Information sheet for environmental audits and preliminary risk screen assessments (PRSAs)

Publication 2009 June 2021

Victoria's audit system

An environmental audit system has operated in Victoria since 1989. The *Environment Protection Act 2017* (the Act) provides for the appointment of environmental auditors. It also provides for Environment Protection Authority (EPA or the Authority) to have a system of preliminary risk screen assessments (PRSAs) and environmental audits. These are used in the planning, approval, regulation and management of activities, and in protection of human health and the environment.

Under the Act, the functions of an environmental auditor include to:

- conduct PRSAs and environmental audits
- prepare and issue PRSA statements and reports, and environmental audit statements and reports.

The purpose of a PRSA is to:

- assess the likelihood of the presence of contaminated land
- determine if an environmental audit is required
- recommend a scope for the environmental audit if an environmental audit is required.

The purpose of an environmental audit is to:

- assess the nature and extent of the risk of harm to human health or the environment from contaminated land, waste, pollution, or any activity
- recommend measures to manage the risk of harm to human health or the environment from contaminated land, waste, pollution, or any activity
- make recommendations to manage any contaminated land, waste, pollution or activity.

Upon completion, all PRSAs and environmental audits require preparation of either a PRSA statement, accompanied by a PRSA report, or an environmental audit statement, accompanied by an environmental audit report.

A person may engage an environmental auditor to conduct a PRSA or an environmental audit.

EPA administers the environmental audit system and ensures an acceptable quality of environmental auditing is maintained. This is achieved by assessing auditor applications and conducting a quality assurance program. These measures ensure that PRSAs and environmental audits that environmental auditors undertake are completed in accordance with the relevant sections of the Act or any other Act, and with the guidelines the Authority or other government agencies have published.

Environment Protection Authority Victoria
GPO BOX 4395 Melbourne VIC 3001
1300 372 842 (1300 EPA VIC) **epa.vic.gov.au**

File structures

EPA stores digital statements and reports from PRSAs and environmental audits in three parts:

- Part A, the PRSA or environmental audit report
- Part B, report appendices
- Part C, the PRSA statement and executive summary or environmental audit statement and executive summary.

Report executive summaries, findings and recommendations should be read and relied upon only in the context of the whole document, including any appendices and the PRSA statement or environmental audit statement.

Currency of PRSAs and environmental audits

PRSAs and environmental audits are based on the conditions encountered and information reviewed at the time of preparation. They don't represent any changes that may have occurred since the completion date. As it's not possible for the PRSA or audit report to present all data that could be of interest to all readers, consideration should be made to any appendices or referenced documentation for further information.

When information about the site changes from what was available at the time the PRSA or environmental audit was completed, or where an administrative error is identified, an environmental auditor may amend or withdraw PRSA or environmental audit statements and/or reports. Users are advised to check EPA's website to ensure documents' currency.

PDF searchability and printing

EPA can only provide PRSAs and environmental audit statements, reports and appendices that the environmental auditor provided to EPA via the EPA portal on the EPA website.

All statements and reports should be in a Portable Document Format (PDF) and searchable; however at times some appendices may be provided as image-only PDFs, which can affect searchability.

The PDF is compatible with Adobe Acrobat Reader, which is downloadable free from Adobe's Website (www.adobe.com).

Further information

For more information on Victoria's environmental audit system, visit EPA's website or contact EPA's Environmental Audit Unit.

Web: www.epa.vic.gov.au

Email: environmental.audit@epa.vic.gov.au

EPA VICTORIA

Preliminary risk screen assessment statement

Under Part 8.3 of the *Environment Protection Act 2017*

Publication F1031 published September 2021

This statement is a summary of the findings of a preliminary risk screen assessment conducted under Part 8.3 of the *Environment Protection Act 2017* for:

Lot 2, 650 Diggers Rd, Werribee South, VIC

Further details are provided in the preliminary risk screen assessment report that accompanies this statement.

Section 1: Preliminary risk screen assessment overview

Environmental auditor details

Name:	Mark Stuckey
Company:	Environmental Earth Sciences
Address:	98 Maribyrnong St Footscray VIC 3011
Phone:	03 9687 1666
Email:	mstuckey@eesigroup.com

Site owner/occupant

Name:	Mary Portelli
Company:	-

Environmental auditor engaged by

Name:	Maurice Grasso
Company:	Storgrad Pty Ltd
Relationship to site owner:	Executor

Reason for preliminary risk screen assessment

Planning scheme:	Wyndham
Other:	PRSA requested to support proposed subdivision of Lot 1 and Lot 2. Risk of individual subdivision to be considered.

Section 2: Assessment scope

Site details

Address:	650 Diggers Rd, Werribee South
Title details:	Lot 2 PS900032
Area (hectares):	0.3472 ha

☒ a plan of the site is attached

Use or proposed use assessed

☒ Sensitive use (including land used for residential use, a child care centre, pre-school, or primary school) or secondary school or children's playground
- ☐ high density
- ☒ other (lower density)

☐ Recreation/open space
☐ Parks and reserves
☐ Agricultural
☐ Commercial
☐ Industrial
☐ Other

Environmental elements assessed

☐ Ambient air
- ☐ all environmental values were considered **OR**
- ☐ all environmental values other than the following were considered:

☐ Ambient sound
- ☐ all environmental values were considered **OR**
- ☐ all environmental values other than the following were considered:

☒ Land
- ☒ all environmental values that apply to the land use category were considered **OR**
- ☐ all environmental values that apply to the land use category, other than the following, were considered:

☒ Water
- ☐ Surface water
  - ☐ all environmental values that apply to the applicable segment were considered **OR**
  - ☐ all environmental values that apply to the applicable segment, other than the following, were considered:
- ☒ Groundwater
  - ☒ all environmental values that apply to the applicable segment were considered **OR**
  - ☐ all environmental values that apply to the applicable segment, other than the following, were considered:

Standards considered

Environment Reference Standard 2021

Preliminary risk screen assessment statement

National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013)

Assumptions made during the assessment or any limitations

Property to be subdivided as per the attached plan

Exclusions from the assessment and the rationale for these

-

This statement is accompanied by the following preliminary risk screen assessment report

Title:	Preliminary Risk Screen Assessment at 650 Diggers Rd, Werribee South VIC
Report no:	221082_PRSA_Lot 2_V1
Date:	2 December 2021

Section 3: Assessment outcome

Based on my assessment, I am of the opinion that an environmental audit is **required for Lot 2 PS900032** for the following land uses, **including** the use or proposed use for which the site has been assessed:

(Tick as appropriate and strike out those uses not assessed and for which the need for an audit has not been determined)

- ☒ Sensitive use (including land used for residential use, a child care centre, pre-school, or primary school) or secondary school or children's playground
  - ☐ high density
  - ☒ other (lower density)
- ☐ Recreation/open space
- ☐ Parks and reserves
- ☐ Agricultural
- ☐ Commercial
- ☐ Industrial
- ☐ Other

Other information

Reason for environmental audit

Underground petroleum storage tanks

Proposed scope of environmental audit

Site to be audited:	
Site/premises name	-
Address	650 Diggers Rd, Werribee South, VIC
Title details	Lot 2, PS900032
Area (hectares)	0.3472 ha
Use or proposed use of the site to be audited:	☒ Sensitive use (including land used for residential use, a child care centre, pre-school, or primary school) or secondary school or children's playground ☐ high density ☒ other (lower density) ☐ Recreation/open space ☐ Parks and reserves ☐ Agricultural ☐ Commercial ☐ Industrial ☐ Other:
Elements of the environment to be assessed in the environmental audit:	☐ Ambient air ☐ all environmental values to be considered **OR** ☐ all environmental values other than the following to be considered: ☐ Ambient sound ☐ all environmental values to be considered **OR** ☐ all environmental values other than the following to be considered:

Preliminary risk screen assessment statement

	☒ Land ☒ all environmental values that apply to the land use category to be considered **OR** ☐ all environmental values that apply to the land use category, other than the following, to be considered: _____ ☒ Water ☐ Surface water ☐ all environmental values that apply to the segment to be considered **OR** ☐ all environmental values that apply to the segment, other than the following, to be considered: _____ ☒ Groundwater ☒ all environmental values that apply to the segment to be considered **OR** ☐ all environmental values that apply to the segment, other than the following, to be considered: _____
Standards and reference documents to be considered:	Environment Reference Standard 2021 National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended 2013. Australian and New Zealand Governments (ANZG) (2018). Australian and New Zealand guidelines for fresh and marine water quality. August 2018. Hickey, C W (2013). Updating nitrate toxicity effects on freshwater aquatic species. National Institute of Water & Atmospheric Research Ltd (NIWA), Hamilton, NZ, January 2013. National Health and Medical Research Council (NHMRC)/ Natural Resource Management Ministerial Council (NRMMC) (2011). Australian drinking water guidelines. National Water Quality Management Strategy. NHMRC & NRMMC (2008). Guidelines for managing risks in recreational water. Australian Government, February 2008.
Exclusions from the environmental audit and rationale for these:	
Assumptions made or limitations on the environmental audit:	

Note: An assessment that an audit is not required does not include any judgement as to whether responsibilities under section 39 of the *Environment Protection Act 2017* (duty to manage contaminated land) exist for the person in management or control of the land. Please refer to EPA publication 1977, *Assessing and controlling contaminated land risks: A guide to meeting the duty to manage for those in management or control of land* (https://www.epa.vic.gov.au/about-epa/publications/1977).

Section 4: Environmental auditor's declaration

I state that:

- I am appointed as an environmental auditor by the Environment Protection Authority Victoria under the *Environment Protection Act 2017.*
- The findings contained in this statement represents a true and accurate summary of the findings of the preliminary risk screen assessment that I have completed.

Date: 13 April 2022

Signed:

Name: Mark Stuckey

Environmental Auditor

PLAN OF SUBDIVISION

EDITION

PS 900032U

LOCATION OF LAND

PARISH:	DEUTGAM
TOWNSHIP:	-
SECTION:	G
CROWN ALLOTMENT:	24A (PART), 24B AND 24C
CROWN PORTION:	-
TITLE REFERENCE:	VOL 11907 FOL 071
LAST PLAN REFERENCE:	PC377788L
POSTAL ADDRESS: (at time of consolidation)	646 - 650 DIGGERS ROAD, WERRIBEE SOUTH, 3030
MGA 94 CO-ORDINATES: (approx. centre of land in plan)	E 296 630 ZONE: 55 N 5 795 290

EASEMENT INFORMATION

LEGEND: E - ENCUMBERING EASEMENT, CONDITION IN CROWN GRANT IN THE NATURE OF AN EASEMENT OR OTHER ENCUMBRANCE A - APPURTENANT EASEMENT

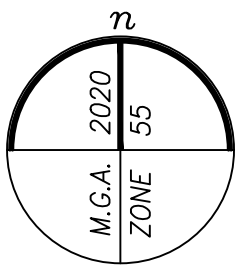
SUBJECT LAND	PURPOSE	WIDTH (metres)	ORIGIN	LAND BENEFITED/IN FAVOUR OF
E-1	SEWERAGE	SEE DIA	LP 111609	LOTS ON LP 111609

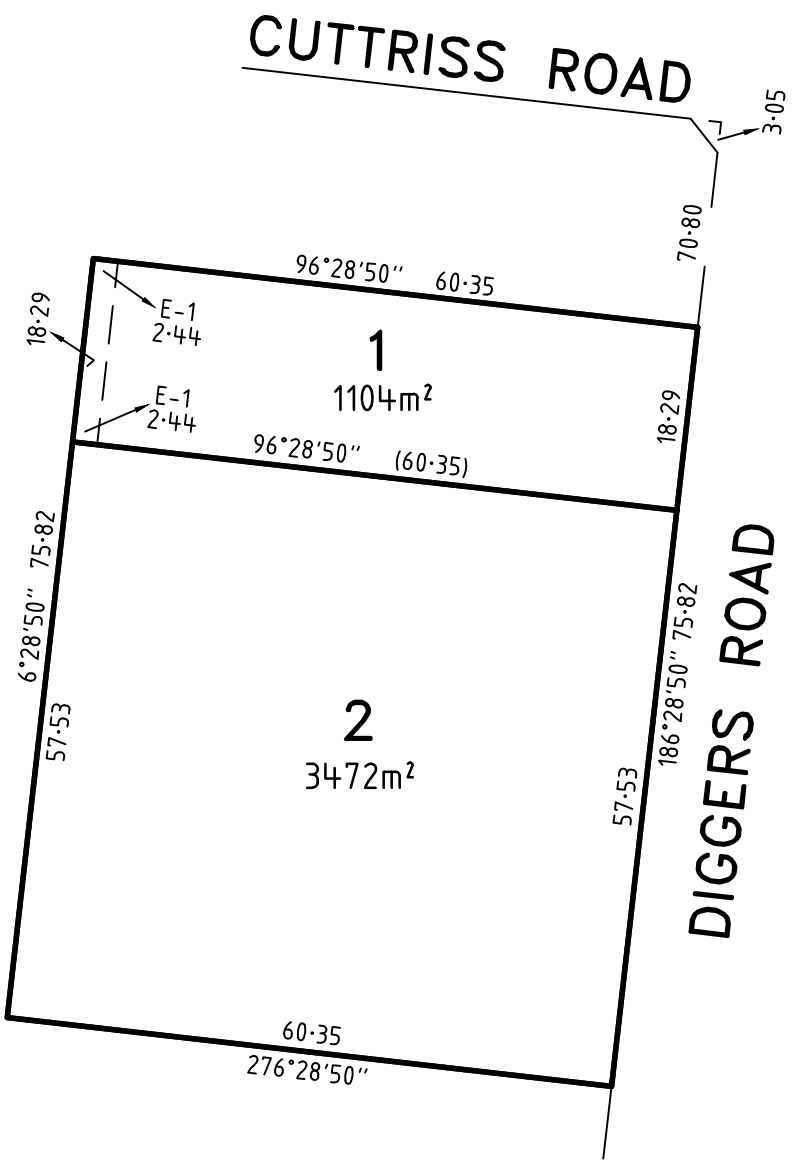
NOTATIONS

SURVEY THIS PLAN IS / ~~IS NOT~~ BASED ON SURVEY

THIS SURVEY HAS BEEN CONNECTED TO PERMANENT MARKS NO(S)
IN PROCLAIMED SURVEY AREA NO. --

DEPTH LIMITATION 15.24m BELOW THE SURFACE





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DATE 08/06/21 REFERENCE 31829003

VERSION A DRAWING 3182900BA

ORIGINAL SHEET SIZE A3

SHEET 1 OF 1 SHEETS

ENVIRONMENTAL EARTH SCIENCES
CONTAMINATION RESOLVED

PRELIMINARY RISK SCREEN ASSESSMENT AT 650 DIGGERS RD, WERRIBEE SOUTH VIC

STORGAD PTY LTD

2 DECEMBER 2021
221082_LOT 2
VERSION 1

ENVIRONMENTAL EARTH SCIENCES
CONTAMINATION RESOLVED

8 December 2021

Storgad Pty Ltd
5 Bennett Close
Hoppers Crossing
VIC 3029

Attention: **Maurice Grasso**

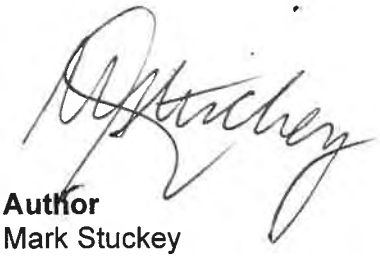
Dear Maurice

Preliminary Risk Screen Assessment at Lot 2, 650 Diggers Rd, Werribee South VIC

Please find enclosed a copy of our report entitled as above. Thank you for the opportunity to undertake this work.

Should you have any queries, please do not hesitate to contact us on (03) 9687 1666.

For and on behalf of
Environmental Earth Sciences VIC



Author
Mark Stuckey
Environmental Auditor (Contaminated Land)
appointed pursuant to the *Environment Protection Act 2017*

221082_PRSA_Lot 2_V1

ENVIRONMENTAL EARTH SCIENCES
CONTAMINATION RESOLVED

EXECUTIVE SUMMARY

Table 1: Summary of PRSA information

Item	Details
Auditor	Mark Stuckey
Auditor account number	EXT001139
Name of person requesting audit or PRSA	Maurice Grasso
Relationship of person requesting audit or PRSA to site	Executor
Name of site owner	Mary Portelli
Date of auditor engagement	29 September 2021
Completion date of the audit or PRSA	2 December 2021
Reason for audit or PRSA	Council request
Elements of the environment assessed	Soil
Planning permit number or requirement detail if applicable	N/A
EPA Region	Western Metro
Municipality	Wyndham
Dominant — Lot on plan	Lot 2 PS900032
Additional — Lot on plan(s)	-
Site/premises name	-
Street/Lot — Lower No.	650
Street/Lot — Upper No	-
Street Name	Diggers
Street type (For example, road, court)	Road
Street suffix (For example, North, South)	
Suburb	Werribee South
Postcode	3030
Site area (in square metres)	3,472 m^2
Plan of site/ premises/ location showing the audit site boundary attached	Yes
Members and categories of support team utilised	Patrick Carroll – Environmental Scientist John Massie – Auditor's assistant
Further work or requirements	Audit on Lot 2 PS900032
Nature and extent of continuing risk of harm	Groundwater and soil due to presence of underground petroleum storage tanks

Item	Details
Outcome of the PRSA report	No audit required on Lot 1 PS900032 Audit on Lot 2 PS900032

Table 2: Physical site information

Item	Details
Historical land use	Lot 2 – Agricultural, commercial, petroleum storage
Current land use	Lot 2 – Vacant
Proposed land use	Residential
Current land use zoning	General Residential Zone 1
Proposed land use zoning	General Residential Zone 1
Surrounding land use – north	Residential and agricultural
Surrounding land use – south	Residential and agricultural
Surrounding land use – east	Agricultural
Surrounding land use – west	Agricultural
Has EPA been notified about the site under Section 40 of the Environment Protection Act 2017?	No
Nearest surface water receptor – name	Werribee River
Nearest surface water receptor – direction	South
Site aquifer formation	Alluvial
Groundwater segment	Segment A2 – B (inferred)

*The information provided in **Table 1** and **Table 2** above is relevant to Lot 2 PS900032 only. The report body provides information on both Lot 1 PS900032 and Lot 2 PS900032.*

ENVIRONMENTAL EARTH SCIENCES
CONTAMINATION RESOLVED

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Appendices

1 INTRODUCTION

Storgad Pty Ltd engaged Mark Stuckey of Environmental Earth Sciences to undertake a preliminary risk screen assessment (PRSA) of a property located at 650 Diggers Rd, Werribee South ('the site').

Environmental Earth Sciences understands that a subdivision of the property is planned. The site currently comprises two lots, Lots 1 and 2 on PS900032, from which it is planned to create two separate properties.

As a condition of permit, Council has required completion of a PRSA and, if recommended, an Environmental Audit in accordance with Section 208 of the *Environment Protection (EP) Act 2017*.

The site layout is shown in **Figure 1**.

2 OBJECTIVES

The objective of the PRSA is to:

- Assess the potential for contamination to be present at the site;
- Conclude whether an Audit of the site will be required to determine that the land is suitable for the proposed residential use; and
- If an Audit is considered by the Auditor to be required, an outline scope for Audit will be provided.

3 SCOPE OF WORK

The scope of work undertaken comprised the following:

- A desktop review of site history and environmental setting.
- A site inspection, including soil sampling at two targeted locations, with subsequent laboratory analysis of collected soil samples.
- Development of a conceptual site model (CSM) and assessment of the likelihood of the land being contaminated.
- Preparation of a PRSA report summarising the details and findings of the investigation and basis for conclusions as to whether or not an Audit is required.
- Preparation of a PRSA Statement in accordance with Section 206 of the EP Act including, if one is recommended, a scope for the Audit.

- Submission of the PRSA report and Statement to EPA within five business days of completion, as per Section 205 of the EP Act.

4 PHYSICAL SITE INFORMATION

4.1 Site location and identification

4.1.1 Site land use

The site is located at 650 Diggers Rd, Werribee South. The site is currently occupied by a vacant building, formerly a general store. The site identification details are summarised in **Table 3** below and the site locality and layout are presented in **Figure 1** (Figures Appendix).

Table 3: Site Identification

Item	Details
Site Address	650 Diggers Rd, Werribee South
Site Owner	Mary Portelli
Lot & Plan number	Lot 1 PS900032 Lot 2 PS900032
Area	4,576 m^2
Current Zoning	General Residential Zone 1
Planning Overlays	Heritage Overlay
Current land use	Vacant with historical building
Local Government Authority	Wyndham
Site locality and layout	See **Figure 1**

4.1.2 Surrounding land uses

The surrounding land uses to the site are presented below in **Table 4**.

Table 4: Surrounding land uses

Direction	Description
East	Diggers Rd. A dam attached to agricultural crop land.
West	Residential and agricultural properties with residential dwellings present upon them
North	Residential and agricultural properties with residential dwellings present upon them
South	Residential properties, Grahams Reserve (400m) and the Werribee River (530m)

4.1.3 Sensitive receptors

The nearest sensitive receptors to the site include those listed in **Table 5**.

Table 5: Surrounding land uses

Receptor	Onsite	Offsite
Human	Site users (present and future) including residents, workers and maintenance workers	Surrounding site users (present and future) including residents, pedestrians, workers and maintenance workers.
Ecological	Flora and fauna with access to site soil.	Flora and fauna at the location of groundwater discharge. The location of groundwater discharge is considered likely to be the Werribee River 530m south of the site.

4.1.4 Proposed site use

The properties two lots are to be separated into individual properties as part of the subdivision. The future use of the lots is planned for low density residential.

4.2 Regional geology

A review of Melbourne 1: 63,360 geological map (Geological Survey of Victoria, 1974) indicates the surface geology at the site is Deutgam Silt, a Quaternary Period Pleistocene Epoch (12,000-2.6 million year old [Myo]) fluvial sediment consisting of silt with abundant carbonate nodules and minor sand and gravel.

The Duetgam silt is inferred to overlie the Quaternary Period Pleistocene Epoch Newer Volcanics Formation, predominantly comprising dark to light grey olivine basalt.

4.3 Soil and acid sulfate soils

According to ASRIS (CSIRO 2021) these soils are classified as Sodosols, which are soils with clear or abrupt textural B horizon and in which the major part of the upper 0.2 m of the B2 horizon (or the major part of the entire B2 horizon if it is less than 0.2 m thick) is sodic and is not strongly sub plastic.

A review of the ASRIS Atlas of Australian Acid Sulfate Soils Map indicates there is an extremely low probability for acid sulfate soils to occur at the site. This is confirmed by DNRE (2002).

4.4 Topography and hydrology

The approximate surface elevation of the site is 7-8 mAHD (DELWP 2021b). The site is observed to be predominantly flat, however, surface drainage is likely to flows the gentle gradient towards the south.

4.5 Hydrogeology

The depth to groundwater at the site is inferred to be <5m below ground level (VVG 2021) noting the groundwater is presumably in connection with the Werribee River, which reaches Port Philip Bay approximately 700m south of the site. Surface expressions of groundwater are visible at Grahams Reserve, 400m south of the site.

Groundwater flow direction is inferred to be south, in the direction of the Werribee River, 530m south of the site.

The water bearing geological unit is anticipated to be alluvial flood plain sediments in connection with the Werribee River. The described lithology of registered groundwater bores in the vicinity of the site is consistent with alluvial flood plain sediments (silts, sand, clay and gravel/ pebbles).

Groundwater salinity is anticipated to be present in the range 1,000 – 3,500 mg/L as total dissolved salts (TDS), placing the groundwater salinity within the range of Segment A2 – B as defined in the *Environmental Reference Standard* (ERS) (Victorian Government 2021, Table 5.2). This requires protection of all environmental values relevant to groundwater, as per Table 5.3 of the ERS.

4.6 Registered groundwater bores

A search of registered groundwater users was undertaken. Forty-four (44) bores were identified within a 2km radius of the site. Below is a summary of surrounding registered groundwater uses and aquifer details, whilst the database output is provided in **Appendix I**:

- The closest bore to site is located 428 m south east and was drilled to a depth of 13m. Screen depth and lithology were not recorded.
- The second closest bore is located 552m south east and is registered for domestic purposes. The bore is screened between 12 – 15m depth in coarse gravel and pebbles.
- Ten bores were registered for irrigation and stock purposes. The depths of the bores range 3.5 – 25.9 m bgl with one bore screened within coarse gravels and river pebble sediments. The screened lithology for the other irrigation/ stock bores was not published.
- Nine bores were registered for domestic purposes. Bores were drilled to between 3 – 19.5 m bgl. Bores were screened between 6 – 19.5 m bgl within coarse gravels and river pebble sediments.
- Eight bores were registered for groundwater investigation purposes. Bores were drilled to between 5.1 – 19.5. The screened lithology of the bores is listed as mottled clay, coarse sandstone/ clay cemented gravels, sand and large stones, sandy clay, and sandy silt.

4.7 Groundwater dependent ecosystems

A review of the Department of Environment, Land, Water and Planning (DELWP) and Australian Government Bureau of Meteorology (BOM) Groundwater dependent ecosystems (GDE) atlas maps (2021) suggests the site in not situated within an area identified as being

reliant upon the surface expression of groundwater (terrestrial GDE). The agricultural dam across Diggers Rd is identified as a high potential terrestrial GDE supplying the Plains Grassy Woodland ecosystem, as is the Werribee River. The Werribee River 520m south of site is also identified as a known aquatic GDE from regional studies.

5 HISTORICAL REVIEW

The site historical review included a review of the following documents and information sources:

- Interview with site owner;
- Historical aerial imagery;
- Royal Historical society of Victoria (RHSV);
- Historical title certificates;
- EPA completed audits;
- EPA priority register;
- EPA Groundwater Quality Restricted Use Zones (GQRUZ) Map;
- EPA Victoria List of former landfill sites;
- Cathodic protections systems register; and
- WorkSafe Dangerous Goods register.

5.1 Site interview

Environmental Earth Sciences questioned the owners regarding the sites history. The owners have had involvement with the site for over 50 years. The following information was obtained.

5.1.1 Lot 1

- The property was formerly part of a dairy farm prior to use as a residential lot.
- The dwelling that was placed on the lot was a weatherboard house which was transported to site from elsewhere.
- The dwelling was subsequently removed from site.
- The lot has been owned by the family along with Lot 2 and has been consolidated into one property in the last decade.

5.1.2 Lot 2

- The general store was opened in the 1940's and petrol was sold at the store from that time.
- Originally petrol was stored in two USTs present on the outside of the property boundary along Diggers Rd. The status and exact location of the redundant USTs is unknown.
- Two petrol tanks were installed in the 1970s, approximately 5,000 L each. The tanks were used to store super and regular petrol (see **Figure 1** for location).
- Petrol was sold at the store until 1999.
- The shop onsite was a general store and also a bait supply store.
- The sheds formerly present on the southern half of Lot 2 were used for bait packaging and a cold store.
- A large vegetable garden occupied much of Lot 2.
- Along the fence line of Lot 2 was an extensive plantation of prickly pear trees.
- Soil material is not believed to have been brought onto site at any point.
- No waste is said to have been deposited to land.
- Some burning of green waste is said to have occurred from time to time.
- A groundwater bore with brick headworks is present along the western boundary (observed to still be present onsite) which was used for groundwater extraction until approximately 10 years ago.

5.2 Aerial photographs

Presented below in **Table 6** is a review of available historical aerial imagery.

The aerial photographs are presented in **Appendix A**.

Table 6: Aerial photograph summary

Year	Onsite		Offsite
	Lot 1	Lot 2	
1945	The lot appears to be part of an agricultural paddock. Defined plough lines are present suggesting a market garden.	A structure is present along the eastern boundary likely to be the present-day general store building. In the north west of the lot surface disturbance is visible. The southern half of the lot appears to be vacant.	The surrounding area appears to be used predominantly for agricultural purposes. Diggers Rd is present to the east of the site and appears to be unsealed. Lots of similar size are present to the south suggesting potential residential use.

Year	Onsite		Offsite
	Lot 1	Lot 2	
1964	As per 1945	The surface disturbance apparent in the north western corner appears to be a garden. Trees appear to be present along the north western boundary.	The lots present to the south of site are now occupied by residential dwellings.
1970	A house is present in eastern half of the lot and what appears to be a small shed is present in the western half.	As per 1964	As per 1964
1974	An additional shed is present to the south of the shed identified in the 1970 photograph.	An additional shed is present in the southern half of the lot.	As per 1964
1984	As per 1974	The site configuration is as per 1974. A number of boats appears to be present in the south western corner of the site.	Residential development has occurred to the north of Lot 1. A surface water dam is present to the east of Diggers Rd.
1991	As per 1974	As per 1984	As per 1984
2003	No structures are present upon the lot and the site appears to have a surface covering of grass	The site does not appear to have boats stored upon it. Site configuration is the same.	As per 1984
2013	As per 2003	As per 2003	As per 1984
2017	As per 2003	As per 2003	As per 1984
2020	As per 2003	Features such as trees and sheds have been removed from the site. The general store building is present surrounded by an apparent grass covering.	As per 1984

5.3 Royal Historical Society of Victoria

The Royal Historical Society of Victoria (RHSV) search notes:

- Werribee South was not covered by the Sands and McDougall directories (1858 – 1974).
- The region of Werribee South was listed as an 'Irrigation area used for intensive agriculture and market gardening, dairy farming and grazing' in the Victorian Municipal Directories (1976 – 1994).
- The area of Werribee South is first listed in the 1978 Melways. The area south of the site is listed as Beach Rd and is developed with a caravan park and Price Reserve for beach holidaying and fishing.

- The site is shown in the 1984 Melways as a shop with a petrol bowser which closed down in the early 2000's.

The RHSV transcript is presented in **Appendix B**.

5.4 Historical title certificates

A review of historical title certificates indicates that the site:

- Originated from Crown land in 1933 and 1946;
- Is the result of multiple subdivisions of larger plots of land; and
- Is likely to have been historically utilised for agricultural purposes prior to use as a general store (Lot 2) and residential premises (Lot 1).

Historical titles are presented in **Appendix C**.

A summary of the sites title history is presented below in **Table 7**.

Table 7: Historical title summary

Volume Folio	Registered Proprietors	Date	Status
V.11907 F.071	Mary Portelli	14.08.2017	Current
V.9518 F.220	Salvatore Portelli	01.07.1983	History
V.9040 F.446	Phillip Portelli (Television Technician)	02.03.1976	History
	Ralph Graham (Farmer)	27.08.1974	History
V.8808 F.967	Ralph Graham (Farmer)	07.10.1969	History
V.6971 F.046	Jean Graham	22.07.1964	History
	William Graham	07.10.1947	History
	Public Trustee	03.10.1946	History
	Crown Land		
V.5957 F.254	Salvatore Portelli	01.10.1971	History
	Fillipo Portelli (Laborer)	07.06.1933	History
	Crown Land		
V.5957 F.214	Salvatore Portelli	01.10.1971	History
	Fillipo Portelli (Laborer)	31.03.1954	History
	Sebastiano di Gregorio (Laborer)	07.06.1933	History
	Crown Land		

5.5 EPA Victoria records and searches

5.5.1 Completed audit reports

A search of completed EPA audits identified one completed audit within 2km of the site, the details of which are presented below in **Table 8**.

Table 8: Completed audit summary

Address	1040 Duncans Road, Werribee South
Distance and direction	1.8 km east
CARMS	61891-1
Site history	Agricultural farm, market gardening
Soil contaminants	Not found to be contaminated
Groundwater contaminants	Regional nitrate concentrations
Depth to Groundwater	6 – 20 m bgl
Flow direction	South east
Aquifer	Unconfined/ semi confined – Werribee delta alluvial
Segment	Segment B – 1,100 – 2,300 mg/L TDS

5.5.2 Priority site register

A search of completed EPA priority site register (dated 31 July 2021) identified an EPA priority site 1.2 km south west of the site. The details are presented below:

- Werribee waste-water treatment plant, New Farm Rd Werribee – Current waste-water treatment plant. Requires assessment and/or clean up. This site spans from the southern side of the Werribee River to Point Wilson (14km south west) and inland to the M1 freeway (7km north).

5.5.3 Former landfill register

A search of the EPA Victoria landfill register did not identify any former or current landfill within 2km of the site.

5.5.4 Groundwater restricted use zones (GQRUZ)

A search of the EPA Victoria GQRUZ data base did not identify any GQRUZ within 2km of the site.

5.6 Cathodic protections systems

A search of the cathodic protection systems database dated 7 October 2021 (provided within the **Appendix D**) did not identify the presence of a cathodic protection system at the site.

5.7 Worksafe dangerous goods search

A search of the Worksafe dangerous goods register dated 11 October 2021 (provided within the **Appendix E**) did not identify current or historical records of dangerous goods being stored at the site.

6 CONCEPTUAL SITE MODEL DEVELOPMENT

A conceptual site model (CSM) of the site can be formed by considering the geophysical characteristics at play at the site, the contaminant source, potential receptors and the pathways to the receptors. The CSM, as required by ASC NEPM (2013), is an iterative process constantly being updated during the investigation process as more information becomes available.

6.1 Chemicals of potential concern

Based on the site history the chemicals of potential concern (CoPC) are considered to be confined to:

- Pesticides (OCPs and OPPs);
- Petroleum hydrocarbons (TRH /TPH);
- Lead (Pb);
- Tributyltin (TBT);
- Asbestos containing materials (ACM); and
- Benzene, toluene, ethyl benzene, xylenes and naphthalene (BTEXN).

6.2 Source to receptor pathway analysis

6.2.1 Sources

Sources of potential contamination are considered to be limited to the following:

- Lot 1 and Lot 2 – Agricultural practices (pesticides such as OCPs and OPPs);
- Lot 2 – Contamination associated with the storage of petrol (TRH/TPH, Pb and BTEXN);
- Lot 2 – Boat storage and maintenance (TBT); and
- Lot 2 – Demolition of site structures (ACM).

A high potential for groundwater contamination is anticipated given the age of the underground storage tanks (USTs) at the site. Leakages from the USTs may also have

resulted in soil contamination surrounding the area. The potential for volatile contamination also needs to be considered.

6.2.2 Pathways and geophysical components of the CSM

The potential pathways between the sources and receptors include:

- Soil: direct contact, inhalation of volatile chemicals/asbestos and ingestion; and
- Groundwater: extraction and ingestion, inhalation of volatile contamination, and lateral migration in the underlying aquifer (likely to be to the south).

Given that petrol was stored onsite, there is a potential for volatile contamination and subsequent vapour intrusion.

Pathways relevant to impacted soil are considered likely to be limited to areas in the immediate vicinity of the UST infrastructure (in particular given the high clay content of the site soils likely limiting any significant migration in soil) and areas surrounding former shed infrastructure (asbestos and tributyl tin), whilst any groundwater contamination may have migrated away from the vicinity of the USTs.

6.2.3 Receptors

The potential human receptors include the future users of the site (residents, workers and visitors) and workers and visitors at the surroundings sites from consumption of groundwater and inhalation of vapours. The potential environmental receptors include flora and fauna at the point of groundwater discharge (taken to be Werribee River), as well as the on-site soil terrestrial ecosystem.

7 FIELD PROGRAM

7.1 Site inspections

A site inspection was conducted on 16 November 2021 by the Auditors assistant. Photographs were taken and are presented in **Appendix F**. The following observations were made during the site inspection:

- The site was observed to be predominantly flat with limited fall across the two lots;
- Some minor land indentation was observed to be present in the location of the former vegetable garden on Lot 2;
- Grass coverage was present across the entire site (Lot 1 and Lot 2) with no evidence of vegetation dieback;
- Discontinuous gravel was observed to be present at the surface of the site in locations consistent with former sheds on Lot 2 (based on aerial imagery and observation made with the site owner);

- No waste was observed to be present at the surface of the site;
- One building was present on Lot 2. Some asbestos containing material (ACM) was observed to be present on one external wall;
- Vent pipe infrastructure was present on the eastern fence of Lot 2;
- A dilapidated bowser was present out the front of the general store on Lot 2;
- A groundwater extraction bore is present along the western boundary of Lot 2. The depth of the groundwater bore was not measured during the inspection; and
- The surrounding land use of the area is predominantly agricultural. Exposed, tilled soils were visible in surrounding paddocks and were noted to be a distinct red/ brown colour, a description relevant to the expected soil profile of the area, the Deutgam Silt.

7.2 Soil investigation

7.2.1 Rationale for sampling locations

Two targeted soil sampling locations were advanced at the site on the basis of the following rationale:

- BH01 – Advanced along the southern boundary of Lot 1 to provide an indication of the presence of imported fill material and potential shallow soil impacts which may have arisen from surface spillages associated with the operation of a UST approximately 10m south on Lot 2.
- BH02 – Advanced in the central portion of Lot 2 to investigate the potential for imported fill material across the lot.

The borehole locations are shown in **Figure 1**.

7.2.2 Soil sampling methodology

Two soil boreholes were advanced using a hand auger to a depth of 0.7 and 0.4 m bgl.

Soil profiles were logged by a suitably qualified environmental scientist, with information collected including soil classification, moisture, texture, pH (Raupach method), visual/ olfactory indicators of contamination (including photo-ionisation detector [PID] readings) and water ingress.

The soil samples were collected from the upper fill material layer. The samples were collected and retrieved using a clean spatula. All samples were placed in laboratory prepared containers, labelled with the location number, depth of discrete sample collection, site reference and date before being placed into a chilled container. The container was dispatched to the laboratory on the same day of sampling with a chain of custody form.

Soil samples were collected in accordance with Standards Australia (1999) and Standards Australia (2005). Geological borelogs are included in **Appendix G**.

8 LABORATORY ANALYSIS

Collected soil samples were analysed by ALS Environmental (ALS), accredited with the National Association of Testing Authorities (NATA) for the methods used.

8.1 Soil

Analysis was undertaken for the following chemicals:

- Heavy metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, zinc);
- Organochlorine and organophosphorus pesticides (OCP/OPPs);
- Petroleum hydrocarbons (TRH/TPH);
- Benzene, toluene, ethylbenzene, xylene and naphthalene (BTEXN); and
- Soil characterisation parameters (pH, CEC, clay content, total iron and organic carbon).

Laboratory transcripts are provided in **Appendix H**.

8.2 Procedures for quality control and quality assurance

Quality control (QC) is achieved by using NATA registered laboratories using ASTM standard methods supported by internal duplicates, the checking of high, abnormal or otherwise anomalous results against background and other chemical results for the sample concerned.

Quality assurance (QA) is achieved by confirming that field results, or anticipated results based upon comparison with field observations, are consistent with laboratory results. Also that sampling methods are uniform and that decontamination of sampling equipment is thorough.

Field observations were compared with laboratory results when they are not as expected. Confirmation, re-sampling and re-analysis of a sample are undertaken if the results are not consistent with field observations and/or measurements.

The overall assessment of the data quality is as follows:

- No analysis holding time breaches were present;
- Field observations and measurements were generally comparable to laboratory data;
- Internal laboratory quality data is considered acceptable;
- The use of field instruments was acceptable;
- The dataset as a whole is considered reliable.

9 ENVIRONMENTAL QUALITY OBJECTIVES AND CRITERIA

The Victorian Government has prepared an *Environmental Reference Standard* (ERS) in accordance with Clause 93 of the *Environment Protection Act* 2017. The ERS provides the framework for the assessment and reporting on environmental conditions in Victoria. It sets out the environmental values (EVs) of the ambient air, ambient sound, land, and water environments that are sought to be achieved or maintained in Victoria and standards to support those values.

Standards for the EVs are comprised of objectives for supporting different uses of the environment and indicators that can be measured to determine whether those objectives are being met. The ERS is not a compliance standard, but the indicators and objectives provide a basis for assessment and reporting on environmental conditions in Victoria and the ERS is required to be considered by Auditors when carrying out their functions under the Act, including conducting Audits.

The PRSA process requires that the levels of contamination reported be assessed in the context of the future land use. The applicable sections of the environment which need to be considered, such as soil, groundwater, surface water and air, are discussed in more detail below.

9.1 Land environmental values

Part 4 of the ERS sets out EVs applicable to various land use categories. These are summarised in **Table 9**.

Table 9: Land Environmental Values

Environmental Values		Land use						
		Parks and reserves	Agricultural	Sensitive use		Recreation/ open space	Commercial	Industrial
				High Density	Other (lower density)			
Land dependant ecosystems and species	Natural ecosystems	✓						
	Modified ecosystems	✓	✓		✓	✓		
	Highly modified ecosystems	✓	✓	✓	✓	✓	✓	✓
Human Health		✓	✓	✓	✓	✓	✓	✓
Building and structures		✓	✓	✓	✓	✓	✓	✓
Aesthetics		✓		✓	✓	✓	✓	
Production of food, flora, and fibre		✓	✓		✓			

Both lots are likely to be used for low density residential use, for which EVs are:

- Modified ecosystems
- Highly modified ecosystems
- Human Health
- Buildings and Structures
- Aesthetics
- Production of food, flora and fibre.

All of the above land EVs are considered to be applicable to the site.

9.2 Soil assessment criteria

The environmental quality indicators and objectives applicable to the assessment of the relevant EVs for the proposed land uses are detailed in **Table 10**.

Table 10: Indicators and objectives for relevant land environmental values

Beneficial use	Indicators	Objectives
Human health	Concentration of contaminants.	Health investigation or screening levels (HIL/ HSL) specified in the NEPM or other such levels (where no guidelines are available) or where more appropriate, levels derived in accordance with risk-based methodologies specific in the NEPM or background levels established in accordance with the Act.
Maintenance of ecosystems	Concentration of contaminants.	Contamination must not adversely affect the maintenance of relevant ecosystems and the level of any indicator must not be greater than any ecological investigation/ screening level (EIL/ ESL) developed in accordance with the NEPM or levels approved by EPA Victoria.
Aesthetics	Any chemical substance or waste that may be offensive to the senses.	Contamination must not cause the land to be offensive to the senses of human beings.
Buildings and structures	pH; sulfate; ORP; salinity; other substance or waste that may have a detrimental impact on the structural integrity of buildings and other structures.	Contamination must not cause the land to be corrosive to or adversely affect the integrity of structures or building materials.
Production of food, flora and fibre	Concentration of contaminants.	Contamination must not adversely affect produce quality or yield; and affect the level of an indicator in the food, fibre or flora produced at the site (or that may be produced) such that the level of that indicator is greater than that

Beneficial use	Indicators	Objectives
		specified in the Australian and New Zealand Food Authority Standards Codes. NEPM 2013 EIL/ ESLs have been adopted as a conservative measure.

The following section discusses the specific assessment criteria adopted for the protection of relevant land EVs at site.

9.2.1 Human health

Schedule B(1) of the NEPM provides a range of investigation levels for the protection of human health, referred to as health investigation levels (HILs), and provides health screening levels (HSLs) for BTEXN and petroleum hydrocarbons. HILs and HSLs are provided for four generic land use settings:

- HIL A: residential with garden / accessible soil (home grown produce <10% fruit and vegetable intake, (no poultry), also includes children's day care centres, preschools and primary schools;
- HIL B: residential with minimal opportunities for soil access includes dwellings with fully and permanently paved yard space such as high-rise buildings and flats;
- HIL C: public open space such as parks, playgrounds, playing fields (e.g., ovals), secondary schools and footpaths. It does not include undeveloped public open space (such as urban bushland and reserves) which should be subject to a site-specific assessment where appropriate; and
- HIL D: commercial/ industrial such as shops, offices, factories, and industrial sites.

The adopted HIL level for the site is HIL A (low density residential) based on the likely future use of the allotments.

9.2.2 Maintenance of ecosystems

The ERS states that the contamination must not adversely affect the maintenance of relevant ecosystems (i.e. natural, modified and highly modified ecosystems). As stated in **Table 10** above, any soil contamination must not adversely affect the maintenance of relevant ecosystems and the level of any indicator must not be greater than any ecological investigation levels (EILs) and ecological screening levels (ESLs) developed in accordance with NEPC (2013).

The EILs assigned by the NEPC (2013) Schedule B5a – *Guideline on Ecological Risk Assessment* are adopted for this assessment. This guideline presents the methodology for deriving terrestrial EILs using aged (i.e. >2 years old) contamination for soil with the following land use types:

- Areas of ecological significance (AES);

- Urban residential/ public open space (UR/POS); and
- Commercial/ industrial (C/I).

The methodology has been developed to protect soil processes, soil biota (flora and fauna) and terrestrial invertebrates and vertebrates. As the proposed use for both of the lots onsite is low density residential, the UR/POS EIL has been adopted for the assessment.

The EILs provided in the ASC NEPM are calculated from summing the added contaminant limit (ACL) to the ambient background concentration (ABC) to derive the site-specific soil quality guideline taking into account the effect caused by pH, exchangeable cations, iron and total organic carbon in soil that can affect concentration toxicity data.

The values presented for zinc, chromium (III), copper and lead are based on derivation of ACLs. Values presented for lead, arsenic, naphthalene and DDT are generic EILs based on total concentrations of aged (arsenic) and fresh contaminants.

A summary of the EILs for aged contamination in soil (>2 years) for the adopted proposed land use is presented in **Table 11**, and the derivation methodology provided in **Appendix J**.

Table 11: Site specific EILs

Analyte	Ambient background concentration (mg/kg)[1]	EIL (mg/kg) – UR/POS
Arsenic	16	100
Naphthalene	-	170
DDT	-	180
Chromium III	132	730
Copper	25	200
Lead	7	1100
Nickel	37	170
Zinc	49	420

Notes:
1. ABCs were derived from Hamon et al. (2004);
2. ACL – Added contaminant limit, determined using Tables 1B(1-3), Schedule B1, NEPC (2013)
3. Clay content = 35%, total organic carbon = 1.2%, pH = 6.3 and CEC = 9.1 cmolc/kg were used to derive specific values

Ecological screening levels (ESLs) listed in Table 1B(5) of NEPC (2013) have been adopted in this assessment for TPH/TRH and BTEXN compounds.

9.2.3 Aesthetics

The ERS states that contamination must not cause the land to be offensive to the senses of human beings. Aesthetic issues may include: discoloured soil (stained from spills); solid inert waste (bricks, glass, steel, polyvinylchloride [PVC], etc.); fill with waste (demolition rubble, ash, coke, black carbon, foundry slag, etc.); and offensive odours.

9.2.4 Buildings and structures

The ERS states that the contamination must not cause the land to be corrosive to or adversely affect the integrity of structures or building materials. The relevant indicators include pH, sulfate, redox potential, salinity or any chemical substance or waste that may have detrimental impact on the structural integrity of buildings and other structures.

Objectives for these key indicators have primarily been sourced from AS 2159 (2009), *Piling Design and Installation*, in which levels of pH, chloride and sulfate which are considered to represent mild and/or non-aggressive conditions for concrete or steel piles are specified. The values adopted for initial screening (<5,000 mg/kg sulfate, pH >5 and <5,000 mg/kg chloride) are the most conservative of those reported in AS 2159 for concrete and steel piles and are considered to be associated with mild or non-aggressive conditions only where all objectives are met.

9.2.5 Production of food, flora and fibre

The ERS defers to the levels referenced in the Australian and New Zealand Food Authority Standards Codes for assessing the production of food, flora and fibre at a site. In this case, the Auditor has used the EILs (which are the most sensitive investigation level) as an initial screening tool.

9.2.6 Considerations

For a contaminant in soil to be considered acceptable for the respective land-use, the data set should conform to the following requirements, as outlined in the NEPM:

- The 95% upper confidence limit (UCL) of the arithmetic mean of analytical results is below the site criteria;
- The arithmetic (or geometric in cases where the data is log normally distributed) mean is below the site criteria;
- The standard deviation is less than 50% of the site criteria; and
- No single sample analytical result is greater than 250% of the site criteria.

10 DISCUSSION OF RESULTS

The analytical results for soil and groundwater have been summarised and presented in the Tables section of this report and the chain of custody documentation and complete laboratory transcripts are provided in **Appendix H**, while the soil results are summarised in **Table 12** (Tables Appendix).

10.1 Physical observations

During the collection of soil samples, the following was noted:

- Soil sampled at the site was representative of the natural soil conditions of the surrounding area (red brown clay and silt);
- No odours or staining was identified during sampling; and
- No elevated PID detections were noted during sampling.

10.2 Soil analytical results

Three soil samples were analysed across the site, the following was noted:

- No exceedances of adopted site criteria (human and ecological) for chemicals were identified in the soil samples analysed.
- 4,4-DDE was detected at a concentration of 0.12 mg/kg (LOR = 0.05 mg/kg, criteria = 240 mg/kg) in soil sample BH01_0.1, potentially indicating trace historical pesticide use.
- Zinc was detected at a concentration of 249 mg/kg in sample BH02_0.4 and considered to be elevated above natural background concentration (50 mg/kg). The location of the soil sample is within the vicinity of a former shed at the site and is potentially associated with zinc enriched runoff from galvanised roofing, however is well below all relevant land-use criteria including 420 mg/kg for protection of terrestrial ecological soil receptors.
- The reported soil results and physical observations are not considered to be representative of contamination which may potentially preclude the relevant EVs at the site (as defined in Section 9.2 above).

11 CONTAMINATION RISK AND PRSA OUTCOMES

11.1 Lot 1

11.1.1 Risk

The site is considered to have a low risk of contamination due to the following:

- No potentially contaminating historical activities have been identified;
- The site is inferred to be situated upgradient of the UST present upon Lot 2 (and is therefore considered a “medium potential for contamination” after DEWLP 2021c, Table 2);
- Inferred groundwater flow direction is considered to be south/ south west towards the nearby Werribee River, hence potential groundwater contamination is not considered likely to have migrated towards Lot 1;

- Former agricultural use is considered to be a “medium potential for contamination” (after DEWLP 2021c, Table 2) with soil analysis confirming acceptable levels of pesticides; and
- Limited soil sampling (BH01) did not identify the presence of contamination.

11.1.2 PRSA Outcome

As the site is considered to have a low risk of contamination the PRSA outcome is:

- **Outcome 1.** Unlikely that contaminated land is present, and no environmental audit is required.

11.2 Lot 2

11.2.1 Risk

The site is considered to have a moderate – high risk of contamination due to the following:

- The identified presence of two USTs at the site is considered to present a moderate – high risk to groundwater contamination (after DEWLP 2021c, Table 2); and
- Limited fill material was observed to be present (minor gravel observed discontinuously) and as such the potential for soil contamination is considered to be predominantly limited to the immediate surrounds of the USTs.
- Potential low to moderate risk of isolated tributyl tin and asbestos impacts in shallow soils surrounding former boat storage and shed structures.

11.2.2 PRSA Outcome

As contamination cannot be ruled out the PRSA outcome is:

- **Outcome 3.** Likely that contaminated land is present, and an environmental audit is required.

11.2.3 Audit scope

The audit scope to be completed at Lot 2 is to include the following:

- Remediation and validation of the UST area onsite;
- A groundwater investigation to assess potential impacts arising from the USTs present onsite; and
- A targeted soil assessment around areas surrounding the former boat storage area and shed structures.

12 CONCLUSION AND OUTCOME

12.1 Conclusion

The historical investigation, site inspection and soil sampling undertaken to date at the site suggests the following:

- There is a low risk to future onsite or offsite receptors as a result of the soil and groundwater condition on Lot 1.
- There is a moderate to high risk to future onsite or offsite receptors as a result of the groundwater condition on Lot 2.

12.2 PRSA outcomes

One the basis of the information presented within this report, the outcomes as per EPA (2021b) are:

Lot 1 – Outcome 1 – Unlikely that contaminated land is present, and no environmental audit is required.

Lot 2 – Outcome 3 – Likely that contaminated land is present, and an environmental audit is required.

12.3 Lot 2 – Audit scope

The audit scope to be completed at Lot 2 is to include the following:

- Remediation and validation of the UST area onsite;
- A groundwater investigation to assess potential impacts arising from the USTs present onsite; and
- A targeted soil assessment around areas surrounding the former boat storage area and shed structures.

13 LIMITATIONS

This report has been prepared by Environmental Earth Sciences VIC ACN 109 404 024 in response to and subject to the following limitations:

1. The specific instructions received from Storgrad Pty Ltd;
2. The specific scope of works set out in PO221160V1 issued by Environmental Earth Sciences VIC for and on behalf of Platinum Constructions (VIC) Pty Ltd , is included in Section 3 (Scope of Work) of this report;

3. May not be relied upon by any third party not named in this report (with the exception of regulatory authorities) for any purpose except with the prior written consent of Environmental Earth Sciences VIC (which consent may or may not be given at the discretion of Environmental Earth Sciences VIC);

4. This report comprises the formal report, documentation sections, tables, figures and appendices as referred to in the index to this report and must not be released to any third party or copied in part without all the material included in this report for any reason;

5. The report only relates to the site referred to in the scope of works being located at 650 Diggers Rd, Werribee, VIC ("the site");

6. The report relates to the site as at the date of the report as conditions may change thereafter due to natural processes and/or site activities;

7. No warranty or guarantee is made in regard to any other use than as specified in the scope of works and only applies to the depth tested and reported in this report;

8. Fill, soil, groundwater and rock to the depth tested on the site may be fit for the use specified in this report. Unless it is expressly stated in this report, the fill, soil and/or rock may not be suitable for classification as clean fill if deposited off site;

9. This report is not a geotechnical report; and

10. Our General Limitations set out at the back of the body of this report.

14 REFERENCES

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ENVIRONMENTAL EARTH SCIENCES
CONTAMINATION RESOLVED

ENVIRONMENTAL EARTH SCIENCES GENERAL LIMITATIONS

Scope of services
The work presented in this report is Environmental Earth Sciences response to the specific scope of works requested by, planned with and approved by the client. It cannot be relied on by any other third party for any purpose except with our prior written consent. Client may distribute this report to other parties and in doing so warrants that the report is suitable for the purpose it was intended for. However, any party wishing to rely on this report should contact us to determine the suitability of this report for their specific purpose.

Data should not be separated from the report
A report is provided inclusive of all documentation sections, limitations, tables, figures and appendices and should not be provided or copied in part without all supporting documentation for any reason, because misinterpretation may occur.

Subsurface conditions change
Understanding an environmental study will reduce exposure to the risk of the presence of contaminated soil and or groundwater. However, contaminants may be present in areas that were not investigated, or may migrate to other areas. Analysis cannot cover every type of contaminant that could possibly be present. When combined with field observations, field measurements and professional judgement, this approach increases the probability of identifying contaminated soil and or groundwater. Under no circumstances can it be considered that these findings represent the actual condition of the site at all points.

Environmental studies identify actual sub-surface conditions only at those points where samples are taken, when they are taken. Actual conditions between sampling locations differ from those inferred because no professional, no matter how qualified, and no sub-surface exploration program, no matter how comprehensive, can reveal what is hidden below the ground surface. The actual interface between materials may be far more gradual or abrupt than an assessment indicates. Actual conditions in areas not sampled may differ from that predicted. Nothing can be done to prevent the unanticipated. However, steps can be taken to help minimize the impact. For this reason, site owners should retain our services.

Problems with interpretation by others
Advice and interpretation is provided on the basis that subsequent work will be undertaken by Environmental Earth Sciences VIC. This will identify variances, maintain consistency in how data is interpreted, conduct additional tests that may be necessary and recommend solutions to problems encountered on site. Other parties may misinterpret our work and we cannot be responsible for how the information in this report is used. If further data is collected or comes to light we reserve the right to alter their conclusions.

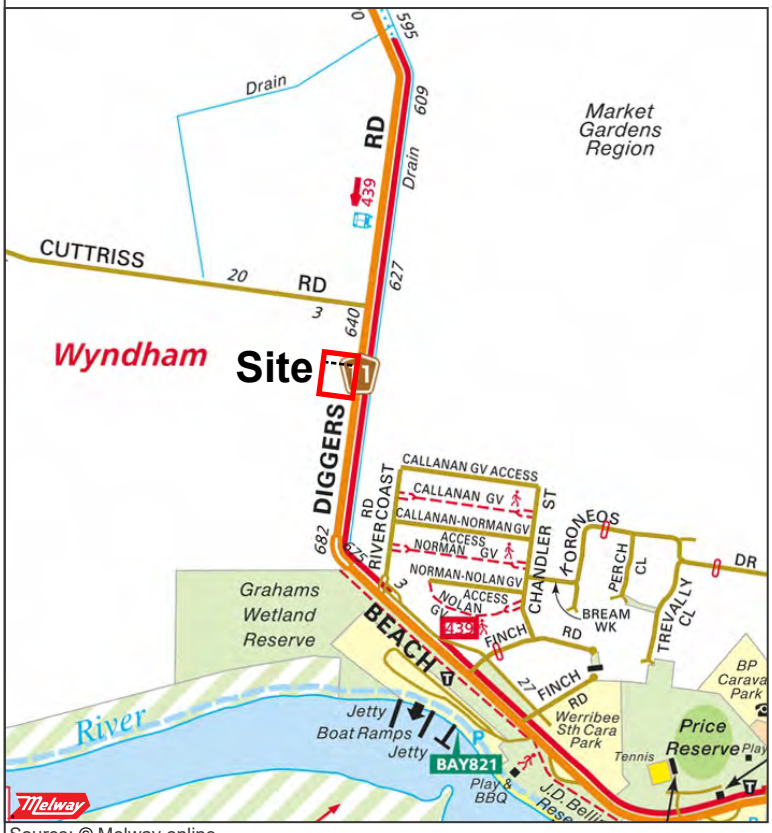
Obtain regulatory approval
The investigation and remediation of contaminated sites is a field in which legislation and interpretation of legislation is changing rapidly. Our interpretation of the investigation findings should not be taken to be that of any other party. When approval from a statutory authority is required for a project, that approval should be directly sought by the client.

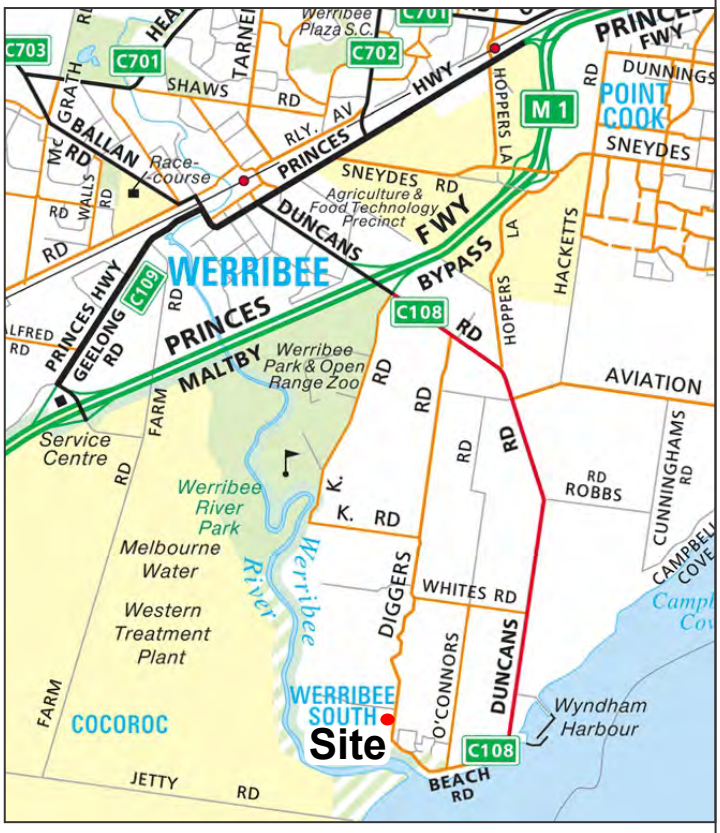
Limit of liability
This study has been carried out to a particular scope of works at a specified site and should not be used for any other purpose. This report is provided on the condition that Environmental Earth Sciences VIC disclaims all liability to any person or entity other than the client in respect of anything done or omitted to be done and of the consequence of anything done or omitted to be done by any such person in reliance, whether in whole or in part, on the contents of this report. Furthermore, Environmental Earth Sciences VIC disclaims all liability in respect of anything done or omitted to be done and of the consequence of anything done or omitted to be done by the client, or any such person in reliance, whether in whole or any part of the contents of this report of all matters not stated in the brief outlined in Environmental Earth Sciences VIC's proposal number and according to Environmental Earth Sciences general terms and conditions and special terms and conditions for contaminated sites.

To the maximum extent permitted by law, we exclude all liability of whatever nature, whether in contract, tort or otherwise, for the acts, omissions or default, whether negligent or otherwise for any loss or damage whatsoever that may arise in any way in connection with the supply of services. Under circumstances where liability cannot be excluded, such liability is limited to the value of the purchased service.

FIGURES

Source: © Nearmap





Source: © Melway online

ENVIRONMENTAL EARTH SCIENCES
CONTAMINATION RESOLVED

Title:	Site Layout and Sampling Plan		
Location:	650 Diggers Road, Werribee South, Vic.		
Client:	Storgrad Pty Ltd	Job No:	221082
PM:	PC	Scale:	As Shown
Drawn:	LB	Date:	November 2021
			Figure 1

TABLES

ENVIRONMENTAL EARTH SCIENCES
CONTAMINATION RESOLVED

Table 12: Soil results

Chemical Group	Chemical Name	Units	LOR	NEPM 2013 Table 1A(1) HILs Res A Soil	NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Clay 0-1m	NEPM 2013 Table 1B(6) ESLs for Urban Res, Fine Soil	NEPM 2013 Table 1B (1 - 4) EILs	NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Fine Soil	BH01_0.1 16/11/2021	BH01_0.5 16/11/2021	BH02_0.4 16/11/2021
Inorganics	pH (CaCl2)	pH Unit	0.1						6.3	-	-
	CEC	meq/100g	0.1						9.1	-	-
	Clay content	%	1						35	-	-
	Moisture Content	%	1						8.1	12.1	12
	Organic Matter	%	0.5						2.1	-	-
TPH (NEPM, 1999)	TPH C6-C9 Fraciton	mg/kg	10						<10	<10	-
	TPH C10 - C14 Fraction	mg/kg	50						<50	<50	-
	TPH C15-C28 Fraction	mg/kg	100						<100	<100	-
	TPH C29-C36 Fraction	mg/kg	100						<100	<100	-
	TPH C10 - C36 (Sum of total)	mg/kg	50						<50	<50	-
TRH (NEPM, 2013)	TRH C6-C10 Fraction	mg/kg	10					700|800	<10	<10	-
	TRH C6-C10 less BTEX (F1)	mg/kg	10		50	180			<10	<10	-
	TRH >C10-C16 Fraction	mg/kg	50					1000	<50	<50	-
	TRH >C10 - C16 Fraction minus Naphthalene (F2)	mg/kg	50		280	120			<50	<50	-
	TRH >C16-C34 Fraction	mg/kg	100			1300		2500|3500	<100	<100	-
	TRH >C34-C40 Fraction	mg/kg	100			5600		10000	<100	<100	-
	TRH C10 - C40 (Sum of total)	mg/kg	50						<50	<50	-
BTEX	Benzene	mg/kg	0.2		0.7	65			<0.2	<0.2	-
	Ethylbenzene	mg/kg	0.5		NL	125			<0.5	<0.5	-
	Toluene	mg/kg	0.5		480	105			<0.5	<0.5	-
	Xylene (m & p)	mg/kg	0.5						<0.5	<0.5	-
	Xylene (o)	mg/kg	0.5						<0.5	<0.5	-
	Xylene Total	mg/kg	0.5		110	45			<0.5	<0.5	-
	Total BTEX	mg/kg	0.2						<0.2	<0.2	-
Metals	Arsenic	mg/kg	5	100			100		5	7	6
	Cadmium	mg/kg	1	20					<1	<1	<1
	Chromium (III+VI)	mg/kg	2				730		21	41	21
	Copper	mg/kg	5	6000			200		6	12	25
	Lead	mg/kg	5	300			1100		12	13	68
	Mercury	mg/kg	0.1	40					<0.1	<0.1	<0.1
	Nickel	mg/kg	2	400			170		12	25	16
	Zinc	mg/kg	5	7400			420		25	31	249
Organochlorine Pesticides	4,4-DDE	mg/kg	0.05						0.12	-	-
	a-BHC	mg/kg	0.05						<0.05	-	-
	Aldrin	mg/kg	0.05						<0.05	-	-
	Aldrin + Dieldrin	mg/kg	0.05	6					<0.05	-	-
	b-BHC	mg/kg	0.05						<0.05	-	-
	chlordane	mg/kg	0.05	50					<0.05	-	-
	Chlordane (cis)	mg/kg	0.05						<0.05	-	-
	Chlordane (trans)	mg/kg	0.05						<0.05	-	-
	d-BHC	mg/kg	0.05						<0.05	-	-
	DDD	mg/kg	0.05						<0.05	-	-
	DDT	mg/kg	0.2				180		<0.2	-	-
	DDT+DDE+DDD	mg/kg	0.05	240					0.12	-	-
	Dieldrin	mg/kg	0.05						<0.05	-	-
	Endosulfan	mg/kg	0.05	270					<0.05	-	-
	Endosulfan I	mg/kg	0.05						<0.05	-	-
	Endosulfan II	mg/kg	0.05						<0.05	-	-
	Endosulfan sulphate	mg/kg	0.05						<0.05	-	-
	Endrin	mg/kg	0.05	10					<0.05	-	-
	Endrin aldehyde	mg/kg	0.05						<0.05	-	-
	Endrin ketone	mg/kg	0.05						<0.05	-	-
	g-BHC (Lindane)	mg/kg	0.05						<0.05	-	-
	Heptachlor	mg/kg	0.05	6					<0.05	-	-
	Heptachlor epoxide	mg/kg	0.05						<0.05	-	-
	Methoxychlor	mg/kg	0.2	300					<0.2	-	-
	Hexachlorobenzene	mg/kg	0.05	10					<0.05	-	-
Organophosphorous Pesticides	Azinophos methyl	mg/kg	0.05						<0.05	-	-
	Bromophos-ethyl	mg/kg	0.05						<0.05	-	-
	Carbophenothion	mg/kg	0.05						<0.05	-	-
	Chlorfenvinphos	mg/kg	0.05						<0.05	-	-
	Chlorpyrifos	mg/kg	0.05	160					<0.05	-	-
	Chlorpyrifos-methyl	mg/kg	0.05						<0.05	-	-
	Demeton-S-methyl	mg/kg	0.05						<0.05	-	-
	Diazinon	mg/kg	0.05						<0.05	-	-
	Dichlorvos	mg/kg	0.05						<0.05	-	-
	Dimethoate	mg/kg	0.05						<0.05	-	-
	Ethion	mg/kg	0.05						<0.05	-	-
	Fenamiphos	mg/kg	0.05						<0.05	-	-
	Fenthion	mg/kg	0.05						<0.05	-	-
	Malathion	mg/kg	0.05						<0.05	-	-
	Methyl parathion	mg/kg	0.2						<0.2	-	-
	Monocrotophos	mg/kg	0.2						<0.2	-	-
	Parathion	mg/kg	0.2						<0.2	-	-
	Pirimphos-ethyl	mg/kg	0.05						<0.05	-	-
	Prothiofos	mg/kg	0.05						<0.05	-	-
PAH	Naphthalene	mg/kg	1		5		170		<1	<1	-