

[TRANSCRIPT BY MOIRA DONOVAN, LINDA CAMPBELL SPEAKING, INTERPRETER]

I'm just looking for a sign I wanted to point out here. So you can see here a sign. It's a government issued sign to warn people of the arsenic contamination on the site.

This is where the brook goes through, as I mentioned, and this is a tailings area, right now it's quite dry. Normally there's puddles all across the front here, where we will be walking. The arsenic is severely very, very high in this area. And this is where people had brought- they were mining the ore from the shafts, as I mentioned, as we were going along the trail and they would crush the ore in that area. They'd bring the crushed ore to the mills that were established here, and mills would typically use mercury to do the amalgamation process. So it's a double whammy of the arsenic and the mercury contamination on these sites.

Here, arsenic is more of a concern than the mercury and mercury has ecosystems and health concerns. Mercury bioaccumulates and goes up the food chain. And arsenic does not. It has a direct toxicity effect. So, for here, it's a primary site because the arsenic is extremely elevated and there's potential for health risks to people who live in the area.

So if I can ask you, given that we're speaking in the context of the Auditor General's report on contaminated sites, as someone who has been working on this in a concerted way for five years, what was your reaction to the release of this report saying that there were serious gaps in the way that the province was handling contaminated sites.

I was happy that they finally did start the process of identifying and analyzing the issues in the province and how to approach them. It's a very, very challenging issue to address for sure. So it is a good first step forward. But as a researcher, sometimes I've gotten lost, what actions should be done, who to talk with? Who should I approach to provide our work to, to help that process along for the government? So that's been a challenging part that I've experienced because there is no protocol or agreement within the governments, to date.

Just in terms of I mean, you identified there a gap, in terms of not knowing who to approach, how to sort of move this forward. And the Auditor General's Report also identified gaps and sort of areas where there was insufficient knowledge. And when it comes to, for instance, former mine sites, where are the gaps? What are the things we don't know about former mine sites in particular given that's, that's what we're talking about here?

We don't have a good comprehensive picture of how the contaminants within the tailings are moving through the environment and the impacts to human and organisms and all of the various levels in the ecosystem. For example, we're not too sure what's happening with water quality, with the fish, invertebrates or what about mammals? Deer, for example, bats. We don't know what's happening there. So far, the approach has really been focused on direct human health impacts. For example, inhalation of the dust from the tailing sites, but we're not looking further down the chain. It's only been looking at those direct effects. Another challenge for the gaps as

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well: how do you solve this issue? You can see now that we're here, there's a beautiful forest around the perimeter of the tailings field, but there's nothing growing on the tailings themselves. Again, it's very, very highly contaminated with arsenic and of course, ATV use doesn't help either by disturbing the surface of the tailings. There's a lot of approaches that could be done, one would just be to cap the entire area, is one approach, or you could try to cap and then put some type of layer on top for vegetation regrowth. And another thing as well we're working on, we want to develop a treatment that you would apply in situ, like on the site. And that would block the arsenic and the mercury from accumulating. And you could either then replant with native plant seeds or just allow the site to recover naturally. And then it would just look as if the rest of the site here on the edges, it would look like that. So that's what our research group is working on.

Some people might say that what we're looking at here, looks great, it's green, but it's not. It's only a very thin layer of organic material on top of the tailings which then leaves the growth quite vulnerable, so that area is still contaminated, although it does look green.

Why is it? You said it was vulnerable? Why would it be vulnerable given that it is only a thin layer?

For example, you can see here the ATV tracks where we're standing. All you need is one person to ATV through where there's that little bit of organic material. And you'll see the tracks for many years still remain

If left alone, I mean truly left alone, I mean not disturbed by ATV users, but also not remediated in any way either. would these sites ever restore themselves to a natural balance on their own?

It would be quite challenging. wetland are not static here in Nova Scotia, as you saw in that third area, how dry it was. and I mentioned that there was quite a lot of water in there previous times and that's a wetland, so the wetlands fluctuate in their water level and that impacts the movements of the tailings as well as the chemistry of the mercury and arsenic will fluctuate with that fluctuation in water. Leaving it alone is not probably always the best solution to do.

In other words, we have to do something about these sites.

Yes, yes. Yes.

Over 100 years later, it's still an issue. And we can't afford to wait another 100 years. And that's really part of the challenge.

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