CALIPH

DETAILED SITE INVESTIGATION REPORT
67 & 75 MARY STREET, 43 ROBERTS STREET, 50 & 52 EDITH STREET, ST PETERS NSW

Report E22317 AA_Rev 3
18 September 2015

Environmental Investigations Australia
Contamination | Remediation | Geotechnical

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REPORT DISTRIBUTION

Detailed Site Investigation Report
67 & 75 Mary Street, 43 Roberts Street, 50 & 52 Edith Street, St Peters NSW

EI Report No.: E22317 AA_Rev 3
Date: 18 September 2015

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Revision	Details	Date	Amended By
0	Original	12 December 2014	-
1	Amendment to proposed development and inclusion of 50 & 52 Edith Street, 43 Roberts Street and 67 Mary Street	30 March 2015	C. Yi
2	Revision in response to amendment of development drawings	4 September 2015	C. Yi
3	Revision in response to amendment of development drawings	18 September 2015	C. Yi

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EXECUTIVE SUMMARY

The land parcels known as 67 & 75 Mary Street, 43 Roberts Street, 50 & 52 Edith Street, St Peters NSW was the subject of a Detailed Site Investigation in order to assess the environmental conditions and the potential for on-site contamination associated with the identified current and former land uses. The findings of this assessment by EI and within the limitations of normal environmental investigations (Section 12), were:

- The site comprised an irregular shaped block covering approximately 1.5 hectares (15,289 m^2). It is bounded to the south-west by Mary Street, to the north-west by low density residential buildings followed by Unwins Bridge Road, to the south-east by low density residential buildings and to the north-east by Edith Street;
- At the time of the assessment, 75 Mary Street was occupied by a factory complex consisting of twelve one to three storey industrial buildings and an open car park associated to the complex. The remaining areas of the site were occupied by four residential dwellings;
- A review of the available historical aerials, land title transfer records and council records indicated historical land uses on 75 Mary Street was primarily industrial. In particular, records indicated a paint manufacturing factory had been operating on its premises until the mid-1960s. In the ensuing period, various manufacturing and industrial activities had occurred on this allotment to date. 67 Mary Street, 43 Roberts Street, 50 and 52 Edith Streets appeared to be of residential nature from the 1930s;
- The site was free of statutory notices issued by the NSW EPA/OEH. Records pertaining to the site was not identified on the List of NSW contaminated sites notified to EPA, Stored Chemical Information Database held by WorkCover, or the Protection of the Environment Operations (POEO) public register;
- A plan attached in a historical building application held by Marrickville Council indicated there were three underground storage tanks (USTs) burial areas containing multiple USTs within 75 Mary Street. The site walkover inspection conducted as part of this assessment confirmed the presence of infrastructure associated to USTs (i.e. fill points and vent pipes). Evidence related to chemicals previously stored in the tanks, or the removal of tanks was not available from searches undertaken during the course of this investigation. In addition, the exact number of USTs installed at 75 Mary Street remained inconclusive;
- Soil sampling and testing were conducted at 23 borehole locations down to a maximum depth of 3.25 m bgl, within 75 Mary Street. Due to existing physical obstacles (e.g. building walls, underground and overhanging services and other physical obstructions), the sampling regime was developed using primarily judgemental/targeted sampling patterns which would not allow a systematic characterisation of the environmental conditions on site. The remaining areas of the site were not subject to intrusive investigation due to limited access;
- The sub-surface layers comprised fill materials of various constituents, suggesting several period of filling in the past. The overall geological configuration within the site was anthropogenic fill underlain by residual soils, with Ashfield Shale bedrock at depth.
- Perched groundwater was encountered at 0.03 m bgl at one location (BH4) during the intrusive investigation. Deeper groundwater was inferred to be flowing within the underlying fractured shale bedrock to the south and south-west.

- Laboratory testing of selected soil samples indicated exceedances of the following analytes over the adopted health based investigation/screening levels have been identified on site during this investigation:
  - Lead in the fill layer at BH14;
  - Total recoverable hydrocarbons (TRH) in the fill and residual soil layers at BH3, BH4, BH16 and BH19, located both up and down gradient of the UST burial areas;
  - Carcinogenic and Total Poly Aromatic Hydrocarbons (PAH) in the fill layer at BH7 and BH16, and in both fill and residual soil layers at BH19. Two hotspots were identified at BH16 and BH19;
  - Naphthalene in the fill layer at BH18 and BH19. Both locations were recognised as hotspots;
  - Asbestos in the fill layer at BH2;
  - Elevated concentrations of Chlorobenzene over the interim assessment guidelines was also noted at BH17; and
  - Delineation of impacted profile were not achieved at BH4, BH7, BH16 and BH19.
- Exceedances of heavy metals, TRH and Benzo(a)pyrene over ecological based criteria at various locations across 75 Mary Street were identified. Presence of these contaminants however was not considered posing immediate threat to the existing ecological receptors, as majority of the premises was covered in concrete hardstand, bitumen and gravel pavements;
- Testing of collected groundwater samples identified the following impacts in exceedance of the adopted groundwater investigation and health based screening criteria:
  - Heavy metals (copper, nickel, and zinc) at all wells;
  - F1 and F2 fraction TRH at MW1, MW3 and MW4, with slight sheen and hydrocarbon odour observed at MW4; and
  - Elevated VOCs concentrations over the interim assessment guidelines were noted at MW1, MW4 and MW5.

In summary, contamination was identified at multiple locations onsite during this investigation. The contamination is likely to have been resulted from past filling and from the previous site operations for the storage and manufacture of paint and associated products. Soil and groundwater contamination were noted in both fill and residual strata and likely require remediation prior to any redevelopment. The investigation also identified a number of data gaps which would require further assessment, including intrusive investigation at inaccessible areas during this DSI, prior to any construction at the site, after the site has been vacated and demolition of the targeted structures has been completed.

Based on the findings of this investigation and within the Statement of Limitations, EI considers that the conditions of site soil and groundwater would not prevent the site to be rezoned to allow mixed residential and commercial land-use. The suitability of the site for the proposed development, however, could not be ascertained based on existing data. Recommendations for further investigation and remediation works are provided below in order to render the site suitable (also discussed in Section 11):

1. Preparation of a Remedial Action Plan (RAP) to outline the requirements for the decommissioning of USTs, associated infrastructure, and the remediation requirements for contaminated soils and groundwater. The

RAP should also consider the methodology for the identification and remediation of phase separated hydrocarbons possibly present underneath the site;

2. The RAP should also develop further soil and groundwater investigation program (including soil vapour assessment in TRH and VOCs impacted areas) to close/clarify any data gaps identified during this investigation. Additional investigation should also be conducted at the four residential properties, known as 67 Mary Street, 43 Roberts Street, 50 and 52 Edith Street to characterise conditions within these allotments, once access is available;

3. The RAP should outline further groundwater investigation along the site boundaries and immediately offsite areas to identify potential migration of contaminations and assess the potential risk to on and off-site human and environmental receptors; and

4. The RAP should also outline the need for an ongoing Environmental Management Plan to address potential vapour intrusion risk noted in areas where buildings are to remain (near the old tank/drum cleaning area) to mitigate the risks of exposure for current and future tenants.

5. Due to the limited access available with the presence of tenants and structures, the additional works required as part of the RAP should be conducted once the site has been vacated and demolition of the targeted structures has been completed.

Relevant stakeholders (e.g. landowners) should be aware of the duty to notify EPA regarding contaminated land, details of which are presented in Section 11.2.

In summary EI concludes that the site contamination issues can be managed through the development application process in accordance with the State Environmental Planning Policy 55 (SEPP 55) – Remediation of Land and the Marrickville Council Contaminated Land Policy.

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1. INTRODUCTION

1.1 BACKGROUND AND PURPOSE

Environmental Investigations Australia Pty Ltd (EI) was engaged by Ms Tamara Frangelli of Caliph to conduct a Detailed Site Investigation Report (DSI) on the land parcels known as 67 & 75 Mary Street, 43 Roberts Street, 50 & 52 Edith Street, St Peters NSW ('the site').

The site is situated approximately 6.1 km southwest of the Sydney central business district, within the Local Government Area of Marrickville Council (see Figure 1). The site is identified as Lot 1, DP 556914, Lot 1 DP745014, Lot 1 DP745657, Lot A DP331215, Lot 1 DP 87885 and Lot 1 DP180958, with a total area of approximately 1.5 hectares (15,289 m^2). A site layout plan is presented as Figure 2. This DSI report has been prepared to form part of a development application to Marrickville Council for a proposed rezoning and mixed development (residential/commercial) within the premises.

This DSI report was initially issued on 12 December 2015 (Report Ref. E22317 AA_Rev0), in which the site was identified as 75 Mary Street, St Peters only (also known as Lot 1 DP 556914). The report was subsequently revised on 30 March 2015 (Report Ref. E22317 AA_Rev 1), following an amendment to the proposed development. The revised DSI report incorporated assessment on four additional properties, identified as 50 & 52 Edith Street (Lot 1 DP 745014 and Lot 1 DP 745657), 43 Roberts Street (Lot A DP 331215 and Lot 1 DP 87885) and 67 Mary Street (Lot 1 DP180958). The amended development covered approximately 1.5 hectares (15,289 m^2) area in total.

On 4 September 2015, the DSI report (Ref. E22317 AA_Rev 2) was revised in response to an amendment of the development drawings dated in August 2015.

On 18 September 2015, the DSI report (Ref. E22317 AA_Rev 3) was revised based on the amended development drawings dated in September 2015. Changes to the final site configuration post site development were proposed in the updated development drawings. Relevant environmental implications resulted by the amendment are discussed in sections below.

1.2 PROPOSED DEVELOPMENT

EI was provided with a set of development drawings prepared by Tonkin Zulaikha Greer by the Client in an email dated 16 September 2015. Based on the drawings and the email, EI understood that the proposed development would involve selective demolition of existing buildings located at central to eastern portions of the site, followed by the excavation and construction of two basement levels. The footprint of the proposed basement levels is presented in Figure 4. The development would involve construction of four multi-storey buildings and alterations of existing structures. Proposed land use would include mixed commercial, residential and community, although nature of the community areas were not indicated on the plans supplied to EI. Multiple landscaping areas were proposed on the ground floor. The landscaping areas would partially extend beyond the proposed basement excavation extent.

Copies of the development drawings are attached in Appendix A.

1.3 REGULATORY FRAMEWORK

The following regulatory framework and guidelines were considered during the preparation of this report:

- ANZECC & ARMCANZ (2000) *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*, Australian and New Zealand Environment and Conservation Council / Agriculture and Resource Management Council of Australia and New Zealand, October 2000;
- DECCW (2009) *Guidelines for Implementing the Protection of the Environment Operations (Underground Petroleum Storage Systems) Regulation 2014, (UPSS Guidelines)*, NSW Department of Environment, Climate Change and Water (DECCW, later renamed as the Office of Environment and Heritage – OEH), May 2009;
- DEC (2007) *Guidelines for the Assessment and Management of Groundwater Contamination*, NSW Department of Environment and Conservation (DEC, later renamed OEH), March 2007;
- EPA (1995) *Sampling Design Guidelines*, NSW Environmental Protection Authority, September 1995;
- NEPC (2013) *Schedule B(1) Guideline on Investigation Levels for Soil and Groundwater, National Environment Protection (Assessment of Site Contamination) Measure 1999 – Amendment 2013*, National Environment Protection Council, May 2013;
- NEPC (2013) *Schedule B(2) Guideline on Site Characterisation, National Environment Protection (Assessment of Site Contamination) Measure 1999 – Amendment 2013*, National Environment Protection Council, May 2013;
- *Contaminated Land Management Act* (1997); and
- OEH (2011) *Guidelines for Consultants Reporting on Contaminated Sites*, NSW Office of Environment and Heritage (OEH), August 2011.

1.4 PROJECT OBJECTIVES

The primary objectives of this DSI were to:

- Evaluate the potential of contamination presence on site on the basis of historical land uses, anecdotal and documentary evidence of possible pollutant sources;
- To investigate the degree of any potential contamination by means of intrusive sampling and laboratory analysis, for relevant contaminants; and
- To establish whether Acid Sulfate Soils are present on the site (to 4.5 m below ground level).

A further objective, should site contamination be confirmed, will be to make recommendations for the appropriate management of any contaminated soils and/or groundwater.

Should the assessment confirm the presence of ASSs on the site and find that disturbance to these soils is likely as a consequence of the proposed development, the final report will include recommendations regarding a detailed assessment and the preparation of an Acid Sulfate Soil Management Plan, in accordance with the Acid Sulfate Soils Manual 1998 (ASSMAC, 1998).

1.5 SCOPE OF WORKS

In order to achieve the above objectives and in keeping the project cost-effective while generally complying with the OEH (2011) *Guidelines for consultants reporting on contaminated sites*, the scope of works was as follows:

1.5.1 Desktop Study

- A review of relevant topographical, geological, hydrogeological and soil landscape maps for the project area;
- Search of historical aerial photographs archived at NSW Land and Property Information in order to review previous site use and the historical sequence of land development in the neighbouring area;
- A land titles search, also conducted through NSW Land and Property Information for information relating to site ownership;
- Site history survey involving a detailed search of Marrickville Council records for information relating to operational site history and/or relevant environmental incidents;
- A search through the NSW EPA Land Information records to confirm that there are no statutory notices, notification and licences current on the site under the Contaminated Land Management Act (1997) and Protection of the Environment Operations Act (1997);
- A search of the Stored Chemical Information Database (SCID) and microfiche records held by WorkCover NSW relating to possible underground tank approvals and locations; and
- A review of existing underground services on site.

1.5.2 Field Work

- A detailed site walkover inspection;
- Drilling of boreholes at 23 locations (BH1 – BH23) distributed in a triangular grid pattern across accessible areas of the site;
- Installation of five (5) groundwater monitoring bores drilled to a maximum depth of 9 m (or refusal) both up gradient and down gradient of the proposed redevelopment area. Groundwater monitoring bores will be constructed to standard environmental protocols to investigate the potential for groundwater contamination, and migration of contaminants off-site;
- Multiple level soil sampling within fill and natural soils and one round of groundwater sampling from the five newly constructed groundwater monitoring bores; and
- Laboratory analysis of selected soil and groundwater samples for relevant analytical parameters as determined from the site history survey and field observations during the investigation program.

1.5.3 Data Analysis and Reporting

The final task of this assessment involved the preparation of a DSI report to document investigation works, methodologies used, borehole logs and monitoring well construction logs, with discussion of data search findings and laboratory analytical results in regards to potential risks to human health, the environment and the aesthetic uses of the land.

2. SITE DESCRIPTION

2.1 PROPERTY IDENTIFICATION, LOCATION AND PHYSICAL SETTING

The site identification details and associated information are presented in Table 2-1, while the site locality is shown in Figure 1.

Table 2-1 Site Identification, Location and Zoning

Attribute	Description
Street Address	67 & 75 Mary Street, 43 Roberts Street, 50 & 52 Edith Street, St Peters NSW
Location Description	The site is an irregular shaped block, located approximately 6.1 km south-west of the Sydney CBD. It is bounded to the south-west by Mary Street, to the north-west by low density residential buildings followed by Unwins Bridge Road, to the south-east by low density residential buildings and to the north-east by Edith Street. Coordinates of the north corner of site under GDA94-MGA56: Easting: 331113.3, Northing: 6245987.45 (Source: http://maps.six.nsw.gov.au).
Site Area	75 Mary Street: approx.1.3 hectares (13,395 m^2, Ref. Watson Buchan Pty Ltd) 67 Mary Street, 43 Roberts Street, 50 and 52 Edith Street: approximate 0.2 hectares (1,894 m^2) Total Area: Approx. 1.5 hectares (15,289 m^2).
Site Owners	As in March 2015, the owners of the site properties were identified as: Michael Francs Kelly, Marcela Cecilia Pacheco (50 Edith Street, St Peters) Borce Ivanovski (52 Edith Street, St Peters) JVM Holdings Pty Ltd & Chalak Holdings Pty Ltd (the remainder of the site) Refer to Section 3.1 for further details.
Lot and Deposited Plan (DP)	Lot 1, DP 556914, Lot 1 DP745014, Lot 1 DP745657, Lot A DP331215, Lot 1 DP 87885 and Lot 1 DP180958
State Survey Marks	Three State Survey Marks (SSM) is situated in close proximity to the site: SS125950 on the footpath of Edith Street at the north-eastern perimeter of the site, SS125943 at the south-eastern corner of the site, and SS125948 at the opposite of Mary Street, near the north-western corner of the site t (Source: http://maps.six.nsw.gov.au).
Local Government Authority	Marrickville Council
Parish	Petersham Parish
County	Cumberland County
Current Zoning	IN2 – Light Industrial and R2 – Low Density Residential (Marrickville Local Environment Plan, 2011)

At the time of the assessment, majority of the site (75 Mary Street) was occupied by a factory complex consisting of twelve one to three storey industrial buildings and an open car park associated to the complex. The remaining areas of the site were occupied by four residential dwellings. The assessment area is illustrated in Figure 2.

2.2 LOCAL LAND USE

The site is situated within an area of mixed use. Current uses on surrounding lands are described in Table 2-2.

Table 2-2 Local Land Use

Direction Relative to Site	Land Use Description
North-east	Edith Street, with single to two-storey residential buildings beyond.
North-west	Single-storey residential buildings with Unwins Bridge Road beyond.
South-east	Single-to two-storey residential buildings.
South-west	Mary Street, with single to two-storey residential buildings and commercial warehouses beyond.

2.3 REGIONAL SETTING

Local ground topography, geology, soil landscape and hydrogeological information are summarised in Table 2-3.

Table 2-3 Topographical, Geological, Soil Landscape and Hydrogeological Information

Attribute	Description
Topography	The regional topography consists of gently undulating rises with local relief to 30 m. Slopes are usually <5%. Broad rounded crests and ridges with gently inclined slopes. Local topography on site slopes gently to the south with a gradient < 5 degrees, starting from approximately 16.3 m AHD at the north corner of 75 Mary Street to approximately 9.8 m AHD at the south corner of 75 Mary Street.
Regional Geology	Information on regional sub-surface conditions, referenced from the Department of Mineral Resources Geological Map Sydney 1:100,000 Geological Series Sheet 9130 (DMR 1991) indicates the site is anticipated to be underlain by Ashfield Shale of the Wianamatta Group, which typically comprises black to dark grey shale and laminite. Ashfield Shale generally weathers into silty clay of medium to high plasticity.
Soil Landscapes	The Soil Conservation Service of NSW Sydney 1:100,000 Soil Landscapes Series Sheet 9130 (2nd Edition) indicates that the residual landscape at the site likely comprises the Blacktown (bt) Landscape. Soils are generally shallow to moderately deep (< 1 m) red and brown podzolic soils on upper slopes; deep (150-300 cm) yellow podzolic soils and soloths on lower slopes.
Acid Sulfate Soil Risk	With reference to the Botany Bay Acid Sulfate Soil Risk Map Edition Two (1:25,000 scale; Soil Conservation Service of NSW, 1997), the subject land lies within the map class description of *No Known Occurrence*. In such cases, Acid Sulfate Soils (ASS) are not known or expected to occur and "land management activities are not likely to be affected by ASS materials". In accordance with the Marrickville Local Environmental Plan 2011 Acid Sulfate Soils Map – Sheet ASS_004, the site falls within a category classified as Class 5 Acid Sulfate Soils (ASS). Council consent hence is required for development works within 500 m of adjacent Class 1, 2, 3 or 4 lands that is below 5 m AHD, and the works are likely to lower the water table to below 1 m AHD on adjacent Class 1, 2, 3 or 4 land. Two class 2 ASS zones were found within 500 m of the site, one located across the Illawarra Railway approximately 250 m north-west of the site, the other located approximately 350 m south of the site beyond Princes Highway. The site geology i.e. Ashfield Shale indicates ASS is unlikely to be present at the site.
Likelihood & Depth of Site Filling	Based on the field observations made during this investigation, the maximum fill depth across the site is anticipated to be < 1.0 m below ground level (m bgl).

Attribute	Description
Site Drainage	Majority of 75 Mary Street was sealed by concrete hardstand. Site drainage in these areas is anticipated to occur via existing pits and strip drains, and subsequently discharge to the municipal stormwater system. Direct infiltration of surface water to subsurface soils is likely to be the preferential drainage pathway in unsealed area (i.e. the open car park in north-east) and where cracks on concrete hardstand were present. Site drainage in the remaining areas of the site is anticipated to occur as overland flow and discharge to the municipal stormwater system. Minor infiltration to subsurface soils, however may occur in gardening areas.
Depth to Groundwater	Perched groundwater was encountered at 0.03 m bgl at one location (BH4) during the intrusive investigation. Deeper groundwater was expected to flow within the mass of the underlying fractured shale bedrock. Onsite groundwater conditions, including inferred groundwater flow direction, are discussed in Section 7.2.
Vadose Zone Soil Types	Fill overlying residual soil, with shale bedrock at depth.
Aquifer Types	Groundwater likely comprises intermittent seepage zones that may be present in the fill and residual soil (primarily clay) layers. Deeper groundwater is expected to move through the joints and fractures within the underlying Shale bedrock.
Nearest Receiving Surface Water Feature	Cooks River and Alexandra Canal, which are located approximately 2.1 km south, and 1 km south-east of the site, respectively. We also note that a stormwater basin is situated about 430 meters north-west of the site. The basin is not considered a receiving water body for surface runoff from the site as it is up-gradient.
Hydraulic Conductivity	Groundwater flow through the Ashfield Shale is documented to be influenced by the bedrock fracture system with hydraulic conductivities estimated to range between 10^{-7} to 10^{-9} in fresh shale and 10^{-6} to 10^{-9} m/s (McNally, 2004).
Groundwater Flow Direction	Groundwater flow direction in the vicinity of the site is inferred to be towards south and south-west joining Cooks River and Alexandra Canal, based on the findings of this investigation.

2.4 GROUNDWATER BORE RECORDS AND LOCAL GROUNDWATER USE

An online search of registered groundwater bores was conducted by EI on 26 March 2015 through the NSW Office of Water (Ref. http://allwaterdata.water.nsw.gov.au/water.stm). There were six registered bores identified within about 1 km radius of the site, all authorised for monitoring / testing purposes only. A summary of the information retrieved from the database for these bores are presented in Table 2-4. A bore location plan and detailed information regarding the identified bores are attached in Appendix B.

Table 2-4 Summary of Registered Groundwater Bores within 1 km Radius of the Site

Bore No.	Date Drilled	Drilled Depth (m)	SWL(mbgl)* / Salinity†	Authorised Bore Uses
GW109821	1997	35.00	14.50 / 4400	Monitoring Bore
GW109822	1997	10.45	3.00 / 958.00	Monitoring Bore
GW109823	2000	29.00	12.50 / 10600*	Monitoring Bore
GW109824	2005	20.70	4.51 / 4350	Monitoring Bore
GW109825	2005	22.00	14.90 / 1800	Monitoring Bore
GW072643	1996	12.00	NA / NA	Test Bore

Notes:
m bgl = metres below ground level.
NA = Information not available.
SWL = Standing Water Level.
†Salinity units – not recorded in NR Atlas records.
* = Salinity measured in GW109823 was also recorded as 10.60. Without further information on the salinity unit used, the higher value is reported here.

We noted that the site is situated within Management Zone 2 of the Botany Sand Beds Aquifer area. The NSW Government has been actively managing the extraction of groundwater in the Botany area and in August 2003 an embargo under Section 113A of the Water Act 1912 was announced in the northern part of the aquifer, because available water was depleted by plumes of contamination. This prohibition prevented any new applications to extract groundwater from being made. In August 2006, an order prohibiting the use of existing domestic bores was made for four zones within the northern Botany Sands Aquifer under Section 323 of the Water Management Act 2000. The ban on domestic use was made in the interest of public health and the zones were based on current and historical land use activity, as well as the potential for contamination. In June 2007, the remaining parts of the Botany Sands aquifer were embargoed under the Water Act 1912, to prevent any additional extraction. Hence, the current site lies within an area where the beneficial uses of groundwater have become highly restricted. Given the above information, as well as the fact that beneficial uses of groundwater was not identified through the registered bores search, and the fact that reticulated water supply is available in the area, the likelihood of domestic groundwater uses onsite, or in proximity of the site, is considered to be low. Use of groundwater for industrial purposes, however, may occur.

2.5 SITE WALKOVER INSPECTION

Mr Tony Guirguis (EI, Environmental Scientist) made a number of observations during a detailed walkover inspection of the site on 12 September 2014. The observations and findings made during the inspection were summarised in Table 2-4. Selected site photographs were presented in Appendix C.

Table 2-4 Summary of Buildings and Infrastructure

Site Area	Buildings	USTs/ASTs	Observations
Overall site area	The site was occupied by an industrial complex consisting of total 12 buildings at the time of inspection. North-east corner of the site was used as open car park area servicing the complex.	-	-
Industrial complex	A plan of the complex layout with building numbers denoted is attached in Figure 2. Site observations indicated that Building 1, 2, 3, 5, 6, 7, 8 were brick structures in average to deteriorating conditions. Metal structural alterations and additions, apparently from later periods and possible of different ages, were observed at Building 3, 5 and 7. Building 4, 9, 10 and 11 were sheet metal structures in good to average conditions.	Multiple UST filling points and remnants of former existed filling points and vent pipes were observed onsite, at following locations: • The driveway between Building 3 and Building 5; • East of Building 8. • Near the east corner of Building 5. These locations are also shown on Figure 2.	Areas not under the building footprints were primarily covered by concrete hardstand in deteriorating conditions. Multiple patchworks, cracks, joints and minor to moderate staining were noted at various locations on the concrete pavement. Step downs and ramps were noted at several locations, as shown on Figure 3, suggesting possible importation of fill in the past. Signs of moderate to significant weathering were noted on the exteriors of all buildings. There were multiple tenants on site at the time of assessment. Activities on site observed during the inspection included furniture manufacturing, motor vehicle maintenance, offices, wood workshops, tile storage/transportation, machinery maintenance, and design studios. Access to majority of the buildings was limited due to the presence of operating businesses on site, hence detailed inspection of internal areas of the buildings were not able to be carried out. Garbage bins were identified at various open areas of the site. A substation enclosed by metal wire fence was situated near the northwest boundary between Building 1 and Building 7. The substation and surrounding fence was in average conditions. A substation was possibly situated in the north-east of Building 5. However, this was not confirmed due to access constrains. Vehicles parking were observed on driveways.
Open Car Park	The area was unsealed and paved with loose gravels.	No UST identified.	Vehicle parking was noted in the area. A piece of damaged asbestos pipe was observed half buried in the gravel pavements.

43 Roberts Street, 50 and 52 Edith Street were found to be one-storey, brick residential houses. 67 Mary Street was a two-storey brick house. All four properties were in fair to good condition. Internal areas of these properties were not inspected due to limited access.

3. SITE HISTORY AND SEARCHES

3.1 SITE LAND TITLES INFORMATION

3.1.1 Land Titles Information for 75 Mary Street

Historical land title searches for the site were conducted through Service First Registration Pty Ltd and Legal Liaisons Searching Services Pty Ltd. Copies of relevant documents resulting from these two searches are presented in Appendix D.

The site was found to be consisting of 8 allotments previously, the outlines of which are shown in Figure 3-1. A consolidation of land titles of these allotments took place in 1973. A chronicle list of all historical and current registered proprietors is presented below.

Figure 3-1 Approximate Outline of Former Allotments

Table 3-1 Historical and Current Proprietorships of 75 Mary Street

Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available
As regards the part highlighted yellow and numbered (1) on Figure 3-1 up to 2013	
11.06.1911 (1911 to 1923)	George McAllister (Builder)
09.07.1923 (1923 to 1965)	Taubmans' Limited, now Taubmans Industries Limited
29.10.1965 (1965 to 2013)	Genimpex Pty Limited
Leases: - • Numerous leases were found affecting this land from 20.01.1966 • 23.01.1970 to Sydney County Council, of Substation No. 723, together with rights, now expired Easements: - • 22.11.1965 Right of Way (K500099) associated with a lease now expired 22.01.1973	
As regards the part highlighted yellow and numbered (2) on Figure 3-1 up to 2013	
29.02.1912 (1912 to 1965)	Taubmans' Limited, now, Taubmans Industries Limited
29.10.1965 (1965 to 2013)	Genimpex Pty Limited
Leases: - • Various leases were found affecting this land from 1970	
As regards the part highlighted yellow and numbered (3) on Figure 3-1 up to 2013	
30.04.1896 (1896 to 1921)	Charles Benjamin Comber (Cook)
23.02.1921 (1921 to 1965)	Taubmans' Limited, now, Taubmans Industries Limited
29.10.1965 (1965 to 2013)	Genimpex Pty Limited
Leases: - • Various leases were found affecting this land from 20.01.1966	
As regards the part highlighted yellow and numbered (4) on Figure 3-1 up to 2013	
13.11.1911 (1911 to 1923)	John Miller (Brick Layer)
10.09.1923 (1923 to 1923)	Victor James Pringle (Commercial Traveller)
10.10.1923 (1923 to 1965)	Taubmans' Limited, now, Taubmans Industries Limited
29.10.1965 (1965 to 2013)	Genimpex Pty Limited
Leases: - • Various leases were found affecting this land from 20.01.1966	
As regards the part highlighted yellow and numbered (5) on Figure 3-1 up to 2013	
08.09.1899 (1899 to 1922)	William Frederick Dawes (Brick Maker)
22.05.1922 (1922 to 1928)	Edward Townsend (Carrier)
14.02.1928 (1928 to 1965)	Taubmans' Limited, now, Taubmans Industries Limited
29.10.1965 (1965 to 2013)	Genimpex Pty Limited
Easements: - • 22.11.1965 Right of Way (K500099) associated with a lease now expired 22.01.1973	

Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available
As regards the part highlighted yellow and numbered (6) on Figure 3-1 up to 2013	
08.04.1911 (1911 to 1930)	Henry Alfred Gale Jobbins (Gentleman) Frederick Lynne Rolin (Solicitor)
31.03.1930 (1930 to 1938)	Frederick Lynne Rolin (Solicitor)
20.01.1938 (1938 to 1945)	Frederick Lynne Rolin (Solicitor) Francis Archer Lynne Rolin (No occupation)
16.07.1945 (1945 to 1965)	Taubmans' Limited, now, Taubmans Industries Limited
29.10.1965 (1965 to 2013)	Genimpex Pty Limited
As regards the part highlighted yellow and numbered (7A) and (7B) on Figure 3-1 up to 2013	
01.06.1891 (1891 to 1937)	Richard Ralph (Butcher) (Part 7B)
20.01.1937 (1937 to 1942)	Frank William Cable (Solicitor) (Part 7B)
29.05.1942 (1942 to 1965)	Taubmans' Limited, now, Taubmans Industries Limited (Part 7B)
04.08.1910 (1910 to 1946)	Isaac Edwin Spackman (Ironmonger) Annie Adelaide Spackman (Married Woman) (Part 7A)
29.01.1946 (1946 to 1965)	Taubmans' Limited, now, Taubmans Industries Limited (Part 7A)
29.10.1965 (1965 to 2013)	Genimpex Pty Limited (Whole of 7A & 7B)
Leases: - • 07.02.1946 to Henry James Bennett (Plasterer) – affects parcel 7A, term of 3 years	
As regards the part highlighted yellow and numbered (8) on Figure 3-1 up to 2013 *These parts were formerly road subsequently closed* *The first title to issue is dated 20.07.1946*	
20.07.1946 (1946 to 1965)	Taubmans' Limited, now, Taubmans Industries Limited
29.10.1965 (1965 to 2013)	Genimpex Pty Limited
Leases: - • 20.09.1971 to Atlantic Lithographic Plates Pty Limited, of part of Factory 7 Suite 2 Leases continued as regards the whole: - • 09.03.1992 to Sydney County Council, of Substation No. 723 (E 284177), together with right of way and easement, expires 30.09.2041 • Numerous leases were found affecting – these have not been investigated	
As regards the whole Lot 1 DP556914 on Figure 3-1 from 2013	
08.11.2013 (2013 to date)	#JVM Holdings Pty Ltd # Chalak Holdings Pty Ltd
Easements continued from 01.01.2013: - NIL Leases continued from 01.01.2013: - • Various leases were registered from 01.01.2013 to the present date. Please refer to computer title Folio Identifier 1/556914 for all current leases	

In summary, at the beginning of the 20th century, most land parcels within the current site boundaries, apart from allotment 2 and 8, were owned by individual private owners. Allotment 2 was registered under Taubmans Limited,

known to be a paint manufacturer, which started acquiring other allotments from the early 1920s. By late 1920s, allotments numbered 1 to 5 had been transferred to Taubmans Limited. During the 1940s Taubmans Limited underwent another expansion and gained the proprietorship over allotments 6, 7A, 7B and 8. Taubmans' ownership over the site was transferred to Genimpex Pty Ltd in 1965. In 2013, JVM Holding Pty Ltd and Chalak Holdings Pty Ltd acquired the site jointly.

In addition to the above findings, the search indicated numerous leases have been registered under the land title records since 1966.

3.1.2 Land Titles Information for 67 Mary Street, 43 Roberts Street, 50 and 52 Edith Street

Land title searches for 67 Mary Street, 43 Roberts Street, 50 and 52 Edith Street, St Peters were conducted through Legal Liaison Searching Services Pty Ltd subsequent to the amendment of the proposed development. A chronicle list of all historical and current registered proprietors of these properties is presented below.

Figure 3-2 Approximate Outline of Former Allotments

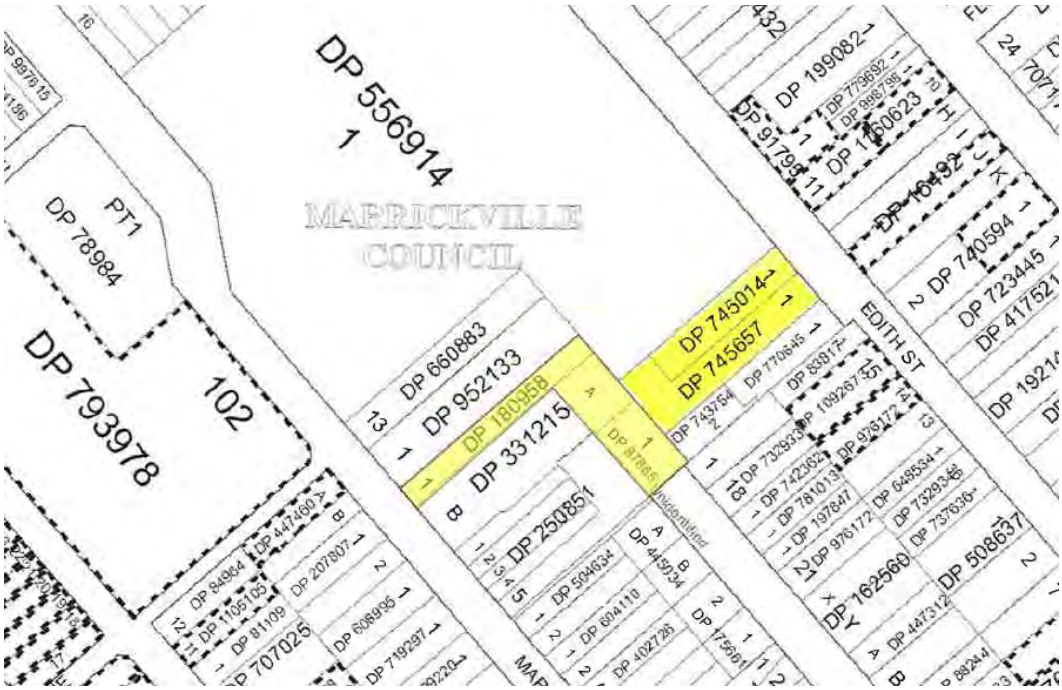

Table 3-2 Historical and Current Proprietorships of 67 Mary Street, 43 Roberts Street, 50 & 52 Edith Street, St Peters

Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available
As regards 43 Roberts Street, St Peters (Lot A D.P.331215)	
29.09.1887 (1887 to 1924)	Emma Annabel (Married Woman) (& Her Deceased Estate)
27.11.1924 (1924 to 1935)	Edith Isabel Annabel (Spinster) Alice Adelaide Harcourt (Married Woman)
29.03.1935 (1935 to 1951)	Leslie Norman Annabel (Carter)
13.06.1951 (1951 to 1965)	Taubmans Limited Now Taubmans Industries Limited
29.10.1965 (1965 to 2013)	Genimpex Pty Limited
08.11.2013 (2013 to date)	# JVM Holdings Pty Ltd # Chalak Holdings Pty Ltd
As regards 43 Roberts Street, St Peters (Lot 1 D.P. 87885)	
29.09.1887 (1887 to 1920)	Emma Annabel (Married Woman) (& Her Deceased Estate)
16.07.1920 (1920 to 1928)	Thomas William Annabel (Freeholder)
09.01.1928 (1928 to 1951)	Leslie Norman Annabel (Motor Driver)
13.06.1951 (1951 to 1965)	Taubmans Limited Now Taubmans Industries Limited
29.10.1965 (1965 to 2013)	Genimpex Pty Limited
08.11.2013 (2013 to date)	# JVM Holdings Pty Ltd # Chalak Holdings Pty Ltd
<u>Easement: -</u> 09.01.1928 Book 1499 No. 361 Right of Way	
As regards 50 Edith Street, St Peters (Lot 1 D.P. 745657)	
05.08.1909 (1909 to 1953)	Amelia Grace Favell (Married Woman, now Widow)
30.11.1953 (1953 to 1959)	Sydney James Wedderburn (Salesman)
02.02.1959 (1959 to 1987)	Yvonne Valerie Lyden (Married Woman)
31.07.1987 (1987 to 1990)	Brian McLenaghan (Clerk) Deborah Patricia McLenaghan (Married Woman)
23.01.1990 (1990 to 1996)	Emma Margaret O'Malley (Secretary)
02.02.1996 (1996 to date)	# Michael Francs Kelly # Marcela Cecilia Pacheco
As regards 52 Edith Street, St Peters (Lot 1 D.P. 745014)	
05.08.1909 (1909 to 1953)	Amelia Grace Favell (Married Woman, now Widow)
30.11.1953 (1953 to 1987)	Sydney James Wedderburn (Salesman)
21.08.1987 (1987 to 1999)	George Yacoub (Taxi Driver)
22.10.1999 (1999 to date)	# Borche Ivanovski Now # Borce Ivanovski

Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available
As regards 67 Mary Street, St Peters (Lot 1 D.P. 180958)	
26.09.1916 (1916 to 1918)	Gertrude Strongman (Spinster)
25.04.1918 (1918 to 1920)	James Auburn Edwards (General Merchant)
28.01.1920 (1920 to 1928)	Agnes Frances Edwards (Married Woman)
10.08.1928 (1928 to 1945)	William Collins (Carrier)
07.03.1945 (1945 to 1945)	Emma Collins (Widow) (Transmission Application not investigated)
19.03.1945 (1945 to 1973)	Gordon Anthony Scott (Council Employee)
12.11.1973 (1973 to 1973)	William Kenneth Scott (Taxi Driver) (Section 93 Application not investigated)
20.12.1973 (1973 to 1978)	Peter Yanakoulias (or Yiannakoulias) (Assembler, now Panel Beater) Debby (or Debbie) Yanakoulias (or Yiannakoulias) (Married Woman)
21.12.1978 (1978 to 1979)	Paul Grant (Panel Beater) Colleen Mary Grant (Married Woman)
24.12.1979 (1979 to 2014)	Noel John Power (Electric Mechanic) Ruby Adeline Power (Married Woman)
07.05.2014 (2014 to date)	# JVM Holdings Pty Ltd # Chalak Holdings Pty Ltd

In summary, the search results of these properties indicated that 67 Mary Street, 50 and 52 Edith Street were owned by various individual owners from the early 20th century up to the time of investigation, except for 67 Mary Street, which was acquired by JVM Holdings Pty Ltd and Chalak Holdings Pty Ltd (also the registered proprietors of 75 Mary Street) jointly in 2014. The search also found that, 43 Roberts Street (comprising Lot A DP 331215 and Lot 1 DP 87885), was registered under different individual owners until 1951, when Taubmans Industries Limited acquired the property. Both lots were transferred to Genimpex Pty Limited in 1965, along with 75 Mary Street. In 2013, JVM Holdings Pty Ltd and Chalak Holdings PTY Ltd acquired both allotments along with 75 Mary Street.

3.2 HISTORICAL AERIAL PHOTOGRAPHY REVIEW

An assessment of the site and surrounding land uses using land title information discussed in Section 3.1 and historical aerial photographs sourced from NSW Land and Property Information was carried out. Aerial photographs reviewed as part of this assessment are the followings:

- 1930: 20 February 1930, Run 17, Map 3428 B/W – Commonwealth Australia Crown
- 1943: Sydney 1943 Imagery (source : http://maps.six.nsw.gov.au/)
- 1951: May 1951, Run 15, Map 467 – 28 B/W – Lands Photo
- 1961: Run 37E, Map 1042 B/W, Lands photo, Cumberland 1961 series – Lands Photo
- 1978: 06 May 1978, Run 18, Misc. 1029 Cumberland 1970 series – Lands Photo NSW 2713
- 1986: 02 August 1986, Run 24E, M 1742 – Department of Lands NSW 3527
- 1994: 04 October 1994, Run 11– Lands Department NSW 4244
- 2005: 10 December 2005, Run 11, M2510 – Department of Lands NSW 4937
- 2010: 16 September 2010 – Nearmap – http://au.nearmap.com/
- 2014: 11 September 2014 – Nearmap – http://au.nearmap.com/

A summary of the pertinent information identified for 75 Mary Street from the reviewed photographs is presented in Table 3-3., under the section 75 Mary Street.

Information obtained from the historical aerials on 67 Mary Street, 43 Roberts Street, 50 and 52 Edith Street is summarised in Table 3-3, under the section named *Other Properties*.

Table 3-3 Summary of Aerial Photograph Review

Aerial Photograph	Site observations based on historical aerial photographs	Potential Land Uses	Surrounding land uses based on historical aerial photographs
1930: 20 February 1930, Run 17, Map 3428 B/W – Commonwealth Australia Crown	75 Mary Street: Majority of the site was occupied by multiple low rise, medium sized industrial structures, except for the north east corner where residential properties were present. Other Properties: All four allotments appeared to be occupied by residential dwellings and associated backyard gardens.	75 Mary Street: Primarily industrial except in north-east was used for residential. Other Properties: Residential.	East: low density residential dwellings; Two pits and their associated industrial facilities were noted beyond Princes Highway; South: Mary Street, followed by structures apparently of industrial nature and a pond; West: low density residential dwellings, followed by Unwins Bridge Road, beyond which were industrial buildings and a pit; North: Edith Street, followed by low density residential dwellings.
1943: Sydney 1943 Imagery (source : http://maps.six.nsw.gov.au/)	75 Mary Street: Little change from the 1930 aerial photograph. Other Properties: Little change from the 1930 aerial photograph except addition of a few shed-like structure in the backyard gardens.	75 Mary Street: Primarily industrial except in north-east was used for residential. Other Properties: Residential.	Little change from the 1930 aerial photograph, except the two pits east of the area had expanded in size.
1951: May 1951, Run 15, Map 467 – 28 B/W – Lands Photo	75 Mary Street: Two new industrial structures had been erected in the east of the site. One of the residential properties, previously identified in northeast of the site on the 1943 aerial, had been replaced with a driveway, while minor alterations/additions appeared had occurred on others. Other Properties: Little change from the 1943 aerial photograph.	75 Mary Street: Industrial. Other Properties: Residential.	East: little change from the 1943 aerial photograph; South: the previous industrial structures appeared damaged. The adjacent pond had been backfilled. The filled area appeared to be vacant; West: The pit beyond Unwins Bridge Road appeared had been filled with water; North: little change from the 1943 aerial photograph.

Aerial Photograph	Site observations based on historical aerial photographs	Potential Land Uses	Surrounding land uses based on historical aerial photographs
1961: Run 37E, Map 1042 B/W, ands photo, Cumberland 1961 series – Lands Photo	75 Mary Street: The residential properties in northeast of the site were demolished. Vehicles were noted in the footprint area. Other Properties: Little change from the 1951 aerial photograph.	75 Mary Street: Industrial. Other Properties: Residential.	East: The two pits beyond Princes Highway had further expanded in size and were joined as one; South: An increase of industrial properties were noted south of the site, within the footprint of the previous pond area; West: The pit beyond Unwins Bridge Road appeared had been partially filled. Water within the pit was evident; North: little change from the 1943 aerial photograph.
1978: 06 May 1978, Run 18, Misc. 1029 Cumberland 1970 series – Lands Photo NSW 2713	75 Mary Street: Little change from the 1961 aerial. Other Properties: Little change from the 1961 aerial photograph, except addition of a rectangular building in the backyard of A DP 87885 (rear of 43 Roberts Street)	75 Mary Street: Industrial. Other Properties: Residential.	Little change from the 1961 aerial, except for the pond west of the site beyond Unwins Bridge Road was completely filled and now occupied by industrial structures.
1986: 02 August 1986, Run 24E, M 1742 – Department of Lands NSW 3527	75 Mary Street: Little change from the 1978 aerial. Other Properties: Little change from the 1978 aerial.	75 Mary Street: Industrial. Other Properties: Residential.	Land uses in surrounding areas remained largely unchanged from the 1978 aerial.
1994: 04 October 1994, Run 11– Lands Department NSW 4244	75 Mary Street: Little change from the 1986 aerial. Other Properties: Little change from the 1986 aerial, except addition of a pool to Lot 1 DP 745014 (52 Edith Street)	75 Mary Street: Industrial. Other Properties: Residential.	Land uses in surrounding areas remained largely unchanged from the 1986 aerial, except for the pit east of the site beyond Princes Highway had been filled to ground level and appeared vacant.
2005: 10 December 2005, Run 11, M2510 – Department of Lands NSW 4937	75 Mary Street: Little change from the 1994 aerial. Other Properties: Residential.	75 Mary Street: Industrial. Other Properties: Residential.	Land uses in surrounding areas remained largely unchanged from the 1994 aerial.
2010: 16 September 2010 – Nearmap – http://au.nearmap.com/	75 Mary Street: Little change from the 2005 aerial. Other Properties: Little change from the 2005 aerial, except vegetation at rear of 43 Roberts Street had been cleared and parked vehicle was noted in the area.	75 Mary Street: Industrial. Other Properties: Residential.	Land uses in surrounding areas remained largely unchanged from the 2005 aerial.

Aerial Photograph	Site observations based on historical aerial photographs	Potential Land Uses	Surrounding land uses based on historical aerial photographs
2014: 11 September 2014 – Nearmap – http://au.nearmap.com/	75 Mary Street: Little change from the 2010 aerial. Other Properties: Little change from the 2010 aerial.	75 Mary Street: Industrial. Other Properties: Residential.	Land uses in surrounding areas remained largely unchanged from the 2010 aerial.

In summary, 75 Mary Street has been primarily used for industrial purposes, as suggested by the earliest available aerial photograph and land title records. Minor scale of residential land uses had previously occurred in the north-east area of the site, but had ceased by no later than the early 1960s and converted to a car park.

Review of the historical aerial photographs suggested 67 Mary Street, 50 and 52 Edith Street appeared to be residential properties from the 1930s. 43 Roberts Street, appeared as a residential dwelling on the 1930 and 1943 aerial photographs, was acquired by Taubmans Pty Ltd in 1951 and likely remained residential in nature (Refer to Section 3.3).

Historical land uses in surrounding areas were primarily residential and industrial.

3.3 COUNCIL INFORMATION

Site history records held by Marrickville Council for 75 Mary Street were inspected on 24 September 2014. A summary of relevant documents reviewed (i.e. building applications, development applications, town planning reports) is presented in Table 3-4. The original copy of the documents can be reviewed at the Council office.

Table 3-4 Summary of Historical Records Archived at Marrickville Council

Period / Year	Series (Council Reference)	Description
1950	BA 153/50	Applicant: Taubmans Pty Ltd Proposed: Addition of shelter over loading dock in Lacquer Department of the existing paint factory. We noted that the proposed development was situated opposite the site across Mary Street. Applied: 30 June 1950. Approved: 6 July 1950. Other information included in the application: Based on the attached plans, the new development would involve use of fibro walls, asbestos in corrugated roof, and lead flashing throughout the structure.
1950	BA 204/50	Applicant: Taubmans Pty Ltd Proposed: Addition to factory and new store at Lots 27, 28, 29 of Certificate of Title 3490/76. Applied: 17 August 1950 Approved: 18 September 1950 Other information included in the application: A schematic sketch of existing buildings situated adjacent to the proposed development suggested the presence of chemical and chlorine sections in the factory.
1950	BA 235/50	Applicant: Taubmans Pty Ltd Proposed: New drum cleaning shed at Lot 5, 6, 7 of Edith Street Applied: 7 September 1950 Approved 20 September 1950

Period / Year	Series (Council Reference)	Description
1951	BA 159/51	Applicant: Taubmans Pty Ltd Proposed: Extension to garage adjacent to 24/27 & 28/31 Mary Street. We noted that the development was situated opposite of the site across Mary Street. Applied: 28 June 1951 Approved: 4 July 1951 Other information included in the application: A letter attached in the record dated 22 December 1950 from Taubmans Pty Ltd to the Town Clerk of Marrickville Council indicated the building was originally proposed in view of the recent fire at the factory.
1951	BA 239/51	Applicant: Taubmans Pty Ltd Proposed: Addition and alteration to existing building as a new can store at Lot 23 DP 6336 Mary Street. Applied: 24 August 1951 Approved: Not recorded. Other information included in the application: A factory block plan numbered S43 and stamped by Municipality of Marrickville on 15 October 1951 accompanying the application denoted the designated use of existing buildings at the time of BA submission. Three underground storage tank areas were also identified on the plan. Information obtained from this plan is presented on Figure 5.
1954	BA 116/54	Applicant: Taubmans Pty Ltd Proposed: Temporary store within main group buildings. Applied: 23 April 1953 Approved: 3 May 1954 Other information included in the application: A building location plan (Ref. S218 Revision C, dated 5 June 1952) accompanying the application denoted the designated use of existing buildings at the time of BA submission. On the building location plan, 43 Roberts Street was denoted as “Cottage Block”.
1967	BA 397/67	Applicant: George Colemen (Construction) Pty Ltd Owner: Genimpex Pty Ltd Proposed: installation of a substation within Building 5 Applied: 24 September 1967 Approved: 28 September 1967

In summary, council records back dated to 1950 indicated the premises known as 75 Mary Street was used by Taubmans Pty Ltd as a paint factory. Associated activities in buildings on site included paint manufacturing, varnish manufacturing and drum washing etc. as shown on Figure 5. A smaller section of the factory was located across Mary Street (off-site), in which lacquer, nitrocotton manufacturing and storage were carried out. A fire, likely occurred in the early 1950s, appeared had damage part of the factory buildings.

From 1966, large volume of building applications and town planning reports associated with uses of the buildings were retrieved during the search. A list of these documents is attached in Appendix E. Review of these records indicated the site was owned by Genimpex Pty Ltd during this period, and was under leases to various different

tenants. Proposed land uses on site since this time, based on the reviewed documents, included motor manufacturing and repairing, furniture manufacturing, wood working, yarn/cloth manufacturing and storage, paper lamination, styrene moulding for food models, sign wiring and motor vehicle detailing, storage of metal spray equipment, forklift repair and servicing, manufacture of fibre glass based product, wielding and wrought iron production, neon signs manufacture, jewellery and casting manufacture. In addition, a letter included in TP 595/88 indicated a complaint regarding fume and spraying spreading to adjacent houses was submitted by neighbours.

These findings are generally consistent with the potential land uses determined from aerial photography review and historical land titles information discussed in Section 3.1 and Section 3.2.

3.4 WorkCover NSW Authority Search

A correspondence issued by WorkCover regarding historical storage of dangerous goods on 75 Mary Street was issued on 22 October 2013. The correspondence indicated that records pertaining to historical storage of dangerous goods on site were not identified in Stored Chemical Information Database (SCID) or the microfiche records held by WorkCover. A copy of the received document from WorkCover is attached in Appendix F.

3.5 Hazardous Chemicals and Regulatory Compliance

On 26 March 2015, an on-line search of the Contaminated Land – Record of EPA Notices was conducted. This search confirmed that the NSW OEH had no regulatory involvement in relation to the area of investigation, or properties in proximity to the site. The contaminated land public record is a searchable database of:

- orders made under Part 3 of the Contaminated Land Management Act 1997 (CLM Act)
- approved voluntary management proposals under the CLM Act that have not been fully carried out and where the approval of the Environment Protection Authority (EPA) has not been revoked
- site audit statements provided to the EPA under section 53B of the CLM Act that relate to significantly contaminated land
- where practicable, copies of anything formerly required to be part of the public record, and
- actions taken by EPA under section 35 or 36 of the Environmentally Hazardous Chemicals Act 1985 (EHC Act).

A search through the List of NSW Contaminated Site notified to EPA was also conducted on 26 March 2015. This list is maintained by NSW EPA under Section 60 of the CLM Act 2008 Amendments and contains sites that the notifiers consider are contaminated and warrant reporting to EPA, but may or may not be significant enough to warrant regulation by the EPA. The search did not find the site, or properties in its immediate surroundings, was reported to EPA.

On-line search of the public register under the Protection of Environment Operation Act 1997, including list of current licence and unlicensed premises were conducted on 22 October 2014. The search did not identify any records registered under the addresses of 67 & 75 Mary Street, 43 Roberts Street, 50 and 52 Edith Street, St Peters.

3.6 INFORMATION FROM ANECDOTAL AND OTHER SOURCES

Based on site observations and anecdotal information obtained during the site inspection, EI understood that multiple USTs were previously installed within 75 Mary Street. UST filling points were identified at several locations on this premise. It is uncertain that, however, based on the information collected in this investigation, the exact number of USTs that had been installed, and whether the USTs had been removed from the site.

A newspaper article dated 8 December 1950 indicated the former Taubmans factory section located opposite 75 Mary Street across Mary Street suffered a fire incident on 7 December 1950. It remained uncertain that whether the fire was limited to this portion of the factory, or extended to the main group buildings situated within the site boundaries. Potential mobilisation of contaminants via overland flow was also noted in the article.

Further studies on Taubmans' history suggested the company was also involved in the production of ethyl dichlorobenzene and DDT. Evidence, however, was not identified during this investigation to confirm if the manufacturing activities took place on the site.

4. PRELIMINARY CONCEPTUAL SITE MODEL

In accordance with Schedule B2 – Guideline on Site Characterisation of the National Environmental Protection (Assessment of Site Contamination) Measure 1999, Amendment 2013 (NEPM 2013) and to aid in the assessment of data collection for the site, EI developed a preliminary conceptual site model (CSM) assessing plausible pollutant linkages between potential contamination sources, migration pathways and receptors. The CSM provides a framework for the review of the reliability and useability of the data collected and to identify data gaps in the existing site characterisation.

4.1 CHEMICAL HAZARDS AND CONTAMINATION SOURCES

On the basis of site history and search findings (described in Section 3) EI considered potential chemical hazards and onsite contamination sources to be as follows:

- Imported fill soils of unknown constituents and origin distributed across the site;
- Impacts from previous paint and chemicals manufacturing, storage activities on site;
- Impacts from long term, ongoing industrial activities on site, including various manufacturing activities;
- Impacts from weathered exterior surfaces of existing buildings;
- Impacts from onsite pesticide use;
- Impacts from offsite sources, generated by historical and current industrial activities on adjacent lands;
- Hazardous materials, including potential asbestos-containing materials (ACM) from building products in former and existing structures;
- Residual polychlorinated biphenyls originated from electrical substations on site;
- Impacts from abandoned underground petroleum storage systems (UPSS) remained on site;
- Deeper, natural soils containing residual impacts, acting as a potential secondary sources of contamination; and
- Other unknown onsite/offsite contamination sources.

4.2 CHEMICAL OF CONCERN

Based on the findings of the site history studies described in Section 3 and site inspection findings, the chemicals of concern at the site are considered to be:

- Soil – heavy metals (HMs), total recoverable hydrocarbons (TRH), polycyclic aromatic hydrocarbons (PAH), monocyclic aromatic hydrocarbon (MAH) compounds (benzene, toluene, ethyl benzene and xylenes (BTEX)), Organochlorine and organophosphorus pesticides (OCP/ OPP), polychlorinated biphenyls (PCB), volatile organic compounds, phenols and asbestos;
- Groundwater – HMs, TRH, BTEX, PAH, phenols, volatile organic compounds (VOC), including chlorinated VOC (VOCC) such as trichloroethylene (TCE).

4.3 POTENTIAL SOURCES, EXPOSURE PATHWAYS AND RECEPTORS

Potential contamination sources, exposure pathways and receptors that were considered relevant for this assessment are summarised along with a qualitative assessment of the potential risks posed by complete exposure pathways in Table 4-1.

Table 4-1 Preliminary Conceptual Site Model

Contamination Media	Transport Mechanism	Exposure Pathway	Potential Receptor	Potential Risk of Exposure
Soils	Direct exposure to contaminated soils during construction works and post construction in accessible soil areas	Ingestion and dermal contact, plant uptake, inhalation during and post site redevelopment.	Future construction workers, Future maintenance workers, Future site tenants Ecological receptors	Unlikely under current site setting Likely during site development Possible post site development depends on final site setting
	Volatilisation of VOC vapours from contaminated substrates	Inhalation of VOC vapours during site redevelopment.	Future construction workers, Future maintenance workers, Future site tenants Ecological receptors	Likely – if VOC contaminants are present in site soils
	Migration of VOCs through utility / service trenches and volatilisation of VOC vapours (onsite and offsite)	Inhalation of VOC vapours during and post site redevelopment	Future construction workers, Future maintenance workers, Future site tenants Offsite sensitive receptors Ecological receptors	Likely– if VOC contaminants are present in site soils
	Volatilisation of VOC vapours and ingression to buildings and basements	Ingress of VOC vapours emanating from subsurface soils into buildings and basements	Current site tenants Future maintenance workers, Future site tenants	Likely – if VOC contaminants are present in site soils
Groundwater	Direct exposure to contaminated groundwater (onsite)	Dermal contact and ingestion of contaminated groundwater during redevelopment and via groundwater ingress into basements post construction	Future construction workers, Future maintenance workers; Future site tenants.	Possible – if contaminants are present in groundwater
	Volatilisation of VOC vapours from contaminated groundwater (onsite)	Inhalation of vapours from contaminated groundwater during site excavation and construction	Future construction workers, Future maintenance workers;	Likely – if contaminants are present in groundwater
	Migration of contaminated groundwater (offsite)	Contaminants in groundwater discharging into surface water bodies;Dermal contact and ingestion of contamination groundwater via unlicensed groundwater bores uses.	Ecological receptors (Alexandria Canal and Cooks River) Offsite receptors	Possible – however attenuation processes (dilution, dispersion, adsorption and natural attenuation) will likely reduce concentrations of groundwater contaminants spatially before site waters reach receptor.
	Volatilisation of VOC vapours from contaminated groundwater and ingression to buildings and basements	Vapour intrusion and groundwater ingress into basements	Current site tenants Future construction workers Future maintenance workers, Future site tenants	Likely – if VOC contaminants are present in site soils
Building Fabrics	Release of hazardous building products into surrounding environment during the demolition of existing structures	Dermal contact, inhalation and ingestion of contaminants.	Future construction workers; Future maintenance workers; Future site tenants.	Likely – if hazardous building products occur in existing structures

4.4 DATA GAPS

On the basis of historical and current on-site activities, intrusive investigations were considered necessary to characterise potential, adverse environmental impacts resulting from:

- Presence of imported fill materials of unknown origin and quality;
- Impacts from previous paint and chemicals manufacturing, storage activities on site;
- Impacts from long term, ongoing industrial activities on site, including various manufacturing activities;
- Impacts from onsite electrical substations;
- Impacts from weathered external surfaces, and hazardous building products present in existing buildings;
- Impacts from onsite pesticide use;
- Hazardous materials, including potential asbestos-containing materials (ACM) from building products in former and existing structures;
- Impacts from abandoned underground petroleum storage systems (UPSS) remained on site;
- Potential presence of light and dense non aqueous phase liquids (LNAPL & DNAPL);
- Deeper, natural soils containing residual impacts, acting as a potential secondary sources of contamination;
- Impacts from offsite sources, generated by historical and current industrial activities, and past fire incident; and
- Other unknown onsite/offsite contamination sources.

5. SAMPLING, ANALYTICAL AND QUALITY PLAN (SAQP)

The SAQP plays a crucial role in ensuring that the data collected as part of this, and ongoing environmental works carried out at the site are representative, and provide a robust basis for site assessment decisions. This SAQP includes the following:

- Data quality objectives, including a summary of the objectives of the DSI;
- Investigation methodology including media to be sampled, details of analytes and parameters to be monitored and a description of intended sampling points;
- Sampling methods and procedures;
- Field screening methods;
- Analysis Methods;
- Sample handling, preservation and storage; and
- Analytical QA/QC.

5.1 DATA QUALITY OBJECTIVES (DQO)

In accordance with the USEPA (2006) *Data Quality Assessment* and the DEC (2006) *Guidelines for the NSW Site Auditor Scheme*, the process of developing Data Quality Objectives (DQO) was used by the EI assessment team to determine the appropriate level of data quality needed for the specific data requirements of the project. The DQO process that was applied for this assessment is documented in Table 5-1.

Table 5-1 Summary of Project Data Quality Objectives

DQO Steps (NSW DEC, 2006)	US EPA (2006) (modified)	Details	Comments (changes during investigation)
1. State the Problem Summarise the contamination problem that will require new environmental data, and identify the resources available to resolve the problem; develop a conceptual site model	Give a concise description of the problem Develop a conceptual model of the environmental hazard to be investigated. Identify resources available.	A conceptual site model has been developed for the site, as discussed in Section 4. The CSM recognised the potential for the site to be impacted by its past and current land uses, and risks of exposure to potential contaminants exist. Intrusive investigation including a program of sampling is required to evaluate the site conditions and provide baseline information for site characterisation purpose. The investigation must provide supportive data to assess the overall site conditions.	-
2. Identify the Goal of the Study (Identify the decisions) Identify the decisions that need to be made on the contamination problem and the new environmental data required to make them	Identify principal study question(s). Consider alternative outcomes or actions that may result from answering the question(s). For decision problems, develop decision statement(s), organise multiple decisions. For estimation problems, state what needs to be estimated and key assumptions.	The goal of this assessment is to provide baseline data for determining if the site is contaminated. At the end of the assessment a decision shall be made regarding whether further investigation works are required to address the environmental conditions on site.	-
3. Identify Information Inputs (Identify inputs to decision) Identify the information needed to support any decision and specify which inputs require new environmental measurements	Identify types and sources of information needed to resolve decisions or produce estimates. Identify the basis of information that will guide or support choices to be made in later steps of the DQO Process. Select appropriate sampling and analysis methods for generating the information.	The main inputs to the investigation works include: Historical information including land title transfer records, historical aerials, WorkCover records, records held by local government authority and other available source; Proposed development plans provided by the client; Areas of concern identified during the preliminary site inspection prior to intrusive investigation. National and NSW EPA guidelines under the NSW Contaminated Land Management Act 1997.	Modifications to the proposed development, including final basement excavation depths, were made after the completion of fieldworks.

DQO Steps (NSW DEC, 2006)	US EPA (2006) (modified)	Details	Comments (changes during investigation)
4. Define the Boundaries of the Study Specify the spatial and temporal aspects of the environmental media that the data must represent to support decision	Define the target land-use and receptors of interest and its relevant spatial boundaries. Define what constitutes a sampling unit. Specify temporal boundaries and other practical constraints associated with sample/data collection. Specify the smallest unit on which decisions or estimates will be made.	For the purpose of preliminary site characterisation, the boundaries of the study were limited to the following: Lateral – the boundaries of the site; Vertical – Investigation depth to be extended down to natural soils for soil investigations, and to the underlying groundwater aquifer for groundwater investigations; and. Temporal – One round of groundwater sampling was undertaken.	The site boundaries were extended to include four additional properties, known as 67 Mary Street, 43 Roberts Street, 50 and 52 Edith Street, subsequent to the issue of E22317 AA_Rev 0 on 12 December 2014. The addition of the new properties rendered the existing sampling pattern failed in meeting the minimum sampling density requirement (EPA, 1995). Additional investigation however, was unable to be conducted due to limited access under the current site setting.
5. Develop the Analytic Approach (Develop a decision rule) To define the parameter of interest, specify the action level, and integrate previous DQO outputs into a single statement that describes a logical basis for choosing from alternative actions	Specify appropriate land-use parameters for making decisions or estimates. For decision problems, choose a workable Action Level and generate an "If then else" decision rule which involves it. For estimation problems, specify the methodology and the estimation procedure.	The decision rules for the investigation were: If concentrations of contaminants found in tested soils or groundwater samples exceed the adopted land use criteria described in Section 6.3, then assess the need for further investigation on site; Decision criteria for QA/QC measures are defined by the Data Quality Indicators (DQI) in Table 5.2.	The proposed development was initially considered a Type B development – *Residential with minimal opportunities for soil access*, as defined in NEPM 2013. After the August 2015 amendment of proposed development layout, as a prudent approach, the proposed development was considered a Type A development – Residential with garden/accessible soils. Existing data was re-assessed accordingly.

DQO Steps (NSW DEC, 2006)	US EPA (2006) (modified)	Details	Comments (changes during investigation)
6. Specify Performance or Acceptance Criteria (Specify limits on decision errors) Specify the decision-maker's acceptable limits on decision errors, which are used to establish performance goals for limiting uncertainties in the data	For decision problems, specify the decision rule as a statistical hypothesis test, examine consequences of making incorrect decisions from the test, and place acceptable limits on the likelihood of making decision errors. For estimation problems, specify acceptable limits on estimation uncertainty.	Specific limits for this project were in accordance with the appropriate guidance made by the NSW EPA, appropriate indicators of data quality and standard procedures for field sampling and handling. This should include the following points to quantify tolerable limits: A decision can be made based on a probability that 95% Upper Confidence Limits (UCL) of the data will satisfy the given site criteria. Therefore a limit on the decision error will be 5% that a conclusive statement may be incorrect. A decision can be made based on the probability that a contamination hotspot of a certain circular diameter will be detected with 95% confidence using a selected density of systematic data points. The decision error will be limited to a probability of 5% that a contamination hotspot may not be detected. Groundwater contamination is not reported.	Due to existing access limitation onsite, the distribution of the sampling points was not considered as in a systematic fashion. Hence, the statistical approach for site characterisation cannot be utilised. As a result, a decision was made if contaminations were reported in any of the tested samples.
7. Develop the Detailed Plan for Obtaining Data (Optimise the design for obtaining data) Identify the most resource-effective sampling and analysis design for general data that are expected to satisfy the DQOs	Compile all data and outputs generated in Steps 1 to 6. Use this information to identify alternative sampling designs that fit your intended use Select and document a design that will yield data to best achieve your data quality.	Soil sampling locations were set using a combined judgemental and systematic pattern across the accessible areas of the site; Five groundwater monitoring wells would be installed across the site, both up and down gradient, to assess the overall conditions of groundwater on site. An upper soil profile sample (soil extracted immediately beneath the concrete hardstand/pavement, or at surface level if a pavement is not present) will be collected at each borehole location and tested for chemicals of concern, to assess the conditions of fill layer, and impacts from activities above ground. Further sampling would be carried out at deeper soil layers. These samples would be selected for testing based on field observations, while giving consideration to characterise the subsurface soil stratigraphy. Sampling for Acid Sulfate Soils was carried out at 3 borehole locations. Written instructions will be issued to guide field personnel in the required fieldwork activities.	Borehole locations were adjusted to accommodate access constrains encountered during the course of investigations. As a result, the sampling locations were not considered to be in a systematic pattern.

5.2 DATA QUALITY INDICATORS

To ensure that the investigation data collected was of an acceptable quality, the investigation data set was assessed against the data quality indicators (DQI) outlined in Table 5-2, which related to both field and laboratory-based procedures. The data quality assessment is discussed in Section 8.

Table 5-2 Data Quality Indicators

QA/QC Measures	Data Quality Indicators
Precision – A quantitative measure of the variability (or reproducibility) of data	Data precision would be assessed by reviewing the performance of blind field duplicate sample sets, through calculation of relative percentage differences (RPD). Data precision would be deemed acceptable if RPDs are found to be less than 30%. RPDs that exceed this range may be considered acceptable where: • Results are less than 10 times the limits of reporting (LOR); • Results are less than 20 times the LOR and the RPD is less than 50%; or • Heterogeneous materials or volatile compounds are encountered.
Accuracy – A quantitative measure of the closeness of reported data to the "true" value	Data accuracy would be assessed through the analysis of: • Method blanks, which are analysed for the analytes targeted in the primary samples; • Matrix spike and matrix spike duplicate sample sets; and • Laboratory control samples.
Representativeness – The confidence (expressed qualitatively) that data are representative of each medium present onsite	To ensure the data produced by the laboratory is representative of conditions encountered in the field, the laboratory would carry out the following: • Blank samples will be run in parallel with field samples to confirm there are no unacceptable instances of laboratory artefacts; • Review of relative percentage differences (RPD) values for field and laboratory duplicates to provide an indication that the samples are generally homogeneous, with no unacceptable instances of significant sample matrix heterogeneities; and • The appropriateness of collection methodologies, handling, storage and preservation techniques will be assessed to ensure/confirm there was minimal opportunity for sample interference or degradation (i.e. volatile loss during transport due to incorrect preservation / transport methods).
Completeness – A measure of the amount of useable data from a data collection activity	Analytical data sets acquired during the assessment will be evaluated as complete, upon confirmation that: • Standard operating procedures (SOPs) for sampling protocols were adhered to; and • Copies of all COC documentation are presented, reviewed and found to be properly completed. It can therefore be considered whether the proportion of "useable data" generated in the data collection activities is sufficient for the purposes of the land use assessment.
Comparability – The confidence (expressed qualitatively) that data may be considered to be equivalent for each sampling and analytical event	Given that a reported data set can comprise several data sets from separate sampling episodes, issues of comparability between data sets are reduced through adherence to SOPs and regulator-endorsed or published guidelines and standards on each data gathering activity. In addition the data will be collected by experienced samplers and NATA-accredited laboratory methodologies will be employed in all laboratory testing programs.

6. ASSESSMENT METHODOLOGY

6.1 SAMPLING RATIONALE

With reference to the preliminary CSM described in Section 4, soil and groundwater investigation works were planned in accordance with the following rationale:

- Sampling fill and natural soils from 23 borehole locations located across 75 Mary Street using a combined judgemental and systematic sampling patterns, whilst accommodating existing access constrains, to characterise in-situ soils;
- Considerations were given to potential onsite contamination sources when determining borehole locations (i.e. in proximity of the Underground Storage Tanks, adjacent to substations) to assess the impacts from these facilities;
- Sampling groundwater during a single groundwater monitoring event (GME) at five monitoring wells, converted from selected newly constructed boreholes at both up and down gradient of the site, to assess overall groundwater conditions within the premises; and
- Laboratory analysis of representative soil and groundwater samples for identified chemicals of concern.
- Following the amendment of the proposed development which involve the inclusion of four more properties (67 Mary Street, 43 Roberts Street, 50 and 52 Edith Street), additional intrusive investigation is required to characterise environmental conditions in these parts of the site. The investigation, however, could not be carried out as part of this DSI due to limited access to these properties.

6.2 INVESTIGATION CONSTRAINTS

The main constrain encountered during the course of investigation at 75 Mary Street was the existing industrial complex structures onsite. Majority of the areas within these structures was not accessible for intrusive investigation due to limited space or the presence of businesses in operation. As a result, the sampling plans were amended to limit the investigation locations in accessible areas.

Due to presence of structural obstacles (such as buildings and fences), access to the four additional properties was limited and therefore intrusive investigation was not carried out in these allotments.

6.3 ASSESSMENT CRITERIA

The assessment criteria proposed for this project are outlined in Table 6-1 and Table 6-2. These were selected from available published guidelines that are endorsed by national or state regulatory authorities, with due consideration of the exposure scenario that is expected for various parts of the site, the likely exposure pathways and the identified potential receptors.

Table 6-1 Adopted Investigation Levels for Soil and Groundwater

Environmental Media	Adopted Guidelines	Rationale
Soil	NEPM, 2013 Soil HILs, EILs, HSLs, ESLs & Management Limits for TRHs	Soil Health-based Investigation Levels (HILs) Soil samples will be assessed against HIL B provided in the NEPM 2013, as the description on the proposed development was consistent with the land use described in the definition of HIL B, being residential with minimal opportunities for soil access. After the August 2015 amendment of the proposed development plans, the HIL A criteria for residential with garden/accessible soils were considered relevant and therefore applied for assessment. Ecological Investigation Levels (EILs) Soil samples would also be assessed against the NEPM 2013 EILs (urban residential/public open space) for arsenic, copper, chromium (III), nickel, lead, zinc, DDT and naphthalene, which have been derived for protection of terrestrial ecosystems. Soil Health-based Screening Levels (HSLs) The NEPM 2013 Soil HSL A & B for vapour intrusion would be applied to assess for potential human health impacts from residual vapours resulting from petroleum, BTEX & naphthalene. Soils asbestos results to be assessed against the NEPM 2013 Soil HSL thresholds for "all forms of asbestos". Ecological Screening Levels (ESLs) & Management Limits for Petroleum Hydrocarbons Soil samples to be assessed against the NEPM 2013 ESLs (urban residential/public open space) for selected petroleum hydrocarbons & TRH fractions for protection of terrestrial ecosystems. Should the ESLs and HSLs be exceeded for petroleum hydrocarbons, soil samples would also be assessed against the NEPM 2013 *Management Limits* for the TPH fractions F1 – F4 to assess propensity for phase-separated hydrocarbons (PSH), fire and explosive hazards & adverse effects on buried infrastructure. Region 9 Screening Levels for Residential Soils (RSLs) In the event that an investigation level is not supplied in the aforementioned guidelines, the Regional 9 Screening Levels provided by the United States Environmental Protection Agency will be used as an interim criteria for assessing risks associated with chemicals found in subsurface soils on site.
Groundwater	NEPM, 2013 GILs for Marine Waters, Fresh Waters and Drinking Waters	Groundwater Investigation Levels (GILs) for Marine Water NEPM 2013 provides GILs for typical, slightly-moderately disturbed aquatic ecosystems, which are based on the ANZECC & ARMCANZ 2000 Trigger Values (TVs) for the 95% level of protection of aquatic ecosystems; however, the 99% TVs were applied for the bio-accumulative metals *cadmium* and *mercury*. The marine criteria were considered relevant as the two closest, potential surface water receptors were Alexandra Canal and Cooks River, both were understood to be tidally influence. Groundwater Investigation Levels (GILs) for Fresh Water and Drinking Waters Should criteria be not provided in GILs for Marine Water, GILs for Fresh Water will be used for assessment. GILs for Drinking Waters will then be used if criteria for Fresh Water system are not provided as well.

Environmental Media	Adopted Guidelines	Rationale
Domestic non-potable groundwater use	NEPM 2013 based on NHMRC Drinking Water Guidelines (2011)	The NEPM (2013) guidelines recommend that groundwater used for non-potable use be derived by multiplying the drinking water criteria by a factor of 10 – 20. For the purpose of this report a multiplication factor of 10 has would be used to assess health risks from domestic non-potable groundwater use.
Vapour Risk	NEPM, 2013 Interim Soil Vapour Health Investigation Levels for Volatile Organic Chlorinated Compounds	Interim Soil vapour health investigation levels for Volatile Organic Chlorinated Compounds (VOCCs) An estimate of soil vapour concentrations will be derived with Henry's Law and assessed against the interim soil vapour HIL for VOCCs.
	NEPM, 2013 Groundwater HSLs for Vapour Intrusion	Health-based Screening Levels (HSLs) The NEPM 2013 groundwater HSL A & B for vapour intrusion were used to assess for potential human health impacts from residual vapours resulting from petroleum, BTEX and naphthalene impacts.
	OSWER Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils, 2002, Target Groundwater Concentration	Target Groundwater Concentration (C_{gw}) Target groundwater concentration supplied by US EPA was used as an interim assessment guidelines, if HSLs were not available for particular volatile compounds.

Table 6-2 Generic and Derived Ecological Investigation Levels

Metal	Assumed Values [1]	EIL (mg/kg) [2]
Arsenic	Generic EIL	100
Chromium (III)	ABC - 15 mg/kg (assumes an old NSW high traffic suburb) ACL - 190 mg/kg (assumes clay content <1 %)	205
Copper	ABC - 30 mg/kg (assumes an old NSW high traffic suburb) ACL - 60 mg/kg (assumes pH 4.5)	90
DDT	Generic EIL	180
Lead	ABC - 160 mg/kg (assumes an old NSW high traffic suburb) ACL – 1,100 mg/kg	1,260
Naphthalene	Generic EIL	170
Nickel	ABC - 5 mg/kg (assumes an old NSW high traffic suburb) ACL - 30 mg/kg (assumes CEC 5)	35
Zinc	ABC - 120 mg/kg (assumes an old NSW high traffic suburb) ACL - 70 mg/kg (assumes pH 4 & CEC 5)	190

Notes:
ACL - added contaminant limit; ACLs for Urban residential and public open space were used for this project

ABC - ambient background concentration

The most stringent ACL values were adopted for Chromium (III), Copper, Lead, Nickel and Zinc, as site soil physiochemical properties (i.e. pH, CEC and clay content) were not tested (Ref. NEPM 2013 Schedule B1, Tables 1B(1), 1B(2), 1B(3) and 1B(4) *Soil-specific added contaminant limits*)

[1] Assumed values are based on NEPM 2013 Schedule B5(c) *Guideline on Ecological Investigation Levels for Arsenic, Chromium (III), Copper, DDT, Lead, Naphthalene, Nickel & Zinc*

[2] EIL = ABC + ACL, unless Generic EIL is applicable

Adopted SILs and GILs are presented alongside the analytical results in the corresponding summary tables, which are discussed in Section 7.

6.4 SOIL INVESTIGATIONS

The soil investigations conducted at the site are described in Table 6-3. Borehole locations are illustrated in Figure 3.

Table 6-3 Summary of Soil Investigation Methodology

Activity/Item	Details
Fieldwork	Site investigations were conducted from 22 to 25 September 2014. Total 23 boreholes were drilled and sampled and 5 monitoring wells installed within 75 Mary Street.
Drilling Method & Investigation Depth	BH1, BH2 and BH3, BH4, BH5 and BH6 were drilled to weathered shale profile, and subsequently cored to targeted depths using Multidrill 3000 (Model). Remaining boreholes were drilled with a truck mounted drilling rig fitted with a 75 mm diameter solid flight auger. Final depths of boreholes ranged from 2.0 m to 4.5 m bgl, except for BH1 – BH6, which extended to 6.52 m to 9.0 m bgl for groundwater and geotechnical investigation purposes. Further details of the completion depths of each boreholes and monitoring wells are presented in Appendix G.
Soil Logging	Drilled soils were classified in the field with respect to lithological characteristics and evaluated on a qualitative basis for odour and visual signs of contamination. Soil classifications and descriptions were based on Unified Soil Classification System (USCS) and Australian Standard (AS) 4482.1-2005. Bore logs are presented in Appendix G.
Soil Sampling	Soil samples were collected using grab/dry methods & placed into laboratory-supplied, acid-washed, solvent-rinsed glass jars using dedicated nitrile gloves. Samples collected for analysis of asbestos in soils were placed into plastic "zip-lock" bags.
Decontamination Procedures	The drilling rods and hand auger were decontaminated between sampling locations until the augers were free of all residual materials.
Sample Preservation	Samples were stored in a refrigerated (ice brick-filled) chest, whilst on-site and in transit to the laboratory. All samples were submitted and analysed within the required holding period, as documented in laboratory reports discussed in a later section.
Management of Soil Cuttings	Soil cuttings were used as backfill for completed boreholes. Excess materials were store in plastic drums with cover and removed from the site in accordance with DECCW waste disposal guidelines.

Activity/Item	Details
Quality Control & Laboratory Analysis	A number of soil samples were submitted for analysis of previously-identified COPC by SGS Laboratories (SGS). QA/QC testing comprised intra-laboratory duplicates ('field duplicates') tested blind by SGS and an inter-laboratory field duplicate tested blind by Envirolab Services (Envirolab). All samples were transported under strict Chain-of-Custody (COC) conditions and COC certificates and laboratory sample receipt documentation were provided to EI for confirmation purposes, as discussed in Section 8.
Soil Vapour Screening	Screening for potential VOCs in collected soil sample duplicate placed in a zip lock bags was conducted using a Photo-ionisation Detector (PID). Detailed results of the screening are described in Section 7.1.

6.5 GROUNDWATER INVESTIGATIONS

The groundwater investigations conducted at the site are described in Table 6-4. Monitoring well locations are illustrated in Figure 3.

Table 6-4 Summary of Groundwater Investigation Methodology

Activity/Item	Details
Fieldwork	Groundwater monitoring wells were installed at BH1 to BH5, upon the completion of drilling at corresponding boreholes. All wells were developed on 1 October 2014. Water level gauging, well purging, field testing and groundwater sampling of the wells were carried out on 8 October 2014.
Well Construction	Boreholes were converted to groundwater monitoring wells as follows: • BH1 –7.00 m deep, onsite, up-gradient well identified as MW1, near the north-west boundary; • BH2 – 9.00 m deep, onsite, centred well identified as MW2, near one of the identified UST areas • BH3 – 6.52 m deep, on site, down-gradient well identified as MW3, near the south boundary; • BH4 – 7.96 m deep, onsite, down-gradient well identified as MW4, near the south-west boundary; and • BH5 – 8.66 m deep, onsite, up-gradient well identified as MW5, near the south-east boundary. Well construction was in general accordance with the standards described in Minimum Construction Requirements for Water Bores in Australia (NUDLC, 2012) and involved the following: • 50 mm, Class 18 uPVC, threaded, machine-slotted screen and casing; • base of the well was sealed with a uPVC cap; • Top of the well was sealed with a well plug; • annular, graded sand filter was used to minimum 300mm above top of screen interval; • granular bentonite was applied above the annular filter to ground level at BH2 to BH4 to seal the screened interval; • granular bentonite was applied above the annular filter at BH1, followed by sand backfills to just below ground level; and • surface completion comprised a gatic cover set in cement and finished flush with the concrete hardstand level. Further well construction detail is tabulated in Table 7-2 and documented in the bore logs presented in Appendix G.

Activity/Item	Details
Well Development	Well development was conducted on 1 October 2014. This involved agitation within the full length of the water column using a dedicated, HDPE, disposable bailer, and removal of water with the same bailer, until no further reduction in suspended sediment was observed. The volume of water removed at each well is presented in Appendix H.
Well Elevation and Location	Well elevations at ground level were extrapolated from the spot elevations marked on the survey plan provided by the client (Figure 3) in metres relative to Australian Height Datum (m AHD).
Well Gauging	Monitoring wells were gauged with an interface probe for standing water level (SWL, depth to groundwater) and potential presence of LNAPL prior to well purging at the commencement of the GME on 8 October 2014. The groundwater flow direction within the site was deduced based on the reduced water levels (RWLs, i.e. SWLs corrected to AHD) calculated at each well (Table 7-3). Inferred groundwater flow direction is discussed in Section 7.2.
Well Purging, Field Testing & Groundwater sampling	Monitoring wells were purged and sampled using low-flow/minimal drawdown sampling method with a MicroPurge kit (MP15) on 8 October 2014. The MicroPurge system incorporates a low density poly-ethylene (LDPE) pump bladder, and a Teflon-lined LDPE sample delivery tube. The system used for this investigation also included a MicroPurge QMP15 controller, which employed pressurised carbon dioxide gas to regulate groundwater flow. Pump pressure and pumping cycles were adjusted accordingly to regulate extraction flow rate, to avoid causing excessive drawdown of water level during the sampling process. Field measurements for groundwater temperature Redox, Electrical Conductivity (EC) and pH of the sampled water were conducted using a water quality meter (Hanna Multi Parameter 9828). Samples were taken when the readings of all parameters were stabilised. The readings at time of sampling, along with the total purged volume were recorded onto field data sheets (Appendix H).
Decontamination Procedure	Decontamination was not required on the pump bladder and delivery tube of the MicroPurge kit, and the disposable bailer as they were dedicated to each groundwater sampling point. The remainder of the system was decontaminated with a solution of potable water and Decon 90, followed by a rinse of potable water prior to the sampling of next well.
Sample Preservation	Sample containers were supplied by the laboratory with the following preservatives: • two, 1 litre amber glass, acid-washed and solvent-rinsed bottle; • two, 40ml glass vials, pre-preserved with dilute hydrochloric acid, Teflon-sealed; and • one, 250mL, HDPE bottle, pre-preserved with dilute nitric acid (1 mL). Sample for metals analysis was field-filtered using 0.45 µm pore-size filters. All containers were filled with sample to the brim (except the HDPE bottles), then capped and stored in ice-filled chests, until completion of the fieldwork and during sample transit to the laboratory.
Quality Control & Laboratory Analysis	All groundwater samples were submitted for analysis of previously-identified chemicals of concern by SGS Laboratories (SGS). QA/QC testing comprised intra-laboratory duplicates ('field duplicates') tested blind by SGS and an inter-laboratory field duplicate tested blind by Envirolab Services (Envirolab). All samples were transported under strict Chain-of-Custody (COC) conditions and COC certificates and laboratory sample receipt documentation were provided to EI for confirmation purposes.
Sample Transport	After sampling, refrigerated sample chests were transported to SGS Australia Pty Ltd using strict Chain-of-Custody (COC) procedures. Inter-laboratory duplicate (ILD) samples were forwarded to Envirolab Services Pty Ltd (Envirolab) for QA/QC analysis. A Sample Receipt Advice (SRA) was provided by each laboratory to document sample condition upon receipt. Copies of SRA and COC certificates are presented in Appendix I.

7. RESULTS

7.1 SOIL INVESTIGATION RESULTS

7.1.1 Site Geology and Subsurface Conditions

The overall geology encountered during the drilling of soil investigation borehole and installation of monitoring wells typically comprised anthropogenic filling overlying residual soils, with weathered Ashfield Shale at depth. The geological information obtained during the investigation is summarised in Table 7-1 and borehole logs from these works are presented in Appendix G.

Table 7-1 Generalised Subsurface Profile (m bgl)

Layer	Description	Depth to top & bottom of layer (m bgl)+	
		Top	Bottom
Fill	Asphalt and concrete hardstand up to 190 mm thick overlying filling materials of various constituents, including sandy CLAY, clayey SILT, CLAY, silty GRAVEL, gravelly CLAY and gravelly SAND, with some brick and glass fragments. Colours observed were generally grey to brown. Fill is inferred to be uncontrolled and poorly compacted.	0.0	0.3 – 0.7
Residual Soil (including Extremely Weathered Shale)	Generally firm to very stiff, medium to high plasticity clay and silty clay with trace fine to medium ironstone gravel grading to extremely weathered shale. Colours observed were generally grey - brown with occasional orange – red mottling.	0.3 – 0.7	2.5 – 3.0
Bedrock	Inferred distinctly to slightly weathered shale, with degree of weathering reducing at increasing depths. Colours observed were generally brown/grey to orange.	2.5 – 3.0	Observed up to borehole termination depth at BH1, BH2, BH4, BH5 and BH6, ranging from 6.52 – 9.00 m bgl.

Notes: + Approximate depth below ground level at the time of our investigation. More detailed descriptions of subsurface conditions are available in the borehole logs in Appendix G. Depths may vary across the site.

7.1.2 Field Observations and PID Results

Soil samples were collected from each boreholes at various depths ranging from 0.0 m to 4.8 m bgl. All examined soil samples were evaluated on a qualitative basis for odour and visual signs of contamination (e.g. hydrocarbon odours, oil staining, petrochemical filming, asbestos fragments, ash, charcoal) with the following observations noted:

- Filling materials of various compositions were identified across the site, suggesting multiple importation of filling materials from varying sources had occurred historically;
- Hydrocarbon odours were noted at multiple locations (BH1, BH2, BH3, BH4, BH5, BH11, BH14, BH15, BH16, BH18, BH19 and BH20), generally within the fill and residual soils layers (between the depths of 0 – 2.8 m bgl), except for BH4 where odours were noted down to extremely weathered shale layer.
- Chemical odour was noted at BH17 in the fill layer, between 0.4 – 0.9 m bgl;

- An approximately 4.2 m deep void was encountered during the drilling of BH13, immediately beneath the concrete hardstand (approximately 280mm thick). Trapped water at 2.7 m bgl with slight hydrocarbon sheen was observed in the void.
- Minor fragmented bricks were noted at BH1, BH2, BH3, BH5, BH6 and BH20 within the fill layers;
- Visible fibre cemented sheeting fragments were not noted during the field investigation works;
- Visual indicators of actual and potential acid sulphate soils were not observed during the investigation (i.e. presence of shell in soil, jarositic horizons or substantial iron oxide mottling, waterlogged soils, or estuarine/sedimentary silty sands or sands;
- The collected soil samples were field-screened using a portable PID fitted with a 10.9 eV lamp. Elevated VOC concentrations from 6.0 to 176.0 parts per million (ppm) were detected in multiple soil samples at BH1, BH3, BH4, BH5, BH17 and BH21, generally within the fill and residual soil layers between 0.2 m to 1.5 m bgl. The exception being BH4, where a PID reading of 14 ppm was recorded at approximately 3 m bgl, within the extremely weathered shale strata. PID readings were noted on deeper samples, at the above locations, however, at lower values. The PID results are shown in the borehole logs (Appendix G), and considerations were given to PID results when assigning samples for laboratory analysis.

7.2 GROUNDWATER INVESTIGATION RESULTS

7.2.1 Monitoring Well Construction

The construction details for the three installed groundwater monitoring wells are summarised in Table 7-2.

Table 7-2 Monitoring Well Construction Details

Well ID	Bore Depth * (m bgl)	RL (GL)	RL (TOC)	Screen Interval (m bgl)	Lithology Screened
MW1	7.00	15.56	15.430	4.0 – 7.0	Shale
MW2	9.00	14.44	14.295	6.0 – 9.0	Shale
MW3	6.52	11.80	11.650	3.52 – 6.52	Shale
MW4	7.96	12.90	12.720	1.96 – 7.96	Residual Soils and Clay
MW5	8.66	14.13	13.965	5.66 – 8.66	Shale

Notes:
m bgl = metres below ground level.
RL = Reduced Level – Extrapolated ground elevation in metres relative to Australian Height Datum (m AHD) based on existing survey plan.
TOC = top of well casing.
RL (TOC) = Calculated elevation at TOC in m AHD based on field measurements and existing survey plan.
* = Depth of MWs presented here were from the field records at time of well installation. Ingression of sediments appeared had occurred after the installation, hence the measured bore depths at time of sampling were not used.

7.2.2 Field Observations and Water Test Results

All monitoring wells, MW1 – MW5, were gauged and sampled on 8 October 2014. Prior to the purging and sampling of each well, Standing water levels (SWLs) were measured and recorded in all wells. During the purging of each well, water quality parameters were constantly monitored with a Hanna Multi Parameter 9828 and discrete readings were taken and recorded along the with purge volume at the time of reading. A summary of the recorded field data is presented in Table 7-3 and copies of the completed Field Data Sheets are included in Appendix H.

Table 7-3 Groundwater Levels, Field Water Test Results and Observations (GME date 8 October 2014)

Well ID	SWL (m BTOC)	RL (TOC)	WL[†] (m AHD)	Purge Volume (L)	DO[#] (mg/L)	Field pH	Field EC (µS/cm)	Temp (°C)	Redox (mV)	Odours / Turbidity
GME Dated 8 October 2014										
MW1	3.030	15.43	12.400	9.0	-	4.88	3273	20.59	103.0	No odours / High turbidity
MW2	1.409	14.295	12.886	10.5	-	5.06	3455	20.26	92.5	No odours / Low turbidity
MW3	0.845	11.65	10.805	11.0	-	4.52	1419	18.48	122.4	No odours / Moderate turbidity
MW4	1.610	12.72	11.110	3.0	-	4.32	736	18.82	132.8	Slight HC odours / Moderate turbidity
MW5	0.900	13.965	13.065	9.0	-	5.12	5266	20.12	89.1	No odours / Moderate turbidity

Notes:
GME – Groundwater monitoring event.
SWL – Standing Water Levels as measured from TOC (top of well casing) prior to groundwater sampling.
m BTOC – metres below top of well casing.
RL (TOC) – Reduced Level, extrapolated elevation at TOC in metres relative to Australian Height Datum (m AHD) based on existing survey plan.
HC - Hydrocarbon
[†] WL = Calculated groundwater level, in m AHD (calculated as RL – SWL)
[#] DO – Dissolved oxygen readings were not taken for samples collected due to faulty equipment.
EC – groundwater electrical conductivity as measured onsite using portable EC meter.
µS/cm – micro Siemens per centimetre (EC units).
DO – Dissolved Oxygen in units of milligrams per litre (mg/L)
All groundwater parameters (pH, EC) were tested on site.

Presence of LNAPL was not observed during the monitoring well gauging, purging and sampling process, however, slight sheens, accompanied by slight hydrocarbon odour, were observed in groundwater extracted from MW4.

With reference to Table 7-3, the field pH data indicated that the groundwater was moderately acidic (pH ranged from 4.32 – 5.06). Electrical Conductivity (EC) measurements were recorded in the range of 736 to 5266 µS/cm, suggesting the groundwater encountered during the investigation was marginally fresh to brackish, which is typical of aquifers present in Shale (McNally, 2004).

Analysis of the water level corrected to m AHD suggested that groundwater on site is likely flowing in a south-westerly to southerly direction.

7.3 LABORATORY ANALYTICAL RESULTS

7.3.1 Soil Analytical Results

A summary of laboratory results showing test sample quantities, minimum/maximum analyte concentrations is presented in Table 7-4. Detailed tabulations of results showing the tested concentrations for individual samples alongside the adopted soil criteria are presented in Tables T1 to T6. Completed documentation used to track soil sample movements and laboratory receipt (i.e. COC and SRA forms) are copied in Appendix I and all laboratory analytical reports for tested soil samples are presented in Appendix J.

Table 7-4 Summary of Soil Analytical Results

No. of primary samples	Analyte	Min. Conc. (mg/kg)	Max. Conc. (mg/kg)	Sample locations exceeding investigation levels *
Heavy Metal				
36	Arsenic	<3	19	None
36	Cadmium	<0.3	5.6	None
36	Chromium (Total)	2.6	71	None
36	Copper	2.2	260	Samples exceeding EIL: BH14-1; BH21-2
36	Lead	11	2400	Sample exceeding HIL: BH5-1, BH14-1, BH17-1, BH21-1, BH22-1 Samples exceeding EIL: BH5-1; BH14-1; BH17-1; BH21-2; BH22-1
36	Mercury	<0.01	1.5	None
36	Nickel	<0.5	34	Sample exceeding EIL: BH5-1
36	Zinc	1.9	2500	Samples exceeding EIL: BH1-1, BH2-1; BH5-1; BH5-2; BH7-1; BH9-1; BH12-1; BH14-1; BH14-2; BH15-1; BH16-1; BH17-1; BH21-1; BH22-1.
TRHs (including BTEX) & Naphthalene				
36	TRH C6-C10 minus BTEX (F1)	<25	72	Samples exceeding HSL: BH3-1; BH4-2; BH16-2
36	TRH >C10-C16 (F2) minus Naphthalene	<25	1100	Samples exceeding HSL: BH4-2; BH16-1; BH16-2; BH19-1 Samples exceeding ESL (for F2 including Naphthalene): BH1-2; BH4-2; BH14-1; BH16-1; BH16-2; BH18-1; BH19-1; BH21-2
36	TRH >C16-C34 (F3)	<90	8400	Samples exceeding ESL: BH16-1; BH19-1
36	TRH >C34-C40 (F4)	<120	1200	None
36	Benzene	<0.1	0.1	None
36	Toluene	<0.1	0.5	None

No. of primary samples	Analyte	Min. Conc. (mg/kg)	Max. Conc. (mg/kg)	Sample locations exceeding investigation levels *
36	Ethylbenzene	<0.1	0.2	None
36	Total Xylenes	<0.3	1.2	None
36	Naphthalene (Volatile)	<0.1	17	Samples exceeding HSL: BH18-1; BH19-1
PAHs				
36	Benzo(a)pyrene	<0.1	120	Samples exceeding ESL: BH1-1; BH4-1; BH7-1; BH14-1; BH16-1; BH18-1; BH19-1; BH19-2; BH21-1
36	Carcinogenic PAHs	<0.3	160	Samples exceeding HIL: BH7-1; BH16-1; BH18-1; BH19-1; BH19-2
36	Total PAHs	<0.8	1800	Samples exceeding HIL: BH16-1; BH19-1
Asbestos				
23	Asbestos	N/A	N/A	Asbestos fibres were not detected in tested samples except for BH2-1
Total Phenols				
36	Total Phenols	<0.1	6.8	None
OCPs				
23	Aldrin & Dieldrin	<0.1 & <0.2	<0.1 & <0.2	None
23	Chlordane	<0.2	<0.2	None
23	DDT+DDD+DDE	<0.6	6.9	None
23	Heptachlor	<0.1	<0.1	None
OPPs				
23	Total OPPs	Below PQLs	Below PQLs	None
PCBs				
23	Total PCBs	Below PQLs	Below PQLs	None
VOCs**				
36	Chlorobenzene	<0.1	59	-
36	1,1,2,2-tetrachloroethane	<0.1	0.1	-
36	Isopropylbenzene (Cumene)	<0.1	1.4	-
36	n-propylbenzene	<0.1	2.9	-
36	1,3,5-trimethylbenzene	<0.1	9.5	-
36	1,2,4-trimethylbenzene	<0.1	18	-
36	sec-butylbenzene	<0.1	0.5	-
36	p-isopropyltoluene	<0.1	0.2	-

No. of primary samples	Analyte	Min. Conc. (mg/kg)	Max. Conc. (mg/kg)	Sample locations exceeding investigation levels *
36	n-butylbenzene	<0.1	8.6	-
36	Hexachlorobutadiene	<0.1	0.2	-

Notes:

* = Refer to Section 6.3 for all investigation levels adopted.
** = Only VOCs with concentrations greater than laboratory PQLs are listed here.

Heavy Metals

With reference to Table 7-4 and Table T1, Exceedance of health based investigation levels (HIL) for lead was found in soil sample BH5-1, BH14-1, BH17-1, BH21-1 and BH22-1. Delineation of the impacted depth were achieved at BH5-2, BH14-2 and BH17-2 and BH21-2, the lowest being 1.2 m bgl.

In regards to ecological risks, concentrations of lead in BH5-1, BH14-1, BH17-1, BH21-1 and BH22-1 also exceeded the ecological based investigation levels (EIL). Concentrations in deeper soil samples at the above locations (except for BH22 where deep soil sample was not tested), however, were found to be at a lower level.

Exceedances of EIL for copper, nickel, zinc were found in various samples, as listed in Table 7-4. However, as the EILs adopted for these screened heavy metals were the sum of generic Ambient Background Concentration and the most stringent Added Contaminant Concentration values, without the inclusion of site-specific Ambient Background Concentration and Added Contaminant Concentrations, the adopted criteria are considered to be conservative. Further collection of information on overall site soil conditions may be required to derive EILs specific for the site.

TRHs

As shown in Table T2, concentrations of F1 fraction of total recoverable hydrocarbons (TRH) in BH3-1, BH4-2 and BH16-2 was found to exceed the adopted HSL. Delineation of impacts at BH3 was achieved at BH3-2 at depth 0.5 – 0.95 m bgl.

F2 fraction of TRH in sample BH4-2, BH16-1, BH16-2 and BH19-1 were found to be in exceedance over the adopted HSL and ESL. BH19-1 was identified as a health based impacted hotspot as the concentration exceeded the criteria for over 2.5 times, while all four locations were identified as ecological based impacted hotspot. In addition to the above locations, BH1-2, BH14-1, BH18-1 and BH21-1 were also found to be over the adopted ESLs. It is also noted that the concentration found in BH19-1 was over the F2 Management Limit Value provided in NEPM 1999.

Samples BH16-1 and BH19-1 were identified as ecological based hotspots for F3 fraction of TRH. Although corresponding HSL criteria were not available in NEPM 1999, the concentration in BH19-1 was found to be exceeding the provided management limits, and the one in BH16-1 was at the provided limit. Concentrations found in deeper soil samples at these locations, BH16-2 and BH19-2, however, were found to be under both ESLs and management limits.

BTEX and Volatile Naphthalene

With reference to Table T2, concentrations of all BTEX compounds in tested samples were found to be under the adopted SILs;

Concentrations of volatile Naphthalene in sample BH18-1 and BH19-1 were in exceedances of the adopted HSL, and both sampling locations were identified as Naphthalene impacted hotspots. Delineation of the impact was achieved at BH19-2 at 0.8 m bgl.

PAHs (including semi-Volatile Naphthalene)

As summarised in Table T3, concentrations of Carcinogenic PAHs (as Benzo (a) pyrene toxicity equivalent quotient) in BH7-1, BH16-1, BH18-1, BH19-1 and BH19-2 were found to be over the adopted HIL. BH16-1, BH19-1 and BH19-2 were found to be Carcinogenic PAHs impacted hotspots as the concentrations were over 2.5 times of the adopted criteria. Delineation of the impact was only achieved at BH16 with the reported concentration in BH16-2 found to be under the adopted criteria.

Exceedances of Benzo(a)pyrene concentrations over adopted ESL were observed in samples BH1-1, BH4-1, BH7-1, BH14-1, BH16-1, BH18-1, BH19-1, BH19-2 and BH21-1. Furthermore BH7-1, BH16-1, BH18-1, BH19-1 and BH19-2 were defined as Benzo(a)pyrene impacted hotspots. Delineation were achieved at BH1, BH4, BH14, BH16 and BH21 at deeper soil samples, suggesting the impacts were limited to the fill layer.

Total PAHs at sample BH16-1 and BH19-1 were over the adopted HIL, with BH19-1 found to be a hotspot. Delineation were achieved at both locations at deeper soil samples.

Asbestos

As summarised in Table T4, asbestos was only detected in BH2-1, with delineation achieved at BH2-2.

Phenols

As summarised in Table T4, concentrations of total phenols in all tested samples were below the adopted SILs.

OCPs, OPPs and PCBs

With reference to Table T5, concentrations of OCP, OPP and PCB compounds in all tested samples were below adopted SILs.

VOCs

With reference to Table T6, the concentrations Chlorobenzene found in BH17-1 exceeded the adopted criteria. Delineation was achieved at BH17-2 at 1 m bgl within the residual soil layer.

7.3.2 Groundwater Analytical Results

Laboratory analytical results for groundwater samples are summarised in Table T7 and Table T8, which also include the adopted GILs. Completed documentation used to track groundwater sample movements and laboratory receipt (COC and SRA forms) are copied in Appendix I. Copies of the laboratory analytical reports are attached in Appendix J.

Heavy Metals

With reference to Table T7, concentrations of most screened heavy metals were under adopted GILs, with the exception of copper, nickel and zinc. The exceedances of these three heavy metals over adopted GILs were observed in all groundwater samples, except for Copper in MW5.

It is considered that the identified groundwater metal concentrations are potentially the result of long-term urban development in the existing groundwater catchment area, and may not necessarily be attributable to onsite contamination sources. Realisation of impacts to the nearest environmental receptor is also unlikely as elevated heavy metal concentrations are likely to attenuate prior to reaching the point of exposure, that being Alexandria Canal. Therefore, whether these results are treated as exceedances of the GILs, or representative of urban background groundwater conditions, the identified groundwater concentrations are not considered to represent a cause for environmental concern.

TRHs and BTEX

As shown in Table T7, presence of Benzene were detected in MW1-1 and MW4-1. The concentration of Benzene in MW4-1 exceeded both the criteria for Marine Water aquatic systems and HSL for residential developments. Ethylbenzene and xylene were also found in MW4-1, however, at concentrations lower that the adopted criteria.

F1 fraction TRH concentrations at 12,000 µg/L was found in sample MW1-1. Presence of F2 fraction TRH ranging from 63 µg/L to 1,600 µg/L were also found in MW1-1, MW3-1 and MW4-1.

PAHs (including semi-volatile Naphthalene)

As shown in Table T7, the concentration of Naphthalene in MW4-1 exceeded the adopted GIL. Presence of various PAH compounds were also noted in MW1-1, MW2-1, MW3-1 and MW4-1, however, there was no available criteria for assessment.

Ammonia Nitrogen, Sulphate and Chloride

As shown in Table T7, the concentration of Ammonia Nitrogen, sulphate and Chloride found in tested samples were within the adopted criteria.

VOCs (including volatile Naphthalene)

With reference to Table T8, concentrations of Vinyl Chloride, Chloroform, and 1,2- dichloroethane in MW1-1, as well as 1,1-dichloroethene in MW5-1 were found to be in exceedance of the adopted criteria.

Concentrations of Isopropyl benzene (Cumene), 1,3,5-trimethylbenzene and 1,2,4-trimethylbenzene in MW4-1 were found to be in exceedance of the interim assessment criteria.

7.3.3 Acid Sulfate Soils Analytical Results

Laboratory results of tested ASS samples are tabulated in Table T9.

Non-Oxidised and Oxidised pH Testing

Measured pH KCl values (non-oxidised pH testing) in samples indicated general acidic conditions in tested soils. Measured pH Ox values (oxidised pH testing) suggested the tested soil samples were not prone to major pH value changes after peroxide oxidisation.

sPOCAS

Suspended peroxide oxidation combined acidity and sulfate testing was conducted on all samples, with the peroxide oxidisable sulphur (SPOS) of ASS3-1, ASS4-1 and ASS4-2 found to be over 0.03% w/w. Acid trail was also detected, with total potential acidity in most samples found to be close or over 100 mol H+/tonne, except for ASS5-1. Measured total

sulfidic acidity in ASS3-1 and ASS4-1 were found to be over 18 mol H+/tonne. It is noted that though soil samples tested were residual soils originated from Ashfield Shale bedrock rather than soils exhibiting characteristics of actual/potential acid sulfate soils.

8. DATA QUALITY ASSESSMENT

The assessment of data quality is defined as the scientific and statistical evaluation of environmental data to determine if these data meet the objectives of the project (Ref. USEPA 2006). Data quality assessment includes an evaluation of the compliance of the field sampling and laboratory analytical procedures and an assessment of the accuracy and precision of these data from the laboratory quality control measurements obtained.

The data quality assessment process for this assessment included a review of analytical procedures to confirm compliance with established laboratory protocols and an assessment of the accuracy and precision of analytical data from a range of quality control measurements. The QC measures generated from the field sampling and analytical program were as follows:

- suitable records of fieldwork observations including borehole logs;
- relevant and appropriate sampling plan (density, type, and location);
- use of approved and appropriate sampling methods;
- preservation and storage of samples upon collection and during transport to the laboratory;
- complete field and analytical laboratory sample COC procedures and documentation;
- sample holding times within acceptable limits;
- use of appropriate analytical procedures and NATA-accredited laboratories; and
- required LOR (to allow for comparison with adopted IL);
- frequency of conducting quality control measurements;
- laboratory blanks;
- field duplicates;
- laboratory duplicates;
- matrix spike/matrix spike duplicates (MS/MSDs);
- surrogates (or System Monitoring Compounds);
- analytical results for replicated samples, including field and laboratory duplicates and inter-laboratory duplicates, expressed as Relative Percentage Difference (RPD); and
- checking for the occurrence of apparently unusual or anomalous results, e.g. laboratory results that appear to be inconsistent with field observations or measurements.

The findings of the data quality assessment in relation to the soil and groundwater investigations at the site are discussed in detail in Appendix J. QA/QC policies and DQOs are presented in Appendix K.

On the basis of the analytical data validation procedure employed the overall quality of the soil and groundwater analytical data produced for the site were considered to be of an acceptable standard for interpretive use.

9. SITE CHARACTERISATION DISCUSSION

9.1 CONCEPTUAL SITE MODEL

On the basis of investigation findings presented above, the preliminary CSM discussed in Section 4 was considered generally appropriate in identifying contamination sources, migration mechanisms and exposure pathways, as well as potential onsite and offsite receptors. Some of the previously known data gaps, as outlined in Section 4.4 have been addressed; however, the following remaining data gaps need to be addressed in subsequent investigation works:

- The areas directly under the existing building footprints at 75 Mary Street remained unassessed in this investigation due to access constraints. As a result, the sampling plan developed for this investigation is more a targeted than systematic pattern, hence may not achieve the confidence level required for contamination and hotspot detection using the statistical approach recommended by NSW EPA. An alternative decision rule was adopted as a result, as discussed in Section 5. Consequently, some impacts present on site may not have been fully addressed including the lateral delineations of the identified impacts. Thus it is recommended that, further investigation, including additional intrusive investigation and samplings, shall be conducted after access to the existing building areas is made possible;
- Intrusive investigations at the four additional properties included in the amended development proposal (i.e. 67 Mary Street, 43 Roberts Street, 50 and 52 Edith Street) were not carried out in this DSI, due to presence of structural obstacles within their premises. The environmental condition in these parts of the site require confirmation, once access to these areas is made available;
- The investigation reported that the concentrations of lead in the fill layer at BH14 was in exceedance of HIL. However the source and lateral extent of the impact were not established during this investigation, as discussed in Section 9.2;
- The presence of hydrocarbon impacts in subsurface soils and groundwater was identified during this investigation. The impacts were partially attributed to the abandoned Underground Storage Tanks on site, namely those identified on Figure 5. However it remained inconclusive that whether the impacts found at locations upstream of the USTs (i.e. northern portion of the site, where BH1, BH14, BH15, BH16, BH17, BH18 and BH19 were situated) have resulted from the same source. Nevertheless, we noted that past and current manufacturing activities on site, including paint, furniture manufacturing and fabrication activities, may form a contributing factor for impacts found at these locations;
- The investigation findings also suggested that TRH concentrations in exceedances of the adopted criteria were identified within the 75 Mary Street. The impacted locations are BH3, exceeding the health based criteria, and BH14 and BH21, exceeding the ecological based criteria. Of these three locations, the TRH impact at BH21 were not delineated vertically, and may require further investigation.
- The exact number, location and conditions of USTs at 75 Mary Street, as well as the chemicals previously stored has not been confirmed, due to lack of information from reliable sources. Further investigation, required may include ground penetration radar, interviewing with historical site tenants and intrusive investigations to close these data gaps;
- The subsurface soils and groundwater conditions below and within the identified USTs tank pits were not assessed during this investigation and remained unknown;

- Carcinogenic PAH (B(a)P TEQ), and Benzo(a)pyrene impacts in exceedance of the health based criteria were identified at BH7, BH16 and BH19, and delineation was achieved only at BH16 at 0.9 m bgl. We noted that BH7 and BH19 were situated within or adjacent to the proposed basement excavation area. Further delineation of both the horizontal and vertical extent of the impacts at all three location, as well as to establish the source of the impacts, may be required;
- The groundwater flow direction is generally toward the south and south west but may be influenced by the UST tank pits. Groundwater characterisation may need refinement with the installation of additional monitoring wells, both on site and off site, to verify the groundwater flow direction and the potential for off-site migration (particularly well MW1 on the western boundary);
- TRH, naphthalene and VOC impacts were identified in monitoring wells MW1 and MW4, which were situated in proximity to the site boundaries. As above the installation of additional monitoring wells in offsite areas may be required to determine potential off-site migration;
- The primary sources for the identified TRH and VOCs in groundwater are likely to be the USTs and former drum store area but further investigation may be require to confirm the actual sources;
- The F1 fraction TRH reported in MW1 exceeded the water solubility limit and phase separated hydrocarbon (PSH)/light non aqueous phase liquid (LNAPL) may occur in groundwater as a result. Although PSH/LNAPL was not measured by the interface probe during this investigation, a slight sheen was noted during the sampling of MW4, suggesting the potential for PSH/LNAPL. Further investigation, including targeted sampling for phase separated hydrocarbons, speciation of reported TRH compounds, and vapour intrusion assessment may be required to confirm the presence of any PSH/LNAPL.

9.2 HEAVY METAL IN SOIL

Concentrations of heavy metals (HM) found in all tested samples were generally under the adopted health-based SILs, with the only exception being lead, with multiple exceedances in the fill material was observed at BH5, BH14, BH17, BH21 and BH22. It is uncertain that if the source of the detected HM originated from the constituents of the filing materials, or from the underground storage tanks in close proximity of the sampled location. It is recommended that further samplings, including in the existing building footprint, to be carried out to confirm the source of the heavy metal impacts.

In regard to ecological risks, concentrations of Copper, Lead, Nickel, and Zinc exceeding the ecological-based SILs were identified at various locations on site, as listed in Section 7.3.1. It is noted that site-specific ambient background concentration and added contaminant limits were not included in the derivation of Ecological based SILs for Copper, Nickel and Zinc, resulting in more conservative criteria. The test results also suggested the found exceedances were mostly limited within shallow soil depths. At the time of assessment, the open area of 75 Mary Street was primarily covered in concrete or gravel pavement, hence the exposure pathways for these contaminants are unlikely to be complete in the current site configuration. With considerations given to the proposed excavation depths and extent, it is understood that most of the impacted areas will likely be removed during the excavation phase. Soils at other impacted areas shall be managed to minimise the exposure risks to sensitive receptors.

9.3 RESIDUAL PETROLEUM HYDROCARBONS (TRH) IN SOIL

Residual TRH fraction in exceedance of the adopted health-based screening levels (HSL) were detected in both fill and residual soil layers at multiple locations of the site, as shown in Table 9-1. Lateral delineation of the impacts was not achieved, as the identified impacted locations were situated on driveways between existing buildings, the internal of which were inaccessible during this investigation. BH4 and BH16 were not vertically delineated, and it is recognised that the TRH impacts extended to the residual soil layer at least.

Table 9-1 Summary of Elevated TRH Concentration in Tested Soil Sample

Sample ID	Sample Depths (m bgl)	Soil Units	TRH Fractions	Concentration (mg/kg)	Adopted Investigation Levels (mg/kg)	Vertically delineated?
BH3-1	0.2-0.4	Fill	F1	71	50	Yes, at 0.5-0.95 m bgl
BH4-2	0.5-0.95	Residual Soil	F1	72	50	No
			F2	300	280	
BH16-1	0.4-0.5	Fill	F2	320	280	No
BH16-2	0.7-0.9	Residual Soil	F1	72	50	No
			F2	300	280	
BH19-1	0.2-0.4	Fill	F2	1100	280	Yes, at 0.8-1.0 m bgl

As the impacted locations scattered across the site among the northern, western and southern portion of the site, it is inferred that multiple sources of TRH contaminants were present on site. Potential contributing sources included residual chemical from the USTs, and residual TRH introduced to subsurface layers by past and current activities on site (i.e. paint manufacturing, drum washing, varnish manufacturing and storage, engineering works, mechanical works). Further investigation may be required the full extent of impact and the remedial works required.

As BH4, BH16 and BH19 are situated in close proximity to the proposed basement footprint, risks associated with vapour intrusion to the basement structures may arise as the basement structures may be in contact with the impacted soils, necessitating a risk assessment for vapour intrusion to the proposed basement.

9.4 POLYCYCLIC AROMATIC HYDROCARBON (PAH) IN SOIL

Carcinogenic PAHs (calculated as Benzo (a) pyrene toxicity equivalent quotient as per NEPM 2013) was found to exceed adopted HILs in BH16-1, BH19-1, BH19-2 and BH7-1, and concentrations of total PAHs exceeded the adopted HIL in BH16-1 and BH19-1. BH16-1 and BH19-1 were defined as hotspots for both carcinogenic PAHs and total PAHs. Vertical delineation of the carcinogenic PAH impact was not achieved at BH19 with the concentration detected in BH19-2 still exceeded the criteria, but at a much lower level when compared to BH19-1.

Based on the sampling depths of tested samples and their respective reported concentrations, the presence of carcinogenic PAHs and total PAHs in subsurface soils are likely restricted to the fill layer and upper residual soil

profiles and may be due to past filling, fire episodes or the burial ash from incinerator waste (common in the inner city areas prior to improved council waste services).

As open areas within 75 Mary Street was capped with concrete hardstand/gravel pavement at the time of assessment, the exposure pathways to both health and ecological receptors were considered unlikely to be completed under the existing site configuration. However, management of disturbed soils will be required to mitigate the potential exposure risks during and post the site redevelopment works.

9.5 ASBESTOS RISK

Laboratory testing of surface samples indicates asbestos fibres were found in sample BH2-1. Delineation of the impacted depths was achieved at BH2-2 in the residual soil layer. Given the above facts, the asbestos fibres impacted soils are likely limited to the fill layer. Although asbestos were not detected in other samples, we noted that areas under existing building footprints were not assessed in this investigation and require further investigation to delineate the lateral extent of asbestos impacted soils.

A damaged asbestos pipe was observed in the north-east car park area, suggesting past use of asbestos containing materials on site had occurred. Information from council records also indicated asbestos containing materials (ACM) were previously used in the construction of onsite structures. There was no evidence indicating the removal of these ACMs. In light of this, it is recommended that a Hazardous Materials Survey, including laboratory testing of samples collected from existing structures, be carried out prior to the demolition of structures on site, to minimise the risk of exposure during demolition works.

9.6 VOCS IN SOIL

Two Naphthalene impacted hotspots in exceedance of the adopted HSL were found during this investigation in BH18-1 and BH19-1. Elevated concentration of Chlorobenzene in BH17-1 in exceedance of the interim assessment criteria was also noted but were not delineated due to the limited investigation regime.

The locations of these exceedances were beyond the proposed residential development and basement excavation areas, near the boundaries. Given the close proximity of these locations to the boundaries of the proposed building and basement footprint, EI considered there is a high risk of exposure to the reported VOCs contaminants during the basement excavation and construction process. Risks associated to vapour intrusion to internal building areas will likely rise post site redevelopment works as well. In light of this, further investigation, including an assessment of soil vapour risks, shall be carried out

9.7 TRHS AND VOCS IN GROUNDWATER

Elevated concentration of TRH and VOCs were detected in MW1, MW3, MW4 and MW5, as shown in Table 9-2 and Figure 6. It is noted that the concentrations of F1 fraction TRH reported in sample MW1-1 was over the groundwater solubility limit (9,000 µg/L). Under such cases, phase separated hydrocarbons (PSH) in forms of light/dense non aqueous phase liquid may present in groundwater, depending on individual chemical composition in the detected T1 fraction TRH. In addition, slight sheen was observed in groundwater extracted from MW4. In view of the above, EI considered there is a high risk of exposure to TRH compounds during the excavation and construction of basement. Further investigation, including soil vapour assessment, will be necessary to quantify the vapour intrusions associated with the presence of VOCs in groundwater.

Groundwater beneath the site is within a fractured shale aquifer and the inferred flow direction may be influenced by the joints, bedding planes and fractures within the rock mass. As a result, additional groundwater monitoring will be required to characterise the overall groundwater conditions within the site, and monitor potential migration of chemicals to offsite areas.

Table 9-2 Summary of Elevated TRH and VOCs Concentration in Tested Groundwater Samples

Sample ID	Analyte	Concentration (µg/kg)
MW1-1	F1	12,0001
	F2	63
	Vinyl Chloride	57
	Chloroform	180
	1,2-dichloroethane	3600
MW3-1	F2	480
MW4-1	Benzene	710
	Ethylbenzene	250
	Total Xylene	350
	F2	1600
	Chlorobenzene	270
	Cumene	63
	1,3,5-trimethylbenzene	140
	1,2,4-trimethylbenzene	590
MW5-1	1,1-dichloroethene	34

9.8 Acid Sulfate Soils

The laboratory test results of acid sulfate soils suggested general acidic conditions in the subsurface soils on site. We noted that the test results of the soil samples exceeded the action criteria specified in Acid Sulfate Soil Assessment Guidelines (ASSMAC, 1998). However, given the fact that the site was overlying a residual soil landscape originated from Ashfield Shale, it is unlikely that the acidic conditions and sulfate content found in the tested soil samples are indicative of the presence of acid sulfate soils. Other sulphur containing minerals, for example Pyrite (FeS_2), a common mineral constituent found in Wianamatta Group lithology (Herbert, 1979), are likely contributing to the sulfate contents detected in ASS samples. Furthermore, the site is found to be situated within a zone of "*No Known Occurrence*" of ASS, and within a class 5 ASS land (Refer to Section 2.3), there is no historical evidence indicating ASS is present within the site area. Visual indicators of actual and potential ASS (ASSMAC, 1998) also were not observed during this field investigation. In light of the above, the likelihood of subsurface soils on site being actual or potential ASS is deemed low.

9.9 Characterisation of 67 Mary Street, 43 Roberts Street, 50 and 52 Edith Street

Intrusive investigation at the above four properties was not carried out in this DSI, due to access constrains present within their boundaries. Review of the associated land title records and historical aerials on these properties,

however, indicated that they have likely been used for residential use since the early 20th century. Therefore, EI consider the historical activities on these parts of the site were unlikely to result in significant contamination issues. The environmental conditions of these properties, nevertheless, will require confirmation by means of intrusive investigation, once the structural obstacles have been cleared.

10. CONCLUSIONS

The land parcels known as 67 & 75 Mary Street, 43 Roberts Street, 50 & 52 Edith Street, St Peters NSW was the subject of a Detailed Site Investigation in order to assess the environmental conditions and the potential for on-site contamination associated with the identified current and former land uses. Based on the findings of this assessment and within the limitations of normal environmental investigations (Section 12), EI conclude that:

- The site comprised an irregular shaped block covering approximately 1.5 hectares (15,289 m^2). It is bounded to the south-west by Mary Street, to the north-west by low density residential buildings followed by Unwins Bridge Road, to the south-east by low density residential buildings and to the north-east by Edith Street;
- At the time of the assessment, 75 Mary Street was occupied by a factory complex consisting of twelve one to three storey industrial buildings and an open car park associated to the complex. The remaining areas of the site were occupied by four residential dwellings;
- A review of the available historical aerials, land title transfer records and council records indicated historical land uses on 75 Mary Street was primarily industrial. In particular, records indicated a paint manufacturing factory had been operating on its premise until the mid-1960s. In the ensuing period, various manufacturing and industrial activities had occurred on this allotment to date. 67 Mary Street, 43 Roberts Street, 50 and 52 Edith Streets appeared to be of residential nature from the 1930s;
- The site was free of statutory notices issued by the NSW EPA/OEH. Records pertaining to the site was not identified on the List of NSW contaminated sites notified to EPA, Stored Chemical Information Database held by WorkCover, or the Protection of the Environment Operations (POEO) public register;
- A plan attached in a historical building application held by Marrickville Council indicated there were three underground storage tanks (USTs) burial areas containing multiple USTs within 75 Mary Street. The site walkover inspection conducted as part of this assessment confirmed the presence of infrastructure associated to USTs (i.e. fill points and vent pipes). Evidence related to chemicals previously stored in the tanks, or the removal of tanks was not available from searches undertaken during the course of this investigation. In addition, the exact number of USTs installed at 75 Mary Street remained inconclusive;
- Soil sampling and testing were conducted at 23 borehole locations down to a maximum depth of 3.25 m bgl, within 75 Mary Street. Due to existing physical obstacles (e.g. building walls, underground and overhanging services and other physical obstructions), the sampling regime was developed using primarily judgemental/targeted sampling patterns which would not allow a systematic characterisation of the environmental conditions on site. The remaining areas of the site, i.e. the four residential properties, were not subject to intrusive investigation due to limited access;
- The sub-surface layers comprised fill materials of various constituents, suggesting several period of filling in the past. The overall geological configuration within the site was anthropogenic fill underlain by residual soils, with Ashfield Shale bedrock at depth;
- Perched groundwater was encountered at 0.03 m bgl at one location (BH4) during the intrusive investigation. Deeper groundwater was inferred to be flowing within the underlying fractured shale bedrock to the south and south-west;
- Laboratory testing of selected soil samples indicated exceedances of the following analytes over the adopted health based investigation/screening levels have been identified on site during this investigation:

  - Lead in the fill layer at BH5, BH14, BH17, BH21 and BH22;
  - Total recoverable hydrocarbons (TRH) in the fill and residual soil layers at BH3, BH4, BH16 and BH19, located both up and down gradient of the UST burial areas;
  - Carcinogenic and Total Poly Aromatic Hydrocarbons (PAH) in the fill layer at BH7 and BH16, and in both fill and residual soil layers at BH19. Two hotspots were identified at BH16 and BH19;
  - Naphthalene in the fill layer at BH18 and BH19. Both locations were recognised as hotspots;
  - Asbestos in the fill layer at BH2;
  - Elevated concentrations of Chlorobenzene over the interim assessment guidelines was also noted at BH17; and
  - Delineation of impacted profile were not achieved at BH4, BH7, BH16 and BH19.
- Exceedances of heavy metals, TRH and Benzo(a)pyrene over ecological based criteria at various locations across 75 Mary Street were identified. Presence of these contaminants however was not considered posing immediate threat to the existing ecological receptors, as majority of the premises was covered in concrete hardstand, bitumen and gravel pavements;
- Testing of collected groundwater samples identified the following impacts in exceedance of the adopted groundwater investigation and health based screening criteria:
  - Heavy metals (copper, nickel and zinc) at all wells;
  - F1 and F2 fraction TRH at MW1, MW3 and MW4, with slight sheen and hydrocarbon odour observed at MW4; and
  - Elevated VOCs concentrations over the interim assessment guidelines were noted at MW1, MW4 and MW5.

In summary, contamination was identified at multiple locations onsite during this investigation. The contamination is likely to have resulted from past filling and from the previous site operations for the storage and manufacture of paint and associated products. Soil and groundwater contaminations were noted in both fill and residual strata and are likely require remediation prior to any redevelopment. The investigation, also identified a number of data gaps which would require further assessment, including intrusive investigation at inaccessible areas during this DSI, prior to any construction at the site.

In conclusion and within the Statement of Limitations, EI concludes the conditions of site soil and groundwater would not prevent the site to be rezoned to allow mixed residential and commercial land-use. The suitability of the site for the proposed development, however, could not be ascertained based on existing data. It is recommended further investigation and remediation works to be carried out to render the site suitable for the development. Site contamination issues can be managed through the development application process in accordance with the State Environmental Planning Policy 55 (SEPP 55) – Remediation of Land and the Marrickville Council Contaminated Land Policy.

11. RECOMMENDATIONS

11.1 FURTHER WORKS

Based on the findings of this investigation, EI provides the following recommendation to allow the site to be rendered suitable for the proposed mixed residential/commercial use:

1. Preparation of a Remedial Action Plan (RAP) to outline the requirements for the decommissioning of UST's and associated infrastructure and the remediation requirements for contaminated soils and groundwater. The RAP should also consider the methodology for the identification and remediation of potential phase separated hydrocarbons that may present underneath the site;

2. The RAP should also develop further soil and groundwater investigation program (including soil vapour assessment in TRH and VOCs impacted areas) to close/clarify any data gaps identified during this investigation. Additional investigation shall also be conducted at the four residential properties, known as 67 Mary Street, 43 Roberts Street, 50 and 52 Edith Street to characterise conditions within these allotments, upon access to these properties is made available;

3. The RAP should outline further groundwater investigation along the site boundaries and immediately offsite areas to identify potential migration of contaminations and assess the potential risk to on and off-site human and environmental receptors; and

4. The RAP should also outline the need for an ongoing Environmental Management Plan to address potential vapour intrusion risk noted in areas where buildings are to remain (near the old tank/drum cleaning area) to mitigate the risks of exposure for current and future tenants.

5. Due to the limited access available with the presence of tenants and structures, the additional works required as part of the RAP should be conducted once the site has been vacated and demolition of the targeted structures has been completed.

11.2 DUTY TO NOTIFY EPA

If phase separated hydrocarbons are identified on the site boundary, the owner of the site is required to report the contamination to the NSW EPA under the Contaminated Land Management Act (1997). This process is described below.

Under Section 60(3) (a) of the CLM Act (1997), a person whose activities have contaminated land or a landowner whose land has been contaminated is required to notify the NSW EPA when they become aware of the contamination. Notification of actual or foreseeable contamination of groundwater is required:

- If the contaminant has entered, or will foreseeably enter the groundwater.

AND

- The concentration of the contaminant in the groundwater is, or will foreseeably be, above the concentration specified for that contaminant in Column 1 of Appendix A of the NSW EPA Guidelines on the Duty to Report Contamination under the Contaminated Land Management Act 1997.

AND

- The concentration of the contaminant in the groundwater will foreseeably continue to remain above the specified concentration. Separate-phase contamination of groundwater (i.e. immiscible organic liquid), if found, requires notification regardless of the concentration in the groundwater.

Separate-phase contamination of groundwater (i.e. immiscible organic liquid), if found, requires notification regardless of the concentration in the groundwater.

Based on the results of this investigation and the access limitations, EI consider that:

- There is a potential for phase separated hydrocarbons to be present in groundwater near the boundary of 75 Mary Street; and
- The concentration of contaminants (e.g. benzene, F1 TRH, vinyl chloride and other organic compounds) found in groundwater are over the relevant concentrations provided in NSW EPA guidelines under the Contaminated Land Management Act 1997 and that the concentrations will remain at this level for the foreseeable future.

12. STATEMENT OF LIMITATIONS

The findings presented in this report are the result of discrete and specific sampling methodologies used in accordance with best industry practices and standards. Due to the site-specific nature of soil sampling from point locations, it is considered likely that all variations in subsurface conditions across a site cannot be fully defined, no matter how comprehensive the field investigation program.

While normal assessments of data reliability have been made, EI assumes no responsibility or liability for errors in any data obtained from previous assessments conducted on site, regulatory agencies (e.g. Council, EPA), statements from sources outside of EI, or developments resulting from situations outside the scope of works of this project.

Despite all reasonable care and diligence, the ground conditions encountered and concentrations of contaminants measured may not be representative of conditions between the locations sampled and investigated. In addition, site characteristics may change at any time in response to variations in natural conditions, chemical reactions and other events, e.g. groundwater movement and or spillages of contaminating substances. These changes may occur subsequent to EI's investigations and assessment.

EI's assessment is necessarily based upon the result of the site investigation and the restricted program of surface and subsurface sampling, screening and chemical testing which was set out in the proposal. Neither EI, nor any other reputable consultant, can provide unqualified warranties nor does EI assume any liability for site conditions not observed or accessible during the time of the investigations.

This report was prepared for Caliph and no responsibility is accepted for use of any part of this report in any other context or for any other purpose or by other third parties. This report does not purport to provide legal advice.

This report and associated documents remain the property of EI subject to payment of all fees due for this assessment. The report shall not be reproduced except in full and with prior written permission by EI.

13. REFERENCES

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14. ABBREVIATIONS

AECs	Areas of Environmental Concern
AHD	Australian Height Datum
ASS	Acid sulfate soils
ANZECC	Australian and New Zealand Environment Conservation Council
B(a)P	Benzo(a)Pyrene
BFD	Blind Field Duplicate (QA/QC sample, tested by the primary laboratory)
bgl	Below Ground Level
BH	Borehole
BTEX	Benzene, Toluene, Ethyl benzene, Xylene
COC	Chain of Custody
CSM	Conceptual Site Model
DEC	Department of Environment and Conservation, NSW
DECC	Department of Environment and Climate Change, NSW (formerly DEC)
DA	Development Application
DO	Dissolved Oxygen
DP	Deposited Plan
EC	Electrical Conductivity
Eh	Redox potential
EPA	Environment Protection Authority
F1	TPH C6 – C10 less the sum of BTEX concentrations
F2	TPH >C10 – C16 less the concentration of naphthalene
GIL	Groundwater Investigation Level
GME	Groundwater monitoring event
HIL	Health-based Investigation Level
HSL	Health-based Screening Level
IFD	Inter-laboratory Field Duplicate (QA/QC sample, tested by the secondary laboratory)
km	Kilometres
LNAPL	Light non aqueous phase liquid
DNAPL	Dense non aqueous phase liquid
m	Metres
mAHD	Metres relative to Australian Height Datum
mbgl	Metres below ground level
mg/m3	Milligrams per cubic metre
mg/L	Milligrams per litre
µg/L	Micrograms per litre
mV	Millivolts
MW	Monitoring well
NATA	National Association of Testing Authorities, Australia
NEPC	National Environmental Protection Council
OEH	Office of Environment and Heritage, NSW (formerly DEC, DECC, DECCW)
PAHs	Polycyclic Aromatic Hydrocarbons

PCBs	Polychlorinated Biphenyls
pH	Measure of the acidity or basicity of an aqueous solution
ppbv	Parts per billion by volume
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance / Quality Control
SWL	Standing Water Level
TPHs	Total Petroleum Hydrocarbons
UCL	Upper Confidence Limit
USEPA	United States Environmental Protection Agency
UST	Underground Storage Tank
VOCs	Volatile Organic Compounds (including VOCCs)
VOCCs	Volatile Organic Chlorinated Compounds

FIGURES

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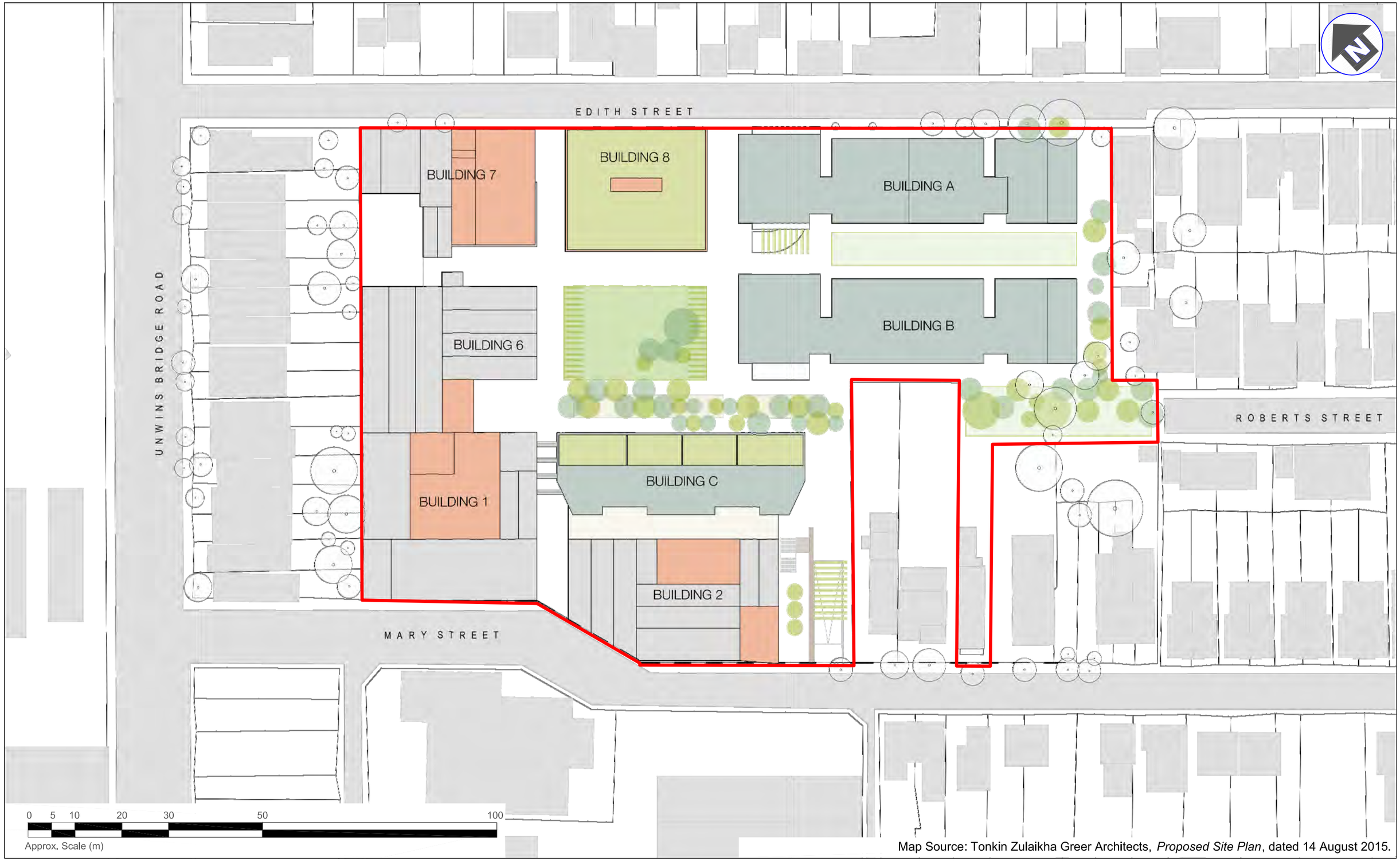
Approx Scale:	N.T.S

Caliph

Detailed Site Investigation
67 & 75 Mary Street, 50 & 52 Edith Street and 43 Roberts Street, ST PETERS, NSW
Site Locality Plan

Figure: 1

Project: E22317 AA Rev_3



Map Source: Tonkin Zulaikha Greer Architects, *Proposed Site Plan*, dated 14 August 2015.

LEGEND

- – – – Approx. site boundary

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Detailed Site Investigation
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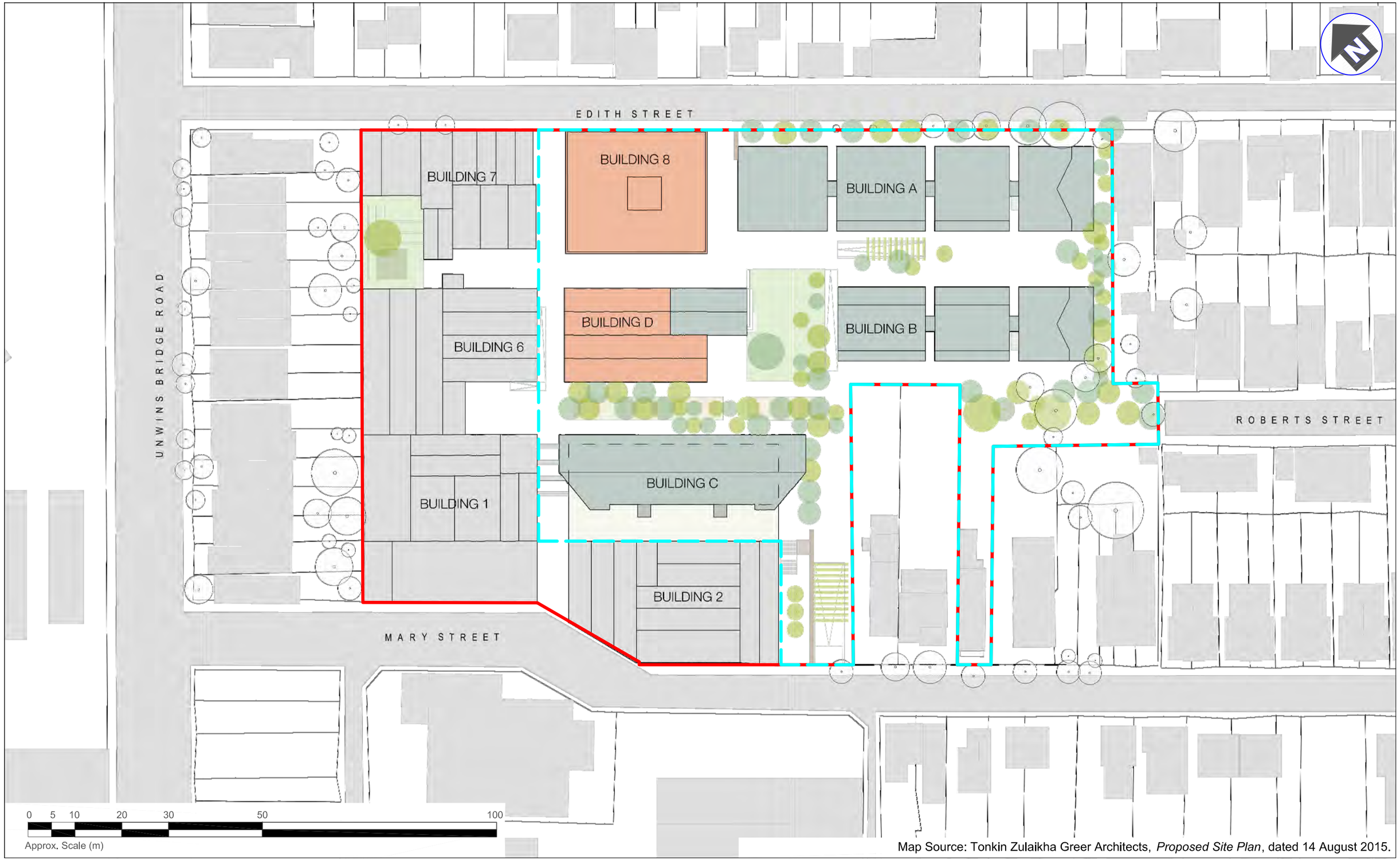
ST PETERS, NSW
Development Layout Plan

Figure: 2

Project: E22317 AA Rev_3



Map Source: Tonkin Zulaikha Greer Architects, *Proposed Site Plan*, dated 14 August 2015.

LEGEND

- Approx. extent of residential development
- Approx. site boundary

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Proposed Extent of Residential Development

Figure:
2a

Project: E22317 AA Rev_3

Map Source: Watson Buchan Pty Ltd, "*Plan Showing Levels & Details over Lot 1 in D.P. 556914*", 20/12/2013, Ref. 13/541

LEGEND

- Approx. Monitoring Well/Borehole Locations (EI, 2014)
- Approx. Environmental Borehole Locations (EI, 2014)
- Approx. Site Boundary

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Detailed Site Investigation
67 & 75 Mary Street, 50 & 52 Edith Street and 43 Roberts Street,
ST PETERS, NSW
Sampling Location Plan

Figure: 3

Project: E22317 AA Rev_3

Map Source: Watson Buchan Pty Ltd, "*Plan Showing Levels & Details over Lot 1 in D.P. 556914*", 20/12/2013, Ref. 13/541

LEGEND

- Approx. Monitoring Well/Borehole Locations (EI, 2014)
- Approx. Environmental Borehole Locations (EI, 2014)
- Approx. Site Boundary
- Basement Level B1 Footprint
- Basement Level B2 Footprint

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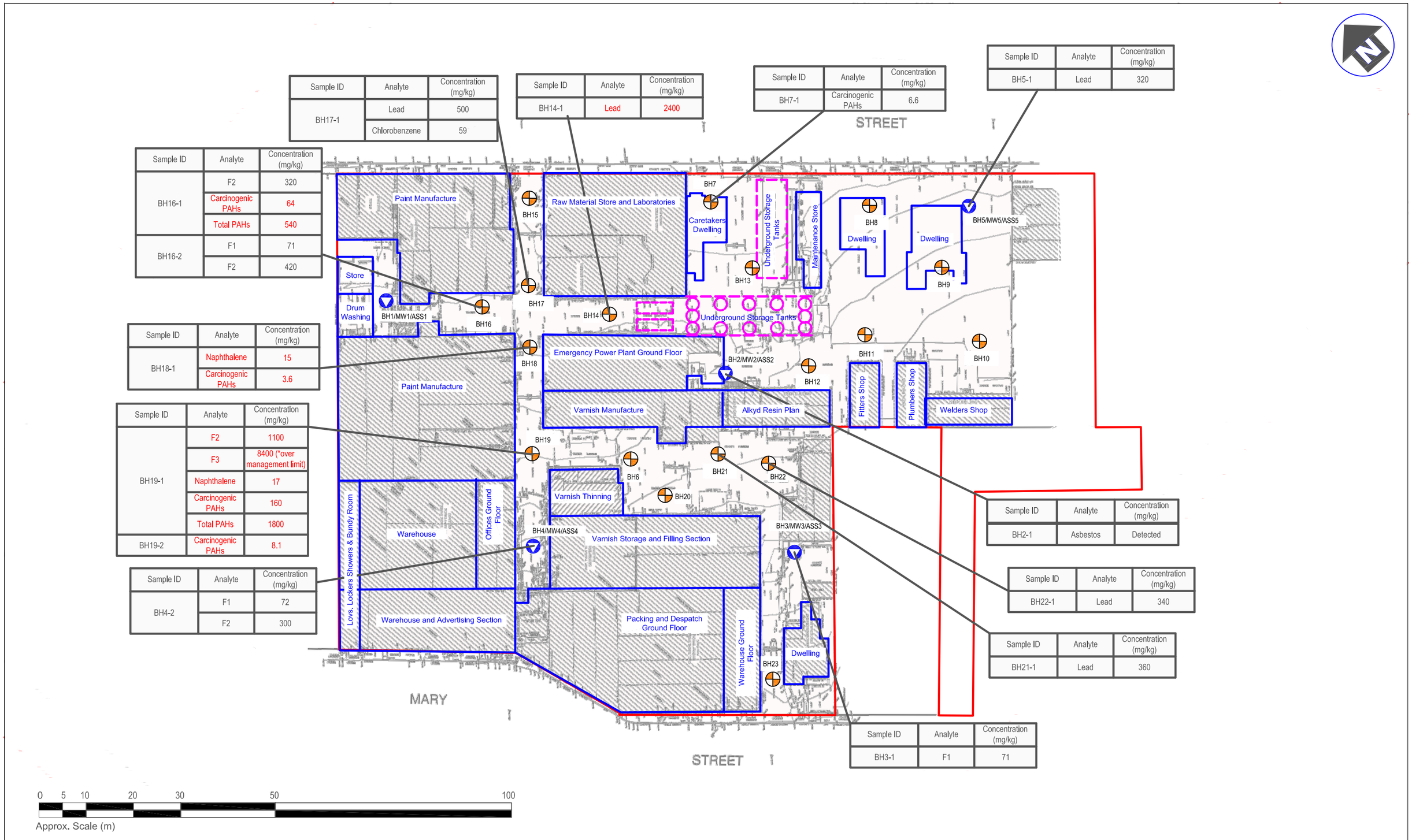
ST PETERS, NSW
Proposed Basement Footprint

Figure: 4

Project: E22317 AA Rev_3



Sample ID	Analyte	Concentration (mg/kg)
BH17-1	Lead	500
	Chlorobenzene	59

Sample ID	Analyte	Concentration (mg/kg)
BH14-1	Lead	2400

Sample ID	Analyte	Concentration (mg/kg)
BH7-1	Carcinogenic PAHs	6.6

Sample ID	Analyte	Concentration (mg/kg)
BH5-1	Lead	320

Sample ID	Analyte	Concentration (mg/kg)
BH16-1	F2	320
	Carcinogenic PAHs	64
	Total PAHs	540
BH16-2	F1	71
	F2	420

Sample ID	Analyte	Concentration (mg/kg)
BH18-1	Naphthalene	15
	Carcinogenic PAHs	3.6

Sample ID	Analyte	Concentration (mg/kg)
BH19-1	F2	1100
	F3	8400 (*over management limit)
	Naphthalene	17
	Carcinogenic PAHs	160
	Total PAHs	1800
BH19-2	Carcinogenic PAHs	8.1

Sample ID	Analyte	Concentration (mg/kg)
BH4-2	F1	72
	F2	300

Sample ID	Analyte	Concentration (mg/kg)
BH2-1	Asbestos	Detected

Sample ID	Analyte	Concentration (mg/kg)
BH22-1	Lead	340

Sample ID	Analyte	Concentration (mg/kg)
BH21-1	Lead	360

Sample ID	Analyte	Concentration (mg/kg)
BH3-1	F1	71

Map Source: Watson Buchan Pty Ltd, "*Plan Showing Levels & Details over Lot 1 in D.P. 556914*", 20/12/2013, Ref. 13/541

LEGEND

- Approx. Monitoring Well/Borehole Locations (EI, 2014)
- Approx. Borehole Locations (EI, 2014)
- Approx. Site Boundary

Warehouse — Denotes previous use of buildings in 1950, based on the block plan numbered 'S43' in BA 239/51, held in Marrickville Council's archive

XX — Denotes Health-based Hotspot

XX — Denotes exceedance of HIL

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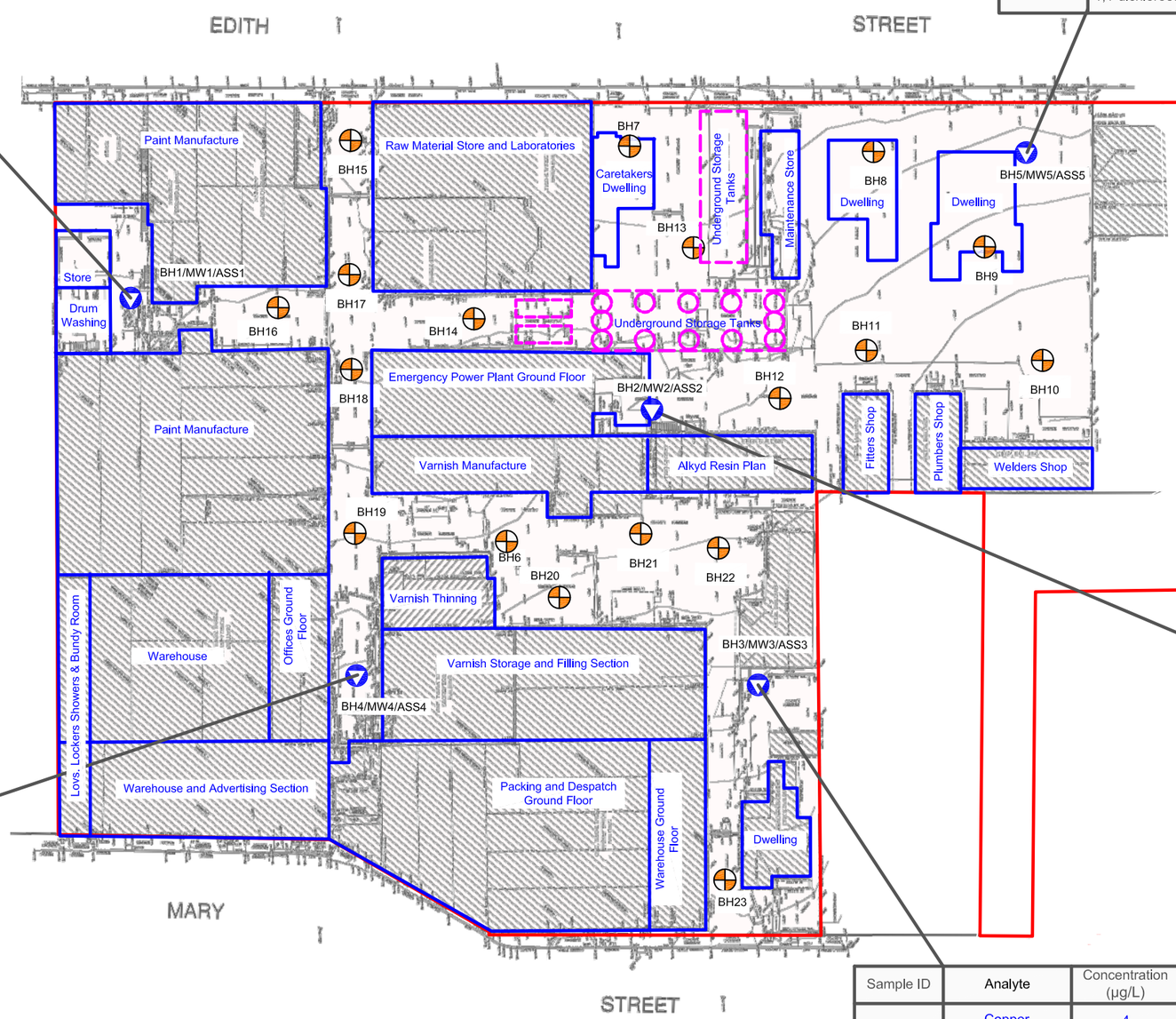
67 & 75 Mary Street, 50 & 52 Edith Street and 43 Roberts Street,
ST PETERS, NSW
Elevated Concentrations in Soil Samples

Figure: 5

Project: E22317 AA Rev_3

Sample ID	Analyte	Concentration (µg/L)
MW1-1	Copper	3
	Nickel	38
	Zinc	99
	F1 TRH	12000
	F2 TRH	63
	Vinyl Chloride	57
	Chloroform	180
	1,2-dichloroethane	3600

Sample ID	Analyte	Concentration (µg/L)
MW5-1	Nickel	39
	Zinc	70
	1,1-dichloroethene	34



Sample ID	Analyte	Concentration (µg/L)
MW4-1	Copper	2
	Nickel	11
	Zinc	39
	Benzene	710
	F2 TRH	1600
	Naphthalene	60
	Cumene	63
	1,3,5-trimethylbenzene	140
	1,2,4-trimethylbenzene	590

Sample ID	Analyte	Concentration (µg/L)
MW2-1	Copper	3
	Nickel	34
	Zinc	100

Sample ID	Analyte	Concentration (µg/L)
MW3-1	Copper	4
	Nickel	11
	Zinc	38
	F2 TRH	480

0 5 10 20 30 50 100

Approx. Scale (m)

Map Source: Watson Buchan Pty Ltd, "Plan Showing Levels & Details over Lot 1 in D.P. 556914", 20/12/2013, Ref. 13/541

LEGEND

- Approx. Monitoring Well/Borehole Locations (EI, 2014)
- Approx. Borehole Locations (EI, 2014)
- Approx. Site Boundary

Warehouse — Denotes previous use of buildings in 1950, based on the block plan numbered 'S43' in BA 239/51, held in Marrickville Council's archive

XX — Denotes Health-based Hotspot

XX — Denotes Exceedance of Health-based Criteria

XX — Denotes Exceedance of Ecological-based Criteria

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Detailed Site Investigation
67 & 75 Mary Street, 50 & 52 Edith Street and 43 Roberts Street,
ST PETERS, NSW
Elevated Concentrations in Groundwater

Figure: 6

Project: E22317 AA Rev_3

TABLES

Sample ID	Arsenic[1] (mg/kg)	Cadmium (mg/kg)	Chromium[2] (mg/kg)	Copper (mg/kg)	Lead[3] (mg/kg)	Mercury[4] (mg/kg)	Nickel (mg/kg)	Zinc (mg/kg)
BH1-1	11	0.5	49	41	240	0.10	11	250
BH1-2	5	<0.3	12	3.5	20	<0.01	0.5	2.7
BH2-1	8	0.9	16	51	220	0.29	11	660
BH2-2	10	0.3	33	2.2	20	0.03	1.5	11
BH2-4	<3	<0.3	2.6	6.9	11	0.01	<0.5	1.9
BH3-1	10	<0.3	27	4.7	26	0.02	1.7	23
BH3-2	12	<0.3	21	3.9	21	<0.01	<0.5	5.7
BH4-1	12	<0.3	20	15	22	<0.01	1.2	8.9
BH4-2	<3	<0.3	5.9	4.0	14	<0.01	<0.5	1.8
BH5-1	5	0.4	27	34	320	0.27	34	210
BH5-2	10	0.9	25	11	200	0.05	7.9	550
BH5-4	<3	<0.3	9.6	3.0	17	<0.01	<0.5	4.7
BH6-1	6	<0.3	14	17	100	0.10	5.1	65
BH6-3	<3	<0.3	6.4	5.5	29	<0.01	<0.5	2.9
BH7-1	8	0.5	18	20	150	0.11	8.5	210
BH8-1	8	0.3	16	5.8	37	0.04	2.4	24
BH9-1	8	1.1	23	3.3	69	0.02	2.9	470
BH10-1	5	0.4	17	11	65	0.13	2.6	190
BH11-1	19	<0.3	10	18	72	0.11	11	47
BH12-1	7	0.6	20	12	27	0.04	2.5	260
BH14-1	17	5.6	71	260	2400	0.86	27	2500
BH14-2	9	0.4	19	14	90	0.09	2.5	74
BH15-1	4	0.3	15	7.4	61	0.04	1.9	150
BH15-2	9	0.4	26	7.0	25	0.02	0.8	8.4
BH16-1	5	1.8	22	31	200	0.13	5.0	480
BH16-2	8	0.4	21	7.6	24	0.02	1.0	51
BH17-1	5	0.6	13	41	500	0.59	8.3	510
BH17-2	9	0.4	24	4.4	29	0.02	1.5	29
BH18-1	9	0.6	21	47	87	0.06	9.9	170
BH19-1	9	0.7	23	28	47	0.04	5.9	75
BH19-2	10	0.5	27	8.2	30	0.03	2.2	20
BH20-1	7	<0.3	18	15	94	0.04	4.0	62
BH21-1	7	0.9	14	98	360	0.14	23	770
BH21-2	12	0.4	31	3.7	62	0.05	1.8	19
BH22-1	<3	0.4	10	47	340	1.5	11	410
BH23-1	11	0.5	27	7.4	47	0.03	3.1	55
SIL								
HIL A	100	20	100	6,000	300	40	400	7,400
EILs	100[5]	NR	205	90	1,260	NR	35	190

Notes:

Highlighted value indicates concentration exceeds adopted HIL.

Highlighted value indicates concentration exceeds adopted EIL.

SIL Soil investigation levels.

HIL A Health-based investigation levels for residential sites with garden/accessible soil, as per Table 1A(1) of NEPM 2013 Schedule B1.

Notes Continued:

EIL Ecological investigation levels for urban residential / public open space sites, as per Table 1B(1) - Table 1B(5) of NEPM 2013 Schedule B1. Assumptions used for deriving the EILs are provided in **Section 6.3** of the report body. The most stringent ACL values were adopted for Chromium (III), Copper, Lead, Nickel and Zinc, as site soil physiochemical properties (i.e. pH, CEC and clay content) were not tested (Ref. NEPM 2013 Schedule B1, Tables 1B(1), 1B(2), 1B(3) and 1B(4) Soil-specific added contaminant limits).

NR No recommended soil assessment criteria are currently available for the indicated parameter(s).

1 Arsenic - HIL assumes 70% oral bioavailability. Site-specific bioavailability may be important and should be considered where appropriate (refer to NEPM 1999 Schedule B7 2013 Amendment).

2 HIL value is provided for Chromium VI while EIL value is provided for Chromium III. Reported sample concentrations were total Chromium including both VI and III. Speciation was not conducted as total Chromium were all under SILs.

3 Lead - HIL is based on blood lead models (IEUBK for HILs A, B and C and adult lead model for HIL D where 50% oral bioavailability has been considered. Site-specific bioavailability may be important and should be considered where appropriate.

4 HIL shown is representative of inorganic mercury as provided in Table 1A(1) of NEPM 2013 Schedule B1.

5 Aged values are applicable to arsenic contamination present in soil for at least two years. For fresh contamination refer to NEPM 1999 Schedule B5c 2013 Amendment.

Sample ID	Depth (m below ground level)	Soil Texture	Total Petroleum Hydrocarbons (mg/kg)					Benzene (mg/kg)	Toluene (mg/kg)	Ethyl benzene (mg/kg)	Total Xylenes (mg/kg)	Naphthalene (mg/kg)
			F1[1]	F2[2] + Naphthalene	F2[2]	F3[3]	F4[4]					
BH1-1	0.14-0.3	FILL: Sandy Clay	<25	<25	<25	150	<120	<0.1	<0.1	<0.1	<0.3	<0.1
BH1-2	1.3-1.5	Clay	63	160	160	<90	<120	<0.1	<0.1	<0.1	<0.3	<0.1
BH2-1	0.14-0.4	FILL: Clayey Silt	<25	25	25	160	<120	<0.1	<0.1	<0.1	0.5	<0.1
BH2-2	0.5-0.95	Silty Clay	<25	77	77	130	<120	<0.1	<0.1	<0.1	<0.3	<0.1
BH2-4	3-3.25	Shale	<25	<25	<25	<90	<120	<0.1	<0.1	<0.1	<0.3	<0.1
BH3-1	0.2-0.4	Fill: clay	71	100	100	<90	<120	<0.1	<0.1	<0.1	<0.3	<0.1
BH3-2	0.5-0.95	Clay	<25	<25	<25	<90	<120	<0.1	<0.1	<0.1	<0.3	<0.1
BH4-1	0.3-0.4	Clay	<25	<25	<25	<90	<120	<0.1	<0.1	<0.1	<0.3	<0.1
BH4-2	0.5-0.95	Clay	72	300	300	<90	<120	0.2	<0.1	1.4	0.7	0.3
BH5-1	0.2-0.3	Fill: gravelly sand	<25	<25	<25	110	<120	<0.1	<0.1	<0.1	<0.3	<0.1
BH5-2	0.3-0.4	FILL: Sandy Clay	<25	<25	<25	<90	<120	<0.1	<0.1	<0.1	<0.3	<0.1
BH5-4	1.5-1.95	Clay	<25	<25	<25	<90	<120	<0.1	<0.1	<0.1	<0.3	<0.1
BH6-1	0.2-0.4	Fill: gravelly clay	<25	<25	<25	210	<120	<0.1	<0.1	<0.1	<0.3	<0.1
BH6-3	1.5-1.95	clay/shale	<25	<25	<25	<90	<120	<0.1	<0.1	<0.1	<0.3	<0.1
BH7-1	0.2-0.3	Fill: gravelly silty clay	<25	<25	<25	370	<120	<0.1	<0.1	<0.1	<0.3	<0.1
BH8-1	0.2-0.3	Fill: gravelly silty clay	<25	<25	<25	<90	<120	<0.1	<0.1	<0.1	<0.3	<0.1
BH9-1	0.2-0.3	Fill: gravelly silty clay	<25	<25	<25	<90	<120	<0.1	<0.1	<0.1	<0.3	<0.1
BH10-1	0.2-0.3	Fill: gravelly silty clay	<25	<25	<25	<90	<120	<0.1	<0.1	<0.1	<0.3	<0.1
BH11-1	0.2-0.4	Fill: gravelly silty clay	<25	<25	<25	<90	<120	<0.1	<0.1	<0.1	<0.3	<0.1
BH12-1	0.2-0.3	Fill: gravelly silty clay	<25	<25	<25	<90	<120	<0.1	<0.1	<0.1	<0.3	<0.1
BH14-1	0.3-0.5	Fill: gravelly silty clay	<25	150	150	1200	160	<0.1	<0.1	<0.1	<0.3	<0.1
BH14-2	0.7-0.9	Silty Clay	<25	<25	<25	<90	<120	<0.1	<0.1	<0.1	<0.3	<0.1
BH15-1	0.3-0.4	Fill: gravelly silty clay	<25	<25	<25	<90	<120	<0.1	<0.1	<0.1	<0.3	<0.1
BH15-2	0.5-0.7	Silty Clay	<25	<25	<25	<90	<120	<0.1	<0.1	<0.1	<0.3	<0.1
BH16-1	0.4-0.5	Fill: gravelly silty clay	34	320	320	3500	670	<0.1	<0.1	<0.1	<0.3	0.3
BH16-2	0.7-0.9	Silty Clay	71	420	420	<90	<120	<0.1	<0.1	<0.1	<0.3	<0.2
BH17-1	0.6-0.8	Fill: gravelly silty clay	<25	<25	<25	<90	<120	<0.1	<0.1	<0.1	<0.3	0.2
BH17-2	1.0-1.2	Silty Clay	<25	<25	<25	<90	<120	<0.1	<0.1	<0.1	<0.3	<0.1
BH18-1	0.3-0.5	Fill: gravelly silty clay	<25	130	110	470	<120	<0.1	<0.1	<0.1	<0.3	15
BH19-1	0.2-0.4	Fill: gravelly silty clay	34	1100	1100	8400	1200	0.1	0.5	0.2	1.2	17
BH19-2	0.8-1.0	Silty Clay	<25	84	83	480	<120	<0.1	<0.1	<0.1	<0.3	1.4
BH20-1	0.22-0.4	FILL: Sandy Clay	<25	<25	<25	<90	<120	<0.1	<0.1	<0.1	<0.3	<0.1
BH21-1	0.2-0.4	Fill: gravelly silty clay	<25	<25	<25	130	<120	<0.1	<0.1	<0.1	<0.3	<0.1
BH21-2	0.7-0.9	Silty Clay	<25	170	170	130	<120	<0.1	<0.1	<0.1	<0.3	0.4
BH22-1	0.2-0.4	Fill: gravelly silty clay	<25	25	25	130	<120	<0.1	<0.1	<0.1	<0.3	<0.1
BH23-1	0.3-0.5	Fill: gravelly silty clay	<25	<25	<25	<90	<120	<0.1	<0.1	<0.1	<0.3	<0.1
SIL												
HSL A & B (Sand)	0 m to <1 m	Sand	45	NR	110	NR	NR	0.5	160	55	40	3
	1 m to <2 m		70	NR	240	NR	NR	0.5	220	NL	60	NL
	2 m to <4 m		110	NR	440	NR	NR	0.5	310	NL	95	NL
HSL A & B (Clay)	0 m to <1 m	Clay	50	NR	280	NR	NR	0.7	480	NL	110	5
	1 m to <2 m		90	NR	NL	NR	NR	1	NL	NL	310	NL
	2 m to <4 m		150	NR	NL	NR	NR	2	NL	NL	NL	NL
ESL[5]		Coarse grained	180*	120*	NR	300	2800	50	85	70	105	170
		Fine grained			NR	1300	5600	65	105	125	45	
Management Limits		Coarse grained	700	1000	NR	2500	10000	NL	NL	NL	NL	NR
		Fine grained	800		NR	3500		NL	NL	NL	NL	

Notes:

Highlighted value indicates concentration exceeds adopted HIL.

Highlighted value indicates concentration exceeds adopted EIL.

SIL	Soil investigation levels.
HSL A & B	Health screening level for residential sites, as per Table 1A(3) of NEPM 2013 Schedule B1. HSL is applied based on each sample's primary soil texture and source depth.
ESL	Ecological screening level for urban residential / public open sapce sites, as per Table 1B(6) of NEPM 2013 Schedule B1.
Management limits	As per Table 1 B(7) in NEPM 1999 Schedule B1, 2013 Amendment. Management limits are applied after consideration of relevant ESLs and HSLs. BTEX and Naphtalene are not subtracted from the relevant fractions to obtain F1 and F2 when considering management limits.
NL	'Not Limiting' If the derived soil vapour limit exceeds the soil concentration at which the pore water phase cannot dissolve any more of the individual chemical, i.e. where the soil vapour is at equilibrium with the pore water, then the soil vapour source cannot exceed a level that would result in the maximum allowable vapour risk for the given scenario, therefore the HSL is not limiting.
NR	No recommended soil assessment criteria are currently available for the indicated parameter(s).
1	F1 was obtained by subtracting the sum of BTEX concentrations from the C_6-C_{10} fraction.
2	F2 refers to Total Recoverable Hydrocarbon >C_{10}-C_{16}, after subtracting the concentration of Naphatlene.
3	F3 refers to Total Recoverable Hydrocarbon >C_{16}-C_{34}.
4	F4 refers to Total Recoverable Hydrocarbon >C_{34}-C_{40}.
5	ESLs are of low reliability except where indicated by * which indicates that the ESL is of moderate reliability.

Sample ID	Naphthalene	2-methylnaphthalene	1-methylnaphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benzo(a)anthracene	Chrysene	Benzo(b&j)fluoranthene	Benzo(k)fluoranthene	Benzo(a)pyrene	Indeno(1,2,3-cd)pyrene	Dibenzo(a&h)anthracene	Benzo(ghi)perylene	Carcinogenic PAHs (as BaP TEQ)-assume results <LOR=LOR	Total PAH
BH1-1	0.1	<0.1	<0.1	0.2	<0.1	0.2	1.6	0.4	2.5	2.4	1.4	1.0	1.6	0.4	**1.2**	0.7	0.1	0.5	1.7	14
BH1-2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.3	<0.8
BH2-1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.2	<0.1	0.4	0.5	0.3	0.3	0.4	<0.1	0.3	0.2	<0.1	0.2	0.5	2.8
BH2-2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.3	<0.8
BH2-4	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.3	<0.8
BH3-1	<0.1	0.2	0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.3	<0.8
BH3-2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.3	<0.8
BH4-1	0.5	0.3	0.2	<0.1	0.4	0.6	2.2	0.7	2.3	1.9	1.0	0.8	0.9	0.3	0.7	0.3	<0.1	0.2	1.0	13
BH4-2	0.8	0.6	0.5	<0.1	0.3	0.4	1.6	0.5	1.5	1.5	0.8	0.6	0.8	0.2	0.6	0.3	<0.1	0.2	0.9	11
BH5-1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.2	<0.1	0.3	0.4	0.3	0.3	0.5	0.1	0.3	0.3	<0.1	0.3	0.5	3.1
BH5-2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.2	<0.1	0.4	0.4	0.3	0.2	0.4	0.1	0.3	0.2	<0.1	0.1	0.5	2.6
BH5-4	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.3	<0.8
BH6-1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.3	<0.8
BH6-3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.3	<0.8
BH7-1	<0.1	<0.1	<0.1	0.1	<0.1	<0.1	0.3	0.2	1.7	3.9	3.0	2.2	6.3	2.1	**4.9**	2.2	0.3	1.9	6.6	29
BH8-1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.3	<0.8
BH9-1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.3	<0.8
BH10-1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.4	0.1	0.6	0.8	0.5	0.4	0.4	0.1	0.2	<0.1	<0.1	<0.1	0.4	3.9
BH11-1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.3	<0.8
BH12-1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.3	<0.8
BH14-1	0.3	0.2	0.1	0.1	<0.1	0.1	1.2	0.5	2.7	2.6	1.6	1.3	2.4	0.7	**1.7**	1.5	0.2	1.4	2.5	19
BH14-2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.3	<0.8
BH15-1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.3	<0.8
BH15-2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.3	<0.8
BH16-1	0.7	1.7	2.3	0.4	5.2	4.2	43	17	100	100	52	38	55	15	**45**	29	3.2	26	64	540
BH16-2	<0.1	<0.2	0.3	<0.1	<0.1	<0.1	0.2	<0.1	0.6	0.6	0.3	0.2	0.4	0.1	0.3	0.2	<0.1	0.2	0.5	3.8
BH17-1	<0.1	<0.1	<0.1	0.1	0.1	0.2	0.8	0.2	1.2	1.1	0.6	0.4	0.7	0.2	0.5	0.4	<0.1	0.3	0.8	6.9
BH17-2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.3	<0.8
BH18-1	14	2.8	2.1	0.1	3.0	1.9	8.0	2.4	6.8	6.6	2.8	2.2	2.8	1.1	**2.5**	1.8	0.2	1.7	3.6	63
BH19-1	51	26	25	2.2	72	46	230	82	310	300	130	99	130	49	**120**	78	8.5	70	160	1800
BH19-2	2.9	1.7	1.5	0.1	4.0	2.4	11	4.1	15	14	6.1	4.7	6.2	2.2	**5.7**	3.7	0.5	3.4	8.1	90
BH20-1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.3	<0.8
BH21-1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.5	0.2	1.1	1.1	0.8	0.6	0.9	0.4	**0.8**	0.7	0.1	0.6	1.2	8.1
BH21-2	0.1	0.2	0.3	<0.1	<0.1	<0.1	0.1	<0.1	0.2	0.3	0.1	0.1	0.2	<0.1	0.1	0.1	<0.1	<0.1	<0.3	2.2
BH22-1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	0.1	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.3	1.1
BH23-1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.3	<0.8
SIL																				
HIL A	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	3	300
ESLs	170	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.7	NR	NR	NR	NR	NR

Notes: All results are reported in mg/kg unless otherwise specified.

Highlighted value indicates concentration exceeds adopted HIL.

Highlighted value indicates concentration exceeds adopted EIL.

SIL Soil investigation levels.

HIL Health-based investigation levels for residential sites with garden/accessible soil, as per Table 1A(1) of NEPM 2013 Schedule B1.

ESL Ecological screening level for urban residential / public open sapce sites, as per Table 1B(6) of NEPM 2013 Schedule B1.

NR No recommended soil assessment criteria are currently available for the indicated parameter(s).

Sample ID	Asbestos (% w/w)	Total Phenols (mg/kg)
BH1-1	<0.01	<0.1
BH1-2	N.A.	<0.1
BH2-1	**>0.01**	1.4
BH2-2	N.A.	0.8
BH2-4	N.A.	<0.1
BH3-1	<0.01	0.2
BH3-2	N.A.	0.1
BH4-1	<0.01	0.2
BH4-2	N.A.	0.3
BH5-1	<0.01	<0.1
BH5-2	<0.01	0.1
BH5-4	N.A.	0.2
BH6-1	<0.01	1.0
BH6-3	N.A.	0.3
BH7-1	<0.01	0.2
BH8-1	<0.01	0.9
BH9-1	<0.01	0.1
BH10-1	<0.01	0.1
BH11-1	<0.01	0.1
BH12-1	<0.01	0.1
BH14-1	<0.01	0.4
BH14-2	N.A.	0.2
BH15-1	<0.01	<0.1
BH15-2	N.A.	0.2
BH16-1	<0.01	1.0
BH16-2	N.A.	1.7
BH17-1	<0.01	1.2
BH17-2	N.A.	0.4
BH18-1	<0.01	6.0
BH19-1	<0.01	6.8
BH19-2	N.A.	2.8
BH20-1	<0.01	0.2
BH21-1	<0.01	0.5
BH21-2	N.A.	1.0
BH22-1	<0.01	2.0
BH23-1	<0.01	0.4
SIL		
HIL A (Bonded ACM)	NR	3000
HSL (Non-bonded/Friable Asbestos)	<0.001*	NR
HSL	<0.01	NR

Notes:

	Highlighted value indicates concentration exceeds adopted HILs/HSLs.

SIL	Soil investigation level.
HIL A	Health-based investigation levels for residential sites with garden/accessible soil, as per Table 1A(1) of NEPM 2013 Schedule B1.
HSL A	Health-based screening investigation levels for residential sites with garden/accessible soil, as per Table 1A(1) of NEPM 2013 Schedule B1.
N.A.	Not analysed.
*	As HSL provided is lower than the laboratory practical quantitation limit (PQL), PQL was used as an interim SIL.

Sample ID	OCPs								Total OPPs (mg/kg)	Total PCBs (mg/kg)
	Aldrin (mg/kg)	Dieldrin (mg/kg)	Endrin (mg/kg)	Chlordane (mg/kg)	Heptachlor (mg/kg)	DDT (mg/kg)	DDD (mg/kg)	DDE (mg/kg)		
BH1-1	<0.1	<0.2	<0.2	<0.2	<0.1	<0.2	<0.2	<0.2	N.D.	N.D.
BH2-1	<0.1	<0.2	<0.2	<0.2	<0.1	<0.2	<0.2	<0.2	N.D.	N.D.
BH3-1	<0.1	<0.2	<0.2	<0.2	<0.1	<0.2	<0.2	<0.2	N.D.	N.D.
BH4-1	<0.1	<0.2	<0.2	<0.2	<0.1	<0.2	<0.2	<0.2	N.D.	N.D.
BH5-1	<0.1	<0.2	<0.2	<0.2	<0.1	<0.2	0.7	<0.4	N.D.	N.D.
BH5-2	<0.1	<0.2	<0.2	<0.2	<0.1	<0.2	<0.2	<0.2	N.D.	N.D.
BH6-1	<0.1	<0.2	<0.2	<0.2	<0.1	<0.2	<0.2	<0.2	N.D.	N.D.
BH7-1	<0.1	<0.2	<0.2	<0.2	<0.1	<0.2	<0.2	<0.2	N.D.	N.D.
BH8-1	<0.1	<0.2	<0.2	<0.2	<0.1	<0.2	<0.2	<0.2	N.D.	N.D.
BH9-1	<0.1	<0.2	<0.2	<0.2	<0.1	<0.2	<0.2	<0.2	N.D.	N.D.
BH10-1	<0.1	<0.2	<0.2	<0.2	<0.1	<0.2	<0.2	<0.2	N.D.	N.D.
BH11-1	<0.1	<0.2	<0.2	<0.2	<0.1	<0.2	<0.2	<0.2	N.D.	N.D.
BH12-1	<0.1	<0.2	<0.2	<0.2	<0.1	<0.2	<0.2	<0.2	N.D.	N.D.
BH14-1	<0.1	<0.2	<0.2	<0.2	<0.1	<0.2	<0.2	<0.2	N.D.	N.D.
BH15-1	<0.1	<0.2	<0.2	<0.2	<0.1	<0.2	<0.2	<0.2	N.D.	N.D.
BH16-1	<0.1	<0.2	<0.2	<0.2	<0.1	<0.2	<0.2	<0.2	N.D.	N.D.
BH17-1	<0.1	<0.2	<0.2	<0.2	<0.1	<0.2	<0.2	<0.2	N.D.	N.D.
BH18-1	<0.1	<0.2	<0.2	<0.2	<0.1	<0.2	<0.2	<0.2	N.D.	N.D.
BH19-1	<0.1	<0.2	<0.2	<0.2	<0.1	<0.2	0.6	<0.3	N.D.	N.D.
BH20-1	<0.1	<0.2	<0.2	<0.2	<0.1	<0.2	<0.2	<0.2	N.D.	N.D.
BH21-1	<0.1	<0.2	<0.2	<0.2	<0.1	<0.2	<0.2	<0.2	N.D.	N.D.
BH22-1	<0.1	<0.2	<0.2	<0.2	<0.1	1.6	3.4	1.9	N.D.	N.D.
BH23-1	<0.1	<0.2	<0.2	<0.2	<0.1	<0.2	<0.2	<0.2	N.D.	N.D.
SIL										
HIL A	Total 6		10	50	6	Total 240			NR	1
EILs	NR	NR	NR	NR	NR	180	NR	NR	NR	NR

Notes:

SIL	Soil investigation levels.
HIL A	Health-based investigation levels for residential sites with garden/accessible soil, as per Table 1A(1) of NEPM 20
EIL	Ecological Investigation Levels (mg/kg) as per NEPM 1999 Schedule B1 2013 Amendment.
NR	No recommended soil assessment criteria are currently available for the indicated parameter(s).
N.D.	Concentrations of all tested analytes in this group was under laboratory's practical quantifation limit.
N.A.	Sample not tested for analyte.

Sample ID	Chlorobenzene	1,1,2,2-tetrachloroethane	Isopropylbenzene (Cumene)	n-propylbenzene	1,3,5-trimethylbenzene	1,2,4-trimethylbenzene	sec-butylbenzene	p-isopropyltoluene	n-butylbenzene	Hexachlorobutadiene	Other VOCs
BH1-1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	N.D.
BH1-2	<0.1	<0.1	<0.1	0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	N.D.
BH2-1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	N.D.
BH2-2	<0.1	<0.1	0.5	0.6	<0.1	<0.1	<0.1	<0.1	8.6	<0.1	N.D.
BH2-4	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	1.1	<0.1	N.D.
BH3-1	<0.1	<0.1	0.4	0.7	<0.1	<0.1	0.5	<0.1	0.5	<0.1	N.D.
BH3-2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	N.D.
BH4-1	<0.1	<0.1	<0.1	0.1	<0.1	0.2	0.1	<0.1	0.1	<0.1	N.D.
BH4-2	0.7	0.1	1.4	2.9	9.5	18	<0.1	<0.1	<0.1	<0.1	N.D.
BH5-1	<0.1	<0.1	<0.1	<0.1	0.1	0.3	<0.1	<0.1	0.2	<0.1	N.D.
BH5-2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	N.D.
BH5-4	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	N.D.
BH6-1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	N.D.
BH6-3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	N.D.
BH7-1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	N.D.
BH8-1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	N.D.
BH9-1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	N.D.
BH10-1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	N.D.
BH11-1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	N.D.
BH12-1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	N.D.
BH14-1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	N.D.
BH14-2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	N.D.
BH15-1	0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	N.D.
BH15-2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	N.D.
BH16-1	0.4	<0.1	<0.1	<0.1	<0.1	<0.1	<0.4	<0.1	0.4	0.2	N.D.
BH16-2	0.9	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.1	0.5	<0.1	N.D.
BH17-1	59	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	N.D.
BH17-2	4.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	N.D.
BH18-1	0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	N.D.
BH19-1	<0.1	<0.1	<0.1	<0.1	0.3	0.8	<0.1	0.2	<0.1	<0.1	N.D.
BH19-2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	N.D.
BH20-1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	N.D.
BH214-1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	N.D.
BH21-2	<0.1	<0.1	<0.1	<0.1	<0.1	0.3	<0.3	<0.1	<0.1	<0.1	N.D.
BH22-1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	N.D.
BH23-1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	N.D.
SIL											
RSL	**28**	**0.6**	**190**	**330**	**78**	**5.8**	**780**	**NR**	**390**	**6.2**	**NR**

Notes: All results are reported in mg/kg

Highlighted value indicates concentration exceeds adopted SIL.

SIL Soil investigation levels.

RSL Region 9 Residential Soil Screening Levels (US EPA, May 2014), used as interim assessment guidelines.

NR No recommended soil assessment criteria are currently available for the indicated parameter(s).

N.D. Concentrations of all tested analytes in this group was under laboratory's practical quantifation limit.

Sample ID	Estimated Source Depth (m bgl)	Heavy Metals								BTEX				TRHs				PAH										Ammonia Nitrogen, NH_3 as N	Sulphate, SO4 (mg/L)	Chloride
		Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc	Benzene	Toluene	Ethylbenzene	Total Xylene	F1*	F2**	F3 ($>C_{16}$-C_{34})	F4 ($>C_{34}$-C_{40})	Naphthalene	2-methylnaphthalene	1-methylnaphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Total PAH (18)			
MW1-1	3.4-7	<1	<0.1	<1	3	<1	<0.1	38	99	2.7	<0.5	<0.5	<1.5	12000	63	<500	<500	0.2	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	170	NA	NA
MW2-1	5.3-9	<1	<0.1	<1	3	<1	<0.1	34	100	<0.5	<0.5	<0.5	<1.5	<50	<60	<500	<500	0.1	0.1	0.1	<0.1	0.1	0.2	0.3	<0.1	1	180	NA	NA
MW3-1	3-6.52	<1	<0.1	<1	4	<1	<0.1	11	38	<0.5	<0.5	<0.5	<1.5	<50	480	<500	<500	<0.1	<0.1	0.2	<0.1	0.1	<0.1	<0.1	<0.1	<1	170	330	260
MW4-1	2-7.96	<1	<0.1	<1	2	<1	<0.1	11	39	710	<2.5	250	350	<250	1600	<500	<500	60	3.3	2.8	<0.1	0.4	0.4	0.6	0.1	67	160	NA	NA
MW5-1	5-8.66	<1	<0.1	<1	<1	<1	<0.1	39	70	<0.5	<0.5	<0.5	<1.5	<50	<60	<500	<500	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	200	NA	NA
GIL																													
GIL (Marine Waters)		NR	0.7[3]	27 (Cr III) 4.4 (Cr VI)	1.3	4.4	0.1[3]	7	15[1]	500[1]	NR	NR	NR	NR	NR	NR	NR	50	NR	NR	NR	NR	NR	NR	NR	NR	910	NR	NR
GIL (Fresh Waters)	24 (AS III) 13 (AS V)	0.2		1 (Cr VI)	1.4	3.4	0.06	11	8	950	NR	NR	550	NR	NR	NR	NR	16	NR	NR	NR	NR	NR	NR	NR	NR	900	NR	NR
GIL (Drinking Waters)		10	2	50 (Cr VI)	2000	10	1	20	NR	1	800	300	600	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	500	NR
HSL A & B [2]		NR	NR	NR	NR	NR	NR	NR	NR	500	NL	NL	NL	NL	NL	NR	NR	NL	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR

Notes: All results are in units of µg/L, unless otherwise specified.

Highlighted concentration value indicates exceedance of adopted GILs.

Indicates criteria used for the assessment.

GIL Groundwater Investigation Level. All GIL values sourced from *National Environment Protection (Assessment of Site Contamination) Measure 1999 – Amendment 2013* , *Schedule (B1)* - Guideline on Investigation Levels for Soil and Groundwater, (NEPC) Investigation levels apply to Marine Waters for typical slightly-moderately disturbed systems.

HSL Health based screening levels. As soils immediately above the groundwater are primarily clay, HSL for clay materials are used.

NL 'Not Limiting' If the derived soil vapour limit exceeds the soil concentration at which the pore water phase cannot dissolve any more of the individual chemical, i.e. where the soil vapour is at equilibrium with the pore water, then the soil vapour source cannot exceed a level that would result in the maximum allowable vapour risk for the given scenario, therefore the limit is not limiting.

NR No recommended soil assessment criteria are currently available for the indicated parameter(s).

* To obtain F1 subtract the sum of BTEX concentrations from the C6-C10 fraction.

** To obtain F2 subtract Naphthalene from the >C10-C16 fraction.

1 Indicated threshold value may not protect key species from chronic toxicity, refer to ANZECC & ARMCANZ (2000) for further guidance.

2 NEPC (2013) Table 1A(4) Groundwater HSL A & HSL B for vapour intrusion at the contaminant source depth ranges in clay 2m to <4m, which is consistent with the groundwater sampling depth.

3 Chemical for which possible bioaccumulation and secondary poisoning effects should be considered, refer to ANZECC & ARMCANZ (2000) for further guidance.

Sample ID	Naphthalene	Vinyl chloride (Chloroethene)	1,1-dichloroethene	1,1-dichloroethane	Chloroform (THM)	1,2-dichloroethane	1,2-dichloropropane	Trichloroethene (Trichloroethylene,TCE)	1,1,2-trichloroethane	Chlorobenzene	Isopropylbenzene (Cumene)	n-propylbenzene	1,3,5-trimethylbenzene	1,2,4-trimethylbenzene	p-isopropyltoluene	Total Phenols
MW1-1	<0.5	57	<0.5	3.3	180	3600	4.2	0.6	41	23	<0.5	<0.5	<0.5	<0.5	<0.5	<10
MW2-1	<0.5	<0.3	<0.5	<0.5	1.1	1.8	<0.5	<0.5	<0.5	<0.5	2.4	<0.5	<0.5	<0.5	<0.5	<10
MW3-1	<0.5	<0.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	10
MW4-1	27	<1.5	23	34	<2.5	<2.5	<2.5	<2.5	<2.5	270	63	50	140	590	4.8	60
MW5-1	<0.5	<0.3	34	6.4	0.6	0.7	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	90
GIL																
GIL (Marine Waters)	NR	NR	NR	NR	NR	NR	NR	NR	1900	NR	NR	NR	NR	NR	NR	400
GIL (Drinking Waters)	NR	0.3	30	NR	3	3	NR	NR	NR	300	NR	NR	NR	NR	NR	NR
Cgw (OSWER)	150	25	190	2200	80	23	35	5	41	390	8.4	320	25	24	NR	NR

Notes:

All results are reported in µg/kg. Only VOCs with a concentration above laboratory PQLs are reported here.

Indicates exceedances of adopted criteria.

Indicates criteria used for the assessment.

GIL — Groundwater Investigation Level. All GIL values sourced from *National Environment Protection (Assessment of Site Contamination) Measure 1999 – Amendment 2013*, *Schedule (B1)* - Guideline on Investigation Levels for Soil and Groundwater, (NEPC) Investigation levels apply to Marine Waters for typical slightly-moderately disturbed systems.

Cgw (OSWER) — Target groundwater concentration correponding to indoor air concentrations associated with 10^{5} incremental lifetime cancer risk, assuming the Soil Gas to Indoor Air Attenuation Factor = 0.001 and partitioning across the water table obeys Henry's Law. Vaues were adopted from Table 2b, "OSWER Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils", 2002, and used as interim working criteria only.

NR — No recommended soil assessment criteria are currently available for the indicated parameter(s).

Sample ID	Sampling Depth (m bgl)	pH KCL	pH Ox	Total Actual Acidity (mol H+/tonne) - TAA	Total Potential Acidity (mol H+/tonne) - TPA	Total Sulfidic Acidity (mol H+/tonne) - TSA	KCl extractable sulfur (% w/w) - SKCl	Peroxide sulfur (% w/w) - SP	Peroxide oxidisable sulfur (% w/w) - SPOS
ASS1-1	0.3-0.5	3.9	4.8	115	101	<5	<0.005	<0.005	<0.005
ASS1-2	1.3-1.5	4.0	4.6	105	99	<5	0.020	0.037	0.017
ASS2-1	0.5-0.95	4.1	5.2	122	125	<5	<0.005	0.011	0.011
ASS2-2	1.5-1.95	3.8	5.2	115	126	11	<0.005	0.013	0.013
ASS3-1	0.4-0.5	4.0	4.3	112	131	19	<0.005	0.052	0.047
ASS3-2	1.8-1.9	4.0	4.9	157	158	<5	<0.005	0.006	<0.005
ASS4-1	1-1.2	3.9	4.1	122	146	24	<0.005	0.041	0.039
ASS4-2	2.5-2.7	4.1	4.2	115	125	10	<0.005	0.044	0.041
ASS5-1	0.4-0.5	6.2	7.1	<5	<5	<5	<0.005	0.022	0.022
ASS5-2	1.5-1.9	3.8	4.4	147	147	<5	0.021	0.030	0.008
Criteria									
ASSMAC (1998)		<4.0	<3.5	NR	18.0	18.0	NR	NR	0.030

Notes:

ASSMAC 1998 Criteria are adopted from Acid Sulfate Soils Assessment Guidelines by NSW Acid Sulfate Soils Management Advisory Committee (August 1998).

Appendix A
Proposed Development Plans

PROPOSED SITE PLAN

75 MARY STREET, ST PETERS - MASTERPLAN AND URBAN DESIGN

1:1000 @ A3

tonkin greer ARCHITECTS

EDITH STREET

LEVEL B1
177 CARS

RL 11.850

RL 10.300

RL 8.750

RL 10.000

STORAGE

BUILDING A NORTH GARBAGE ROOM

BUILDING A SOUTH GARBAGE ROOM

BUILDING B NORTH GARBAGE ROOM

BUILDING B SOUTH GARBAGE ROOM

BUILDING C GARBAGE ROOM 1

BUILDING C GARBAGE ROOM 2

GARBAGE COLLECTION AREA

GARBAGE TRUCK BAY

PLANT/STORAGE

CARPARK SUPPLY FAN ROOM 3.5x3.5m 2m high

CARPARK EXHAUST FAN ROOM 3.5x3.5m 2m high

CARPARK EXHAUST FAN ROOM 3.5m 3m high

CARPARK SUPPLY FAN ROOM 3.5x3.5m 2m high

SPRINKLER PUMP ROOM 3x2m 1.6m high

MAIN SECURITY CONTROL ROOM 3x3m 2.4m high

MAIN SWITCH ROOM 1 3x6m 3m high

MAIN SWITCH ROOM 2 3x6m 3m high

BDY CC 3x2.5m 2.5m high

PLANT/ STORAGE

BIKE PARKING - 180 SPACES

BLIND AISLE TURNING BAY

CAR SHARE PARKING SPACES SHOWN HATCHED

MARY STREET

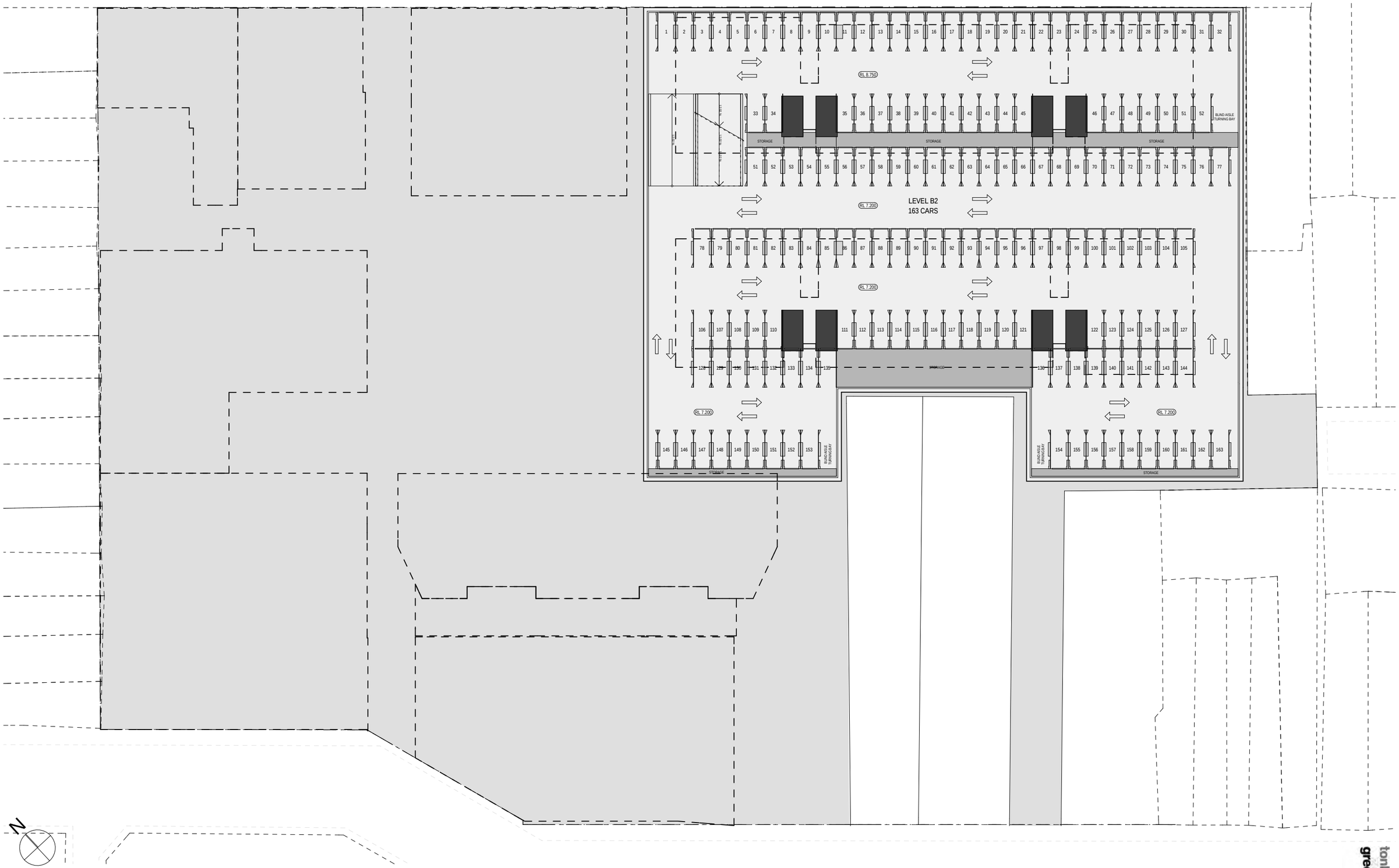
N

B1 BASEMENT PARKING PLAN

75 MARY STREET, ST PETERS - MASTERPLAN AND URBAN DESIGN

1:600 @ A3

tonkin greer ARCHITECTS



B2 BASEMENT PARKING PLAN

75 MARY STREET, ST PETERS - MASTERPLAN AND URBAN DESIGN

1:600 @ A3

tonkin greer ARCHITECTS

EDITH STREET

MARY STREET

GROUND FLOOR

75 MARY STREET, ST PETERS - MASTERPLAN AND URBAN DESIGN

1:500 @ A3

tonkin greer ARCHITECTS

EDITH STREET

MARY STREET

RL 19.500
RL 19.190
RL 17.800
RL 17.300

2 BED 76 m²
1 BED 53 m²
2 BED 80 m²
2 BED 80 m²
2 BED 73 m²
1 BED 49 m²
1 BED 49 m²
1 BED 52 m²
1 BED 49 m²
2 BED 79 m²
2 BED 79 m²
1 BED 49 m²
1 BED 50 m²
STUDIO 39 m²

2 BED 74 m²
2 BED 71 m²
2 BED 77 m²
2 BED 80 m²
2 BED 80 m²
2 BED 79 m²
2 BED 79 m²
1 BED 49 m²
1 BED 49 m²
2 BED 73 m²
1 BED 49 m²
1 BED 52 m²
1 BED 52 m²

3 BED 104 m²
3 BED 107 m²
2 BED 82 m²
2 BED 82 m²
1 BED 50 m²
2 BED 75 m²
2 BED 86 m²

2,400
18,000
12,000
18,000
4,150

SUB-STATION
GOODS LIFT
HOIST
UP
DN

N

LEVEL 1

75 MARY STREET, ST PETERS - MASTERPLAN AND URBAN DESIGN

1:500 @ A3

tonkin greer ARCHITECTS

EDITH STREET

2 BED 74 m²
3 BED 109 m²
2 BED 74 m²
RL 23.070
2 BED 74 m²
1 BED 56 m²
1 BED 56 m²
2 BED 74 m²
RL 23.000
UP
UP
UP
DN
DN
GOODS LIFT
2 BED 76 m²
1 BED 53 m²
2 BED 80 m²
2 BED 80 m²
2 BED 85 m²
RL 22.600
RL 22.600
1 BED 49 m²
1 BED 52 m²
1 BED 49 m²
2 BED 79 m²
2 BED 79 m²
1 BED 49 m²
1 BED 50 m²
2 BED 74 m²
2 BED 71 m²
2 BED 80 m²
2 BED 80 m²
2 BED 85 m²
RL 20.900
RL 20.900
2 BED 77 m²
1 BED 49 m²
2 BED 79 m²
2 BED 79 m²
1 BED 49 m²
1 BED 59 m²
3 BED 104 m²
3 BED 107 m²
RL 20.400
2 BED 82 m²
2 BED 82 m²
1 BED 50 m²
RL 20.400
2 BED 75 m²
2 BED 86 m²
DN
HOST
MARY STREET
N

LEVEL 2

75 MARY STREET, ST PETERS - MASTERPLAN AND URBAN DESIGN

1:500 @ A3

tonkin greer ARCHITECTS

EDITH STREET

2 BED 74 m²
3 BED 109 m²
2 BED 74 m²
RL 26.500
RL 26.170
2 BED 74 m²
1 BED 56 m²
1 BED 56 m²
2 BED 74 m²

2 BED 76 m²
1 BED 53 m²
2 BED 80 m²
2 BED 80 m²
2 BED 85 m²
RL 25.700
RL 25.700
1 BED 49 m²
1 BED 52 m²
1 BED 49 m²
2 BED 79 m²
2 BED 79 m²
1 BED 49 m²
1 BED 50 m²

2 BED 74 m²
2 BED 71 m²
2 BED 80 m²
2 BED 80 m²
2 BED 85 m²
RL 24.000
RL 24.000
2 BED 77 m²
1 BED 49 m²
2 BED 79 m²
2 BED 79 m²
1 BED 49 m²
1 BED 59 m²

3 BED 104 m²
3 BED 107 m²
RL 23.500
2 BED 82 m²
2 BED 82 m²
1 BED 50 m²
RL 23.500
2 BED 75 m²
2 BED 86 m²

MARY STREET

N

LEVEL 3

75 MARY STREET, ST PETERS - MASTERPLAN AND URBAN DESIGN

1:500 @ A3

tonkin greer ARCHITECTS

EDITH STREET

2 BED 74 m²
3 BED 109 m²
2 BED 74 m²
RL 30.000
RL 29.270
2 BED 74 m²
1 BED 56 m²
1 BED 56 m²
2 BED 74 m²

2 BED 76 m²
1 BED 53 m²
2 BED 80 m²
2 BED 80 m²
RL 28.800
RL 28.800
1 BED 49 m²
1 BED 52 m²
1 BED 49 m²
2 BED 79 m²
2 BED 79 m²
1 BED 49 m²

3 BED 104 m²
3 BED 107 m²
1 BED 50 m²
2 BED 75 m²
2 BED 86 m²
RL 26.600
RL 26.600
2 BED 82 m²
2 BED 82 m²

MARY STREET

N

LEVEL 4

75 MARY STREET, ST PETERS - MASTERPLAN AND URBAN DESIGN

1:500 @ A3

tonkin greer ARCHITECTS

EDITH STREET

2 BED
76 m²

1 BED
53 m²

2 BED
80 m²

RL 31.900

1 BED
49 m²

1 BED
52 m²

1 BED
49 m²

2 BED
79 m²

3 BED
104 m²

3 BED
107 m²

RL 29.700

2 BED
82 m²

2 BED
82 m²

1 BED
50 m²

RL 29.700

2 BED
75 m²

2 BED
86 m²

MARY STREET

N

LEVEL 5

75 MARY STREET, ST PETERS - MASTERPLAN AND URBAN DESIGN

1:500 @ A3

tonkin greer ARCHITECTS

EDITH STREET

3 BED
104 m²

3 BED
107 m²

2 BED
82 m²

2 BED
82 m²

1 BED
50 m²

2 BED
75 m²

2 BED
86 m²

RL 32.800

RL 32.800

MARY STREET

N

LEVEL 6

75 MARY STREET, ST PETERS - MASTERPLAN AND URBAN DESIGN

1:500 @ A3

tonkin greer ARCHITECTS

EDITH STREET

3 BED
104 m²

3 BED
107 m²

2 BED
82 m²

2 BED
82 m²

1 BED
50 m²

2 BED
75 m²

2 BED
86 m²

RL 35.900

RL 35.900

MARY STREET

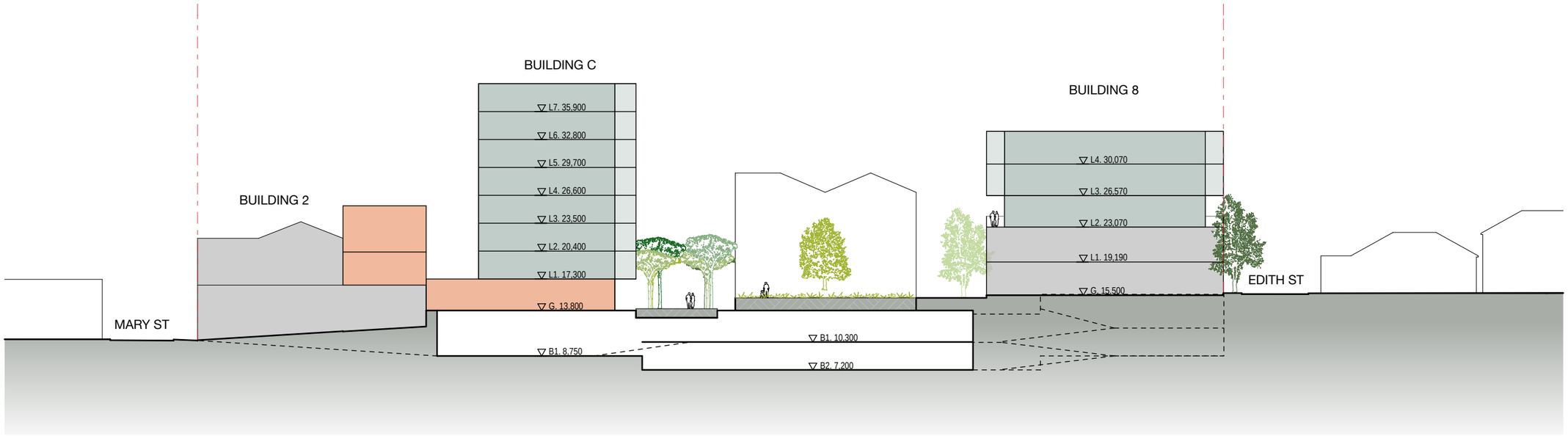
N

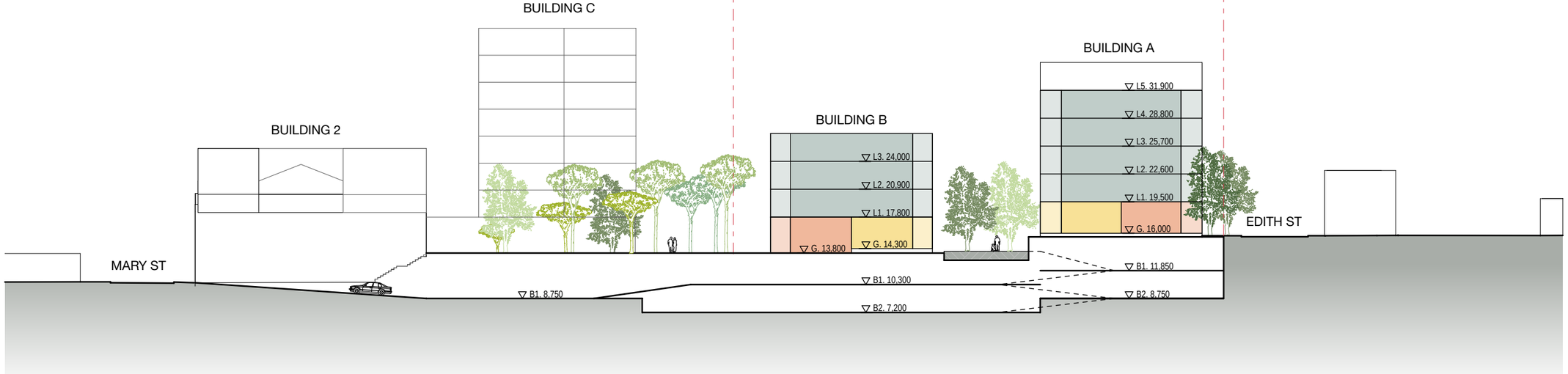
LEVEL 7

75 MARY STREET, ST PETERS - MASTERPLAN AND URBAN DESIGN

1:500 @ A3

tonkin greer ARCHITECTS





SITE SECTIONS

75 MARY STREET, ST PETERS - MASTERPLAN AND URBAN DESIGN

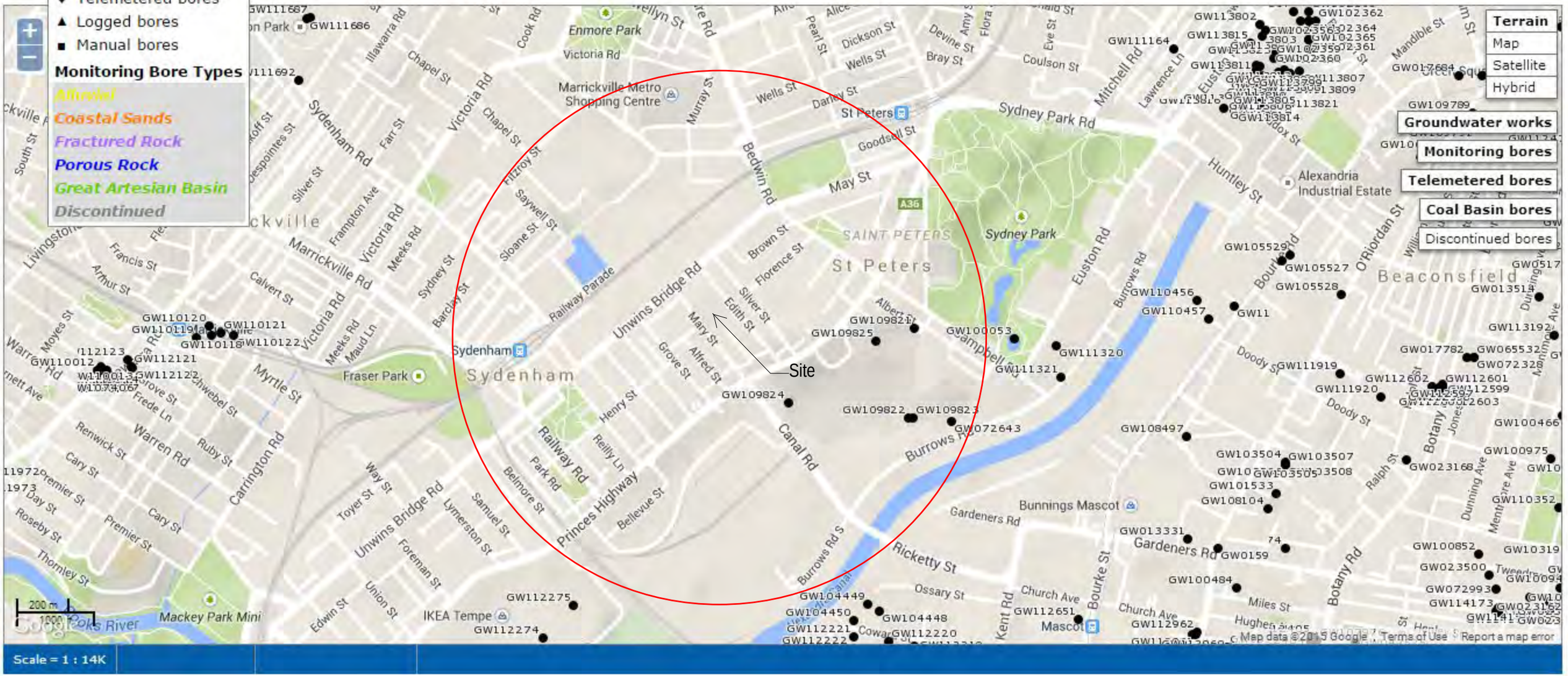
1:500 @ A3

Appendix B
NRAtlas Groundwater Bore Search

bookmark this page
go back to referring page

Greater Sydney Region

All data times are Eastern Standard Time



NSW Office of Water
Work Summary

GW109825

Licence: 10BL164967 Licence Status: ACTIVE

Authorised Purpose(s): MONITORING BORE
Intended Purpose(s): MONITORING BORE

Work Type: Bore
Work Status:
Construct.Method:
Owner Type: Private

Commenced Date:
Completion Date: 10/02/2005
Final Depth: 22.00 m
Drilled Depth: 22.00 m

Contractor Name: ENGINEERING EXPLORATIONS PTY LTD
Driller: Unkown Unknown
Assistant Driller:

Property: ALEXANDRIA LANDFILL ALBERT ST ST PETERS 2044
Standing Water Level: 14.900
GWMA:
GW Zone:
Salinity:
Yield:

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	CUMBE	CUMBE.39	11//1013168
Licensed:			

Region: 10 - Sydney South Coast
River Basin: - Unknown
Area/District:
CMA Map:
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6245853.0
Easting: 331689.0
Latitude: 33°54'51.5"S
Longitude: 151°10'45.7"E

GS Map: -
MGA Zone: 0
Coordinate Source: Unknown

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	22.00	0			Unknown
1		Annulus	Waterworn/Rounded	0.00	0.00				Graded
1	1	Casing	Pvc Class 18	0.00	16.00	62			Screwed
1	1	Opening	Screen	16.00	22.00	62		1	PVC Class 18, Screwed, A:

									0.40mm

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
17.50	22.00	4.50	Unknown	14.90					1800.00

Geologists Log

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	4.50	4.50	FILL	Fill	
4.50	22.00	17.50	SHALE	Shale	

Remarks

*** End of GW109825 ***

NSW Office of Water
Work Summary

GW109824

Licence: 10BL164967 Licence Status: ACTIVE

Authorised Purpose(s): MONITORING BORE
Intended Purpose(s): MONITORING BORE

Work Type: Bore
Work Status:
Construct.Method: Other
Owner Type: Private

Commenced Date:
Completion Date: 05/04/2005
Final Depth: 20.70 m
Drilled Depth: 20.70 m

Contractor Name: Macquarie Drilling
Driller: Unkown Unknown
Assistant Driller:

Property: ALEXANDRIA LANDFILL ALBERT ST ST PETERS 2044
Standing Water Level: 4.510
GWMA:
GW Zone:
Salinity:
Yield:

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	CUMBE	CUMBE.39	11//1013168
Licensed:			

Region: 10 - Sydney South Coast
River Basin: - Unknown
Area/District:
CMA Map:
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6245635.0
Easting: 331393.0
Latitude: 33°54'58.4"S
Longitude: 151°10'34.0"E

GS Map: -
MGA Zone: 0
Coordinate Source: Unknown

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	20.70	100			Other
1		Annulus	Waterworn/Rounded	0.00	0.00				Graded
1	1	Casing	Pvc Class 18	0.00	13.40	63			Screwed
1	1	Opening	Slots - Horizontal	13.40	18.40	63		1	PVC, SL: 6.0mm, A: 0.40mm

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
13.00	20.00	7.00	Unknown	4.51					4350.00

Geologists Log

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	4.50	4.50	FILL	Fill	
4.50	9.00	4.50	LAMINITE	Laterite	
9.00	17.00	8.00	SHALE	Shale	
17.00	20.70	3.70	SANDSTONE	Sandstone	

Remarks

*** End of GW109824 ***

NSW Office of Water
Work Summary

GW109823

Licence: 10BL164967 Licence Status: ACTIVE

Authorised Purpose(s): MONITORING BORE
Intended Purpose(s): MONITORING BORE

Work Type: Bore
Work Status:
Construct.Method: Rotary Air
Owner Type: Private

Commenced Date:
Completion Date: 23/10/2000
Final Depth: 29.00 m
Drilled Depth: 29.00 m

Contractor Name: Macquarie Drilling
Driller: Unkown Unknown
Assistant Driller:

Property: ALEXANDRIA LANDFILL ALBERT ST ST PETERS 2044
Standing Water Level: 12.500
GWMA:
GW Zone:
Salinity:
Yield: 0.100

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	CUMBE	CUMBE.1	11//1013168
Licensed:			

Region: 10 - Sydney South Coast
River Basin: - Unknown
Area/District:
CMA Map:
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6245594.0
Easting: 331819.0
Latitude: 33°54'60.0"S
Longitude: 151°10'50.6"E

GS Map: -
MGA Zone: 0
Coordinate Source: Unknown

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	29.00	125			Rotary Air
1		Annulus	Waterworn/Rounded	0.00	0.00				Graded
1	1	Casing	Pvc Class 18	0.00	23.00	63			Screwed
1	1	Opening	Screen	23.00	29.00	63		1	PVC Class 18, Screwed, A: 0.40mm

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
22.00	29.00	7.00	Unknown	12.50		0.10		00:09:00	10600.00

Geologists Log

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	3.00	3.00	FILL	Fill	
3.00	6.00	3.00	CLAYEY SAND	Clayey Sand	
6.00	8.11	2.11	SAND	Sand	
8.11	11.50	3.39	SANDY CLAY	Sandy Clay	
11.50	29.00	17.50	SHALE	Shale	

Remarks

*** End of GW109823 ***

NSW Office of Water
Work Summary

GW109822

Licence: 10BL164967 Licence Status: ACTIVE

Authorised Purpose(s): MONITORING BORE
Intended Purpose(s): MONITORING BORE

Work Type: Bore
Work Status:
Construct.Method: Other
Owner Type: Private

Commenced Date:
Completion Date: 04/04/1997
Final Depth: 10.45 m
Drilled Depth: 10.45 m

Contractor Name: Macquarie Drilling
Driller: Unkown Unknown
Assistant Driller:

Property: ALEXANDRIA LANDFILL ALBERT ST ST PETERS 2044
Standing Water Level: 3.000
GWMA:
GW Zone:
Salinity:
Yield:

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	CUMBE	CUMBE.1	11//1013168
Licensed:			

Region: 10 - Sydney South Coast
River Basin: - Unknown
Area/District:
CMA Map:
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6245594.0
Easting: 331806.0
Latitude: 33°54'60.0"S
Longitude: 151°10'50.1"E

GS Map: -
MGA Zone: 0
Coordinate Source: Unknown

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	10.45	125			Other
1		Annulus	Waterworn/Rounded	0.00	0.00				Graded
1	1	Casing	Pvc Class 18	0.00	5.00	63			Seated on Bottom, Screwed
1	1	Opening	Slots - Horizontal	5.00	8.00	63		1	Stamped, PVC, SL: 3.0mm, A: 0.40mm

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
3.00	10.45	7.45	Unknown	3.00					958.00

Geologists Log

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	2.60	2.60	FILL	Fill	
2.60	3.80	1.20	CLAYEY SAND	Clayey Sand	
3.80	8.20	4.40	SAND	Sand	
8.20	10.45	2.25	CLAY	Clay	

Remarks

*** End of GW109822 ***

NSW Office of Water
Work Summary

GW109821

Licence: 10BL164967 Licence Status: ACTIVE

Authorised Purpose(s): MONITORING BORE
Intended Purpose(s): MONITORING BORE

Work Type: Bore
Work Status:
Construct.Method: Other
Owner Type: Private

Commenced Date:
Completion Date: 03/04/1997
Final Depth: 35.00 m
Drilled Depth: 35.00 m

Contractor Name: Macquarie Drilling
Driller: Unkown Unknown
Assistant Driller:

Property: ALEXANDRIA LANDFILL ALBERT ST ST PETERS 2044
Standing Water Level: 14.500
GWMA:
GW Zone:
Salinity:
Yield:

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	CUMBE	CUMBE.39	11//1013168
Licensed:			

Region: 10 - Sydney South Coast
River Basin: - Unknown
Area/District:
CMA Map:
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6245899.0
Easting: 331819.0
Latitude: 33°54'50.1"S
Longitude: 151°10'50.8"E

GS Map: -
MGA Zone: 0
Coordinate Source: Unknown

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	35.00	100			Other
1		Annulus	Waterworn/Rounded	0.00	0.00				Graded
1	1	Casing	Pvc Class 18	0.00	29.00	63			Screwed
1	1	Opening	Slots - Horizontal	29.00	35.00	63		1	PVC, SL: 6.0mm, A: 0.40mm

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
29.00	35.00	6.00	Unknown	14.50					4400.00

Geologists Log

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	2.20	2.20	FILL	Fill	
2.20	35.00	32.80	ASHFIELD SHALE	Ash	

Remarks

*** End of GW109821 ***

NSW Office of Water
Work Summary

GW072643

Licence: 10BL156189
Licence Status: LAPSED

Authorised Purpose(s): TEST BORE
Intended Purpose(s): TEST BORE

Work Type: Bore
Work Status: Abandoned
Construct.Method: Cable Tool
Owner Type: Local Govt

Commenced Date:
Completion Date: 25/09/1996
Final Depth:
Drilled Depth:

Contractor Name: B & B DRILLING INC
Driller: Michael Gerard Barrett
Assistant Driller:

Property: N/A
GWMA: -
GW Zone: -
Standing Water Level (m):
Salinity Description:
Yield (L/s):

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	CUMBE	CUMBE1	13//606737
Licensed:	CUMBERLAND	PETERSHAM	Whole Lot 13//606737

Region: 10 - Sydney South Coast
River Basin: - Unknown
Area/District:
CMA Map:
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6245584.0
Easting: 331951.0
Latitude: 33°55'00.4"S
Longitude: 151°10'55.7"E

GS Map: -
MGA Zone: 0
Coordinate Source: Unknown

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth	Duration (hr)	Salinity (mg/L)

							(m)		

Geologists Log

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	2.00	2.00	FILL	Fill	
2.00	6.50	4.50	MEDIUM SANDY GRAVEL	Gravel	
6.50	7.20	0.70	GREY SILTY CLAY WB	Silty Clay	
7.20	8.50	1.30	MEDIUM SAND WB	Sand	
8.50	10.00	1.50	BROWN SILTY SAND WB	Sand	
10.00	12.00	2.00	GREY SHALE CLAY	Shale	

Remarks

25/09/1996: Form A Remarks:
ABANDONED - NO WATER.
10/01/2013: Nat Carling, 10-Jan-2013; Added rock type codes to driller's log & added missing information (based on existing data).

*** End of GW072643 ***

Appendix C
Site Photographs

Photo 1: Kiosk Substation

Photo 2: Unsealed Car Park Area

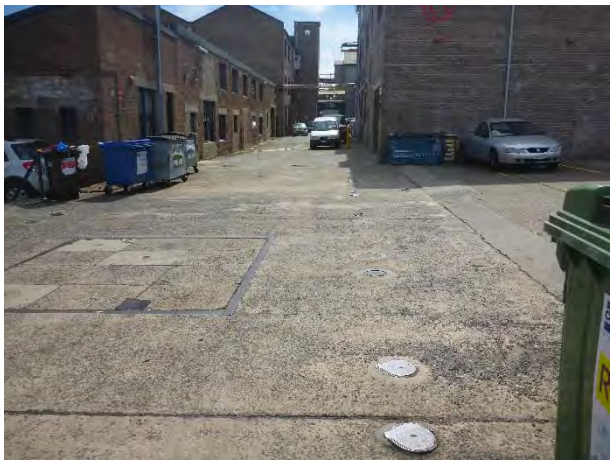


Photo 3: UST Filling Points

Photo 4: Underground Void at BH13.

Appendix D
Historical Property Titles Search

Service First Registration Pty Ltd
ACN: 108 037 029
Ph: 02 9233 1314
Fax: 9233 2878
Suite 102, Level 1, 64 Castlereagh Street
Sydney 2000
PO Box 1539 Sydney 2000
DX 189 Sydney

Summary of Owners Report

LPI **Sydney**

Address: - 75 Mary Street, St Peters

Description: - Lot 1 D.P. 556914

As regards the part highlighted yellow and numbered (1) on the attached cadastre

Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available	Reference to Title at Acquisition and sale
11.06.1911 (1911 to 1923)	George McAllister (Builder)	Vol 2163 Fol 8 Now Vol 2244 Fol 246
09.07.1923 (1923 to 1965)	Taubmans' Limited Now Taubmans Industries Limited	Vol 2244 Fol 246 Now Vol 3490 Fol 76
29.10.1965 (1965 to date)	Genimpex Pty Limited	Vol 3490 Fol 76 Now 1/556914

# Denotes current registered proprietor

Leases: -

- Numerous leases were found affecting this land from 20.01.1966
- 23.01.1970 to Sydney County Council, of Substation No. 723, together with rights, now expired

Easements: -

- 22.11.1965 Right of Way (K500099) associated with a lease now expired 22.01.1973

As regards the part highlighted yellow and numbered (2) on the attached cadastre

Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available	Reference to Title at Acquisition and sale
29.02.1912 (1912 to 1965)	Taubmans' Limited Now Taubmans Industries Limited	Book 965 No. 20 Now Vol 3362 Fol 44
29.10.1965 (1965 to date)	Genimpex Pty Limited	Vol 3362 Fol 44 Now 1/556914

# Denotes current registered proprietor

Leases: -

- Various leases were found affecting this land from 1970

Service First Registration Pty Ltd
ACN: 108 037 029
Ph: 02 9233 1314
Fax: 9233 2878
Suite 102, Level 1, 64 Castlereagh Street
Sydney 2000
PO Box 1539 Sydney 2000
DX 189 Sydney

As regards the part highlighted yellow and numbered (3) on the attached cadastre

Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available	Reference to Title at Acquisition and sale
30.04.1896 (1896 to 1921)	Charles Benjamin Comber (Cook)	Book 577 No. 970
23.02.1921 (1921 to 1965)	Taubmans' Limited Now Taubmans Industries Limited	Book 1217 No. 32 Now Vol 3362 Fol 45
29.10.1965 (1965 to date)	# Genimpex Pty Limited	Vol 3362 Fol 45 Now 1/556914

# Denotes current registered proprietor

Leases: -

- Various leases were found affecting this land from 20.01.1966

As regards the part highlighted yellow and numbered (4) on the attached cadastre

Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available	Reference to Title at Acquisition and sale
13.11.1911 (1911 to 1923)	John Miller (Brick Layer)	Book 950 No. 789
10.09.1923 (1923 to 1923)	Victor James Pringle (Commercial Traveller)	Book 1323 No. 622
10.10.1923 (1923 to 1965)	Taubmans' Limited Now Taubmans Industries Limited	Book 1324 No. 402 Now Vol 4693 Fol 45
29.10.1965 (1965 to date)	Genimpex Pty Limited	Vol 4693 Fol 45 Now 1/556914

# Denotes current registered proprietor

Leases: -

- Various leases were found affecting this land from 20.01.1966

As regards the part highlighted yellow and numbered (5) on the attached cadastre

Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available	Reference to Title at Acquisition and sale
08.09.1899 (1899 to 1922)	William Frederick Dawes (Brick Maker)	Book 649 No. 802
22.05.1922 (1922 to 1928)	Edward Townsend (Carrier)	Book 1275 No. 736
14.02.1928 (1928 to 1965)	Taubmans' Limited Now Taubmans Industries Limited	Book 1503 No. 466 Now Vol 4315 No. 145
29.10.1965 (1965 to date)	Genimpex Pty Limited	Vol 4315 Fol 145 Now 1/556914

# Denotes current registered proprietor

Easements: -

- 22.11.1965 Right of Way (K500099) associated with a lease now expired 22.01.1973

Service First Registration Pty Ltd
ACN: 108 037 029
Ph: 02 9233 1314
Fax: 9233 2878
Suite 102, Level 1, 64 Castlereagh Street
Sydney 2000
PO Box 1539 Sydney 2000
DX 189 Sydney

As regards the part highlighted yellow and numbered (6) on the attached cadastre

Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available	Reference to Title at Acquisition and sale
08.04.1911 (1911 to 1930)	Henry Alfred Gale Jobbins (Gentleman) Frederick Lynne Rolin (Solicitor)	Vol 2677 Fol 218
31.03.1930 (1930 to 1938)	Frederick Lynne Rolin (Solicitor)	Vol 2677 Fol 218
20.01.1938 (1938 to 1945)	Frederick Lynne Rolin (Solicitor) Francis Archer Lynne Rolin (No occupation)	Vol 2677 Fol 218
16.07.1945 (1945 to 1965)	Taubmans' Limited Now Taubmans Industries Limited	Vol 2677 Fol 218 Now Vol 5523 Fol 109
29.10.1965 (1965 to date)	Genimpex Pty Limited	Vol 5523 Fol 109 Now 1/556914

# Denotes current registered proprietor

As regards the parts highlighted yellow and numbered (7A) and (7B) on the attached cadastre

Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available	Reference to Title at Acquisition and sale
01.06.1891 (1891 to 1937)	Richard Ralph (Butcher)	Book 463 No. 938 **(Part 7B)**
20.01.1937 (1937 to 1942)	Frank William Cable (Solicitor)	Book 1770 No. 567 **(Part 7B)**
29.05.1942 (1942 to 1965)	Taubmans' Limited Now Taubmans Industries Limited	Book 1916 No. 92 **(Part 7B)** Now Vol 5811 Fol 66
04.08.1910 (1910 to 1946)	Isaac Edwin Spackman (Ironmonger) Annie Adelaide Spackman (Married Woman)	Book 641 No. 530 & Book 915 No. 549 **(Part 7A)**
29.01.1946 (1946 to 1965)	Taubmans' Limited Now Taubmans Industries Limited	Book 1980 No. 787 **(Part 7A)** Now Vol 5811 Fol 66
29.10.1965 (1965 to date)	Genimpex Pty Limited	Vol 5811 Fol 66 Now 1/556914 **(whole of 7A & 7B)**

# Denotes current registered proprietor

Leases: -

- 07.02.1946 to Henry James Bennett (Plasterer) – affects parcel 7A, term of 3 years

Service First Registration Pty Ltd
ACN: 108 037 029
Ph: 02 9233 1314
Fax: 9233 2878
Suite 102, Level 1, 64 Castlereagh Street
Sydney 2000
PO Box 1539 Sydney 2000
DX 189 Sydney

As regards the parts highlighted yellow and numbered (8) on the attached cadastre

These parts were formerly road subsequently closed

The first title to issue is dated 20.07.1946

Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available	Reference to Title at Acquisition and sale
20.07.1946 (1946 to 1965)	Taubmans' Limited Now Taubmans Industries Limited	Vol 5328 Fol 219
29.10.1965 (1965 to date)	Genimpex Pty Limited	Vol 5328 Fol 219 Now 1/556914

# Denotes current registered proprietor

Leases: -

- 20.09.1971 to Atlantic Lithographic Plates Pty Limited, of part of Factory 7 Suite 2

Leases continued as regards the whole: -

- 09.03.1992 to Sydney County Council, of Substation No. 723 (E 284177), together with right of way and easement, expires 30.09.2041
- Numerous leases were found affecting – these have not been investigated

Yours Sincerely
Mark Groll
23 October 2013
(Ph: 0412 199 304)

Legal Liaison Searching Services

ABN: 52 832 569 710
Ph: 02 9233 5800
Fax: 02 9231 6151

Level 4, 70 Castlereagh Street
Sydney 2000
PO 2513 Sydney 2001
DX 1019 Sydney

Summary of Owners Report

LPI **Sydney**

Address: - 75 Mary Street, St Peters

Description: - Lot 1 D.P. 556914

Continued from 01.01.2013 (previous report)

Date of Acquisition and Term held	Registered Proprietor(s) & occupations where available	Reference to title at acquisition and sale
(2013 to 2013)	Genimpex Pty Limited	1/556914
08.11.2013 (2013 to date)	#JVM Holdings Pty Ltd # Chalak Holdings Pty Ltd	1/556914

# Denotes current registered proprietor

Easements continued from 01.01.2013: - NIL

Leases continued from 01.01.2013: -

- Various leases were registered from 01.01.2013 to the present date. Please refer to computer title Folio Identifier 1/556914 for all current leases

Yours Sincerely
Mark Groll
22 September 2014
(Ph: 0412 199 304)

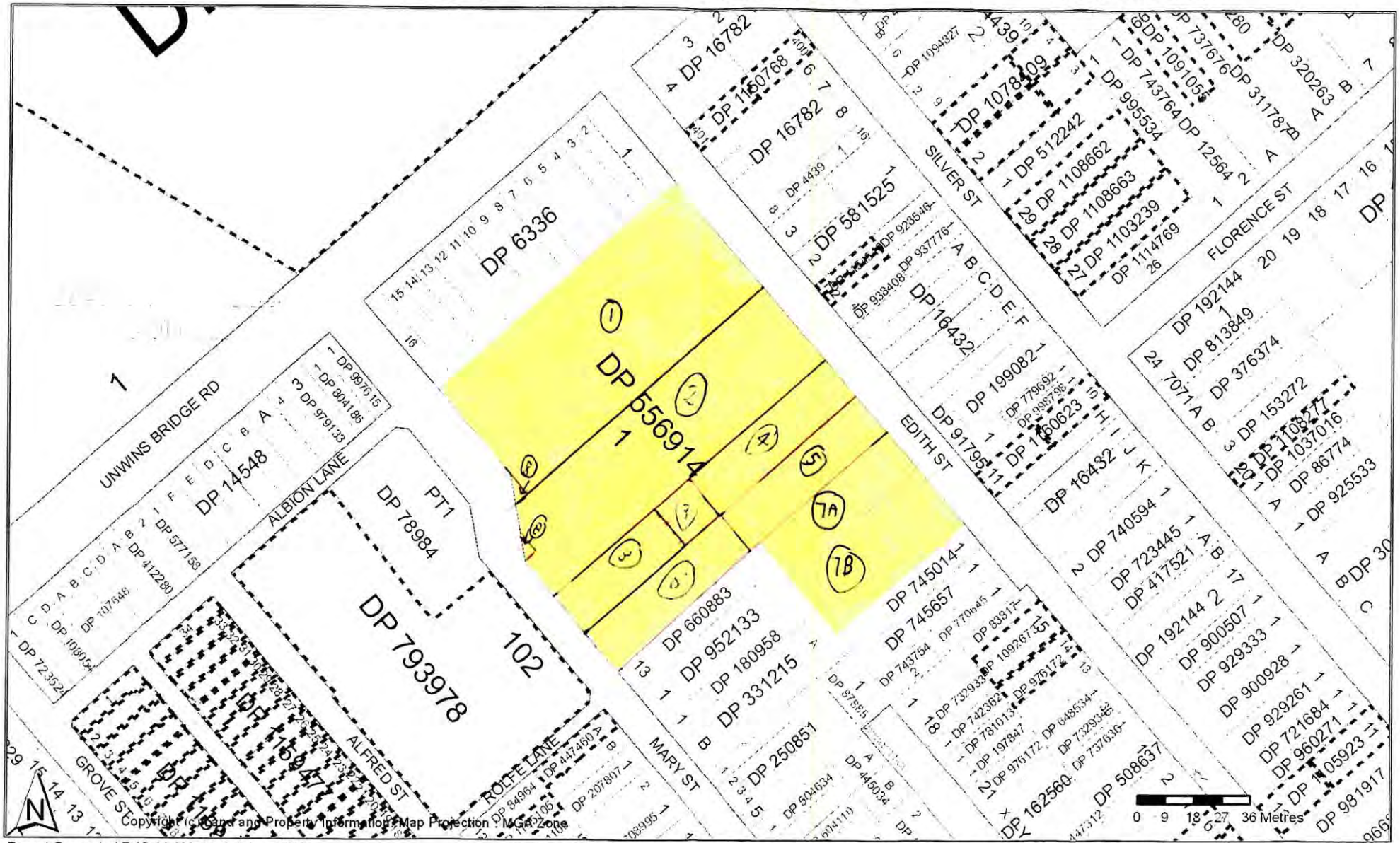
Land Property Information

Cadastral Records Enquiry Report

Ref : surv:scim-grollm

Requested Parcel : Lot 1 DP 556914 **Identified Parcel** : Lot 1 DP 556914

Locality : ST PETERS **LGA** : MARRICKVILLE **Parish** : PETERSHAM **County** : CUMBERLAND



Report Generated 7:18:44 AM, 22 October, 2013

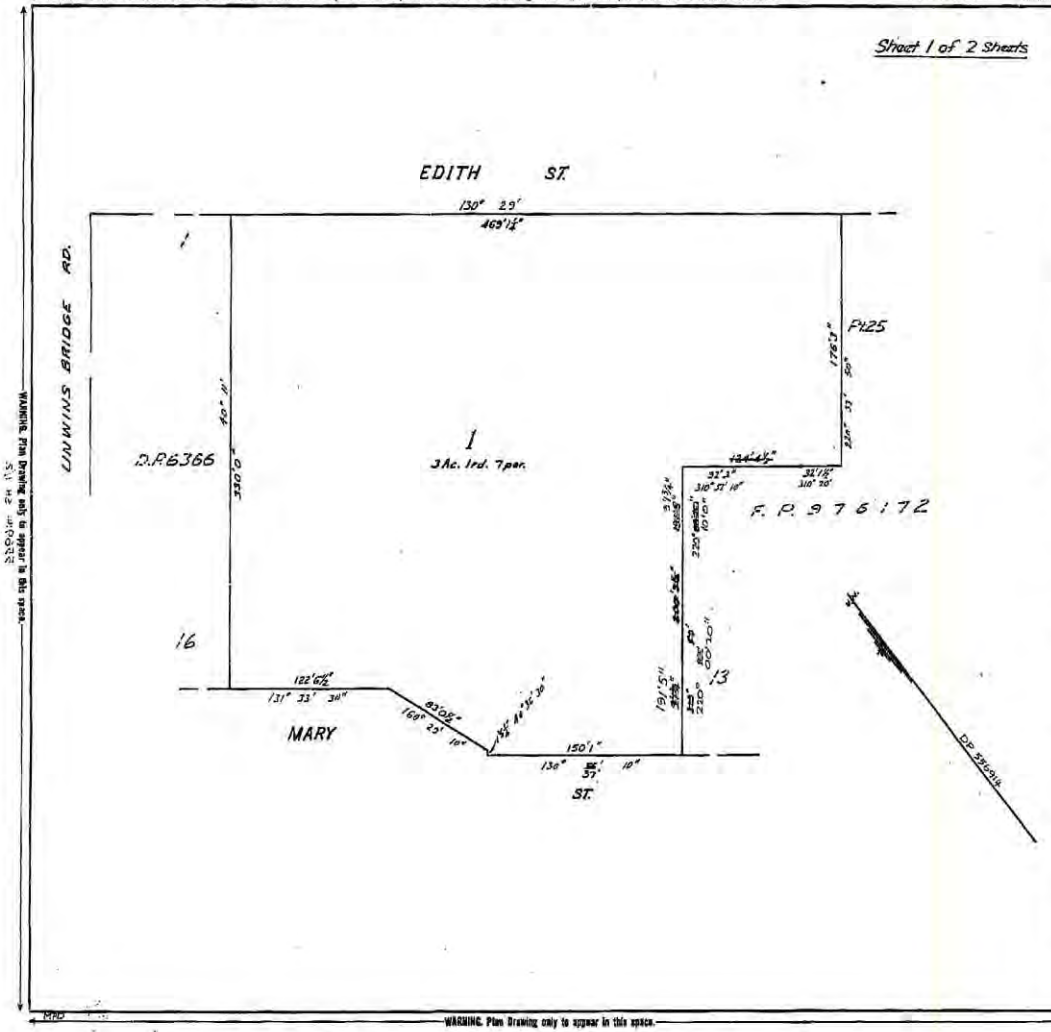
This information is provided as a searching aid only. While every endeavour is made to ensure the current cadastral pattern is accurately reflected, the Registrar General cannot guarantee the information provided. For all ACTIVITY PRIOR to SEPT 2002 you must refer to the RGs Charting and Reference Maps.

Plan Form 2—This form must NOT be used where it is intended to dedicate public roads or public reserves or create drainage reserves, easements, or restrictions as to user.—See Form 3

DP556914

WARNING: CREASING OR FOLDING WILL LEAD TO REJECTION.

Sheet 1 of 2 Sheets



DP 556914

Registered: 28-8-1973

C.A. No 1902 OF 3-5-1973

Title System: TORRENS

Purpose: CONSOLIDATION

Ref. Map: MARRICKVILLE SH 59
~~ST PETERS SH 2~~

Last Plan: DP6996 * 1098(L), DP60772, DP79362, DP79707, DP82077, DP86089

OFFICE USE ONLY. N 0 0 1 K 2 B

PLAN OF the land in Cert. of Title

Vol. 3490 Fol. 76	Vol. 3362 Fol. 44
* 4693 * 45	* 4315 * 145
* 3362 * 45	* 5523 * 109
* 5811 * 66	* 5328 * 219

Scale: 50 feet to an inch

Mun./Shire: ~~Marrickville~~

City: ~~St Peters~~

Locality: St Peters

Parish: Petersham

County: Cumberland

~~This is Sheet 1 of my plan in Sheets~~
Delete if inapplicable.

I,

of

a surveyor registered under the Surveyors Act, 1929, as amended, hereby certify that the survey represented in this plan is accurate and has been made *(1) by me (2) under my immediate supervision in accordance with the Survey Practice Regulations, 1933, and was completed on

Signature

Surveyor registered under Surveyors Act, 1929, as amended.

Datum Line of Azimuth.

*Strike out either (1) or (2). Insert date of survey.

Council Clerk's Certificate.

I hereby certify that—

(a) the requirements of the Local Government Act, 1919 (other than the requirements for the registration of plans); and

*(b) the requirements of section 348 of the Metropolitan Water, Sewerage, and Drainage Act, 1924, as amended, Hunter District Water, Sewerage, and Drainage Act, 1938, as amended,

have been complied with by the applicant in relation to the proposed

(Insert "new road" or "subdivision") set out hereon.

Subdivision No.

Date.

(Signature)

Council Clerk.

*This part of certificate to be deleted where the application is only for the opening of a new road, or where the land to be subdivided is wholly outside the limits of operations of the Metropolitan Water Sewerage, and Drainage Board and the Hunter District Water Board.

(Delete if inapplicable.

28-6-72

SURVEYOR'S REFERENCE: 72111

CONVERSION TABLE ADDED IN REGISTRAR GENERAL'S DEPARTMENT

DP 556914 SH 1/2

FEET	INCHES	METRES
1	5 1/4	0.438
9	1 3/4	2.788
10	-	3.048
32	1 1/2	9.792
83	0 1/2	25.311
92	3	28.119
122	6 1/2	37.351
150	1	45.745
176	3	53.721
191	0	58.394
330	-	100.584
469	1 1/4	142.983

AC	RD	P	HA
3	1	7	1.323

I, Jack Hayward Watson, Registrar General for New South Wales, certify that this negative is a photograph made as a permanent record of a document in my custody this 23rd day of November, 1979.

Jack Watson

Plan Form 3—TO BE USED WHERE IT IS INTENDED TO DEDICATE PUBLIC ROADS OR PUBLIC RESERVES OR CREATE DRAINAGE RESERVES, EASEMENTS, OR RESTRICTIONS AS TO USER.

* OFFICE USE ONLY.

Sheet 2 of 2 sheets

WARNING. Plan Drawing only to appear in this space.

WARNING. Plan Drawing only to appear in this space.

SURVEYOR'S REFERENCE.

DP 556914

Registered:

C.A.:

Title System:

Purpose:

Ref. Map:

Last Plan:

PLAN OF: the land in Cert. of Title

Vol. 3490 Fol. 76 Vol. 5523 fol. 109
" 4693 " 45 " 5328 " 219
" 3862 " 45
" 5811 " 62
" 3362 " 44
" 4315 " 145

Scale: 50 feet to an inch

Mun./Shire: Marrickville

City: St. Peters

Locality: St. Peters

Parish: Petersham

County: Cumberland

This is sheet 1 of my plan in sheets

Delete if inapplicable.

I,

of

a surveyor registered under the Surveyors Act, 1929, as amended, hereby certify that the survey represented in this plan

is accurate and has been made *(1) by me (2) under my immediate supervision in accordance with the Survey Practice Regulations, 1933, and was completed on)

Signature:

Surveyor registered under Surveyors Act, 1929, as amended.

Date Line of Asbuilt.

*Strike out either (1) or (2). Insert date of survey.

Panel for use only for statements of intention to dedicate public roads or public reserves or create drainage reserves, easements, or restrictions as to user.

SIGNATURES AND SEALS ONLY.

THE COMMON SEAL of GENIMPEX PTY. LIMITED was hereunto affixed by order of the Board of Directors in the presence of:

DIRECTOR

SECRETARY

GENIMPEX PTY. LIMITED Common Seal

Council Clerk's Certificate.

I hereby certify that—

(a) the requirements of the Local Government Act, 1919 (other than the requirements for the registration of plans), and

*(b) the requirements of section 340 of the Metropolitan Water, Sewerage, and Drainage Act, 1924, as amended, (Hunter District Water, Sewerage, and Drainage Act, 1938, as amended,

have been complied with by the applicant in relation to the proposed CONSOLIDATION (insert "new road" or "subdivision")

set out hereto.

Subdivision No. 1302

Date 3/6/1973

(Signature) Council Clerk.

*This part of certificate to be deleted where the application is only for the opening of a new road or where the land to be subdivided is wholly outside the areas of operations of the Metropolitan Water Sewerage and Drainage Board and the Hunter District Water Board.

Delete if inapplicable.

WARNING. CREASING OR FOLDING WILL LEAD TO REJECTION.

I, Jack Hayward Watson, Registrar General for New South Wales, certify that this negative is a photograph made as a permanent record of a document in my custody this 23rd day of November, 1976.

2

[redacted]FICATE OF TITLE

12246087

NEW SOUTH WALES 29707

AL PROPERTY ACT, 1900

Appln. Nos.10972,23362,297[redacted]
32077 and 38063 (part)
Prior Titles Vol.3362 Fols.44 and 45
Vol.3490 Fol. 76
Vol.4315 Fol.145
Vol.4693 Fol. 45
Vol.5328 Fol.219
Vol.5523 Fol.109
Vol.5811 Fol. 66

Vol. 12246 Fol. 87

Edition issued 1-11-1973

(Page 1) Vol. 12246 Fol. 87

I certify that the person described in the First Schedule is the registered proprietor of the undermentioned estate in the land within described subject nevertheless to such exceptions encumbrances and interests as are shown in the Second Schedule.

Registrar General

ESTATE AND LAND REFERRED TO SEE AUTO FOLIO

Estate in Fee Simple in Lot 1 in Deposited Plan 556914 at St.Peters in the Municipality of Marrickville Parish of Petersham and County of Cumberland being part of 470 acres granted to Thomas Smyth on 8-10-1799 and part of 1 9/10 perches granted by Crown Grant Volume 5328 Folio 219. EXCEPTING THEREOUT the land below a depth of 50 feet from the surface as regards part and the minerals reserved by the Crown Grant of 1 9/10 perches.

FIRST SCHEDULE

GENIMPEX PTY. LIMITED.

SECOND SCHEDULE

GRY 1. Reservations and conditions, if any, contained in the Crown Grants above referred to.
2. ~~Mortgage No.M[redacted]59 to Industrial Acceptance Corporation Limited. Entered 8-12-1970.~~ Discharged M758979
AG 3. Lease No.M92826 of premises being Substation No.723 (together with rights) to The Sydney County Council. Entered 20-1-1971.
4. ~~Lease No.M92827 of premises being those parts of the building No.4 known as Units 4 (i), (j) and (k) on the first floor to Felina Fabrics Pty. Limited. Entered 10-3-1971.~~ Expired 23.12.1974
5. ~~Lease No.M92828 of premises being those parts of the building No.4 being that part of Unit 4 (a) on the ground floor between the loading dock area and the area adjoining No Felina Fabrics Pty. Limited. Entered 10-3-1971.~~ Expired 23-12-1974
6. ~~Lease No.M95964 of premises being Unit 4H on the first floor of the building known as building No.1 to Felina Fabrics Pty. Limited. Entered 10-3-1971.~~ Expired 23-12-1974
7. ~~Caveat No.M367776 as regards the ground floor of the factory building erected on the land hereby. Entered 9-9-1971.~~ Withdrawn N391790
8. ~~Lease No.M636219 of premises being factory building No.2 being part of the ground floor known as Suite 1 to Whites Wires Pty. Limited. Entered 16-3-1972.~~ Expired 23.12.1974
9. ~~Lease No.M636218 of premises being that part of the ground floor of the building known as Suite A in building No.5 to Flame Coatings Pty. Limited. Entered 12-4-1972.~~ Expired 2-4-1979
10. ~~Lease No.M636220 of premises being that part of the second floor of factory building No. known as Suite 2 to Atlantic Lithographic Plates Pty. Limited. Entered 12-4-1972.~~ Discharged P23.12.1974
11. ~~Lease No.M689018 of premises known as Suite 2 on the ground floor of building No.7 known as 75-83 Mary Street, St.Peters to Neville Lazarus Moss of Kingsford, Contractor. Entered 2-1-1973.~~ Expired 23.12.1974
12. ~~Lease No.M689019 of premises known as Suite 3 on the ground floor of building No.7 known as 75-83 Mary Street, St.Peters to Ronald Gray of Engadine and William Foster of Villawood Paper Shavings Manufacturers. Entered 2-1-1973.~~ Expired 23.12.1974
13. Lease No.M786517 of premises known as Factory No.13 of building No.6 to Petra Knitwear Pty. Limited. Entered 2-1-1973. Expired 2-4-1979

Registrar General

Vol. 12246 Fol. 87

PLAN SHOWING LOCATION OF LAND

~~LENGTHS IN METRES~~