Environmental Conditions Summary

East Village Precinct, Bentleigh East

Prepared for:
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19 September 2017

Distribution

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Contents

List of Acronyms

Acronym	Definition
AS	Australian Standard
CUTEP	Clean up to the extent practicable
ESA	Environmental Site Assessment
EPA	Environment Protection Authority (Victoria)
MAKE	MAKE EBRB Dev Nominee Pty Ltd
VPA	Victoria Planning Authority

1.0 Introduction

Senversa Pty Ltd was engaged by MAKE EBRB Dev Nominee Pty Ltd. (MAKE) to prepare a summary of environmental conditions for the proposed East Village Precinct, Bentleigh East, a 24 hectare parcel of land (with multiple titles) on the corner of East Boundary and North Roads, Bentleigh East (the Precinct).

The Precinct location and layout is shown in **Figure 1**, with MAKE the owner of part of the central portion of the Precinct.

1.1 Project Background and Proposed Development

The Precinct is currently being used for a mix of industrial and commercial uses, together with five residential houses present on the north east corner of the Precinct. The Precinct was once an important industrial area with large-scale manufacturing of automotive parts (Chassis Brakes) and cigarettes (Virginia Slims) occurring on the Precinct. However, large-scale manufacturing has now largely ceased at the Precinct.

The single largest current land use of the Precinct is the former PBR International, now Chassis Brakes International (Australia), factory at 246 East Boundary Road – a manufacturer of automotive parts. Chassis Brakes will cease manufacturing at the Precinct in 2017 and will close the factory by early 2018. Adjacent to 246 East Boundary Road is a factory warehouse area currently used for vehicle storage. South of these warehouses is the Virginia Park Business Centre which contains multiple business and services including light manufacturing, warehousing, childcare and a swim school.

Following community consultation undertaken in 2016 / 2017, the VPA and Glen Eira City Council prepared a concept plan for the redevelopment of the Precinct, with submissions on the concept plan now being sort by Glen Eira City Council. The concept plan includes the redevelopment of the Precinct for a mix of business and residential buildings with local parks, a town square and pedestrian friendly laneways. The Concept Plan and extent of soil and groundwater likely to require management (discussed in **Section 3**) is shown in **Figure 1**.

As a part of the development of the strategic plan, MAKE require an assessment of environmental conditions at the Precinct.

1.2 Objectives

The objectives of the summary report are as follows:

- Confirm whether identified soil and groundwater contamination may be incompatible with the intended future land use.
- Identify potential management measures that may be required to make the land suitable for the proposed use.
- Assess whether an environmental audit overlay (EAO) should be placed over all or part of the Precinct (note, this is just the opinion of Senversa and only an appropriate planning officer can determine the requirement for an EAO).

2.0 Historical Land Use Summary

The history of land use across the Precinct described below is based on information presented within historical environmental assessment reports undertaken on different parts of the Precinct that made available for review. These reports are listed in **Section 6**.

2.1 Common Precinct Land Use History

In order to group areas of the Site that are likely to have similar historical land uses and therefore similar potential to have caused contamination, the Precinct has been divided up into the following three main areas (refer to **Figure 1**):

- **Northern Portion**: Includes approximately 20 predominately automotive light industrial companies including smash and automotive repairs, car hire, a service station and a transformer yard. Five residential houses are also present within the north eastern boundary.
- **Central Portion**: Includes all five former plants of the Chassis Brakes brake manufacturing plant. Now used predominately for commercial uses, with manufacturing still occurring in some areas and childcare centre proposed on the north eastern boundary.
- **Southern Portion**: Includes the former Virginia Slims cigarette factory and associated buildings now used predominately as commercial offices, park and for a childcare centre.

Based predominately on review of aerial photographs provided in the Phase 1 ESA undertaken for the southern portion of the Precinct (LRM, 2015a), the entire Precinct was utilised for market gardens and farmland up until the 1950s when redevelopment of all portions of the Precinct occurred. This use of fertilizers, insecticides, fungicides and herbicides in market gardens and farms may have impacted soils during this period.

2.2 Northern Portion

Review of aerial photographs (LRM, 2015a), suggest that with the exception of the five residential houses on the eastern boundary, that this area has been used for light industrial and commercial businesses (predominately automotive related) since the late 1950s. Review of the Australian Standard 4482.1 (Guide to the investigation and sampling of sites with potentially contaminated soil), finds that the following chemical types are associated with automotive / engine works: hydrocarbons, metals, solvents, acids / alkalis, refrigerants and antifreeze.

As no environmental reports are available for this area, limited further information on potential sources of contamination is available.

2.3 Central Portion

Since the mid-1950s, the central portion of the Precinct has been used for the manufacture of automotive parts, including wheel brake components and hydraulic braking systems. Patons Brake Replacements (PBR) Pty Ltd (owned by Repco Limited) constructed the first manufacturing plant and administration centre in 1954. This was expanded and modernised multiple times up until the late 1980s when the current layout consisting of Plants 1 – 5 (roughly east to west across the central portion) were present.

PBR was purchased by Robert Bosch AU in 2007 where it was renamed initially as Bosch Chassis Systems Australia Pty Ltd and then as Chassis Brakes (International) Group, before being purchased by KPS Capital Partners in 2012. Plants 3, 4 and 5 (eastern half of central portion of the Precinct) were purchased by Griffith Avenue Trust, while Plants 1 and 2 (western half of Central Portion) were

purchased by MAKE EBRB Dev Nominee Pty Ltd. Chassis Brakes (International) Group is expected to cease remaining manufacturing currently being undertaken in Plants 1 and 2 at the Precinct in 2017.

The manufacturing operations undertaken on the central portion of the Precinct historically used a range of chemicals, including (but not limited to) chlorinated solvents, petroleum hydrocarbons, metals, acids, alkalis and coolants. The use of chlorinated solvents (understood to be primarily trichloroethene (TCE)) was discontinued in the early 1980s.

2.4 Southern Portion

The southern portion of the Precinct was first used for the production of tobacco in 1955, with the construction of a large warehouse used to manufacture tobacco by W.D & H.O. Hills (a British owned company and one of the founding companies of Imperial Tobacco). Smaller ancillary sheds around the main warehouse were built over the following years. In 1984 the southern portion was purchased by the Australian Telecommunication Commission for use as a general manufacturing depot.

The disposal of effluent involved in the tobacco manufacturing area may have impacted some areas of the Precinct, along with the use of herbicides and pesticides that may have been present on the tobacco.

The southern portion of the Precinct already has an EAO applied under the Glen Eira Planning Scheme.

3.0 Known Soil and Groundwater Conditions

3.1 Assessment of Soil and Groundwater Conditions

3.1.1 Northern Portion

No known assessment of soil and groundwater has been undertaken across the northern portion of the Precinct. Given the recent history of land use in the area it is considered likely that impact of soil and groundwater with the chemicals likely to have been used at the Precinct (hydrocarbons, metals, solvents) has occurred across at least part of the northern portion of the Precinct.

Should a more sensitive land use be proposed on land within the northern portion of the Precinct an environmental audit will likely be required.

3.1.2 Central Portion

Multiple environmental assessments have been undertaken on the central portion of the Precinct since in the 1980s and a statutory environmental audit completed on the former Plant 5 on the eastern boundary of the Precinct was completed in May 2015 (see **Figure 1**).

Review of the available assessment reports on the central portion of the Precinct (see **Section 6**) finds that groundwater conditions across central portion of the Precinct appear to be strongly influenced by a sewer and or stormwater drain. This influences groundwater to flow in a SE to NW direction across the eastern boundary of the central portion of the Precinct.

The most recent available environmental report undertaken on Plants 1 and 2 (western half of the central portion) (Senversa, 2016), identified five areas of impacted soils with elevated chlorinated and petroleum hydrocarbon concentrations that represent a potential ongoing source of groundwater contamination and therefore would likely require management should the Precinct be redeveloped (see **Figure 1**). A groundwater investigation also largely delineated the extent of chlorinated hydrocarbon concentrations exceeding adopted criteria protective of beneficial uses, that would likely require management or remediation should the Precinct be redevelopment into a more sensitive use. An environmental management plan and groundwater quality and management plan is currently in place to manage potential risks that may be associated with identified impacts in soil and groundwater.

For Plants 3 and 4 (eastern half of the central portion) the most recent available environmental report (Environmental Risk Sciences, 2012) reported that two areas of impacted soils with elevated chlorinated hydrocarbon concentrations represent a potential ongoing source of groundwater contamination and therefore would likely require management should the Precinct be redeveloped (see **Figure 1**). Elevated concentrations of chlorinated hydrocarbons in groundwater were also reported to be exceeding adopted criteria protective of beneficial uses on the Precinct.

Other areas of impacted soils across central portion of the Precinct are likely to require management in the future, however they have not been identified as representing a source of groundwater contamination. Therefore, an assessment of the risk posed to the future development and requirement to clean up or manage these areas would need to be undertaken during a future environmental audit. In conjunction with this other contaminants identified in soil and or groundwater within the central portion of the Precinct that exceeded adopted investigation criteria included heavy metals (arsenic, beryllium, cobalt, chromium, copper, nickel, iron, manganese, zinc), ammonia, cyanide, cresol, nitrate and sulphate. These contaminants are currently considered to represent a lower risk to the future Precinct use than the identified chlorinated and petroleum hydrocarbons, but may still require management should the Precinct be redeveloped to a more sensitive use.

The statutory environmental audit undertaken at the former Plant 5 (Peraco, 2015), found this area to be suitable for future use as a sensitive land uses (including for childcare purposes) subject to the following conditions summarised below:

- There are no substantive changes to the proposed early learning centre without review and acceptance by an EPA appointed auditor.
- As groundwater was found to be polluted, groundwater must not be used for any beneficial use without prior testing and review of results by an EPA appointed auditor.

Groundwater beneath the former Plant 5 was found to be polluted by elevated concentrations of petroleum hydrocarbons, ammonia, metals (arsenic, beryllium, total chromium, cobalt, copper, nickel, iron, manganese and zinc), nitrate, sulphate, and pH.

3.1.3 Southern Portion

For the southern portion of the Precinct, a statutory environmental audit was completed in the south east corner of the Precinct in 2005 (see **Figure 1**), with a Phase 1 and subsequent Phase 2 environmental site assessment (ESA) reports completed across the southern portion of the Precinct in 2015 (LRM, 2015a and LRM, 2015b).

Similar to the statutory environmental audit undertaken on the central portion of the Precinct for another childcare centre, the audit undertaken on the south east corner of the Precinct (IT Environmental, 2006), found this area to be suitable for sensitive uses (including childcare purposes) as long as development occurs in line with the development plans provided and that the current surface coverings are maintained.

For the remainder of the southern portion of the Precinct the Phase 2 ESA report (LWM, 2015b) reported soil conditions to be below adopted investigation for human health and ecological criteria with the exceptions of elevated concentrations of benzo(a)pyrene and nickel exceeding adopted ecological criteria in one location each.

The groundwater assessment undertaken within the ESA identified a number of heavy metals to be exceeding adopted investigation criteria at most investigation locations. However, further investigation is required to determine if these elevated concentrations are naturally elevated or consistent with ambient background in the area before it can be confirmed whether clean up or management of these heavy metals would be required.

In conjunction with this, elevated concentrations of chlorinated and petroleum hydrocarbons exceeding adopted investigation criteria were identified on the western portion of the boundary between the central and southern portions of the Precinct underneath the carpark. These elevated concentrations would likely required clean up or management should the Precinct be redeveloped for a more sensitive use.

It is considered likely that further soil and potentially groundwater assessment would be required across all portions of the Precinct to satisfy a future environmental audit.

3.2 Potential Soil and Groundwater Management Measures

In order to allow the Precinct to be redeveloped to a more sensitive use, due to the previous commercial / industrial use of the entire Precinct (with the exception of residential housing in the north east corner) a statutory environmental audit under Section 53X of Environmental Protection Act would likely be required to be completed as a part of the redevelopment. To complete the audit, identified areas of pollution in soil and groundwater that preclude future beneficial uses or represent a potential vapour risk to the proposed development will be required to be cleaned up to the extent practicable.

Should a basement carpark be excavated over part of the site, it is likely that this would result in an additional cost associated with the excavation and off-site disposal of excess soil, which may in part be contaminated. It would also increase the likelihood that vapour mitigation measures (i.e. a vapour

barrier and/or venting of a void space) may be required to be installed beneath the basement due in part to the relatively shallow water table (1 m – 5 m below ground).

Soil and groundwater remediation in the form of in situ chemical oxidation (ISCO) has previously been undertaken in areas of soil and groundwater found to be the most heavily impacted by chlorinated solvents in former Plants 1, 2, and 4 in the central portion of the Precinct. Measurable decreases in chlorinated hydrocarbon concentrations were measured in groundwater following the ISCO remedial attempts, however these decreases did not generally persist and further remediation of the seven impacted soil areas and groundwater within the central portion of the Precinct (as shown on **Figure 1**) will be required as a part of the redevelopment of the Precinct.

For the identified impacted soil and groundwater area shown on **Figure 1**, potential management / remediation measures that may be able to be employed (potentially more than one) to manage potential risks the future development include one or more of the following:

- Soil source remediation – Excavation, off-site disposal and emplacement of carbon source amendment.
- Soil source remediation – Soil mixing and emplacement of carbon source amendment.
- Enhanced groundwater bioremediation with carbon source amendment.
- Enhanced groundwater bioremediation with microbial augmentation.
- Monitored natural attenuation with source remediation.
- Permeable reactive barrier.
- Hydraulic control.

A remediation feasibility study of the technical, logistical, sustainable and financial merit of these potential groundwater remediation technologies will be required to be made as a part of the future environmental audit. It is possible that the feasibility study may identify other emerging remediation technologies that may be able to be adopted to effectively manage the identified soil and groundwater impacts.

Based on Senversa's experience it is considered likely that the successful employment of one or more of the potential management / remediation measures listed above would reduce contaminant concentrations in soil and groundwater to levels that do not represent a risk to the proposed development. Any remediation undertaken would be required to be monitored by an environmental auditor, and a clean up to the extent practicable (CUTEP) determination of groundwater would be required to be made by the EPA or environmental auditor prior to construction beginning.

4.0 Conclusions

Based on review of the available environmental assessment reports, Senversa makes the following conclusions with respect to the future management of soil and groundwater conditions in the context of the proposed redevelopment:

- As there are no significant known off-site risks, the identified soil and groundwater impacts are considered likely to be able to be effectively managed through completion of a Section 53X Environmental Audit, subject to implementation of remediation and post-audit management measures.
- Successful remediation of the main contaminants precluding beneficial uses at the Precinct (chlorinated and petroleum hydrocarbons) has occurred on multiple sites across Victoria over the past 20 years. Existing technology utilised in Victoria including enhanced bioremediation and various source zone remediation techniques has enabled other sites with similar contaminants to be successfully redeveloped for sensitive uses. Post remediation management measures that may be required include determination of a groundwater quality restricted use zone (GQRUZ) restricting groundwater use and ongoing groundwater monitoring under review by an EPA appointed environmental auditor. The requirement for measures would be confirmed during the course of the environmental audit.
- When considering the *Potentially Contaminated Land General Practice Note* (DSE, 2005) and given the high potential for contamination across much of the Precinct, the requirement for an environmental audit is consistent with Ministerial Direction No. 1 of the *Planning and Environment Act*. This could potentially be implemented via the extension of the existing EAO (currently only applies to the southern portion) to the entire Precinct.

5.0 Principles and Limitations of Investigation

5.1 Inherent Uncertainties and Limitations

The investigation works herein are intended to develop and present sound, scientifically valid data concerning actual site conditions. Senversa does not seek or purport to provide legal or business advice.

The following principles are an integral part of site contamination assessment practices and are intended to be referred to in resolving any ambiguity or exercising such discretion as is accorded the user or site assessor.

Area	Field Observations and Analytical Results
Elimination of Uncertainty	Some uncertainty is inherent in all site investigations. Furthermore, any sample, either surface or subsurface, taken for chemical testing may or may not be representative of a larger population or area. Professional judgment and interpretation are inherent in the process, and even when exercised in accordance with objective scientific principles, uncertainty is inevitable. Additional assessment beyond that which was reasonably undertaken may reduce the uncertainty.
Failure to Detect	Even when site investigation work is executed competently and in accordance with the appropriate Australian guidance, such as the National Environmental Protection (Assessment of Site Contamination) Amendment Measure ('the NEPM'), it must be recognised that certain conditions present especially difficult target analyte detection problems. Such conditions may include, but are not limited to, complex geological settings, unusual or generally poorly understood behaviour and fate characteristics of certain substances, complex, discontinuous, random, or heterogeneous distributions of existing target analytes, physical impediments to investigation imposed by the location of, structures and other man-made objects, and the inherent limitations of assessment technologies.
Limitations of Information	The effectiveness of any site investigation may be compromised by limitations or defects in the information used to define the objectives and scope of the investigation, including inability to obtain information concerning historic site uses or prior site assessment activities despite the efforts of the user and assessor to obtain such information..
Chemical Analysis Error	Chemical testing methods have inherent uncertainties and limitations. Senversa routinely seeks to require the laboratory to report any potential or actual problems experienced, or non-routine events which may have occurred during the testing, so that such problems can be considered in evaluating the data.
Level of Assessment	The investigation herein should not be considered to be an exhaustive assessment of environmental conditions on a property. There is a point at which the effort of information obtained and the time required to obtain it outweigh the benefit of the information gained and, in the context of private transactions and contractual responsibilities, may become a material detriment to the orderly conduct of business. If the presence of target analytes is confirmed on a property, the extent of further assessment is a function of the degree of confidence required and the degree of uncertainty acceptable in relation to the objectives of the assessment.
Comparison with Subsequent Inquiry	The justification and adequacy of the investigation findings in light of the findings of a subsequent inquiry should be evaluated based on the reasonableness of judgments made at the time and under the circumstances in which they were made.
Data Useability	Investigation data generally only represent the site conditions at the time the data were generated. Therefore, the usability of data collected as part of this investigation may have a finite lifetime depending on the application and use being made of the data. In all respects, a future reader of this report should evaluate whether previously generated data are appropriate for any subsequent use beyond the original purpose for which they were collected, or are otherwise subject to lifetime limits imposed by other laws, regulations or regulatory policies.
Nature of Advice	The investigation works herein are intended to develop and present sound, scientifically valid data concerning actual site conditions. Senversa does not seek or purport to provide legal or business advice.

5.2 Project Specific Uncertainties

Specific uncertainties and limitations noted for this investigation are as follows:

- The assessment is based on a review of the condition of the site at the time of assessment undertaken each package of land. Senversa's conclusions presented in this report are therefore based on the information available during the assessment.
- This review relied on previous soil and assessment works undertaken by separate consulting firms, and Senversa cannot verify the quality and/or reliability of soil or groundwater data within these reports.
- The scope of work performed as part of this assessment may not be appropriate to satisfy the needs of any other person. Any other person's use of, or reliance on, the findings, conclusions, recommendations or any other material presented herein, is at that person's sole risk.

6.0 References

Australian Standard 4482.1-2005. Guide to the investigation and sampling of sites with potentially contaminated soil. Part 1: Non-volatile and semi-volatile compounds. Appendix J - Chemical Contaminants listed by industry type.

Department of Sustainability and Environment (2005) *Potentially Contaminated Land General Practice Note,* June 2005

Environmental Risk Sciences, 2012. Human Health Risk Assessment – Former Manufacturing Facility, East Bentleigh. October 2012.

IT Environmental, 2006. Environmental Audit Report, 236-262 East Boundary Road, Bentleigh East

LRM Global, 2015a. Environmental Site Assessment Phase I, 236-262 East Boundary Road, Bentleigh East. March 2015.

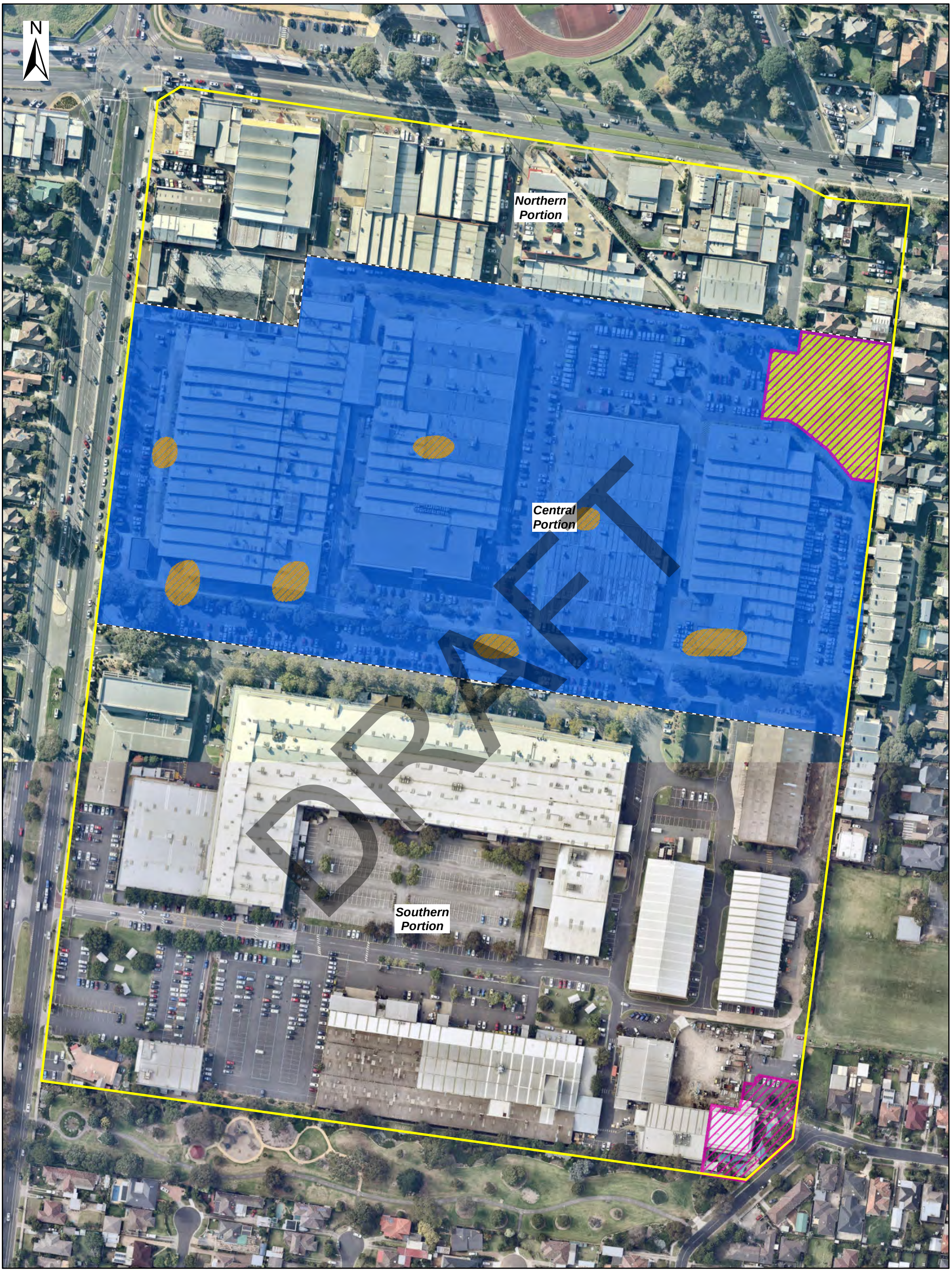
LRM Global, 2015b. Environmental Site Assessment Phase I, 236-262 East Boundary Road, Bentleigh East. August 2015.

Peraco, 2015. Environmental Audit Report, Part of 16 Griffith Avenue, Bentleigh East. May, 2015.

Senversa, 2016. Passive Soil Vapour, Soil and Groundwater Assessment Report, 240-246 East Boundary Road, Bentleigh East. January 2016.

Figures

Figure 1: Summary of Environmental Conditions



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Legend

- Precinct Boundary
- Portion
- Groundwater Quality Restricted Use Zone (GQRUZ)
- Environmental Audit Completed
- Soil Conditions Conditions Likely Requiring Management
- Groundwater Conditions Likely Requiring Management

Designed:	C. Sandiford	Date:	18/09/2017
Drawn:	S. Koroblitsas	Revision:	0
Checked:	.	Scale:	1:2,000 (A3)
File:	M13169_02_F001 sum of enviro conditions		

0 10 20 40 60 80 Metres

Datum GDA 1994, Projection MGA Zone 55

Figure No:	**1**
Title:	**Summary of Environmental Conditions**
Project:	Project
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Client:	VPA

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