

Arsenic and Health

– Living in Areas with Mine Tailings



This booklet contains information for people who live in areas with gold mine tailings. It gives information on what you need to know and actions you can take to protect your family's health.

Acknowledgement

This pamphlet has been adapted from *Arsenic and Health: Are you living in an area with mine tailings?* produced by the Victoria Department of Health, Australia. Te Whatu Ora gratefully acknowledges the Victoria Department of Health for permission to use and adapt this resource.

This document has been revised from the version published in 2012 by the Ministry of Health, PO Box 5013, Wellington, New Zealand.

Citation: Te Whatu Ora – Health New Zealand. 2023.
Arsenic and Health – Living in Areas with Mine Tailings.
Wellington: Te Whatu Ora – Health New Zealand.

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PO Box 793, Wellington 6140, New Zealand

ISBN: 978-1-99-106755-5 (online)

This document is available at tewhatauora.govt.nz

Te Whatu Ora
Health New Zealand

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What is arsenic?

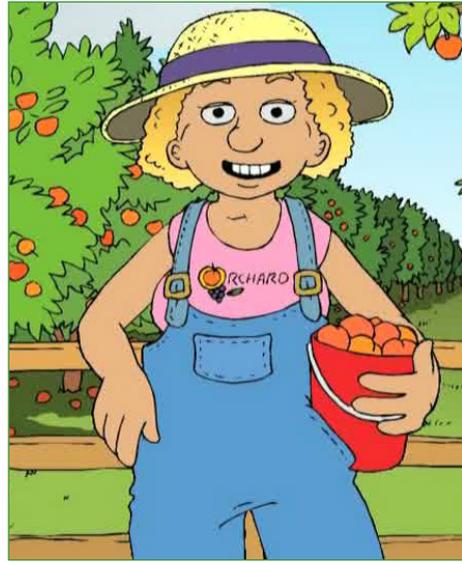
Arsenic is a substance that is found naturally in rock, often near gold deposits. It has been used to kill insects that attack animals, timber, vegetables and fruit. In some situations, arsenic harms people's health.

How does arsenic enter and leave the body?

- Arsenic commonly enters the body in food and water – most usually in food. It also enters the body when we swallow soil or dust. Young children swallow more dust and soil than older children and adults. This is because they get dust or soil on their hands when they crawl or play on the ground, and often put their fingers or toys in their mouths.
- Arsenic can also enter the body if we breathe in fine dust that contains arsenic.
- Arsenic is not absorbed very well through the skin.

Arsenic does not usually accumulate (build up) in the body. It leaves the body in different ways.

- The arsenic that we swallow but that is not absorbed leaves the body in the faeces (bowel motions/poo).
- Most of the arsenic absorbed by the body is passed out in urine (pee).
- Some of the arsenic is deposited inside the hair and nails, and leaves the body as the hair and nails grow.



Arsenic poisoning

Swallowing a large amount of arsenic in a short time can cause severe health effects or even death. Large amounts of arsenic can irritate the stomach and intestines and may damage the heart, nerves, liver and blood. Someone with arsenic poisoning may suffer from:

- stomach pains, nausea (feeling sick), vomiting and diarrhoea (many runny bowel motions/poo)
- extreme tiredness and bruising
- abnormal heartbeat
- a 'pins and needles' feeling in the hands and feet.

Are you living in an area with gold mine tailings?

Mine tailings – left over crushed rocks – from gold mining often contain high levels of arsenic.

When arsenic is released from mine tailings it may be harmful to health. If you live near mine tailings, you can reduce the risk to your health by reducing the amount of soil and dust that you swallow.

- Most people have only a very small chance of being affected.
- Babies and young children are more likely to be affected than adults.
- Children who eat small handfuls of mine tailings are especially at risk of harm to their health.

Fruit and vegetables grown on mine tailings may absorb arsenic.

- Eating fruit and vegetables with raised levels of arsenic may sometimes be harmful to health.

What are mine tailings and why do they contain high levels of arsenic?

When gold is mined, rocks are brought to the surface and crushed to extract the gold. The crushed rocks that are left over after the gold is extracted are known as mine tailings (also called battery sand or tailings sand). Mine tailings are often found in large piles or ‘tailings dumps’.

In many gold mining areas, mine tailings have been used for landscaping instead of normal soil. Mine tailings that contain arsenic may be spread over, or buried below, land now used for housing.

Mine tailings might look like clay or sand, and they may include rock and soil.

Can arsenic in mine tailings affect your health?

Health authorities consider that arsenic in mine tailings may be harmful to health depending on the:

- level of arsenic in the mine tailings
- amount of soil and dust that is swallowed
- weight of the person living there
- length of time they are exposed.

Long-term health effects

Some studies have shown that some people living in areas with high levels of arsenic in soil or mine tailings absorb more arsenic than people living in other areas. There are no definite reports of long-term health effects in people living in areas with soil contaminated with arsenic in mine tailings but there has been very little research in this area.



Health authorities, having considered the available information, believe that:

- adults and older children who swallow only very small amounts of soil and dust from mine tailings for a long time have a very small risk of experiencing long-term health effects
- babies and young children swallowing soil and dust from mine tailings are usually more at risk of experiencing health effects than adults, because they usually swallow more of it, and have lower body weights than adults.

What actions can you take?

If you live in an old gold mining area, your health and your family's health may be at risk from arsenic in mine tailings. However, you can reduce any health risk by reducing the amount of soil and dust from mine tailings that you or your children swallow.

Here are some simple steps that you can take.

- Do not let children, especially young children, play on mine tailings. The soil and dust can stick to their hands and toys and can be swallowed when they put them in their mouths.
- Prevent young children from putting mine tailing sand or soil in their mouths.
- Do not put mine tailing sand in your child's sand pit.
- Wash your hands before eating and sleeping.
- Wash young children's hands frequently.
- Wash children's outdoor toys frequently to remove soil and dust.

- Do not eat home-grown fruit and vegetables, and especially do not feed them to young children, if you do not know whether the garden soil is clean fill. Wait until further information on the level of contamination is available and the risk can be assessed. If you do choose to eat home-grown fruit and vegetables, then thoroughly wash all produce that may be contaminated with soil, and peel the skin off root vegetables. See page 6 for more information about home-grown fruit and vegetables.



- Wash family pets often.
- Remove footwear before going indoors to avoid carrying soil dust indoors, especially if your household includes babies or young children.
- Mop and dust often. Mop and dust with a damp cloth. Using a vacuum cleaner or broom may spread dust around.
- Do not eat fish caught from areas with mine tailings, which may be in the waterways.
- If mine tailings are in a children's play area, cover them with a layer of clean soil and grow grass over the top. Keep it watered during dry weather if possible.
- Cover mine tailings with soil and plants (especially groundcover plants) to reduce dust and stop direct access by young children.

If you decide to remove mine tailings from your property, first contact your local council for guidance. There are restrictions on how contaminated soil must be handled and moved.

Home-grown fruit and vegetables

It is hard to know how much arsenic is absorbed by fruit and vegetables that are grown on mine tailings (or soil containing mine tailings).

Research has shown that, in some situations, arsenic in soil can be absorbed into vegetables and build up above the recommended limit for foods. This can happen in vegetables that are grown in the ground (such as radishes, turnips and carrots) or those grown above the ground (such as silverbeet and beans). Other fruit and vegetables may also be affected. Studies have also shown that washing and peeling may not remove all of the arsenic. Research about arsenic in fruit and vegetables is ongoing.

If you have mine tailings on your property, your home-grown fruit and vegetables may contain raised levels of arsenic. If you eat fruit and vegetables containing raised levels of arsenic, you may increase your risk of experiencing long-term health effects. This is because any arsenic that you absorb from these home-grown fruit and vegetables adds to any arsenic that you absorb from the soil and dust from the mine tailings. Children are most likely to be affected. Adults who regularly eat home-grown fruit and vegetables may also be at risk.

To grow vegetables that contain little or no arsenic, bring in clean soil for garden beds. The clean soil will need to be at least 30 centimetres deep. You can also grow vegetables in pots that contain clean soil or potting mix.

Are all types of arsenic the same?

There are two main types of arsenic: **inorganic arsenic** and **organic arsenic**.

Inorganic arsenic is found in minerals, rocks and mine tailings.

Organic arsenic is found in fish and shellfish, and is sometimes called 'fish arsenic'. Organic arsenic is less harmful than inorganic arsenic.

Is there a medical test to check for arsenic?

There are several medical tests to check if the body is absorbing abnormally high amounts of arsenic. However, testing is not normally required. If you are unwell or concerned about possible symptoms you should discuss this with your GP.

Urine testing

Urine (pee) testing can show if people have been absorbing large amounts of arsenic in the few days before the test. However, the test also measures the less harmful type of arsenic contained in fish and some other seafood (known as ‘fish arsenic’).

Blood testing

Blood testing is not usually recommended or useful, as the body removes arsenic from the blood within a few hours.

Hair testing

Hair testing is not recommended for people living in areas with arsenic in mine tailings. This is because the arsenic in dust that comes from the mine tailings can stick onto the outside of the hair. This makes it difficult to test for arsenic that has been absorbed by the body and deposited inside the hair. This test is not routinely available in New Zealand.



Further information sources

- Regional, district or city councils for general enquiries.
- Te Whatu Ora, National Public Health Service for general public health enquiries (www.tewhatauora.govt.nz/our-health-system/health-sector-organisations/public-health-contacts/).
- Your GP for personal health enquiries.
- Ministry for the Environment website www.mfe.govt.nz for more information about contaminated land.