



Aargus

Environmental - Remediation - Engineering - Laboratories - Drilling

PRELIMINARY SITE INVESTIGATION

**1 Villawood Place,
Villawood NSW**

Prepared for

Grandview Co Pty Ltd

5th November 2015

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ABBREVIATIONS

AIP	Australian Institute of Petroleum Ltd
ANZECC	Australian and New Zealand Environment and Conservation Council
AST	Aboveground Storage Tank
BGL	Below Ground Level
BTEX	Benzene, Toluene, Ethyl benzene and Xylene
COC	Chain of Custody
DQOs	Data Quality Objectives
DSI	Detailed Site Investigation
EIL	Ecological Investigation Level
EIS	Environmental Investigation Services
EPA	Environment Protection Authority
ESL	Ecological Screening Level
HIL	Health-Based Soil Investigation Level
HSL	Health Screening Level
LGA	Local Government Area
NEHF	National Environmental Health Forum
NEPC	National Environmental Protection Council
NHMRC	National Health and Medical Research Council
OCF	Organochlorine Pesticides
OPP	Organophosphate Pesticides
PAH	Polycyclic Aromatic Hydrocarbon
PCB	Polychlorinated Biphenyl
PID	Photo Ionisation Detector
PQL	Practical Quantitation Limit
PSI	Preliminary Site Investigation
QA/QC	Quality Assurance / Quality Control
RAC	Remediation Acceptance Criteria
RAP	Remediation Action Plan
RPD	Relative Percentage Difference
SAC	Site Assessment Criteria
SMP	Site Management Plan
SVC	Site Validation Criteria
TCLP	Toxicity Characteristics Leaching Procedure
TPH	Total Petroleum Hydrocarbons
UCL	Upper Confidence Limit
UST	Underground Storage Tank
VOC	Volatile Organic Compounds
VHC	Volatile Halogenated Compounds

EXECUTIVE SUMMARY

Aargus Pty Ltd (Aargus) was appointed by Grandview CO Pty Ltd (the 'client') to undertake a Preliminary Site Investigation (PSI) for the property located at 1 Villawood Place, Villawood NSW (the 'site'). The site is proposed for redevelopment into a multi-storey commercial and residential building including triple-level basement parking.

A PSI was requested by Fairfield City Council to determine the potential for onsite contamination. This report shall provide a preliminary assessment of any site contamination and, if required, provide a basis for a more detailed investigation.

At the time of the inspection (16th October 2015), the site comprised of a two-storey commercial and residential building named 'Woodville Shopping Village', and a carpark along the western boundary. The commercial entities that occupied the ground floor site include a services office named Woodville Alliance, a household appliances store named i-Home Shop 'n' Save, and restaurants named Villawood China Takeaway, Canton House Takeaway, Bakery Al Sabah & Al Farah, Woodville Village Food and Saddik Halal Meat. The second floor of the site consisted of residential properties. The main access to the site was along Villawood Place along the eastern boundary and Kamira Court along the western boundary of site.

The land title information provided for the site suggested that the site was owned by private individuals until 1944. From 1944 to date, the site was owned by a number of commercial entities, excluding 1961 to 1962 when it was owned by private proprietors. This is consistent with aerial photography which appeared to show the land use of the site to have been continuously commercial from at least 1955 to date. The aerial photography also appeared to show that from at least 1930 to 1955, the site was vacant land. The structure of the current building appeared to have been developed sometime between 1991 and 2015. From 1976 to date, the site has been leased by a range of private individuals and commercial companies. In 2015, the site was transferred to the current site owners Grandview Co. Pty Ltd.

The land title information provided indicated that the site was owned from 1959 to 1960 by The Shell Company of Australia Ltd, which is a fuel supply company.

The findings of the assessment indicated the following areas of potential environmental concern:

- Potential importation of uncontrolled fill that may contain various contaminants;
- Current or past use of pesticides;
- Car park areas where leaks and spills from cars may have occurred;
- Previous petrol station;
- Stockpile that may contain various contaminants; and
- Asbestos based materials.

The contaminants that may be present in some of these areas were considered to be of low to moderate significance in terms of risk to the human and environmental receptors identified.

Therefore, a Detailed Site Investigation (DSI) is required to confirm the presence and extent of contamination in order to determine the suitability of the site for the proposed development application and to address the data gaps identified.

Based on the information collected during this investigation and in reference to Clause 7 (DA development of SEPP 55), the site will be suitable subject to the completion of a Detailed Site Investigation (and after remediation and validation, if required) for the proposed multi-storey commercial and residential building including triple-level basement parking.

1 INTRODUCTION

1.1 Background

Aargus Pty Ltd (Aargus) was appointed by Grandview CO Pty Ltd (the 'client') to undertake a Preliminary Site Investigation (PSI) within the property located at 1 Villawood Place, Villawood NSW (the 'site'). The location of the property is presented in Figure 1 of Appendix A.

It is understood that the site is proposed for the demolition of existing buildings and redevelopment into a multi-storey commercial and residential building including triple-level basement parking. The proposed development plans can be found in Appendix B.

A site investigation was requested by Fairfield City Council to determine the potential for onsite contamination as part of the Development Application (DA).

1.2 Objective

The primary objectives of this PSI are as follows:

- Identify potential areas where contamination may have occurred from current and historical activities;
- Identify potential contaminants associated with potentially contaminating activities;
- Assess the potential for soils and groundwater to have been impacted by current and historical activities; and
- Assess the suitability of the site for redevelopment into a multi-storey commercial and residential building including triple-level basement parking, based on its current condition and the findings of this investigation.

1.3 Scope of Works

The scope of works for this PSI includes:

- Review of the physical site setting and site conditions based on a site inspection, including research of the location of sewers, drains, holding tanks and pits, spills, patches of discoloured vegetation, etc. (where applicable);
- Research and review of the information available, including previous environmental investigations, current and historical titles information, review of aerial photographs, groundwater bore searches, EPA notices, council records, anecdotal evidence, site survey and site records on waste management practices;
- Development of a preliminary Conceptual Site Model (CSM) to demonstrate the interactions between potential sources of contamination, exposure pathways and human/ecological receptors identified; and
- Recommendations for additional investigations should any data gaps be identified or possible strategies for the management of the site, where relevant.

This report was prepared with reference to the NSW Environment Protection Authority (EPA) "*Guidelines for Consultants Reporting on Contaminated Sites*" (2011).

2 SITE IDENTIFICATION AND DESCRIPTION

2.1 Site Identification

Site identification information and land use is summarised in the table below.

Table 1: Site Identification

Lot and DP Number (Address)	Lot 4 in DP1013056 (1 Villawood Place, Villawood NSW)
Coordinates (SE corner)*	Latitude: -33.882478, Longitude: 150.975882
Approx. Site Area	2,324m ²
Local Government Area	Fairfield
Parish	St John
County	Cumberland
Current Land Zoning**	B2 – Local Centre
Proposed Land Use	Commercial and residential
Current Site Owner	Grandview CO Pty Ltd
Site End Users	Residents (adults & children), workers, customers

Notes: * refer to <http://maps.six.nsw.gov.au/>

** refer to Fairfield Zoning Map published in

http://www.legislation.nsw.gov.au/map/2850_COM_LZN_020_010_20150319.pdf?id=68c4a931-df99-453f-b457-dc0e51af6aab

The site boundary and Lot and DP numbers are presented in Figure 2 of Appendix A. A survey plan provided by the client is included in Appendix B.

2.2 Site Inspection

A site visit was carried out on Friday 16th October 2015 by an Aargus field scientist to inspect the site for any potential sources of contamination and document any observations made regarding the current site conditions. At the time of the inspection, a number of sections within the site were inaccessible; hence observations were limited to the available areas of the site. The following observations were made:

- The site was occupied and consisted of a property named 'Woodville Shopping Village'.
- The site comprised of a two-storey commercial and residential building with a tile roof, and a carpark along the western boundary.
- The inside of the building was occupied and inaccessible.
- The commercial entities that occupied the ground floor site include a services office named Woodville Alliance, a household appliances store named i-Home Shop 'n' Save, and restaurants named Villawood China Takeaway, Canton House Takeaway, Bakery Al Sabah & Al Farah, Woodville Village Food and Saddik Halal Meat. The second floor of the site consisted of residential properties.
- The site floor was observed to be sealed by gravel and concrete. The majority of the carpark was sealed by gravel, excluding a section to the east of 'Woodville Alliance', and a concrete pavement along the rear of the restaurants. The sealed surfaces were in generally good condition.
- No vegetation was present within the site during the time of the investigation. Trees were observed outside the northern and eastern boundaries of the site, with no visible signs of stress.
- The main access to the site was along Villawood Place along the eastern boundary and Kamira Court along the western boundary of site.
- No surface standing water was noticed at the site.
- A stockpile of plastic bags of waste was observed in the north of the carpark along the western boundary.

The site features are presented in Figure 3 of Appendix A. Site photographs are included in Appendix C.

2.3 Topography and Surface Water Drainage

The following observations were made during the site inspection carried out on the 16th October 2015:

- The site topography is generally flat, with Villawood Place (along the eastern boundary) slightly sloping to the north east at approximately 2% slope.
- The carpark outside the western boundary, not pertaining to site, was observed to be slightly sloping to south east at approximately 5% slope.
- Stormwater drains were observed in the carpark outside the western boundary of site.
- Stormwater runoff from the site is expected to flow in a south-easterly along the carpark, towards the site, and in a north easterly direction along Villawood Place.

Copies of the topographical survey provided by the client, including existing stormwater and sewer drainage plans can be found in Appendix B.

2.4 Surrounding Land Uses

The surrounding land uses identified are described in the table below:

Table 2: Surrounding Land Uses

Orientation	Description
North	Villawood Road, then commercial properties
East	Villawood Place, then carpark and commercial properties
South	Medical centre, carpark, commercial properties
West	Carpark, then Kamira Court, then vacant land

3 SITE HISTORY

3.1 Land Titles

A review of historical documents held at the NSW Department of Lands offices was undertaken to identify the current and previous land owners, and potential land uses. The results of the title search are summarised in the following table.

Table 3: Land Title Information

Year	Lot 4 in DP1013056 (1 Villawood Place, Villawood NSW)
2015-Current	Grandview Co. Pty Ltd
2010-2015	Wintolly Property Pty Ltd
2011-2012	Lease: Villawood Halal Meat Pty Ltd
2000-2010	The Villawood Town Centre Pty Ltd
2008-2009	Lease: An Zhong Yang
2005-2010	Lease: Phu Phuong Mach / Susan Muoi Tran
2005-2008	Lease: Van Nam Nguyen c/- Quy Lawyers / Diab Corporation Pty Ltd
2004-2013	Lease: Constanti Enterprises Pty Ltd / Sungate Pty Ltd
2004-2005	Lease: Aminatta Abraham
2003-2007	Lease: Taleb Elsheick / Hala Elsheick
2003-2012	Lease: Woodville Community Services Incorporated
	Prior: Vol. 8649, Fol. 84
1995-2000	The Council of the City of Fairfield / New South Wales Land and Housing Corporation
1995-1995	The Housing Commission of Australia
1993-1998	Lease: John Lui / Pauline Lui
1993-1995	Lease: Georg Sidney Khoury
1989-1992	Lease: Malek Helweh
	Prior: Vol. 7222, Fol. 38
1974-1995	New South Wales Land and Housing Corporation
1976-	Lease: The Council of the Municipality of Fairfield
1962-1974	The Council of the Municipality of Fairfield
1961-1962	Heather Eleanor Turnbull / Esme Irene Turnbull
1961-1961	John Albert Higgs / Ronald David Higgs / Rita Gillies
1961-1961	Commonwealth Savings Bank of Australia
1960-1961	Town & Country Development Pty Ltd
1960-1960	Flemings Food Stores Pty Ltd
1959-1960	The Shell Company of Australia Ltd
1956-1959	Rural Bank of New South Wales
1944-1956	The Housing Commission of New South Wales
	Prior: Vol. 4372, Fol. 124
1930-1944	Harold Mandeville
-1930	Emily Clutterbuck / William Reuben Bullivant / Fred Arthur Jacobs / Florence Elizabeth Powell / Charles Fry

In summary, the land title information provided for the site suggested that the site was owned by private individuals until 1944. From 1944 to date, the site was owned by a number of commercial entities, excluding 1961 to 1962 when it was owned by private proprietors. From 1976 to date the site has been leased by a range of private individuals and commercial companies. In 2015, the site was transferred to the current site owners Grandview Co. Pty Ltd.

The operations of the listed companies (where available) have been compiled and will further identify possible land uses at the time of ownership and / or lease and include the following:

- Internet searches indicate that Grandview Co. Pty Ltd is noted as a property development and construction company.
- Internet searches indicate that Wintolly Property Pty Ltd is Australian Proprietary Company.
- Internet searches indicate that Villawood Halal Meat Pty Ltd is a butcher.
- Internet searches indicate that The Villawood Town Centre Pty Ltd is an Australian Proprietary Company.
- Internet searches indicate that Quy Lawyers is a lawyers and solicitors firm.
- Internet searches indicate that Diab Corporation Pty Ltd is an Australian private company, previously known as Ettos Café.
- Internet searches indicate that Constanti Enterprises Pty Ltd is a video tape rental store.
- Internet searches indicate no information about Sungate Pty Ltd.
- Internet searches indicate that Woodville Community Services Incorporated is not-for-profit community organisation, focusing on the support of young people.
- Internet searches indicate that The Council of the City of Fairfield is the local council authority of the Fairfield local government area.
- Internet searches indicate that New South Wales Land and Housing Corporation is responsible for the ownership and management of the NSW Government social houses.

- Internet searches indicate no information about The Housing Commission of Australia.
- Internet searches indicate that Commonwealth Savings Bank of Australia is an Australian multinational bank.
- Internet searches indicate no information about Town & Country Development Pty Ltd.
- Internet searches indicate no information about Flemings Food Stores Pty Ltd.
- Internet searches indicate that The Shell Company of Australia Ltd is the Australian franchise of Royal Dutch Shell, which is a fuel supply company.
- Internet searches indicate that Rural Bank of New South Wales, now known as State Bank of New South Wales and a part of Commonwealth bank, is an Australian bank.

Historical land titles information obtained by Aargus can be found in Appendix D.

3.2 Aerial Photographs

Selected aerial photographs obtained from the NSW Department of Lands were reviewed to describe the site features and surrounding areas at various timelines. A summary of the review is presented in the table below.

Table 4: Summary of Historical Aerial Photos

Year	Site	Surrounding areas
1930	The site appeared to consist of vacant land with a street running through the northern portion and another through the southern portion. However, it was noted that the photo resolution was poor.	N: Vacant land S: Vacant land E: A street, then vacant land W: Vacant land
1943	The site layout appeared to be similar to that observed in the 1930 photo.	No significant changes are visible to the surrounding properties
1955	The site appeared to comprise of three new buildings along the north eastern portion, the	No significant changes are visible to the surrounding properties, with the exception of:

Year	Site	Surrounding areas
	south eastern portion of the site, and the western corner of the site. The streets that previously crossed the site appear to have been covered by the new development.	N: A street, then vacant land
1970	The site layout appeared to be similar to that observed in the 1955 photo, with the addition of car parking spots in the centre of the northern section of the site and along the western boundary of the southern section.	N: A street, then vacant land S: Commercial/industrial developments E: Trees, then a street, then a carpark W: A street then, commercial developments and concrete sealed land possibly used as a carpark
1991	The site layout appeared to be similar to that observed in the 1970 photo. However, it was noted that the photo resolution was poor.	No significant changes are visible to the surrounding properties, with the exception of: N: A street, then commercial developments
2015	The site layout appeared to comprise of a new larger building, attached to the southern and eastern sections of the site, and taking up the northern section of the site. Car parking areas were allocated along the western boundary of the southern section and in the eastern corner of the northern section.	No significant changes are visible to the surrounding properties, with the exception of: W: A street then, a carpark and vacant land

In summary, land use of the site appeared to have been continuously commercial from at least 1955 to date. Prior to 1955, the site appeared as vacant land, from at least 1930. The structure of the building appeared to have been developed sometime between 1991 and 2015.

The general land use of the immediate site vicinity seems to have been consistently a combination of commercial/industrial developments and vacant land from 1930 to date.

Copies of current and historical aerial photographs are presented in Appendix E.

3.3 EPA Records

3.3.1 CLM Act 1997

The NSW EPA publishes records of contaminated sites under Section 58 of the Contaminated Land Management (CLM) Act 1997. The notices relate to investigation and/or remediation of site contamination considered to pose a significant risk of harm under the definition in the CLM Act. However, it should be noted that the EPA record of Notices for Contaminated Land does not provide a record of all contaminated land in NSW.

A search of the EPA database revealed that the subject site is not listed. However, four other sites were listed within the Fairfield Local Government Area. The four sites were situated between 1.5km and 4km away from the site and were not considered to pose an adverse impact on the site.

Copies of the EPA records are included in Appendix F.

3.3.2 POEO Register

A search of the POEO Register revealed that the site was not listed. A copy of the POEO register search is included in Appendix F.

3.4 WorkCover NSW Records

A search of the Stored Chemical Information Database (SCID) for licences to keep dangerous goods at the site was requested from the WorkCover NSW. A search was conducted by WorkCover NSW on the 27th October 2015. No records were located pertaining to the site.

Copies of the WorkCover search documentation are attached in Appendix G.

3.5 Section 149 Certificates

The Planning Certificate – Section 149 (2) of the Environmental Planning & Assessment Act 1979 for the site was obtained by the client and provided to Aargus for review. A summary of the information pertaining to the site is provided below:

- The site is zoned B2 – Local Centre under the provision of the *Fairfield Local Environmental Plan 2013*.
- Complying Developments under the Housing Alterations Code, General Commercial and Industrial Code, General Development Code, Subdivisions Code and Demolition Code may be carried out.
- The land does not include or comprise conservation areas, or environmental heritage items.
- The property is not affected by road widening or road realignment under the Roads Act.
- The land is not affected by the operation of Section 38 or 39 of the *Coastal Protection Act 1979*.
- The land is not within a proclaimed mine subsidence district.
- The land is not affected by a policy that restricts the development of the land because of the likelihood of land slip, bush fire, tidal inundation, subsidence or acid sulphate soils.
- The land is subject to the flood related development controls included in the Fairfield City-Wide Development Control Plan 2013. The land is within the floodplain and identified as being partly within a Medium Flood Risk Precinct and partly within a Low Flood Risk Precinct as a result of overland flooding.
- The land is not affected by one of the matters prescribed by Section 59 (2) of the *Contaminated Land Management Act 1997*.

Copies of the certificates are included in Appendix H.

3.6 Council Search Records

The Fairfield City Council was in the process of providing approval for database access in order to disclose file records relating to the site, however approval was not granted at the time of writing this report.

3.7 Industrial Processes and Products Manufactured

A review of the industrial processes and/or products manufactured at the site was conducted, and a summary of the information pertaining to the site is provided below:

- Processes associated with previous operations at the site as a potential petrol station from 1959 to 1960

3.8 Former Chemical Storage and Transfer Areas

A review of the former chemical storage and transfer areas and/or products manufactured at the site was conducted, and a summary of the information pertaining to the site is provided below:

- Fatty oils disposal storage
- Cooking oils
- Pump bowsers and associated piping
- Possible chemical and storage and transfer areas associated with previous operations at the site as a petrol station from 1959 to 1960

3.9 Product Spill & Loss History

It was indicated by the client, that to their knowledge no serious land or water contamination had occurred.

The majority of the site is currently either occupied by a building and/ or sealed surfaces. At the time of the inspections, the sealed surfaces were in generally good condition with only minor stains observed. There were no visible signs of oil and/or chemical staining, indicating that any surface spills (if they did occur at all) were cleaned up immediately and did not appear to penetrate the existing slab.

3.10 Discharges to Land, Water and Air

At the time of the inspection, discharges to land, water or air were not observed at the site.

3.11 Complaints History

There was no information obtained or provided indicating any relevant complaint history pertaining to the site.

3.12 Historical Use of Adjacent Land

It was indicated by the client that to their knowledge, the adjacent lands to the site have been used primarily for commercial/industrial developments and vacant land

3.13 Discussion and Summary of Site History

Based on available information, the site historical usage is summarised as follows:

- The land title information provided for the site suggested that the site was owned by private individuals until 1944. From 1944 to date, the site was owned by a number of commercial entities, excluding 1961 to 1962 when it was owned by private proprietors. This is consistent with aerial photography which appeared to show the land use of the site to have been continuously commercial from at least 1955 to date. The aerial photography also appeared to show that from at least 1930 to 1955, the site was vacant land. The structure of the current building appeared to have been developed sometime between 1991 and 2015. From 1976 to date, the site has been leased by a range of private individuals and commercial companies. In 2015, the site was transferred to the current site owners Grandview Co. Pty Ltd.
- The land title information provided indicated that the site was owned from 1959 to 1960 by The Shell Company of Australia Ltd, which is a fuel supply company.
- The Planning Certificate – Section 149 (2) of the Environmental Planning & Assessment Act 1979 informs that the site not affected by one of the matters prescribed by Section 59 (2) of the *Contaminated Land Management Act 1997*, however the site is affected by flood related developments controls as contained in *Fairfield City-Wide Development Control Plan 2013*.
- A search of the Stored Chemical Information Database (SCID), for licences to keep dangerous goods at the site, conducted by WorkCover NSW shows no records pertaining to the site.

4 ENVIRONMENTAL SETTING

4.1 Sensitive Environmental Receptors

The nearest down-gradient watercourse is Prospect Creek, located approximately 1.2km south-west of the site, which eventually discharges into the Georges River, located approximately 2.1km south-west of the site. The nearest recreational area is Fairfield Park and is located approximately 1.2km north-west of site.

4.2 Geology

The Geological Map of Sydney (Geological Series Sheet 9130, Scale 1:100,000, 1983), published by the Department of Mineral Resources, indicates the residual soils within the site to be underlain by Quaternary Age soils consisting of fine grained sand, silt and clay.

4.3 Acid Sulfate Soils

To determine whether there is a potential for acid sulphate soils to be present at the site, reference was made to the NSW Department of Land & Water Conservation (DLWC) *Acid Sulphate Soil Risk Maps* (Edition Two, December 1997, Scale 1:250,000), specifically Map No. 92 – “Liverpool”. A review of the map indicated that there is no known occurrence of acid sulphate soil materials at the site, and the presence of acid sulphate soils was considered to be unlikely.

4.4 Hydrogeology

Based on available information, our desktop study indicates that groundwater from site is likely to be flowing towards the Prospect Creek (approximately 1.2km south-west of the site) that eventually discharges into the Georges River.

A search of the Department of Natural Resources (DNR) borehole database information revealed thirty-one (31) groundwater bores within a 1km radius of the site.

Detailed groundwater bore records were not available at the time of reporting. However, based on the local experience and previous investigation conducted by Aargus in the local area, the groundwater is likely to present at a shallow to moderate depth within the more permeable clay soils in the area. Groundwater present within the clay soils is likely to be under semi-confined conditions with low recharge rates during heavy rainfall events. It is also estimated that the groundwater present on site is likely to be fresh to brackish in terms of its salinity.

4.5 Local Meteorology

The monthly rainfall of the local area can be represented by the data collected by Bureau of Meteorology (BOM) from the rainfall gauge located in Bankstown Airport AWS, which is located approximately 4.2 km south east of the site. Records indicate that the total monthly rainfall for September 2015 was 33.4 mm and that the annual mean since 2000 is 788.64 mm.

Reference can be made to Appendix I – Local Meteorology.

5 AREAS OF POTENTIAL ENVIRONMENTAL CONCERN

Based on the site inspection, site history, previous reports and review of available information from the desktop study, the potential Areas of Environmental Concern (AEC) and their associated Contaminants of Concern (CoC) for the site were identified. These are summarised in the following table.

Table 5: Summary of Potential Areas and Contaminants of Concern

Potential AEC	Potentially contaminating activity	Potential CoCs	Likelihood of Site Impact	Justification
Entire site	Importation of fill material from unknown origin	Metals, TPH, BTEX, PAH, OCP, PCB, Phenols, Cyanides, Asbestos	Low	Based on the site observations and site topography, the presence of imported fill material is likely to be minimal.
	Potential for pesticides to have been sprayed or injected on or underneath concrete slabs	OCP	Low	The site is not known for having been used for agricultural purposes from the 1950s when OCPs were first introduced into Australia. If use of OCPs has occurred, the impact is likely to have been localised and limited to the topsoil layer.
Former activities, including a petrol station	Leaks from vehicles, fuels, oils, hydraulic fluids, USTs, bowsters, and associated pipelines	Metals, TPH, BTEX, PAH, VOC, phenols	Low to Moderate	No staining and/or cracking were noted on the sealed surfaces.
Stockpile in north of western boundary	Mitigation of contaminants from stockpiled materials	Metals, TPH, BTEX, PAH, asbestos	Low	No staining and/or cracking were noted on the sealed surfaces.
Building Structures	Potential Asbestos/Fibro Features	Asbestos	Low	If present, these will be removed by licensed contractors.
Car parking areas	Leaks from vehicles	Metals, TPH, BTEX, PAH	Low	Minimal staining was noted on the sealed surfaces.

6 PRELIMINARY CONCEPTUAL SITE MODEL

6.1 Conceptual Site Model

The Preliminary Conceptual Site Model (CSM) presented in the table below provides a representation of the potential risks associated with the linkages between the following elements:

- Potential contamination sources and their associated contaminants of concern identified in Section 5. Only potential areas of concern with a significance rating of low to high were included;
- Potential human receptors that may be impacted by site contamination are current and future end-users, construction workers and the general public within the immediate vicinity;
- Potential environmental receptors identified in Section 4;
- Potential exposure pathways; and
- Whether each source-pathway-receptor pollution linkage are complete, limited or not present, based on current and future site conditions.

Table 6: Conceptual Site Model

Potential Sources	Potential Receptor	Potential Exposure Pathways	Complete Linkages	Risk	Justification
Contaminated soil from placement of uncontrolled fill across the site. Use of OCPs. Current industrial activities. Hydrocarbon spills and leakages from parked vehicles. Previous petrol station. Contamination from stockpile. Asbestos.	Site users or the general public	Dermal contact, inhalation or ingestion of exposed impacted soils	Limited (Current)	Low	Direct contact with impacted soils is limited due to the sealed concrete and gravel surfaces.
			No (Future)	Negligible	If present, contaminated soils are likely to be remediated and removed with the remaining soils from the basement excavation level for off-site disposal.
	The aquatic ecosystems at the nearby creek discharging into Georges River	Migration of impacted groundwater and surface water run-off	Limited (Current)	Low	No obvious sources of contamination were observed on site that could migrate off site with surface water run-off.
			No (Future)	Low	If present, contaminated soils and groundwater is likely to be remediated and any remaining residual contamination would likely be at acceptable concentrations upon reaching the waterway.
	Underlying Bedrock Aquifer	Leaching and migration of contaminants through groundwater infiltration	Limited (Current)	Low to Moderate	Depending on the thickness of the expected confining layer and leachability of metals and organic compounds, vertical migration of contaminants may be limited. However, suspected sub-surface hydrocarbon contamination by mechanical operations leakages may be present and extend into the bedrock aquifer.
			No (Future)	Low	If present, contaminated soils and groundwater is likely to be remediated and any remaining residual contamination would likely be at acceptable concentrations upon reaching the underlying aquifer

6.1.1 Data Gaps

Based on the CSM, the following data gaps were identified with respect to the pollution linkages identified:

- The presence and thickness of imported fill material, if any.
- Confirmation if contamination has occurred from current and historical site activities through collection and laboratory analysis of soil.
- The presence and quality of groundwater is currently unknown and may be impacted by contaminated fill and leakages from current and former operations on site.
- The Fairfield City Council records were not obtained and need to be read to further define the CSM.

7 CONCLUSION AND RECOMMENDATIONS

The findings of the assessment indicated the following areas of potential environmental concern:

- Potential importation of uncontrolled fill that may contain various contaminants;
- Current or past use of pesticides;
- Car park areas where leaks and spills from cars may have occurred;
- Previous petrol station;
- Stockpile that may contain various contaminants; and
- Asbestos based materials.

The contaminants that may be present in some of these areas were considered to be of low to moderate significance in terms of risk to the human and environmental receptors identified.

Therefore, a Detailed Site Investigation (DSI) is required to confirm the presence and extent of contamination in order to determine the suitability of the site for the proposed development application and to address the data gaps identified.

Based on the information collected during this investigation and in reference to Clause 7 (DA development of SEPP 55), the site will be suitable subject to the completion of a Detailed Site Investigation (and after remediation and validation, if required) for the proposed multi-storey commercial and residential building including double-level basement parking.

Thank you for the opportunity to undertake this work. We would be pleased to provide further information on any aspects of this report.

For and on behalf of

Aargus Pty Ltd

Written by:



Celine El-Khoury

Environmental Engineer

Reviewed By:



Mark Kelly

Environmental Manager

LIMITATIONS

The Aargus assessment is based on the result of limited site investigations and sample testing. Neither Aargus, nor any other reputable consultant, can provide unqualified warranties nor does Aargus assume any liability for site conditions not observed or accessible during the time of the investigations.

Despite all reasonable care and diligence, the materials encountered and concentrations of contaminants measured may not be representative of conditions between the locations sampled and investigated. There is always some disparity in subsurface conditions across a site that cannot be fully defined by investigation. Hence it is unlikely that measurements and values obtained from sampling and testing during environmental works carried out at a site will characterise the extremes of conditions that exist within the site. In addition, site characteristics may change at any time in response to variations in natural conditions, chemical reactions, truck movement or contractor movement of soils and other events, e.g. groundwater movement and or spillages of contaminating substances. These changes may occur subsequent to Aargus investigations and assessment.

This report and associated documentation and the information herein have been prepared solely for the use of the client and interested parties at the time of writing the report and is valid (for the purposes of management or transport of material) for a period of one month only from the date of issue. Any other reliance assumed by third parties on this report shall be at such parties' own risk. Any ensuing liability resulting from use of the report by third parties cannot be transferred to Aargus.

Whilst this report provides a review of site conditions encountered at sampling locations within the investigation, it should be noted that if materials are proposed to be moved from site - Part 5.6, Section 143 of the Protection of the Environment Operations (POEO) Act 1997 states that it is an offence for waste to be transported to a place that cannot lawfully be used as a facility to accept that waste. It is the duty of the owner and transporter of the waste to ensure that all material removed from a site must be accompanied by an appropriate waste classification report and materials are disposed of appropriately. An environmental or validation report does not constitute a waste classification report and results are treated

differently. Aargus accepts no liability for the unlawful disposal of waste materials from any site. Aargus does not accept any responsibility for the material tracking, loading, management, transport or disposal of waste from the site. If material is to be removed from a site, before disposal of any material to a licensed landfill is undertaken, the site owner must ensure an appropriate waste classification exists for all materials on the site planning to be removed, the waste producer will need to obtain prior consent from the licensed landfill/recycler. The receiving site should check to ensure that the material received matches the description provided in the report.

Opinions are judgements, which are based on our understanding and interpretation of current regulatory standards, and should not be construed as legal opinions.

Appendix J – Important information about your environmental site report should also be read in conjunction with this report.

REFERENCES

This report was prepared with reference to the following guiding documents:

- ANZECC/NHMRC (1992) – “Australian and New Zealand Guidelines for the Assessment and Management of Contaminated Sites”. Australian and New Zealand Environment and Conservation Council and the National Health and Medical Research Council, Canberra;
- ANZECC National Water Quality Management Strategy “Australian Water Quality Guidelines for Fresh and Marine Waters”, 1992.
- CRC Care Technical Report No. 13 – Soil Vapour Assessment (August 2009);
- Department of Urban Affairs and Planning – EPA (1998) “Managing Land Contamination – Planning Guidelines – SEPP 55 – Remediation of Land”;
- National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013 (No.1);
- NSW DEC, “Guidelines for the Assessment and Management of Groundwater Contamination” (March 2007);
- NSW DEC “Guidelines for the NSW Site Auditor Scheme” (2006, 2nd edition). NSW Environment Protection Authority, Sydney;
- NSW EPA (2014) – “Waste Classification Guidelines, Part 1: Classifying Waste”;
- NSW DECCW, “Vapour Intrusion: Technical Practice Note”, (September 2010);
- NSW EPA “Guidelines for Assessing Service Station Sites” (1994). NSW Environment Protection Authority, Sydney;
- NSW EPA “Guidelines for Consultants Reporting on Contaminated Sites” (2011). NSW Environment Protection Authority, Sydney;
- NSW EPA “Guidelines on the Duty to Report Contamination under the Contaminated Land Management Act 1997” (2009). NSW Environment Protection Authority, Sydney;
- NSW EPA “Sampling Design Guidelines” (1995). NSW Environment Protection Authority, Sydney.