silver), and four were below their Ohio water quality standards in undiluted AquaSalina (arsenic, barium, chromium, and strontium). Therefore, there is no potential for harm to aquatic species in surface water from metals in AquaSalina deicing product runoff.

5. I used a study of drinking water risks from a large spill of gas well brine, which I published in the peer-reviewed scientific journal Risk Analysis, to compare to potential risks to groundwater from metals runoff and infiltration of AquaSalina. The concentration of chemicals in this type of shale gas brine are much higher than those in AquaSalina. Based on my study and laboratory analysis of AquaSalina chemical content, even if 10,000 gallons of AquaSalina was spilled on the ground, the health risks to an adult or child drinking from a nearby well would be insignificant and well-below levels accepted by U.S. EPA and Ohio EPA.

6. AquaSalina contains naturally occurring radioactive materials (NORM) which occur naturally in all rock formations, including salt. Extensive sampling and analysis for radioactive constituents in AquaSalina has been done by both Duck Creek Energy and ODNR. We used the Argonne National Laboratory RESRAD computer model, the most commonly used and accepted code for calculating doses from radiation exposures, to calculate upper-bound estimates of the potential radiological exposure (dose) experienced by members of the public which would result from repeated use of Aqua¬Salina for road deicing. We assumed an unlikely and worst case exposure scenario where soil along a road that has received maximum detected radionuclides from 10 AquaSalina deicing events is excavated and used as surface fill at a residential home with farming. It is assumed that the resident is exposed by direct exposure to external radiation from the contaminated soil material; internal dose from inhalation of airborne radionuclides, including radon progeny; radiation runoff into a pond and leaching into drinking water at only 12 feet below ground surface; and internal dose from ingestion of plant foods grown in the radiation-containing soil and irrigated with radiation-containing water; ingestion of meat and milk from livestock fed with contaminated fodder and water; drinking water from the radiation-containing well or pond; eating fish from the pond; and incidental ingestion of contaminated

soil. The maximum dose from all exposure pathways summed together is estimated to be 0.62 millirem/year for this worst case hypothetical residential exposure scenario. This dose is more than two orders of magnitude below the regulatory criteria for the protection of public health (100 millirem/year) and the Ohio background dose from natural sources of radiation (473 millirem/year). Therefore, the use of AquaSalina for deicing will not result in significant radiological risk from any public exposure pathway.

In addition to our risk assessment, a radiation risk assessment was prepared by the Ohio Department of Health (Ohio DOH) using the laboratory analysis results for radium concentrations in AquaSalina obtained by the ODNR's independent sampling. Ohio DOH also used maximum detected concentrations and conservative assumptions regarding potential exposure to radiation from applied AquaSalina and calculated a dose of 7.2 millirem per year (assuming 12 applications of AquaSalina) and concluded that AquaSalina poses "negligible radiological health and safety risk".

How the screening criteria were developed

The risk assessment demonstrated that concentrations of chemicals and radionuclides would need to be orders of magnitude higher than are present in AquaSalina to exceed standards set by regulatory agencies or natural background levels. Therefore, it is improbable that brines from future source wells for AquaSalina will have concentrations high enough to result in unacceptable risks. Nonetheless, it may be useful to have risk-based brine concentration screening criteria to protect against the unlikely event that inappropriate raw brine is accidentally used to make AquaSalina.

1. The risk assessment found, based on worst case assumptions, that discharges of runoff from roads deiced with AquaSalina will result in surface water concentrations and soil concentrations that are orders of magnitude below Ohio standards and/or natural background levels. As such, adopting the brine content specifications established by the PNS Association will provide a high safety factor to protect human and ecological risks.

2. The lowest (most protective) available Ohio or EPA surface water criteria for barium, benzene, toluene, ethylbenzene, and xylenes are recommended as screening criteria for AquaSalina.

3. The radiological risk assessment was used to calculate concentrations of Ra-226 and Ra-228 in AquaSalina which will result in high confidence that radiation doses to the public from use of AquaSalina will be acceptably low. Keeping AquaSalina radium concentrations at or below these levels will provide at least a one to two order of magnitude safety margin (based on worst case exposure scenarios) that radiation doses by the public are below regulatory standards set by U.S. EPA and NRC for the protection of public health, and well below background levels.

Thank you for your time and attention. I would be happy to answer any questions.