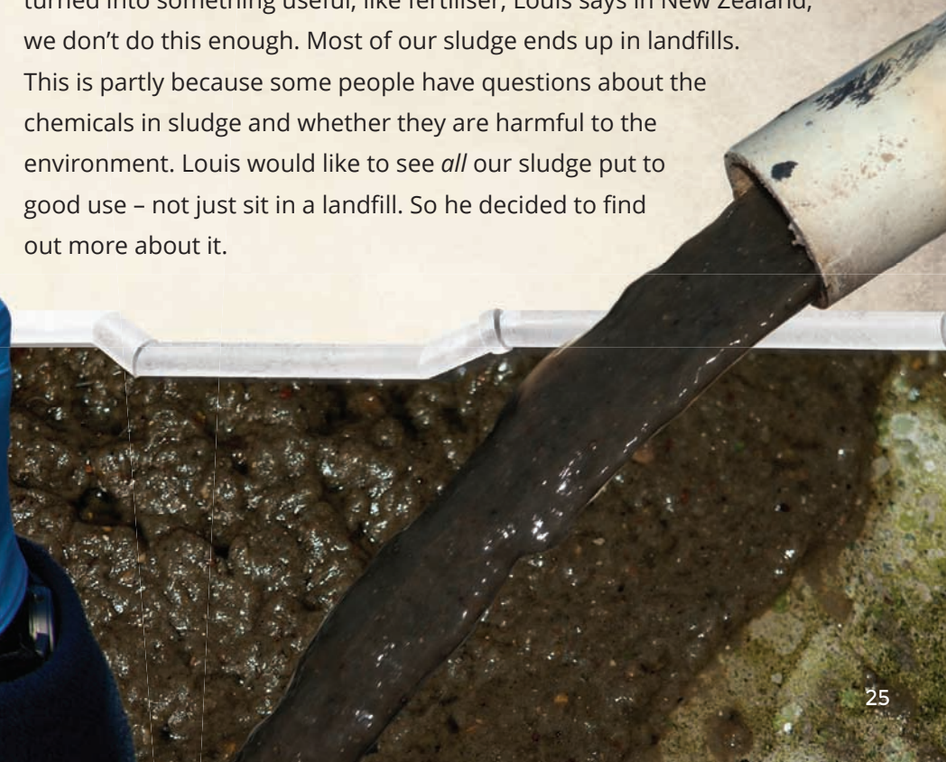
Up the Pipe

You wouldn't expect something brown and slimy to be of much interest to anyone – especially when that brown, slimy stuff is what's left over after sewage has been treated. But some scientists are very interested in these leftovers (or sludge). And they're even willing to go out and get samples so they can take a closer look!

by Fiona Terry

Tonnes of Sludge

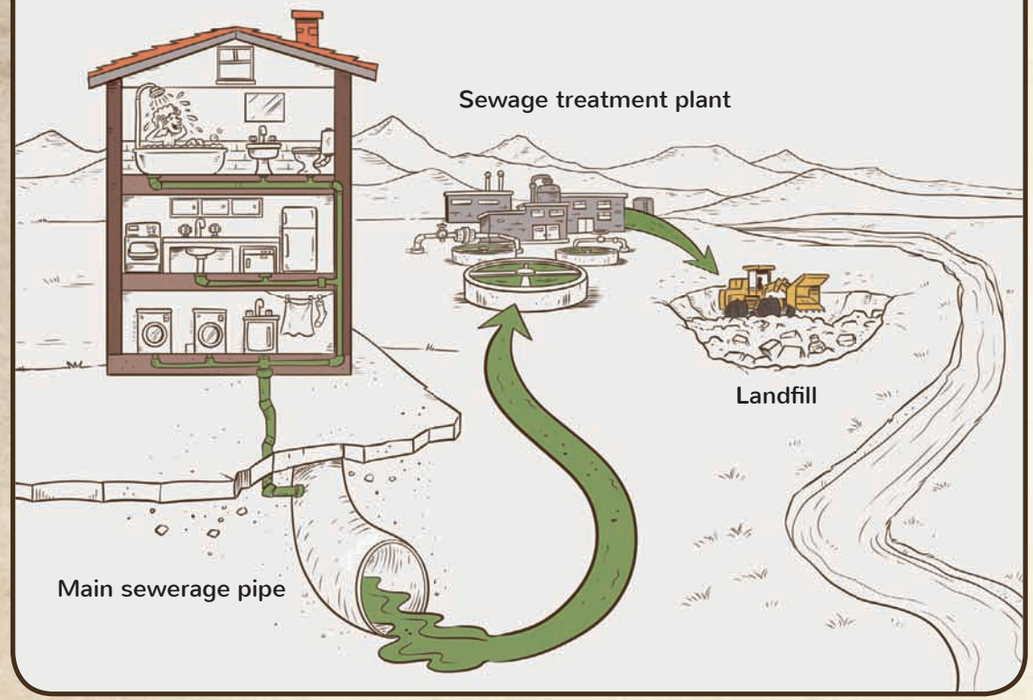
Doctor Louis Tremblay is an environmental toxicologist who began his career studying polluted soil and rivers. Eventually, this work led him to sludge – and there's plenty of it to study. Each year, New Zealanders produce around 350,000 tonnes of the stuff. Although sludge can be turned into something useful, like fertiliser, Louis says in New Zealand, we don't do this enough. Most of our sludge ends up in landfills. This is partly because some people have questions about the chemicals in sludge and whether they are harmful to the environment. Louis would like to see *all* our sludge put to good use – not just sit in a landfill. So he decided to find out more about it.



Everything Matters

A lot of the chemicals in sludge can be traced back to the things we wash down our drains. These include cleaning products, shampoo, conditioner, sunscreen, dishwashing liquid, insect repellent, liquid hand soap, moisturiser … even toothpaste! As Louis explains: "All these things contain chemicals, and they all end up in the same place: the sewage treatment plant and then – most of the time – the landfill. Everything we flush down our drains matters. People think they're doing the right thing when they recycle a plastic container, but they don't realise that the contents of those containers might also be a problem."

From Sink to Sludge to Landfill



Louis had lots of questions. What chemicals, exactly, are turning up in our sludge? Which ones are the most toxic? What's their long-term impact on the environment? And most importantly, how can we reduce their use?

Louis could see that what he wanted to find out was a job for more than one scientist. The job required a team of them – with a variety of skills. So Louis began talking with other scientists, and together, they came up with a plan for a project. Louis believes that this teamwork makes all the difference. "If it were just toxicologists like me working on the project," he says, "we'd miss out on a whole bunch of things, like connecting with the wider community to share our research. If you want your work to create change, then it really helps to work with others."

The Project Team

Environmental chemist runs tests to see what chemicals the sludge contains.

Environmental toxicologist studies the toxicity or harmful effects of the chemicals.

Soil scientist runs tests to see what effects the sludge chemicals have on soil.

Microbiologist checks for germs that can cause disease.

Social scientist communicates with the public.

Cultural scientist makes sure that people from different cultural backgrounds are consulted in ways that best suit them.

Up the Pipe

The project was named Up the Pipe Solutions. This captured the way the team planned to work: from the sewage treatment plants, following the wastewater back up the pipes to people's houses. Now it was time to roll up their sleeves, peg their noses, and get to work.

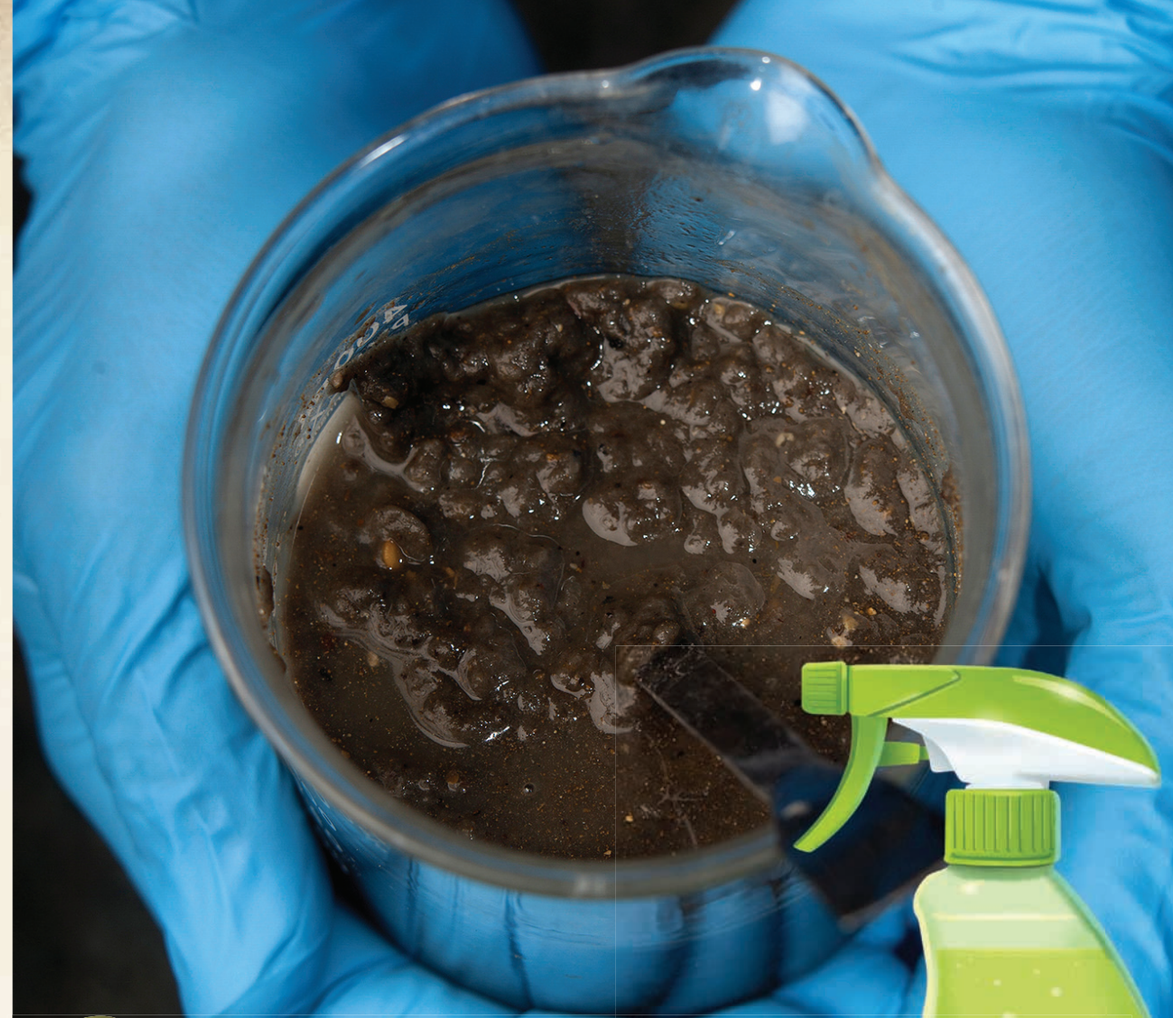
Louis began by collecting sludge samples from different treatment plants. These samples were then tested. "We kept finding the same chemicals that caused us concern, including octyl methoxycinnamate, triclosan, and chloroxylenol," says Louis. These are not just a bunch of crazy names: they're all found in the products that we use every day, especially some sunscreens and anti-bacterial soaps.

Another problem with the chemicals in sludge is that they can leach from the sewage treatment plants and landfills into our soil and waterways.

Louis again: "There's not much information about how these chemicals act once they're out in these places. We don't even really know what levels are safe."

One of the ways the team learnt more was by exposing sea urchin larvae to different chemical mixes. They plan to do similar tests with zebrafish embryos. "These creatures are considered the 'mice' of the aquatic world," explains Louis. "They help us to understand how toxic a chemical might be, as well as its long-term impact."

The research continues, and Louis and the team have high hopes. "The results from our work are vital – and already, we've learnt a great deal. Now people can know more about common household products and the chemicals they contain. This knowledge will help them to make better choices."



Other Culprits?

Louis and his team have studied lots of chemicals that they think may be harmful to the environment. Some of them have the potential to stick around for a long time – and we use them in large amounts. Start reading the labels on the products in your house and look out for the following. You might even feel inspired to make your own cleaning products (see pages 32–33).

Making Better Choices

In the meantime, the Up the Pipe Solutions team continues its work outside the lab by taking workshops in the community. “This is the best part,” says Louis. “Creating change.” The workshops are very practical, with Louis providing recipes so that people can make their own environmentally friendly cleaning products. “These are what our grandparents used,” he says, “so we thought why not use them again?”

Perhaps not surprisingly, Louis’s recipes contain things you’ll find in a kitchen pantry, not a science lab. Salt, baking soda, and vegetable oil are all on the list of ingredients.

At one of the workshops, at a Nelson school, students decided to test one of Louis’s recipes on a pile of dirty dishes. One group used dishwashing liquid bought from a supermarket; the other used Louis’s eco-friendly, home-made version. The students didn’t know which liquid they were using, but the results were put to the vote, and the eco-friendly product won hands down.

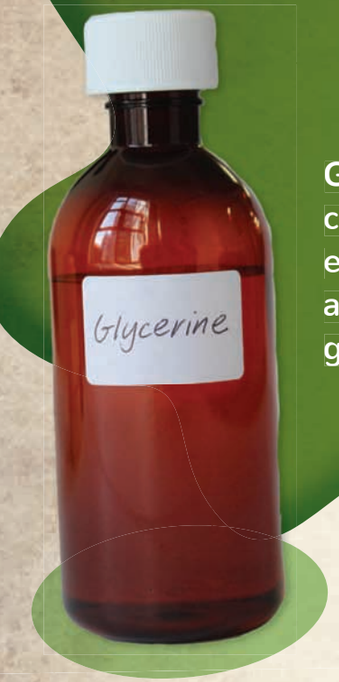
So far, people have been keen to learn, which Louis finds very exciting. “Environmental toxicologists are often the ambulance at the bottom of the cliff, cleaning up the mess. It makes a nice change to get in earlier – to stop the damage in the first place.”

Every Little Change

Of course, some chemicals will always be helpful. Louis says that we just need to use them wisely – something we’re not doing right now. “The chemical triclosan is amazing for fighting germs in hospitals, for example, but there’s no place for it in our homes. That’s just complete overkill.”

Louis emphasises that every little change helps. Even just swapping from liquid soap to bars or using a smaller amount of shampoo can make a difference. “We can still keep ourselves and everything around us clean – let’s just use fewer chemicals to do it,” Louis suggests. “It’s better for our sludge – and better for our planet.”

How to Clean Green



Get clever and make your own greener cleaning products. The ingredients are all easy to find – most will be on the shelves at your local supermarket (although glycerine is usually found at a pharmacy).

Liquid soap

(This can be used for washing dishes. It also works well for hands or as a body wash in the shower.)

- 1 cup of soap flakes or a grated soap bar (try the big yellow blocks)
- 1.5 litres of water
- 1 tablespoon of glycerine

Mix the ingredients together in a large saucepan over a low heat. Stir occasionally until the soap flakes have dissolved. Let the mixture cool overnight. Blend it with a stick blender or in a food processor until it's smooth. Pour into a suitable container.

Dishwasher powder

- 1 cup of washing soda
- 1 cup of baking soda
- ¼ cup of citric acid
- ¼ cup of salt

Mix the ingredients together and store in a sealed container or a jar with a lid. Use one tablespoon for each load of dishes. (And try white vinegar as a dishwasher rinse aid.)

Lemon sugar hand scrub

- 2½ cups of sugar
- 1 cup of vegetable oil*
- 4 tablespoons of lemon juice

Mix everything together and store. Rub some into your hands whenever they are extra dirty. Rinse it off with water.

*extra-virgin olive oil is best

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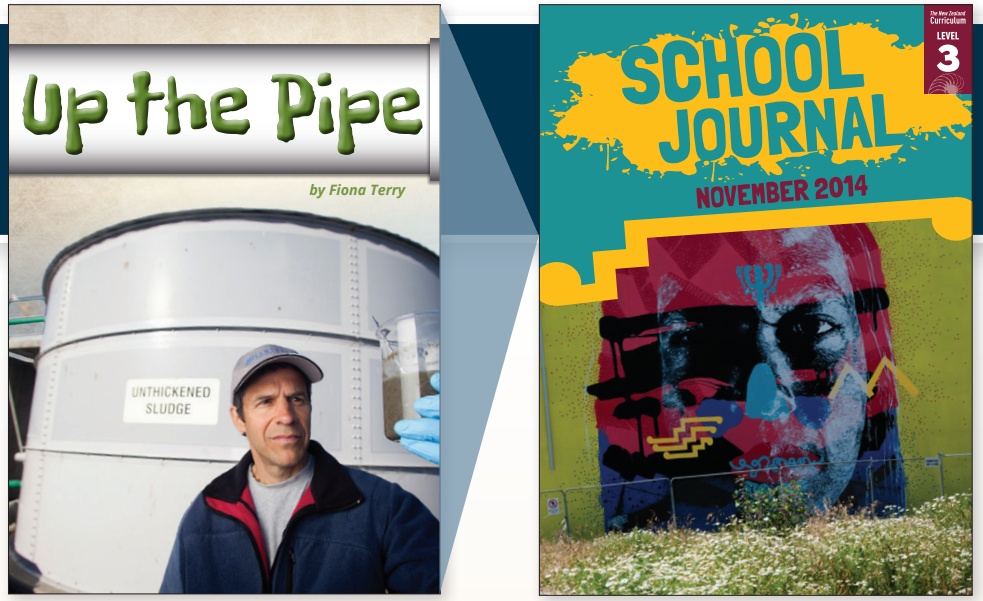

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