

# The Risky Business of land-based biosolids disposal (Sewage Sludge)

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The land disposal of sewage sludge (aka, “biosolids”) in the Nicola Valley has resulted in significant controversy, and a resistance movement is rightfully building to this misguided policy.

Quite simply, the science doesn’t support the disposal of sewage sludge across the landscape. The supposed benefits are more than offset by the risks toward human and environmental health.

As scientists, we have been watching the issue with increasing concern.

*We cannot even say with any degree of confidence what the true range of contaminant risk is from the sludge. Call it an “unknown unknown.”*

An unimaginably large number of chemical and biological contaminants exist in these materials, and they persist in the product up to, and after, land disposal.

Scientific investigations have identified only a tiny fraction of the total contaminant load. We cannot even say with any degree of confidence what the true range of contaminant risk is from the sludge. Call it an “unknown unknown.”

Because of potential synergistic interactions between the contaminants in the sludge, the risks are largely unknowable.

Most public discussions of the chemical contaminants in sewage sludge involve well-known groups such as heavy metals, flame retardants, and pharmaceuticals, among many others.

But these are just the contaminants we have identified. To refer to our current knowledge base as the tip of the iceberg would be grossly overestimating how much we actually do know.

Regulators and others — including elected officials — up and down the policy chain appear to lack a real appreciation for the scope of the problem, and the costs of beginning to understand it.

In a recent news article at the *Herald*, city officials from Merritt stated they were testing the sewage sludge for contaminants four times a year, rather than the required twice per year.

*You are not going to find a problem if you don’t look for it. Of course, over time, that problem may also come looking for you.*

This testing program would cost \$10,000, which is already a substantial amount of money for analytical work in a small community.

But if the city were to test the sludge just once for all possible contaminants in the material, the real bill would be well into the hundreds of thousands of dollars.

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To illustrate the difficulties, take just one group of persistent, bio-accumulative, and toxic compounds known to be in sewage sludge at high concentrations: brominated flame retardants.

Perhaps the most well-known sub-class of the brominated flame retardants are called polybrominated diphenyl ethers (PBDEs).

There are 209 different PBDEs, each of which has a unique toxicology and environmental fate.

PBDEs have been studied around the world for several decades, and despite many millions of dollars in research and thousands of dedicated researchers, we still have a very poor understanding of the true risks from their release into the environment.

This is just one contaminant class among many. There are also 209 different members of the PCBs. Similarly, add in another 210 chlorinated dioxin "congeners."

And the total number of contaminants in sewage sludge climbs as we begin to consider that effectively all current and legacy industrial chemicals end up in our sewage, and during the treatment process they move into the sludge.

If you apply the sludge to the land, we have transferred our toxic effluent onto the landscape.

*Then add on all pharmaceuticals and personal care products, as well as any other compound we use in the home or at work, and all their potential degradation products.*

Now consider that while the tens of thousands of these commercial chemicals are a possible problem which we barely understand, the risks from the much larger suite (i.e., millions) of possible degradation products are essentially unknown.

Then add on all pharmaceuticals and personal care products, as well as any other compound we use in the home or at work, and all their potential degradation products.

We are often asked by regulators, politicians and the general public what to do about the issue. Give us the tests and we will do them, they claim.

In response, we say that not only can you not afford to do all the required tests on your own (the costs must be distributed across entire countries and the international community as best we can, and even that is almost unaffordable), but many of the required tests require advances in technology which we do not yet possess.

The complexity discussed so far just touches on the chemical contaminants. Add to that the massive numbers of biological contaminants — bacteria, viruses, prions, etc. — and what we see are the decision makers throwing their hands up in frustration.

As they should. The current and future problem is inconceivably large, particularly since the human population is producing sewage sludge at a rapidly growing rate.

Those from the large public and private sector industry that has developed around marketing and selling sewage sludge for land disposal — which we collectively term “big sludge” — claim the materials are “non-toxic” and a resource to be cherished, not shunned. The state of the science does not agree with this oversimplification.

While there have been some attempts to review the science surrounding sewage sludge, these are generally wanting.

Either the reviews are out-of-date and incomplete, failing to account for all that we do know about emerging contaminants and what we don't know about all contaminants, or they are written more as promotional materials for big sludge in an attempt to sell the product to an ever more skeptical public.

What should we do in response to all these concerns?

Immediately halt the land disposal of sewage sludge as a starting point, and begin either stockpiling or landfilling the material in secure locations with full leachate collection systems until a more responsible means of dealing with the problem is implemented.

In the meantime, the science must continue in an effort to better understand the risks and to develop more effective treatment technologies.

We also see municipalities and regional districts talking about the revenue stream from selling their sludge for land disposal, but are they telling the taxpayers they are supposed to represent about the very large potential risks from the knowing and willful contamination of lands, waters, and the atmosphere that arises from these choices?

Increased health care costs, decreased property values, and toxic tort lawsuits have collective liabilities to big sludge over time that far outweigh the relatively small cash flows currently coming in to the public purse.

Governments are playing Russian roulette with sewage sludge, and over time there is a high probability this game will be lost at the public's expense.

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