

**Te Whatu Ora**

**Health New Zealand**

Capital, Coast, Hutt Valley and Wairarapa

# Environmental Health Investigation of Lead Poisoning Cases

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**Medical Officer of Health**

**26 May 2023**

**WasteMINZ Residential Lead Workshop**



New Zealand Government

# The Environmental Case Management of Lead-exposed Persons

Guidelines for  
Public Health Units

Revised March 2021



New Zealand Government

# The Investigation and Surveillance of Poisoning and Hazardous- substance Injuries

Guidelines for public health units

2019

Released 2019

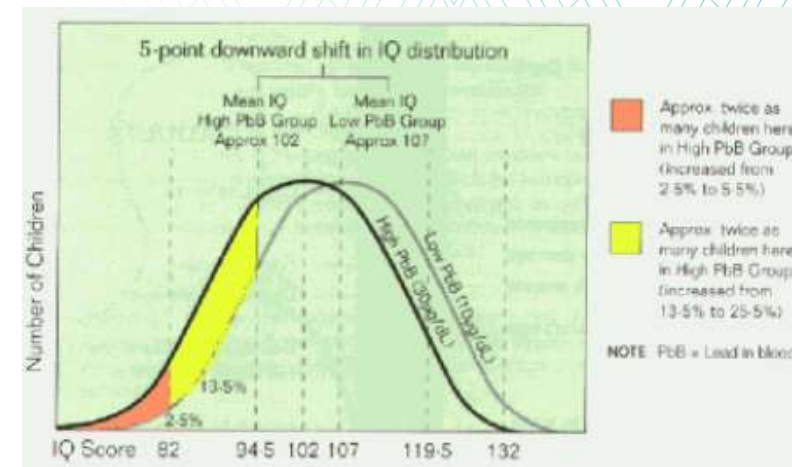
[health.govt.nz](http://health.govt.nz)



# Lead Poisoning a Notifiable Disease

## Health Act 1956

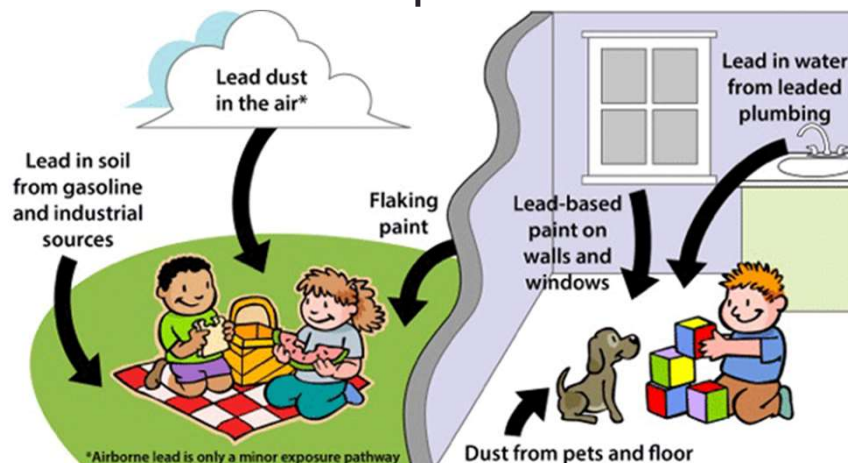
- Blood lead level  $\geq 0.24$   $\mu\text{mol/L}$ 
  - Lowered in 2021 from  $0.48\mu\text{mol/L}$
- Direct laboratory notification and/or clinician notification
- Case investigation +/- environmental investigation
  - Identify potential source
    - If occupational source identified, notified to Worksafe for follow-up
  - Develop a management plan to reduce ongoing exposure
  - Provide recommendations on further follow-up testing
- Entered into national surveillance database



# Case Investigation

## ➤ Interview case

- Risk assessment for all potential sources and exposure pathways
- Need to consider potential for different exposure locations
- Anyone else at risk of exposure?

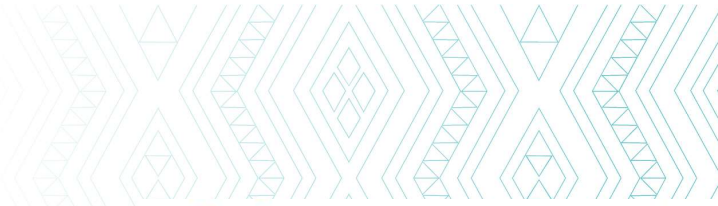


## Lead Case Interview Questionnaire

HPO Name:		Date of interview: / /	
		Time of interview:	
<b>Case Identification</b>			
Name of case:		NHI:	
Date of Birth:		Male	
Address:			
Phone: Home		Work:	Mobile:
Email:			
Ethnicity:			
Occupation:			
Employer:		Employers address:	
GP Name:			
GP Phone #:		GP Address:	
Interpreter needed <input type="checkbox"/> Yes <input type="checkbox"/> No			
<b>Diagnosis</b>			
Date reported to RPH:		Blood lead concentration $\mu\text{mol/L}$	
Has the case been notified by the GP/Nurse of result? <input type="checkbox"/> Yes <input type="checkbox"/> No			
If NO, advise that you will wait a few days before contacting the case to allow GP/Nurse a chance to advise result and that Public Health will be calling.			
<b>Why was the case tested for lead?</b>			
<input type="checkbox"/> Regular Monitoring programmed		<input type="checkbox"/> Hobby	<input type="checkbox"/> Occupational
If yes specify:			
<input type="checkbox"/> Known/possible exposure (e.g. Lead paint removal)		<input type="checkbox"/> Other (e.g. investigation of symptoms)	<input type="checkbox"/> Unknown
<b>Any Signs (Clinical Examination findings from GP) e.g. headache, gastroenteritis, nausea, fatigue etc</b>			
<b>How long have you lived at your current address?</b>			
If less than 6 months please provide address details and dates of where you have previously lived during the past two years:			
In previous/current accommodation, have you noticed flaking of paint? <input type="checkbox"/> Yes <input type="checkbox"/> No			
<b>Are there any unfinished renovations</b>			
If YES provide details:			
In previous/current accommodation, have you or anyone else undertaken any interior or exterior paint stripping? <input type="checkbox"/> Yes <input type="checkbox"/> No			
If YES provide details and what techniques were used e.g. wet or dry sanding, water blasting etc.:			
Does your child spend any time away from home (E.g. informal care provided by a friend, neighbour or relative)? <input type="checkbox"/> Yes <input type="checkbox"/> No			
If YES provide details and condition of the property:			

# Environmental Investigation

- Site visit if required to identify source, inform risk assessment, risk communication and management
  - Focussed on those at highest risk e.g. children, potential for multiple sources, multiple exposed individuals, priority populations
  - Sampling for lead in paint, dust, or soil
- May be undertaken jointly with other agencies



**ESR**  
Science for Communities

ESR0766  
v1.0 (16/05/2021)

## LABORATORY SERVICES REQUEST FORM SINGLE SPECIMEN REQUEST – FOR SPECIMENS OF NON HUMAN ORIGIN

**INSTRUCTIONS FOR USING FILLABLE FORMS:** In Acrobat Reader, please complete this form then "SAVE AS PDF" to your hard drive. Email to [specimens@esr.nz](mailto:specimens@esr.nz) or use the OneDrive link. Print out your form and send to ESR with your specimen.

SOURCE INFORMATION		ESR USE ONLY
<input type="checkbox"/> Animal:	ID:	ASBESTOS Isotest form
Address / locality:		
<input type="checkbox"/> Poultry (specify):		
<input type="checkbox"/> Environment (specify):		
<input type="checkbox"/> Water (specify): <small>(Indicate composition of water when sampled if relevant)</small>		
<input type="checkbox"/> Shellfish (specify):		
<input type="checkbox"/> Food (specify): <input type="checkbox"/> Raw <input type="checkbox"/> Cooked <input type="checkbox"/> Frozen <input type="checkbox"/> Local <input type="checkbox"/> Imported		
<input type="checkbox"/> Other (specify):		Comments:

SPECIMEN INFORMATION	
Laboratory number:	Date sent to ESR:
Date collected:	
Time collected: 1:00 <input type="checkbox"/> am <input type="checkbox"/> pm	
Origin of specimen:	
Isolate submitted as:	
Collection site:	
Location:	
Sampled by:	

DETAILS FOR REPORTING
Lab/Org name:
Contact:
Phone:
Email:

REASON FOR INVESTIGATION
<input type="checkbox"/> For reference <input type="checkbox"/> confirmatory test (please provide your laboratory control)
<input type="checkbox"/> For surveillance / formal survey
<input type="checkbox"/> From outbreak <input type="checkbox"/> from carrier <input type="checkbox"/> from contact
<input type="checkbox"/> Other (specify):
Case number (if known):
Senders order number:

## RELEVANT LABORATORY RESULTS

Your results help us to manage this incident.

## SPECIMEN STORAGE / TRANSPORT HISTORY

Refer any laboratory to the correct site location as comply with ANZ standards. Please indicate the specimen storage condition and transport carrier prior to sending to ESR.

TEST REQUIRED	<input type="checkbox"/> Routine	<input type="checkbox"/> URGENT
<input type="checkbox"/> Antimicrobial susceptibility (specify):		
<input type="checkbox"/> Identification		
<input type="checkbox"/> Isolation (specify):		
<input type="checkbox"/> Molecular typing (specify):		
<input type="checkbox"/> RNA / DNA detection (specify):		
<input type="checkbox"/> Serology (specify disease markers):		
<input type="checkbox"/> Serotyping		
<input type="checkbox"/> Toxin detection (specify):		
<input type="checkbox"/> Whole genome sequencing		
<input type="checkbox"/> Other (specify):		

Stored:	<input type="checkbox"/> Ambient	<input type="checkbox"/> Chilled	<input type="checkbox"/> Frozen	Time
Transported:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	per _____ hours per _____ days per _____ months

Sample sent to:

- Kenepeuru Science Centre: 34 Kenepeuru Drive, Porirua
- NCIRD - Wallaceville: 66 Ward Street, Upper Hut.

ESR USE ONLY
Received: <input type="checkbox"/> Ambient <input type="checkbox"/> Chilled <input type="checkbox"/> Frozen
<input type="checkbox"/> A <input type="checkbox"/> R

# Management Plans

## ➤ Case management

- Tailored advice depending on identified source and mitigation
- Work with clinician to organise follow-up testing
  - Used to assess success of exposure management plan

## ➤ Provide recommended exposure management

- Generic resources
- Discussion around need for abatement and repeat environmental testing
- Liaise with other agencies e.g. local council, worksafe, education
  - Statutory authority to remedy lead hazard generally with another agency

- Place mats at the front and back doors to prevent soil being walked through the house.
- Leave shoes outside where possible.
- Do not dig in soils that have known elevated contaminant levels. Soil contaminants that are present a metre or more under the surface should not be a risk if the soil is not disturbed.
- If you eat home-grown fruit and vegetables, thoroughly wash all produce that may be contaminated with soil and peel the skin off root vegetables.

### Should I avoid eating home-grown fruit and vegetables if my soil is contaminated?

It is hard to know how much contaminant is absorbed by fruit and vegetables grown on contaminated soil. Uptake of contaminants depends on many factors, including the type of plant and soil characteristics.

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

There is no doubt that fresh fruit and vegetables are good for you. You should take into account the health benefits of fresh, home-grown produce before you decide whether to eat produce you've grown yourself in soil that might be contaminated. Be very cautious with what you eat if you are

pregnant and be careful what you give young children.

### How can I minimise my exposure to soil contamination when I'm gardening?

Here are some simple steps to minimising your exposure while you're gardening. Cover the garden area with clean materials such as uncontaminated soil, compost, manure or peat moss.

Adjust your soil pH so that it is near neutral; raising pH levels in the soil can help to immobilise metal contaminants and prevent uptake by plants.

Build raised beds with clean soil at least 30 centimetres deep. A layer of landscape fabric will prevent plant roots from entering the contaminated soil below the bed. You can also grow vegetables in pots that contain clean soil or potting mix.

Don't use CCA-treated timber<sup>3</sup> for raised beds, because this may contaminate the soil even more.

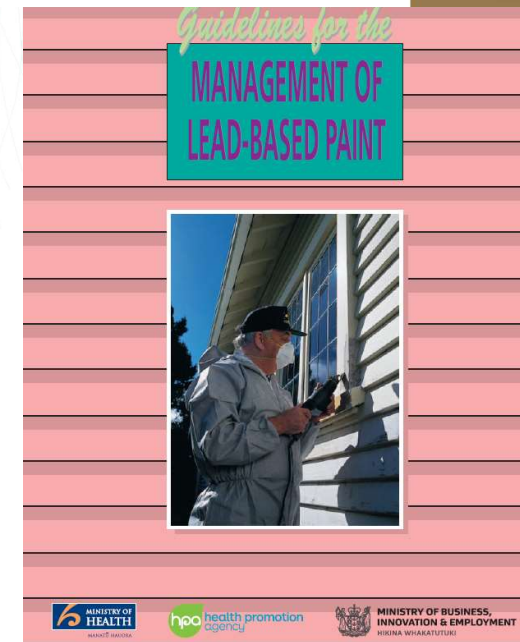
Don't grow fruit and vegetables directly next to old buildings, where lead levels from old lead-based paint are likely to be highest.

Reduce dust and bare soil surrounding the garden from contaminating produce by maintaining grass or other ground-cover plants.

<sup>3</sup> Timber that has been treated with a chemical mix of chromium, copper and arsenic to preserve it.

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 **MINISTRY OF HEALTH**  
HEALTHY PEOPLE  
October 2015  
HP 6263



# Examples of Recommendations

## Educational/Behavioural

### Cleaning to reduce lead dust

- Use of HEPA filter on vacuum
- Damp wipes
- Use of trisodium phosphate detergent

### Hygiene

- Hand washing
- Addressing nail biting, pica
- Suitable playing and activities areas

### Diet

- Nutrients especially iron
- Awareness of chronic medical conditions

## Abatement Strategies

### Paint abatement

- Paint film stabilisation
- Barrier (e.g. flexible surface coating or rigid enclosure)
- Paint removal and repaint

### Replacement

- Building component
- Carpet or soft furnishings

### Soil abatement

- Soft cover with bark/grass
- Hard cover with paving/asphalt
- Removal and replacement
- Raised garden beds

# Management Plans and Other Agencies

- Need to understand all agency roles and responsibilities
  - for concerns around environmental contamination without an associated case notification
  - to support risk mitigation if case investigation determines an environmental contamination source
- Requires a collaborative response

- Agricultural Compounds and Veterinary Medicines Act 1997
- Building Act 2004
- Consumer Guarantees Act 1993
- Education (Early Childhood Services) Regulations 2008
- Fair Trading Act 1986
- Food Act 2014
- Hazardous Substances and New Organisms Act 1996
- Health Act 1956
- Health and Safety at Work Act 2015
- Local Government Act 2002
- Local Government Official Information and Meetings Act 1987
- Pae Ora (Healthy Futures) Act 2022
- Resource Management Act 1991
- Residential Tenancies Act 1986



# Lead in Dust and Soil

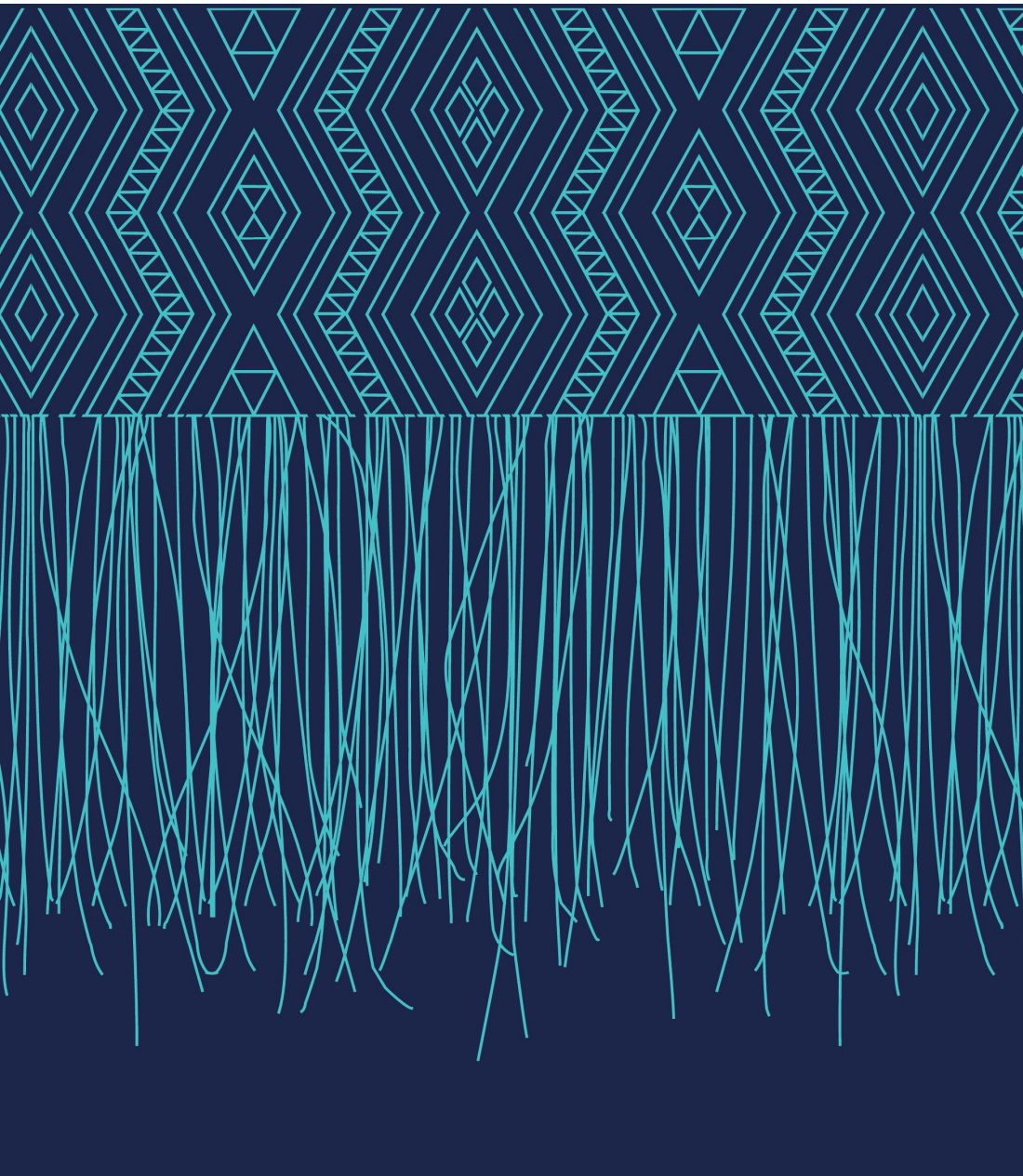
**Table B2: Soil contaminant standards for health (SCS<sub>(health)</sub>) for inorganic substances**

	Arsenic mg/kg	Boron mg/kg	Cadmium (pH 5) <sup>1</sup> mg/kg	Chromium		Copper mg/kg	Inorganic lead mg/kg	Inorganic mercury mg/kg
				III mg/kg	VI mg/kg			
Rural residential / lifestyle block 25% produce	17	>10,000	0.8	>10,000	290	>10,000	160	200
Residential 10% produce	20	>10,000	3	>10,000	460	>10,000	210	310
High-density residential	45	>10,000	230	>10,000	1,500	>10,000	500	1,000
Recreation	80	>10,000	400	>10,000	2,700	>10,000	880	1,800
Commercial / industrial outdoor worker (unpaved)	70	>10,000	1,300	>10,000	6,300	>10,000	3,300	4,200

Notes: All concentrations refer to dry weight (ie, mg/kg dry weight).

<sup>1</sup> Default value is for soil that is pH 5. Concentrations increase with increasing pH (see *Methodology*).

- Lead contaminated dust ingestion major exposure pathway for children
  - Damaged paint surfaces or removal of leaded paint most likely source
  - If contaminates outdoor soil can contribute to indoor dust loading
- Risk from exposure to lead contaminated soil varies by:
  - Ground cover
  - Bioavailability and concentration
  - Meteorological conditions
  - Behaviour
- Use of Soil Contaminant Standards in the NES for Assessing and Managing Contaminants in Soil to Protect Human Health



**Case Studies:  
Collaboration around  
potential exposure to  
contaminated soil**

# Battery Recycling Factory

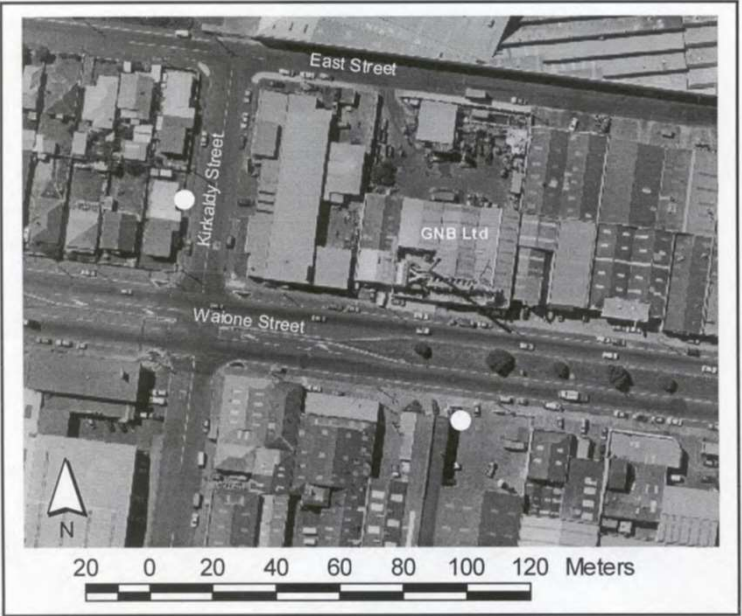


Figure 2.2 Site Layout and Location of Samplers (O)

As a precaution residents in Kirkcaldy Street should not grow vegetables in existing soil without the addition of new compost, mulch or soil to reduce the amount of accessible soil lead. In general, plants do not take up high amounts of lead from soil and fruits tend to contain less lead than root or leafy vegetables. Vegetables should then be washed to remove any surface soil/dust that may contain lead.

To help reduce exposure to lead contaminated soil, ground and plant cover should be maintained to prevent dust generation and soil ingestion. Children should wash their hands after playing outside and not play in any garden soil.

# Community Gardens

## Berhampore's grounded community

May 10, 2019 /  
About one kilometre away from the Orchard, down a quiet street and off a quieter walkway, is Stan's Edible Garden.

Ahmed Zerzouri is the man in charge of a small but productive patch of land running between a barb-wire fenced-off substation and a walkway that only locals know exist.

The garden, organised by allotments, is a labour of love Ahmed inherited from the previous tenant of the neighbouring flat.

Ahmed says he grew up helping his father grow food in Morocco, so making compost, preparing soil and growing food all come naturally to him.

Since he took on the garden he's worked with Council to make the space feel safer – he's built a little white picket fence, planted colourful flowers and organised for the street lighting to be fixed.

"It get better and better...With my work in the garden I'm trying to bring the community and say this place is yours. It's creating safety for a circle of community and for people passing here."



Community orchards and gardens are peppered around Wellington, and are great way to learn how to grow food, connect with your neighbours and create little oases of nature in the middle of the city. We took a tour of three of Berhampore's finest little gardens.

## Concern over city's community gardens after 'exceptionally high' lead levels found in Berhampore

Damian George · 05:00, Jul 26 2021



## Lead and Arsenic Contamination FAQs 6 August 2021

Regional Public Health  
HAUŌRA A WHĀKI TE ŪPOKO O TE KĀ A MAUI  
Get the health for the greater Wellington region

### Summary

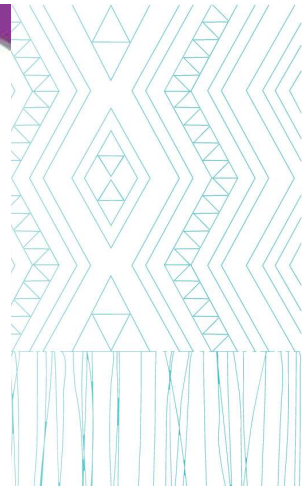
- Recent tests at the Stan's Community garden, Palm Grove/Stanley St found that lead and arsenic in the soil was higher than guideline levels.
- In areas where there has previously been old paint, treated timber or old metal items, lead and arsenic contamination may be found in the soil. The specific source of contamination found at Stan's Community garden is not known.

### Safety precautions

- DON'T** eat vegetables from the garden until the changes agreed with Wellington City Council (such as using raised beds) have been completed and the Council has advised it is safe to do so. The vegetables currently growing in the garden have been cut back to ground level.
- Specific testing of the soil around the fruit trees has not been completed and this would need to be carried out to provide a better understanding of the actual contamination levels. The current advice is to avoid consuming the fruit at this time.
- Wear gloves while gardening and wash your hands well after working in the garden – this is especially important before eating.
- Remove any footwear used in the garden before entering your house.
- Supervise children playing in the area and ensure they don't eat the dirt. Make sure they wash their hands well after leaving the garden.
- If you have been eating vegetables and fruit grown in the garden it is unlikely the level of lead and arsenic contamination will cause health problems, however some people might be at higher risk of becoming ill. The important thing is to avoid ongoing exposure to potential sources of lead or arsenic such as from the soil and produce grown in this garden.
- If you have any health concerns please discuss with your GP or family doctor. Take this information sheet with you to your GP or family doctor.

### What did the soil testing find?

Five soil samples from different areas of Stan's Community garden were tested for arsenic, cadmium, chromium, copper, manganese, lead, nickel and zinc, in May 2021 by SoilSafe Aotearoa.



# Summary of Public Health Service Role

- Notification of raised blood lead level
  - Identify likely source and exposure pathway
  - Provide recommendations
    - Follow-up for case and anyone else potentially exposed
    - Exposure mitigation in liaison with any relevant agencies/parties
- Concern raised around potential exposure to contaminated soil
  - Identify lead agency
  - Provide information and advice around public health risk assessment, management and risk communication

# Te Whatu Ora

Health New Zealand

Capital, Coast, Hutt Valley and Wairarapa

## Ngā mihi nui Questions?

