

Ohio House Committee on Natural Resources
 Jason Stephens, Chair
 May 25, 2021

Dear Mr. Stephens and Committee Members:

I write to vehemently oppose HB 282 and approval of Aquasalina or any other oil and gas waste products as a commodity. This waste is highly radioactive. Its radioactive components are NOT eliminated or even reduced in the manufacture of the de-icing or dust-suppressant product, as confirmed by ODNR’s tests of Aquasalina.

Ohio Administrative Code sets the legal limit for combined Radium-226 and Radium-228 discharge to the environment to 120 pCi/L. (OAC 3701:1-38-12, Appendix C, Table II) U.S. Environmental Protection Agency drinking water standard for combined Radium 226 and 228 is 5pCi/L. (40 CFR 141.66)

All samples of AquaSalina tested by ODNR exceeded federal Drinking Water legal limits for combined Ra-226 and Ra-228 as well as OAC legal limits for discharge to the environment:

- The Aquasalina samples tested by ODNR averaged 1,731 pCi/L, or 346 times the EPA standard. The highest concentration found (from a container of AquaSalina purchased from a hardware store in Hartville, OH) was almost 500 times the standard.
- Ra-226 and Ra-228 radioactivity in all samples also exceeded State of Ohio limits for discharge to the environment (OAC 3701:1-38-12, App. C, Table II, Effluent Concentrations) by many times: The combined radium Ra226/Ra228 concentration in all samples of post-production AquaSalina, other than the Hartville Hardware sample, averaged within 10% of each other at 1,578.6 pCi/l. (ODNR Interoffice Memo 7/26/17)

Furthermore, if one considers the health-based standards determined by USEPA, the degree to which these products exceed standards is even more horrifying and alarming:

Health-based exposure limits: from *Radioactive elements most commonly detected in drinking water Environmental Working Group Tap Water Database 2019* ewg.org/tapwater/reviewed-radiological.php

Element	Primary health concern	Detection level, in picocuries per liter	Health-based limits (based on one-in-a-million cancer risk)	National Maximum Contaminant Level (MCL) in pCi/L	Cancer risk at legal limit
Radium-226 & -228	Bone cancer, other cancers	1	0.05 pCi/L	5 pCi/L for combined radium 226+228	7 cancer cases per 100,000 exposed

USEPA has set a health guideline of zero for all radioactive elements in drinking water. However, federal legal limits for radiation and radioactive contaminants are based on the cost of removing contaminants and don’t necessarily reflect exposure levels considered safe by public health and medical officials. Since detection limits (minimum level needed for detectability) of radioactive substances in water are higher than health-based guidelines, even residents of communities with “no detected radiation” may face cancer risks from radioactivity in drinking water.

It is not surprising that Aquasalina contains such high levels of radioactive materials, since these are not removed in processing and, as Ohio Department of Natural Resources tests confirm, conventional oil

and gas waste contains high levels of radium 226 & 228. Results from tests of both conventional and deep horizontal wells have revealed that this waste contains dangerously high levels of cancer-inducing radioactivity:

Ohio Department of Natural Resources (ODNR) Oil and Gas Brine TEST RESULTS

Radioactive levels of radium 226 and 228 in brine from 151 oil & gas well samples. Well Type	# Wells Sampled	Results*
Conventional (vertical, shallow) wells, the old mom & pop wells	118	66 to 9602 pCi/L**
Horizontal (deep) wells	25	173 to 3264 pCi/L
Out-of-state (brine disposed in OH)	8	54.6 to 9798 pCi/L

* Source: Tests completed for ODNR Radiation Safety Section, Division of Oil and Gas, cited in their memos of 1-23-18 and 7-2-18

** Picocuries: a measure of the intensity of radioactivity; pCi/L reflects the intensity of radioactivity per liter of water.

“Brine” (radioactive oil and gas waste) and Aquasalina are used on some Ohio roads as a de-icer and dust suppressant. Aquasalina specifically:

- is approved for road use in 224 townships/municipalities in Ohio.
- is used by ODOT on state roads in 29 counties.

Use on roads and sidewalks means that the radioactivity gets into soil, can be tracked into homes and becomes airborne as radioactive dust, thus able to contaminate drinking water sources and agricultural products. This has long been known as a source of human illness and death by Ohio regulators. Needless to say, this is a longterm threat for many generations, given the half-lives of these two radioactivity particles.

Radium-226 is especially dangerous because, unlike many radioactive isotopes, it dissolves readily in water. When this contaminated water is ingested, the body mistakenly recognizes Ra-226 as dissolved calcium and deposits it in bone tissue. Radium-226 is a bone seeker and causes bone cancer. Radium-226 is an "alpha particle emitter," meaning that its atoms have enough radioactive energy to bombard surrounding cell tissues and cause cell mutations. Alpha particles are difficult to detect and have a greater potential to damage biological tissue. In fact, radon gas - radium in gas form - is the second leading cause of lung cancer in the U.S. Repeated or high level exposure to radium results in an increased incidence of bone, liver, and breast cancer. U.S. EPA and the National Academy of Sciences Committee on Biological Effects of Ionizing Radiation list radium as a known human carcinogen. (ATSDR ToxFAQs)

I am extremely concerned about health risks to my family and members of the public exposed to this radioactive material. Allowing the spreading of these alpha particles in the environment is a serious health issue that must be stopped, not made more prolific and unregulated, as this legislation would do. Citizens are depending on you to halt this radioactive waste from further use and environmental discharge.

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