



Environment Protection Authority

Port Kembla surface soil testing report



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The EPA tested surface soils on public and community spaces in Port Kembla in November 2021 to check for concentrations of lead, cadmium and other heavy metals within one kilometre of the former copper smelting site. This report summarises the test results.

The EPA also tested properties of interested residents in Port Kembla in March and April 2022. These results were provided in full to the residents and are presented only generally in this report.

Introduction

The Illawarra area has a strong industrial heritage. It's been widely known that lead and other heavy metals are present in the environment, due to airborne and deposited dust.

In response to community concerns about this, the NSW Environment Protection Authority (EPA), NSW Health and Wollongong City Council commissioned the University of Queensland (Uniquest) to do two things:

- examine previous literature related to lead and other heavy metals in soil, roof dust, blood lead studies and air quality in the Wollongong Local Government area
- provide a report.

Uniquest completed its report, *Literature review of the levels of lead and other heavy metals in soil and roof dust in Wollongong and measures to manage any associated health risks*, in 2020. This report identified that lead – and possibly cadmium – could be in the soil at residential properties in Port Kembla at levels above the **health investigation levels** set by national guidelines, which would warrant further investigation. The highest levels typically reported were within one kilometre of the former copper smelter site.

In response to the report, the NSW Government decided to investigate levels of heavy metals (including lead) in soils within one kilometre of the former copper smelting site, to understand the community's potential exposure and keep it informed. As part of the investigation, the EPA carried out precautionary testing of surface soils on public and community spaces – including community gardens, parks and road reserves – in Port Kembla. The testing aimed to:

- determine if the surface soil is contaminated with lead, cadmium, arsenic, copper and/or zinc
- address the recommendation from Uniquest's literature review to obtain more site-specific cadmium data from the Port Kembla area
- show if actions are required to protect human health.

The EPA also conducted precautionary testing of surface soils at thirty-three residential properties in Port Kembla in March and April 2022 for residents who had registered their interest.

Approach taken

Using a handheld X-ray fluorescence (XRF) analyser, which is specialist equipment to measure lead, arsenic, copper and zinc in the field, the EPA screened soil to get an early indication of contaminant levels (**Figure 1**). If elevated levels were indicated, soil samples were collected and sent to a laboratory accredited by the National Association of Testing Authorities (NATA) for testing to confirm the level of lead.

The soil testing involved shallow digging of surface soils – that is, digging small holes about 30–50 mm wide and 0–50 mm deep – within soft ground on each site, mostly in grassed areas and garden beds (i.e. outdoor areas that are not paved or concreted).



Figure 1 Screening soil with an XRF analyser. Photo: David Langston/EPA

Test results

For the sampling undertaken in the public open spaces, fifty-five screening tests were carried out within one kilometre of the former copper smelting site using the XRF analyser in the field.

To make sure the XRF levels were accurate, the EPA collected samples from 14 locations for laboratory testing (a rate of 25%). These locations were chosen to provide a good spread of levels across the region but also seven samples were taken because the XRF had detected heavy metals above 80% of the lowest health investigation level.

Duplicate and triplicate samples were taken from two of these locations to ensure the laboratory analysis was accurate.

The XRF levels were found to correlate well with the levels measured by laboratory tests and so are acceptably accurate. The laboratory measurements themselves were highly consistent.

Two background soil samples were taken from Wollomai Point Park (about 2.5 km west of Port Kembla) to get an understanding of what the concentrations of heavy metal levels could be expected in natural soils in the Port Kembla area.

- **Attachment 1** shows the testing locations.
- **Attachment 2** summarises the laboratory results for each location.
- **Attachment 3** gives the detailed laboratory reports.

For the sampling undertaken in the residential properties, seventy-five (75) screening tests were carried out on thirty-three (33) properties. In total, one hundred and seventeen (117) samples were sent for laboratory analysis.



Figure 2 EPA staff screening soil at Port Kembla. Photo: Samuel Bannon/EPA

What do the results mean?

The EPA has compared the results of the testing to national guidelines for contaminants in soil (known as the *National Environment Protection (Assessment of Site Contamination) Measure*). These guidelines provide health investigation levels which represent contamination levels in soil that warrant further investigation.

Exceedance of the health investigation level does not necessarily indicate that there is a risk to human health. The way in which people are exposed to the contamination and how often this happens must also be considered to understand the potential risk to human health.

At all sampling locations, all contaminants – lead, cadmium, arsenic, copper and zinc – were below the relevant health investigation levels for parks, reserves and public open spaces.

The results for schools and residential properties were provided directly to the schools and residents.

Lead

For parks, reserves and public open spaces, the health investigation level for lead is 600 mg/kg (HIL C). Both XRF and laboratory results showed that all soil samples around the former copper smelting site had lead levels below the relevant health investigation levels.

The health investigation level for residential properties and schools (HIL A) is 300 mg/kg. None of the samples taken from schools were above this level.

Just over half of the residential properties tested had lead concentrations that were above the relevant health investigation level. Potential exposure to lead-contaminated soil can be managed simply with grass cover or another appropriate barrier. All residents have been given information about how to live safely with lead and how to look into soil disposal if they want to.

We (the EPA) did not find any distinct pattern or cluster of results.

We want the community to know how to manage potential exposure to lead in and around the home. Our website has information on [preventing lead exposure](#).

Cadmium

The Uniquist report recommended supplementing the existing cadmium data with measurements cadmium soil levels. We made these measurements with both XRF and laboratory tests.

For parks, reserves and public open space, the health investigation level for cadmium is 100 mg/kg (HIL C) and for residential properties the health investigation level is 20 mg/kg (HIL A). For most of the fifty-five sample locations, cadmium levels were below the detection limit. Of the eight samples where cadmium was detected, the levels were significantly below the health investigation level.

No elevated cadmium was identified at the residential properties.

Other heavy metals

Arsenic, copper and zinc were all measured at levels far below their health investigation levels for public open spaces, schools and residential properties. Attachment 2 gives the measurements for public open space and the health investigation criteria.

Background levels

We took samples from natural soils to establish what the background levels of heavy metals would be in the area. These showed low levels of lead, copper and zinc, as expected (Attachment 2).

Conclusion

The data collected across the Port Kembla public open spaces and schools showed that heavy metal concentrations in surface soils were not above health investigation levels.

Lead was identified above health investigation levels at just over half of the residential properties tested. No other heavy metals we tested for were found to be above health investigation levels. Residents were provided with information on how to live safely with lead.

Disclaimer

This report was prepared by the NSW Environment Protection Authority (EPA) to provide information about the soil testing that was carried out in the Port Kembla area in late 2021 and early 2022. The report is intended to guide the NSW Government in providing services, including public health services, to the community of Port Kembla in relation to the spread of lead from the former copper smelter site. It is not intended to be used to establish a property's status for the purposes of any environmental planning or environment protection requirements relating to contaminated land, or in relation to the sale of land.

New information may be received after the publication of this report and readers should ensure they are using up-to-date information.

For individual medical advice, readers should consult their general practitioner.

Attachment 1: Maps of testing locations in public open spaces

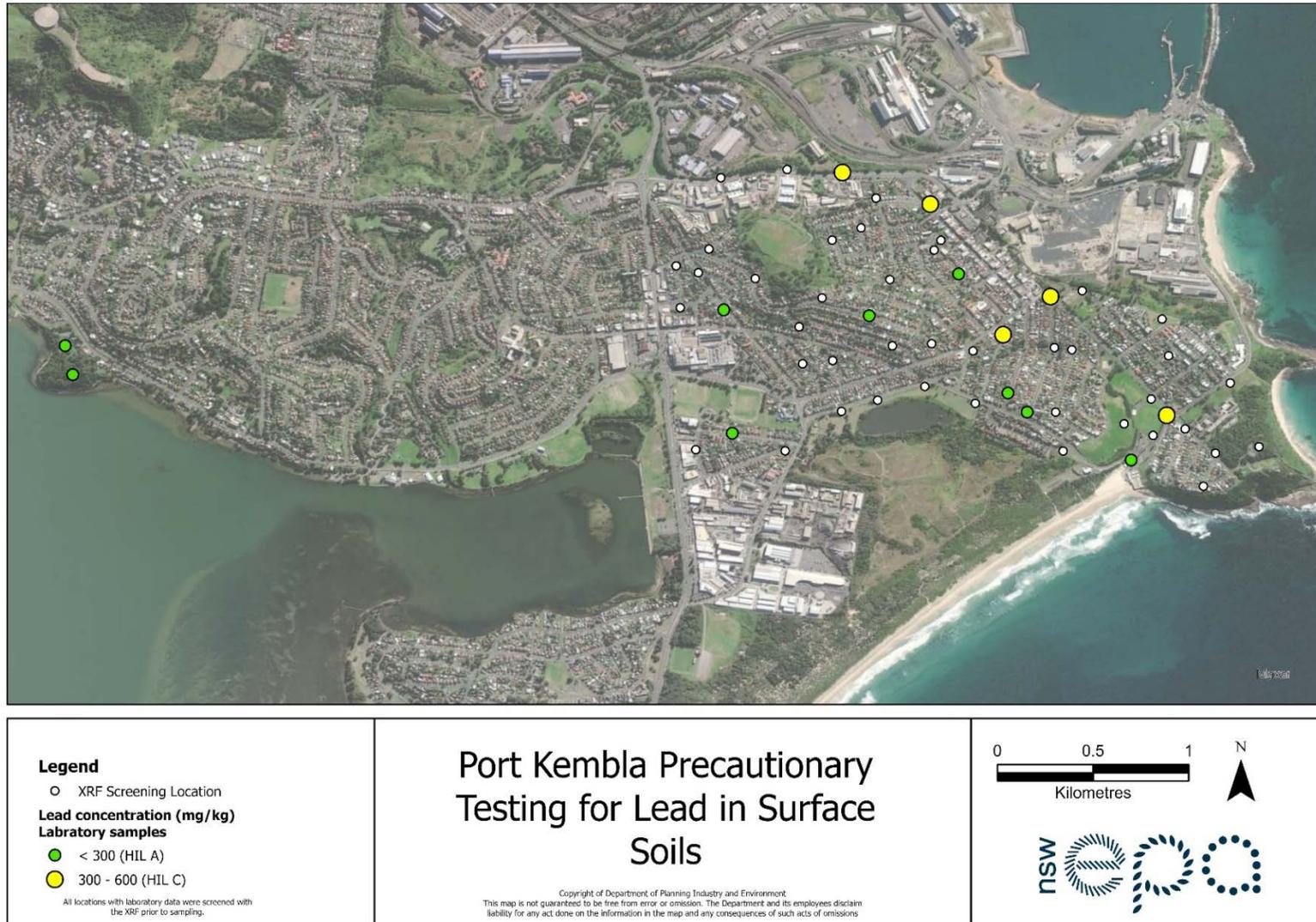


Figure A1 Map of lead levels at testing locations

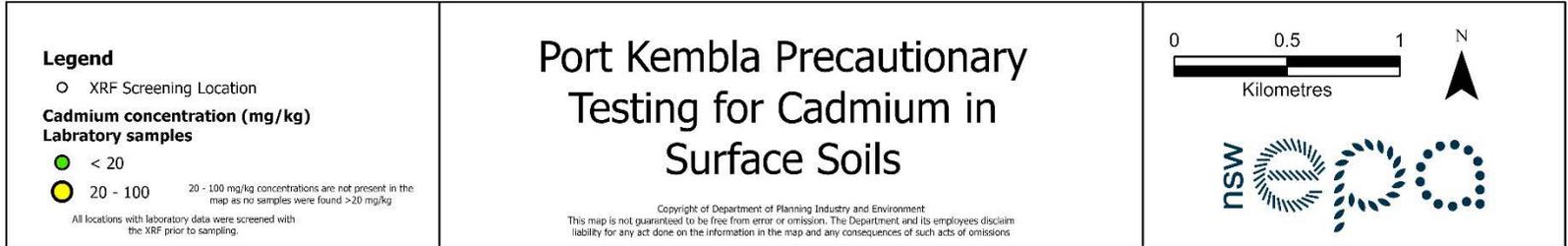
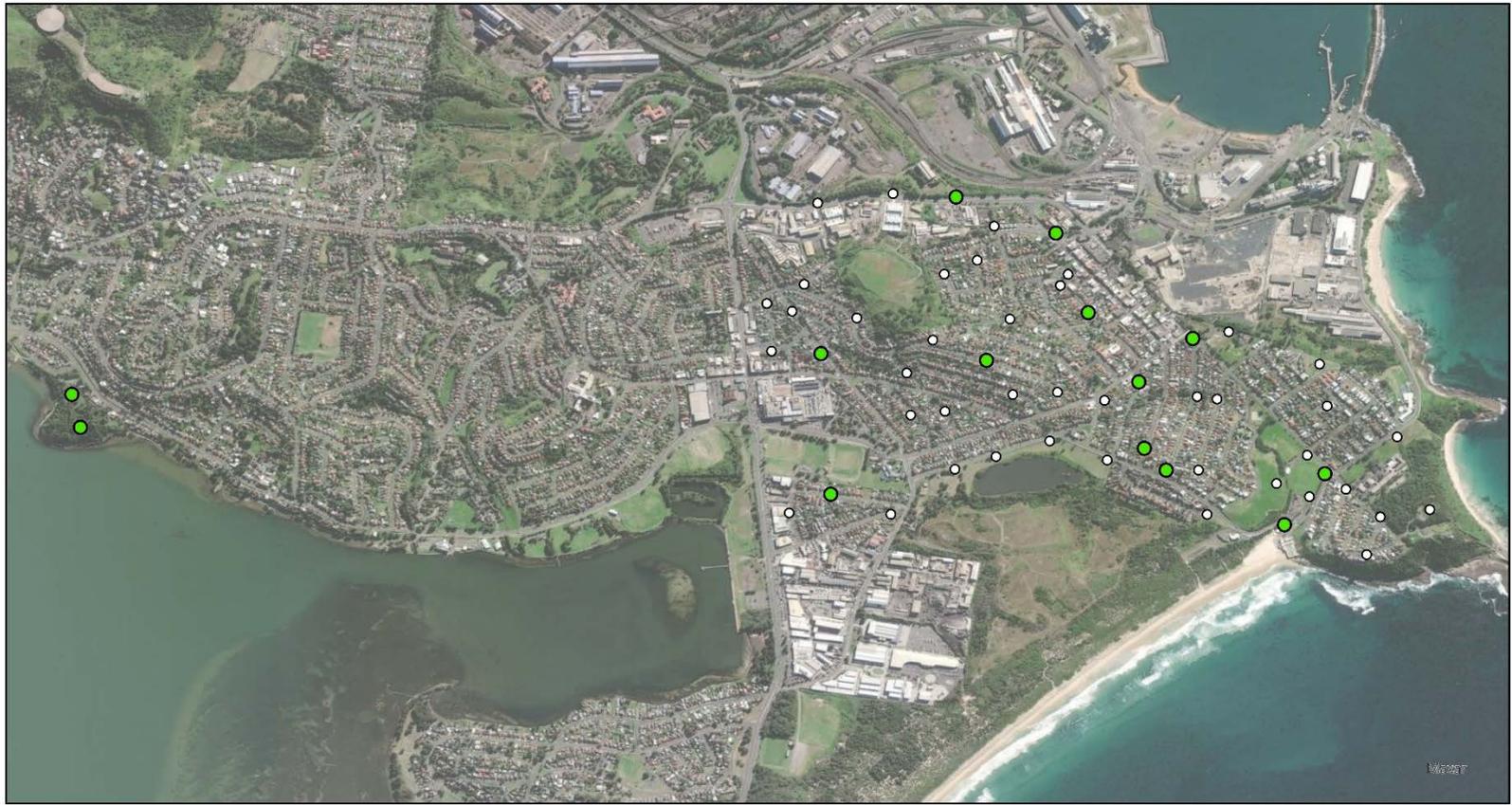


Figure A2 Map of cadmium levels at testing locations

Attachment 2: Summary of laboratory results for public open spaces

The section *What do the results mean?* on page 3 of this report will help you understand the results in this table.

Table 1 Health investigation levels for parks, reserves and public open spaces

Health investigation levels for parks, reserves and public open spaces (NEP(ASC)M, 2013) (HIL C)	Lead mg/kg	Cadmium mg/kg	Arsenic mg/kg	Copper mg/kg	Zinc mg/kg
Levels	600	100	300	20,000	30,000

Table 2 Measured soil levels of heavy metals at sampled locations in Port Kembla

ID name	Sample date	Comments	Lead mg/kg	Cadmium mg/kg	Arsenic mg/kg	Copper mg/kg	Zinc mg/kg
NC_1-1	1/11/2021	(Background sample) Wollamai Point Park	28	<1	6	110	140
ND2-1	4/11/2021	(Background sample) Wollamai Point Park	30	<1	6	100	130
PK_017-1 PK_017-1B PK_017-2B PK_017-2C	1/11/2021	Port Kembla Beach Park on Olympic Boulevard	<2*	<1*	<4*	<3*	16*
PK_020-1	1/11/2021	King George V Park on Military Road	400	2	13	380	1300
PK_026-1	1/11/2021	Fifth Ave	390	4	14	1300	490
PK_028-1	1/11/2021	Corner of Church Street and Military Rd	440	7	18	3100	960
PK_029-1	3/11/2021	Wentworth Street	240	4	11	590	270
PK_030-1	3/11/2021	Corner of Cowper St and Third Ave	69	1	6	220	140
PK_042-1	3/11/2021	Corner of Kemblawarra and Hoskins Ave	230	<1	7	200	370
PK_051-1	4/11/2021	Corner of Shellharbour Rd and McGowen Street	73	<1	8	130	170
PK_063-1 PK_063-1B PK_063-1C	4/11/2021	Bland Street	120*	<1*	11*	213*	280*
PK_071-1	2/11/2021	Kembla Street	260	4	14	760	580
PK_077-1	4/11/2021	Corner of Darcy Road and Wentworth Street	360	4	14	590	840
PK_083-1	4/11/2021	Five Islands Road	370	5	10	1000	770

* Average of original duplicate and triplicate samples

Attachment 3: Full laboratory reports for public open spaces

These begin on the next page.

Personal information has been redacted from the laboratory reports.



Environmental Forensics Report of Analysis
Project 20210245

Report #:

Date Issued:

06-Dec-2021

Page 1 of 12

This report replaces Report Number:

Client Project Reference: Port Kembla Open Space Sampling

Customer: Environment Protection Authority

Attention:

Report Date: 06 December 2021

Project Received: 05 November 2021

EF Project Contact:

[REDACTED]
[REDACTED]
[REDACTED]

The following samples were analysed:

Sample ID	Client ID	Sample Type	Client Sampled Date/Time
212400	NC_1-1	Solid	01/11/2021 10:38AM
212401	NC_1-2	Solid	01/11/2021 10:38AM
212402	ND2-1	Solid	04/11/2021 1:50PM
212403	ND2-2	Solid	04/11/2021 1:50PM
212404	PK_001-1	Solid	02/11/2021 3:07PM
212405	PK_001-2	Solid	02/11/2021 3:07PM
212406	PK_002-1	Solid	02/11/2021 3:16PM
212407	PK_002-2	Solid	02/11/2021 3:16PM
212408	PK_003-1	Solid	
212409	PK_003-1B	Solid	02/11/2021 3:27PM
212410	PK_003-1C	Solid	02/11/2021 3:27PM
212411	PK_003-2	Solid	02/11/2021 3:27PM
212412	PK_003-2B	Solid	02/11/2021 3:27PM
212413	PK_003-2C	Solid	02/11/2021 3:27PM
212414	PK_004-1	Solid	02/11/2021 3:42PM
212415	PK_004-2	Solid	02/11/2021 3:42PM
212416	PK_005-1	Solid	02/11/2021 3:51PM
212417	PK_005-2	Solid	02/11/2021 3:51PM
212418	PK_009-1	Solid	02/11/2021 1:53PM
212419	PK_009-2	Solid	02/11/2021 1:53PM
212420	PK_010-1	Solid	02/11/2021 4:30PM
212421	PK_010-2	Solid	02/11/2021 4:30PM
212422	PK_011-1	Solid	02/11/2021 4:40PM
212423	PK_011-2	Solid	02/11/2021 4:40PM
212424	PK_012-1	Solid	02/11/2021 4:50PM
212425	PK_012-1B	Solid	02/11/2021 4:50PM
212426	PK_012-1C	Solid	
212427	PK_012-2	Solid	02/11/2021 4:50PM
212428	PK_012-2B	Solid	02/11/2021 4:50PM

Tests not covered by NATA accreditation 3040 are denoted with *

Codes: **SN** = Sample Note

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212429	PK_012-2C	Solid	02/11/2021	4:50PM
212430	PK_013-1	Solid	02/11/2021	5:14PM
212431	PK_013-2	Solid	02/11/2021	5:14PM
212432	PK_014-1	Solid	02/11/2021	5:25PM
212433	PK_014-2	Solid	02/11/2021	5:25PM
212434	PK_017-1	Solid	01/11/2021	1:09PM
212435	PK_017-1B	Solid	01/11/2021	1:09PM
212436	PK_017-1C	Solid	01/11/2021	1:09PM
212437	PK_017-2	Solid	01/11/2021	1:09PM
212438	PK_017-2B	Solid	01/11/2021	1:09PM
212439	PK_017-2C	Solid		
212440	PK_020-1	Solid	01/11/2021	1:37PM
212441	PK_020-2	Solid	01/11/2021	1:37PM
212442	PK_026-1	Solid	01/11/2021	11:39AM
212443	PK_026-2	Solid	01/11/2021	11:39AM
212444	PK_028-1	Solid	01/11/2021	12:03PM
212445	PK_028-2	Solid	01/11/2021	12:03PM
212446	PK_029-1	Solid	03/11/2021	11:49AM
212447	PK_029-2	Solid	03/11/2021	11:49AM
212448	PK_030-1	Solid	03/11/2021	11:25AM
212449	PK_030-2	Solid	03/11/2021	11:25AM
212450	PK_042-1	Solid	03/11/2021	2:24PM
212451	PK_042-2	Solid	03/11/2021	2:24PM
212452	PK_045-1	Solid	03/11/2021	3:26PM
212453	PK_045-2	Solid	03/11/2021	3:26PM
212454	PK_046-1	Solid	03/11/2021	3:35PM
212455	PK_046-2	Solid	03/11/2021	3:35PM
212456	PK_047-1	Solid	03/11/2021	3:47PM
212457	PK_047-2	Solid	03/11/2021	3:47PM
212458	PK_048-1	Solid	03/11/2021	3:59PM
212459	PK_048-1B	Solid	03/11/2021	3:59PM

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212460	PK_048-1C	Solid		
212461	PK_048-2	Solid	03/11/2021	3:59PM
212462	PK_048-2B	Solid	03/11/2021	3:59PM
212463	PK_048-2C	Solid	03/11/2021	3:59PM
212464	PK_049-1	Solid	03/11/2021	4:18PM
212465	PK_049-2	Solid	03/11/2021	4:18PM
212466	PK_051-1	Solid	04/11/2021	9:46AM
212467	PK_051-2	Solid	04/11/2021	9:46AM
212468	PK_063-1	Solid	04/11/2021	10:30AM
212469	PK_063-1B	Solid	04/11/2021	10:35AM
212470	PK_063-1C	Solid		
212471	PK_063-2	Solid	04/11/2021	10:33AM
212472	PK_063-2B	Solid	04/11/2021	10:35AM
212473	PK_063-2C	Solid	04/11/2021	10:35AM
212474	PK_067-1	Solid	02/11/2021	10:46AM
212475	PK_067-2	Solid	02/11/2021	10:46AM
212476	PK_068-1	Solid	02/11/2021	10:56AM
212477	PK_068-2	Solid	02/11/2021	10:56AM
212478	PK_069-1	Solid	02/11/2021	11:07AM
212479	PK_070-1	Solid	02/11/2021	11:16AM
212480	PK_070-2	Solid	02/11/2021	11:16AM
212481	PK_071-1	Solid	02/11/2021	11:47AM
212482	PK_071-2	Solid	02/11/2021	11:47AM
212483	PK_077-1	Solid	04/11/2021	12:06PM
212484	PK_077-2	Solid	04/11/2021	12:06PM
212485	PK_079-1	Solid	04/11/2021	11:52AM
212486	PK_079-2	Solid	04/11/2021	11:52AM
212487	PK_082-1	Solid	04/11/2021	11:30AM
212488	PK_082-2	Solid	04/11/2021	11:30AM
212489	PK_083-1	Solid	04/11/2021	12:38PM
212490	PK_083-2	Solid	04/11/2021	12:38PM

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212491	RINSATE 4/11	Liquid	05/11/2021	1:00PM
212492	RB-1	Liquid	02/11/2021	5:43PM
212493	SHOVEL-1 RINSE	Liquid	03/11/2021	4:39PM
212494	SHOVEL-2 RINSE	Liquid	03/11/2021	4:39PM
212495	PK_069-2	Solid	02/11/2021	11:07AM

Report Notes

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- This report shall not be reproduced except in full. Samples analysed as received from the client.
- Results reported as 'less than' (<) indicates a result below the practical quantitation limit for the sample matrix and method used.
- Solid samples are reported on a dry weight basis and biota samples are reported on an as received basis unless specified otherwise.

Project Comments

· Samples 212408, 212426, 212439, 212460, 212470 were sent to Envirolab Services Pty Ltd (NATA Accreditation no: 2901) for the analysis of Acid Extractable metals and Moisture .
Please see the attached Report No: 283084-R01, dated 30/11/2021.



Analysis Results - External Methods*

Area - EXTERNAL

<i>Sample ID</i>	212439	212470
<i>Start Date</i>	11/19/2021	11/19/2021
<i>Client ID</i>	PK_017-2C	PK_063-1C

Analyte

Analyte	Unit	212439	212470
Arsenic	mg/kg	<4	9
Cadmium	mg/kg	<0.4	0.9
Chromium	mg/kg	2	19
Cobalt	mg/kg	<1	11
Copper	mg/kg	3	200
Iron	mg/kg	1,600	32,000
Lead	mg/kg	1	99
Moisture	%	0.6	19
Nickel	mg/kg	<1	10
Zinc	mg/kg	16	230

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Analysis Results - ICPAES

Area - INORGANIC

Analyte

		Sample ID Start Date Client ID	212491 11/9/2021 RINSATE 4/	212492 11/9/2021 RB-1	212493 11/9/2021 SHOVEL-1	212494 11/9/2021 SHOVEL-2
Arsenic (acid extractable)	mg/L		<0.03	<0.03	<0.03	<0.03
Cadmium (acid extractable)	mg/L		<0.01	<0.01	<0.01	<0.01
Chromium (acid extractable)	mg/L		<0.01	<0.01	<0.01	<0.01
Copper (acid extractable)	mg/L		<0.03	<0.03	<0.03	<0.03
Iron (acid extractable)	mg/L		<0.04	<0.04	<0.04	<0.04
Lead (acid extractable)	mg/L		<0.02	<0.02	<0.02	<0.02
Nickel (acid extractable)	mg/L		<0.02	<0.02	<0.02	<0.02
Zinc (acid extractable)	mg/L		<0.03	<0.03	<0.03	<0.03

Analysis Results - ICPAES

Area - INORGANIC

Analyte

		Sample ID Start Date Client ID	212400 11/9/2021 NC_1-1	212402 11/9/2021 ND2-1
Arsenic (acid extractable)	mg/kg		6	6
Cadmium (acid extractable)	mg/kg		<1	<1
Chromium (acid extractable)	mg/kg		32	41
Copper (acid extractable)	mg/kg		110	100
Iron (acid extractable)	mg/kg		53000	57000
Lead (acid extractable)	mg/kg		28	30
Nickel (acid extractable)	mg/kg		17	18
Zinc (acid extractable)	mg/kg		140	130

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Codes: SN = Sample Note

RN = Result Note

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Analysis Results - ICPAES

Area - INORGANIC

Sample ID	212434	212435	212438	212440	212442	212444	212446	212448
Start Date	11/9/2021	11/9/2021	11/9/2021	11/9/2021	11/9/2021	11/9/2021	11/9/2021	11/9/2021
Client ID	PK_017-1	PK_017-1B	PK_017-2B	PK_020-1	PK_026-1	PK_028-1	PK_029-1	PK_030-1

Analyte		212434	212435	212438	212440	212442	212444	212446	212448
Arsenic (acid extractable)	mg/kg	4	4	4	13	14	18	11	6
Cadmium (acid extractable)	mg/kg	<1	<1	<1	2	4	7	4	1
Chromium (acid extractable)	mg/kg	2	3	3	13	19	40	14	10
Copper (acid extractable)	mg/kg	<3	<3	<3	380	1300	3100	590	220
Iron (acid extractable)	mg/kg	1900	1900	2100	26000	26000	37000	21000	15000
Lead (acid extractable)	mg/kg	<2	<2	<2	400	390	440	240	69
Nickel (acid extractable)	mg/kg	<2	<2	<2	9	12	21	8	6
Zinc (acid extractable)	mg/kg	16	15	17	1300	490	960	270	140

Analysis Results - ICPAES

Area - INORGANIC

Sample ID	212450	212466	212468	212469
Start Date	11/9/2021	11/9/2021	11/9/2021	11/9/2021
Client ID	PK_042-1	PK_051-1	PK_063-1	PK_063-1B

Analyte		212450	212466	212468	212469
Arsenic (acid extractable)	mg/kg	7	8	12	13
Cadmium (acid extractable)	mg/kg	<1	<1	<1	1
Chromium (acid extractable)	mg/kg	31	17	28	27
Copper (acid extractable)	mg/kg	200	130	220	220
Iron (acid extractable)	mg/kg	45000	38000	38000	42000
Lead (acid extractable)	mg/kg	230	73	120	140
Nickel (acid extractable)	mg/kg	14	11	14	14
Zinc (acid extractable)	mg/kg	370	170	300	310

Tests not covered by NATA accreditation 3040 are denoted with *

Codes: SN = Sample Note

RN = Result Note

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Analysis Results - ICPAES

Area - INORGANIC

Sample ID	212481	212483	212489
Start Date	11/9/2021	11/9/2021	11/9/2021
Client ID	PK_071-1	PK_077-1	PK_083-1

Analyte		212481	212483	212489
Arsenic (acid extractable)	mg/kg	14	14	10
Cadmium (acid extractable)	mg/kg	4	4	5
Chromium (acid extractable)	mg/kg	17	40	43
Copper (acid extractable)	mg/kg	760	590	1000
Iron (acid extractable)	mg/kg	26000	51000	42000
Lead (acid extractable)	mg/kg	260	360	370
Nickel (acid extractable)	mg/kg	12	20	19
Zinc (acid extractable)	mg/kg	580	840	770

Analysis Results - IMSGR

Area - INORGANIC

Sample ID	212400	212402
Start Date	11/9/2021	11/9/2021
Client ID	NC_1-1	ND2-1

Analyte		212400	212402
Moisture (105 C)	% w/w	6.5	26

Analysis Results - IMSGR

Area - INORGANIC

Sample ID	212434	212435	212438	212440	212442	212444	212446	212448
Start Date	11/9/2021	11/9/2021	11/9/2021	11/9/2021	11/9/2021	11/9/2021	11/9/2021	11/9/2021
Client ID	PK_017-1	PK_017-1B	PK_017-2B	PK_020-1	PK_026-1	PK_028-1	PK_029-1	PK_030-1

Analyte		212434	212435	212438	212440	212442	212444	212446	212448
Moisture (105 C)	% w/w	<0.6	<0.6	<0.6	14	24	21	15	8.4

Analysis Results - IMSGR

Area - INORGANIC

Sample ID	212450	212466	212468	212469
Start Date	11/9/2021	11/9/2021	11/9/2021	11/9/2021
Client ID	PK_042-1	PK_051-1	PK_063-1	PK_063-1B

Analyte		212450	212466	212468	212469
Moisture (105 C)	% w/w	12	16	23	21

Tests not covered by NATA accreditation 3040 are denoted with *

Codes: SN = Sample Note

RN = Result Note

RC = Project Comment



Analysis Results - IMSGR

Area - INORGANIC

<i>Sample ID</i>	212481	212483	212489
<i>Start Date</i>	11/9/2021	11/9/2021	11/9/2021
<i>Client ID</i>	PK_071-1	PK_077-1	PK_083-1

Analyte

Analyte	% w/w	212481	212483	212489
Moisture (105 C)	% w/w	12	18	22

Tests not covered by NATA accreditation 3040 are denoted with *

Codes: **SN** = Sample Note

RN = Result Note

RC = Project Comment



Area - OTHER

Sample ID	Client ID	Method	Start Date	Result
212401	NC_1-2	Hold* - Hold	05/11/2021	No analysis required.
212403	ND2-2	Hold* - Hold	05/11/2021	No analysis required.
212436	PK_017-1C	Hold* - Hold	05/11/2021	No analysis required.
212437	PK_017-2	Hold* - Hold	05/11/2021	No analysis required.
212441	PK_020-2	Hold* - Hold	05/11/2021	No analysis required.
212443	PK_026-2	Hold* - Hold	05/11/2021	No analysis required.
212445	PK_028-2	Hold* - Hold	05/11/2021	No analysis required.
212447	PK_029-2	Hold* - Hold	05/11/2021	No analysis required.
212449	PK_030-2	Hold* - Hold	05/11/2021	No analysis required.
212451	PK_042-2	Hold* - Hold	05/11/2021	No analysis required.
212467	PK_051-2	Hold* - Hold	05/11/2021	No analysis required.
212471	PK_063-2	Hold* - Hold	05/11/2021	No analysis required.
212472	PK_063-2B	Hold* - Hold	05/11/2021	No analysis required.
212473	PK_063-2C	Hold* - Hold	05/11/2021	No analysis required.
212482	PK_071-2	Hold* - Hold	05/11/2021	No analysis required.
212484	PK_077-2	Hold* - Hold	05/11/2021	No analysis required.
212490	PK_083-2	Hold* - Hold	05/11/2021	No analysis required.

Tests not covered by NATA accreditation 3040 are denoted with *

Codes: **SN** = Sample Note

RN = Result Note

RC = Project Comment



The sample(s) referred to in this report were analysed by the following method(s):

<i>Method code</i>	<i>Method description</i>	<i>Area</i>
External Methods*	External Methods - Analysis completed externally	EXTERNAL
ICPAES	Acid extractable element analysis by Inductively Coupled Plasma-Atomic Emission Spectrometry (ICPAES)	INORGANIC
IMSGR	Moisture in Solids - oven dried - with variations at 40°C and/or 105°C	INORGANIC
Hold*	Sample held pending further requests for analysis	OTHER

The results in this report were authorised by:

<i>Name</i>	<i>Title</i>	<i>Area</i>
	Senior Scientist	EXTERNAL
	Senior Scientist	INORGANIC
	Senior Scientist	OTHER