ENVIRONMENTAL INVESTIGATION SERVICES

REPORT

TO

HEALTH INFRASTRUCTURE

ON

STAGE 1 PRELIMINARY ENVIRONMENTAL SITE ASSESSMENT

FOR

PROPOSED MENTAL HEALTH INTENSIVE CARE UNIT AT PRINCE OF WALES HOSPITAL

AT

NO. 220 AVOCA STREET, RANDWICK, NSW

NOVEMBER 2010

REF: E24288KBrpt

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EXECUTIVE SUMMARY

Health Infrastructure (HI) commissioned Environmental Investigation Services (EIS), a division of Jeffery & Katauskas Pty Ltd (J&K), to undertake a Stage 1 preliminary environmental site assessment to assess the likelihood of contamination of the subsurface soils for the proposed mental health intensive care unit at Prince of Wales Hospital, No. 220 Avoca Street, Randwick, NSW.

The proposed development area (referred to as the 'site' within this report) forms part of the wider site identified as Lot 1 in DP870720 as shown in Figure 2. At the time of this investigation the site was occupied by a multi-storey hospital building which was in the process of being demolished. The site location is shown on Figure 1 and the investigation was confined to the proposed development area as shown on Figure 3.

EIS understand that the proposed development is at a conceptual stage and the location, layout and size of the building is yet to be finalised. The proposed building footprint (currently at conceptual stage) is shown on Figure 3. The proposed building may include one to two storeys with a basement. Based on the existing site levels, the basement may be located at or close to the existing ground surface. Minimal excavation can be anticipated for the installation of services.

The scope of work undertaken for the assessment included a site history assessment; design and implementation of a limited field sampling program; laboratory analysis of selected soil samples for potential contaminants of concern and preparation of a report presenting the results of the investigation.

The search of historical information has indicated the following:

- A review of the historical aerial photographs indicates that the site has been used as a hospital since at least 1930. The multi-storey building located on site was constructed during the period between 1970 and 1978. The main administration building of the wider hospital was constructed between 1992 and 2002;
- A review of the historical land title records indicates that the site was owned by Destitute Children's Society from 1863 to 1916. The South Eastern Sydney Area Health Services has owned the site since at least 1997;
- A review of the Section 149 certificates indicates the site is located in a heritage conservation area and is listed as a heritage item. There is no information provided under the Section 59 (2) of the Contaminated Land Management Act 1997; and
- A search of the NSW DECCW public register (POEO) indicated the existence of three notices for the subject site. Two former notices are for the generation and storage of hazardous, industrial or Group A waste. One notice was for a S58 licence variation.

Based on the site inspection and site history assessment, potential contamination at the site was anticipated to be associated with:

- Potentially contaminated, imported fill material; and
- Potential asbestos contamination associated with demolition of the former site buildings.

Soil samples were obtained from 6 boreholes drilled for the J&K geotechnical investigation. The samples were analysed for the contaminants of concern identified at the site.

Elevated concentrations of contaminants were not encountered in the soil samples analysed for the investigation. All results were below the site assessment criteria (SAC) adopted for the investigation.

Based on the results, EIS are of the opinion that the potential for significant widespread soil contamination in the development area is relatively low.

Based on the scope of work undertaken for this assessment EIS consider that the site can be made suitable for the proposed development provided that the site is inspected by experienced environmental personnel during excavation works to assess any unexpected conditions or subsurface facilities that may be discovered between investigation locations. This should facilitate appropriate adjustment of the works programme and schedule in relation to the changed site conditions.

The conclusions presented in this report have been made within the limitations of the scope of works undertaken for the investigation. The conclusions and recommendations should be read in conjunction with the limitations presented in the body of the report.

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1 INTRODUCTION

Health Infrastructure (HI) commissioned Environmental Investigation Services (EIS), a division of Jeffery & Katauskas Pty Ltd (J&K), to undertake a Stage 1 preliminary environmental site assessment to assess the likelihood of contamination of the subsurface soils for the proposed mental health intensive care unit at Prince of Wales Hospital, No. 220 Avoca Street, Randwick, NSW.

The proposed development area (referred to as the 'site' within this report) forms part of the wider site identified as Lot 1 in DP870720 as shown in Figure 2. At the time of this investigation the site was occupied by a multi-storey hospital building which was in the process of being demolished. The site location is shown on Figure 1 and the investigation was confined to the proposed development area as shown on Figure 3.

The investigation was undertaken generally in accordance with an EIS proposal (Ref: EP5096KB) of 27 August 2010 and a contract between J&K and HI (Ref: HIC10026).

This report describes the investigation procedures and presents the results of the Stage 1 environmental site assessment, together with comments, discussion and recommendations.

A geotechnical investigation was undertaken in conjunction with the environmental assessment by J&K and the results are presented in a separate report (Ref. 24288WHrpt, dated 28 October 2010).

1.1 Proposed Development Details

EIS understand that the proposed development is at a conceptual stage and the location, layout and size of the building is yet to be finalised. The proposed building footprint (currently at conceptual stage) is shown on Figure 3. The proposed building may include one to two storeys with a basement. Based on the existing site levels, the basement may be located at or close to the existing ground surface. Minimal excavation can be anticipated for the installation of services.

2 OBJECTIVES AND SCOPE OF WORK

2.1 Objectives

The primary objectives of the investigation were to:

- Assess the soil contamination conditions at the site in relation to the continuing hospital land use;
- Undertake a preliminary waste classification assessment for off-site disposal of excavated soil associated with the proposed development works; and
- Prepare a report presenting the results of the assessment generally in accordance with the *NSW EPA (now DECCW) Guidelines for Consultants Reporting on Contaminated Sites (1997[1])* and *State Environmental Planning Policy No.55 – Remediation of Land (1998[2])*.

2.2 Scope of Work

The scope of work undertaken to achieve the objective included:

1. Review of historical aerial photographs;
2. Review of historical land title records;
3. Search of the NSW DECCW notices for the site under Section 58 of the *Contaminated Land Management Act* (1997[3])[4];
4. Search of the NSW DECCW public register (POEO[5]) for licences, applications or notices for the site;
5. Search of WorkCover databases for licenses to store dangerous goods including underground fuel storage tanks (USTs);
6. Review of Randwick Council Section 149 (2) & (5) certificates for the site;
7. Review of regional geology and groundwater conditions, including the location of registered groundwater bores in the vicinity of the site;
8. Design and implementation of a limited field sampling program;
9. Laboratory analysis of selected soil samples; and
10. Preparation of a report presenting the results of the assessment together with recommendations and comments on the suitability of the site for the proposed development.

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[1] *Guidelines for Consultants Reporting on Contaminated Sites,* NSW EPA (now DECCW), 1997 (Reporting Guidelines 1997)

[2] *State Environmental Planning Policy No. 55 – Remediation of Land,* NSW Government, 1998 (SEPP55)

[3] *Contaminated Land Management Act,* NSW Government Legislation, 1997 (CLM Act 1997)

[4] http://www.environment.nsw.gov.au/prclmapp/searchregister.aspx visited on 27 October 2010

[5] http://www.environment.nsw.gov.au/prpoeoapp/searchregister.aspx visited on 27 October 2010

Field work for this investigation was undertaken on the following dates:

- Drilling and soil sampling was undertaking by J&K on 16 and 17 September 2010; and
- A limited walkover site inspection was undertaken by EIS on 17 September 2010.

3 SITE INFORMATION

3.1 Site Identification

The site identification details are summarised in the following table:

Site Owner:	South Eastern Sydney & Illawarra Area Health Services
Site Address:	No. 220 Avoca Street, Randwick, NSW
Lot & Deposited Plan:	Lot 1 in DP870720
Current Land Use:	Hospital
Proposed Land Use:	Hospital
Local Government Authority:	Randwick City Council
Current Zoning:	Zone No. 5 (Special Uses)
Area of Proposed Development:	Approximately 1,500m^2
AHD:	Approximately 49m to 55m
Geographical Location (MGA):	N: 6245290 E: 337290 (approximately)
Site Locality Plan:	Refer to Figure 1
Site Layout Plan:	Refer to Figure 2
Borehole Location Plan:	Refer to Figure 3

3.2 Site Description

The site forms part of the Prince of Wales Hospital located in Randwick and is bounded by Avoca Street to the east, by Nurses Drive to the north and north-west and by the existing hospital buildings to the south and west. The University of New South Wales is located further to the west of the site. The site is located at the foot of a hill which generally falls to the south at approximately 3° to 5°. The north and north-east site boundaries form a cliff face with falls onto the site. The remaining sections of the site are relatively flat.

At the time of the site inspection, the central and south sections were occupied by a 12 storey brick building which was in the early stages of demolition. A former in-ground swimming pool located adjacent to the north section of the building had been demolished. The area surrounding the building was surface with exposed fill and crushed concrete. Some stockpiles of soil with demolition rubble were located along the north and north-east site boundaries. Several scattered medium to tall trees were located on the site.

Sandstone outcrops (possibly the result of historical quarrying) were located along the north and north-east cliff face which formed the site boundary. There was evidence of staining from past groundwater seepage over the cliff face.

A single storey brick building was located on the north-west corner of the site above the sandstone cliff face.

An asphaltic concrete (AC) carpark was located to the south of the site. A three storey above ground carpark was located further to the west of the site. An AC surfaced internal access road was located along the north site boundary.

3.3 Regional Geology

The geological map of Sydney (1983[6]) indicates the site to be located on the boundary of Hawkesbury Sandstone and medium to fine grained 'marine' sand, with podsols. Hawkesbury Sandstone typically consists of medium to coarse grained quartz sandstone with minor shale and laminite lenses.

3.4 Hydrogeology

NSW Office of Water (formerly Department of Water and Energy[7]) records were researched for the investigation and indicated that 10 registered groundwater bores lie within 500m of the site. The groundwater works summaries and a map indicating the location of the bores in relation to the site are attached in Appendix C. The details are summarised in the following table:

[6] *1:100,000 Geological Map of Sydney (Series 9130),* Department of Mineral Resources (1983) [now Department of Primary Industries]

[7] http://www.waterinfo.nsw.gov.au/gw/ visited on 27 October 2010

Ref No	Approximate Distance from site (m)	Approximate Direction from site	Standing Water Level (SWL in m)	Depth (m)	Registered Purpose
GW106158	350	East	NA	NA	Domestic
GW072463	300	South	NA	43	Industrial
GW104947	400	South	2.71	5	Test Bore
GW108861	450	South-west	20	114	Recreation
GW110240	340	South-west	16.5	150	Recreation
GW017851	300	South-west	NA	4.5	Commercial
GW110524	300	South-west	NA	1.5	Domestic
GW109679	250	South-west	NA	6	Groundwater Remediation
GW109680	250	South-west	NA	5.5	Groundwater Remediation
GW109681	250	South-west	NA	6	Groundwater Remediation

Notes:
NA – Not Available

The groundwater bore search indicated the existence of three monitoring wells licensed for groundwater remediation at a site located to the south-west of the subject site. The remediation site was located on the corner of Barker and Botany Street, approximately 500m down-gradient from the subject site. A review of the aerial photographs indicated that the remediation site was a service station and therefore potentially contaminated with petroleum hydrocarbons. However, based on the topography and the distance, the potential risk of migration of contaminants onto the subject site is considered to be very low.

The stratigraphy of the site is expected to consist of sandy soils overlying relatively shallow bedrock. Based on these conditions groundwater is not considered to be a significant resource at the subject site.

4 SITE HISTORY ASSESSMENT

4.1 Aerial Photographs

Aerial photographs of the site taken in 1930, 1943, 1951, 1961, 1970, 1978, 1986, 1994 and 2002 were obtained from the Department of Lands and were reviewed as part of the assessment of the site history. EIS has also reviewed the 1943 historical aerial photograph available for the site on the NSW Department of Lands SIX Viewer[8]. The information obtained from the photographs are summarised in the following table:

Year	Details
1930	The central and north sections of the subject site were vacant with grass cover. The north site boundary formed a cliff face which sloped onto the subject site. A few small buildings were located on the south section of the site. The area further to the south-west appeared to be vacant and surfaced with exposed soil. Avoca Street was located to the east of the site and appeared to be paved. Nurses Drive was located to the west of the site and appeared to be paved. A review of the land title information indicated that the buildings on site formed a part of the Prince of Wales Repatriation Hospital. Numerous buildings which appeared to be hospital wards were located to the west and north-west of the site. Residential buildings were located to the east of Avoca Street. Numerous residential buildings were located in the immediate surrounds of the wider hospital.
1943	The small buildings located on the south-west section of the site had been demolished. The former building footprints were visible on the photo. Some building to the immediate south of the subject site had been demolished. The remaining sections of the wider hospital appeared similar to the 1930 photograph. The immediate surrounds appeared similar to the 1930 photograph.
1951	A large building had been constructed on top of the cliff face in the north-west corner of the site. The remaining sections of the site and immediate surrounds appeared similar to the 1943 photo.

[8] https://six.maps.nsw.gov.au/wps/portal/SIXViewer

Year	Details
1961	The majority of the subject site appeared similar to the 1951 photograph. Two small buildings which appeared to be residential houses had been constructed on the south-east section of the subject site. A few additional buildings had been constructed on the north-east section of the hospital. The immediate surrounds appeared similar to the 1951 photo.
1970	The building located on top of the cliff in the north-west corner of the site had been demolished. One of the smaller residential building located on the south-east section of the site had been demolished. Numerous stockpiles of soil were located in the central section of the site. Numerous new buildings had been constructed over the wider hospital. A relatively large multistorey building was located in the north section of the wider site. Numerous new buildings associated with Randwick Girls Tech High were located to the south of the hospital. The immediate surrounds appeared similar to the 1961 photo.
1978	A relatively large multi-storey building had been constructed in the central and south sections of the subject site. A small swimming pool was located to the north of the building. Small trees were scattered in the north section of the site. The area to the south of the multi-storey building was occupied by a paved access driveway and carpark. A few smaller buildings had been constructed on top of the cliff in the north-west corner of the site. The immediate surrounds appeared similar to the 1970 photo.
1986	The subject site appeared similar to the 1978 photo. A few of the wards located in the central section of the wider hospital had been demolished. The remaining sections of the wider hospital appeared similar to the 1978 photo. A relatively large shopping complex was located further to the north of High Street. The immediate surrounds appeared similar to the 1978 photo.
1994	The subject site appeared similar to the 1986 photo. The hospital wards located in the central section of the wider site had been demolished. Earthworks and construction was underway in the central section of the wider hospital. The immediate surrounds appeared similar to the 1986 photo.

Year	Details
2002	The subject site appeared similar to the 1994 photo. The current administration and main hospital building had been constructed in the central section of the wider site. The immediate surrounds appeared similar to the 1992 photo.

4.2 Land Title Search

A limited historical land title search was performed on our behalf by Advanced Legal Search Pty Ltd. Copies of the title records are presented in Appendix C and a summary of the relevant information is provided in the following table:

Lot 1 DP 870720

Registration Date	Proprietor
2005 – todate	South Eastern Sydney and Illawarra Area Health Services
(1998 – todate)	*(various commercial leases see Folio Identifier 1/870720)*
1997 – 2005	South Eastern Sydney Area Health Service
(1997 – todate)	*(various commercial leases see Historical Folio 1/870720)*
	(Lot D DP 433525)
1989 – 1997	Eastern Health Service
	(Lot D DP 433525 – Area 8 Perches – CTVol 6200 Fol 34)
1987 – 1989	Eastern Health Service
1984 – 1987	John Wayne Fitzpatrick
1983 – 1984	Noel Bernard Fitzpatrick, engineer
1978 – 1983	Noel Bernard Fitzpatrick, engineer Sheila Patrick Fitzpatrick
1978 – 1978	Ben Arthur Pty Limited
1960 – 1978	Wilvere Pty Limited
1959 – 1960	Alice Amanda Ruddock, widow
1950 – 1959	Herbert Vere Ruddock, retired
	(Land in A237253 – Area 1 Rood 31 ¼ Perches – CTVol 2670 Fol 132)
1946 – 1950	Cyril Edwin Campbell Lupton, solicitor
(1945 – 1948)	*(lease to Eileen Muriel Farell, of 53 – 55 Barker St, Randwick)*
(1938 – 1945)	*(lease to Maria Margaret Wachin, wife of retired brewer, of 53 – 55 Barker St, Randwick)*
1934 – 1946	Herbert Templeton Bennett, retired storekeeper Cyril Edwin Campbell Lupton, solicitor
(1929 – 1939)	*(lease to Mabel Nugent, spinster, of 53 Barker St, Randwick)*
(1925 – 1934)	*(lease to Irene Byrnes, spinster of part)*
(1924 – 1934)	*(lease to Harry Rowe, blacksmith of part)*

Registration Date	Proprietor
1916 – 1934	Augusta Eleanor Bennett, wife of general storekeeper
	(Land in DP 60065 – Area 3 Roods 34 ¾ Perches – CTVol 1212 Fol 26)
1897 – 1916	Harriott Rebecca Allsop, wife of horse trainer
	(Portions 401, 1483 & 1485 Parish Alexandria – PA 65300)
1997 – 1997	South Eastern Sydney Area Health Services
	(Portion 401 Parish Alexandria – Area 31 Acres 3 Roods 38 Perches)
1916 – 1997	Crown Land
(1947 – 1997)	*(Dedicated to The Prince of Wales Repatriation Hospital)*
(1915 – 1947)	*(Requisition by Commonwealth for Hospital & Convalescent accomadation)*
1863 – 1916	Destitute Children's Society
	(Portion 1483 Parish Alexandria – Area 8 Perches)
1941 – 1997	Crown Land
(1947 – 1997)	*(Reserve 72182 from sale, Reserve 72183 from lease, for hospital)*
(1941 – 1947)	*(Reserved for Ambulance Station Site)*
	(Portion 401 Parish Alexandria – Area 31 Acres 3 Roods 38 Perches)
1916 – 1941	Crown Land
1863 – 1916	Destitute Children's Society
	(Portion 1485 Parish Alexandria – Area 2 Roods 11 Perches)
1946 – 1997	Crown Land
(1947 – 1997)	*(Reserve 72182 from sale, Reserve 72183 from lease, for hospital)*
	(Portion 401 Parish Alexandria – Area 31 Acres 3 Roods 38 Perches)
1916 – 1941	Crown Land
1863 – 1916	Destitute Children's Society

The land title search has indicated that the site was owned by the Destitute Children's Society from 1863 to 1916. Some sections of the wider site formed part of Crown Land from at least 1916 to 1997. During this period the site was dedicated to the Prince of Wales Repatriation Hospital. Some sections of the site were owned by private citizens from 1916 to the 1990's. The South Eastern Sydney Area Health Services has owned the site since at least 1997.

4.3 Summary of Section 149 (2) and (5) Certificates

Randwick City Council planning certificate under the Section 149 of the *Environmental Planning and Assessment Act* (1979[9]) issued on 22 September 2010 (certificate number 23263) has been reviewed and presented in Appendix C.

The certificate indicates that the site is subject to a number of local planning controls and state planning instruments. A summary of the information relevant to this investigation is presented below. Reference should be made to Appendix C for further details:

- Randwick Local Environmental Plan (LEP) 1998 (consolidation) gazetted on 15 January 2010 and SEPPs applies to the site;
- The land is located in a heritage conservation area and is listed as a heritage item under the provisions of the Randwick LEP;
- The land is not affected by the operations of section 38 or 39 of the Coastal Protection Act 1979;
- The land is affected by the Contaminated Land Policy adopted by Council;
- The land is not subject to flood related development control;
- The following information is provided under Section 59 (2) of the Contaminated Land Management Act 1997:
  - The site is not declared to be significantly contaminated land;
  - The site is not subject to a management order;
  - The site is not the subject of an approved voluntary management proposal;
  - The site is not the subject of an ongoing maintenance order; and
  - Council has not received a copy of the site audit statement for the site.
- The land is affected by a tree preservation order made under clause 28 of the LEP.

4.4 WorkCover Database Records

A records search for licenses to store dangerous goods is in progress on our behalf by WorkCover. The results of the search will be forwarded when received.

4.5 NSW DECCW Records

A search of the NSW DECCW (EPA) on-line database did not indicate the existence of any EPA notices for the site under section 58 of the CLM Act 1997. The records indicated the existence of notices for a site identified as No. 128 Barker Street, Randwick, NSW 2642 (7 Eleven Service Station). The site is located on the corner of Barker and Botany Street approximately 250m down-gradient from the subject site.

[9] *Environmental Planning and Assessment Act,* NSW Government, 1979 (EP&AA 1979)

The records include the following notices:

- Notice number 26119 issued on 20 May 2009 – Agreed Voluntary Remediation Proposal; and
- Notice number 21125 issued on 10 December 2008 – Declaration of Remediation Site.

A search of the NSW DECCW public register (POEO) indicated the existence of three notices for the subject site. A brief summary of the licences is presented in the table below. Copies of the relevant documents are attached in Appendix C:

Licence Number: 6606	
Licence Holder	South Eastern Sydney & Illawarra Area Health Service
Premises	Prince of Wales Hospital, Barker Street, Randwick, NSW
Licence Status	No longer in force
Activity	Hazardous, Industrial or Group A Waste Generation or Storage (>100 to 500 tonnes).
Licence Number: 10464	
Licence Holder	P. O. W Hospital Pty Ltd
Premises	Prince of Wales Hospital, Barker Street, Randwick, NSW
Licence Status	No longer in force
Activity	Hazardous, Industrial or Group A Waste Generation or Storage
Licence Number: 1035418	
Licence Holder	P. O. W Hospital Pty Ltd
Premises	Prince of Wales Hospital, Barker Street, Randwick, NSW
Licence Status	Active
Activity	S 58 Licence Variation

4.6 Assessment of Historical Information Integrity

The site history assessment has generally been obtained from: government records including the NSW land titles office, local government historical archives and historical aerial photographs. The veracity of the information from these sources is considered to be high, however, given the age of the development, the gap of up to 21 years between aerial photographs and the lack of information available on activities prior to 1900's, a certain degree of information loss is to be expected.

Non verifiable anecdotal information has not been relied upon during assessment of historical site use. Therefore, there is considered to be a high level of integrity associated with information obtained with respect to historical use of the site.

4.7 Summary of Historical Site Use

The search of historical information has indicated the following:

- A review of the historical aerial photographs indicates that the site has been used as a hospital since at least 1930. The multi-storey building located on site was constructed during the period between 1970 and 1978. The main administration building of the wider hospital was constructed between 1992 and 2002;
- A review of the historical land title records indicates that the site was owned by Destitute Children's Society from 1863 to 1916. The South Eastern Sydney Area Health Services has owned the site since at least 1997;
- A review of the Section 149 certificates indicates the site is located in a heritage conservation area and is listed as a heritage item. There is no information provided under the Section 59 (2) of the Contaminated Land Management Act 1997; and
- A search of the NSW DECCW public register (POEO) indicated the existence of three notices for the subject site. Two former notices are for the generation and storage of hazardous, industrial or Group A waste. One notice was for a S58 licence variation.

5 POTENTIAL CONTAMINATION SOURCES

5.1 Potential Site Specific Contamination

Potential contamination at the site would be anticipated to be associated with:

- Potentially contaminated, imported fill material; and
- Potential asbestos contamination associated with demolition of the former site buildings.

5.1.1 Site Specific Soil Contaminants of Concern

The compounds identified as soil contaminants of concern at the site include:

- Heavy metals: arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc;
- Total petroleum hydrocarbons (TPH);
- Monocyclic aromatic hydrocarbon compounds: benzene, toluene, ethyl benzene and xylenes (BTEX);
- Polycyclic aromatic hydrocarbons (PAHs) including benzo(a)pyrene;
- Organochlorine pesticides (OCPs) including Aldrin, dieldrin, chlordane, DDT, DDD, DDE and heptachlor;
- Organophosphorus pesticides (OPPs);
- Polychlorinated Biphenyls (PCBs); and
- Asbestos.

5.1.2 Site Specific Groundwater Contaminants of Concern

The compounds identified as groundwater contaminants of concern at the site include:

- Heavy metals: arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc;
- Total petroleum hydrocarbons (TPH);
- Monocyclic aromatic hydrocarbon compounds: benzene, toluene, ethyl benzene and xylenes (BTEX); and
- Polycyclic aromatic hydrocarbons (PAHs) including benzo(a)pyrene.

5.2 Potential Off-Site Contamination

A search of the NSW DECCW (EPA) on-line database indicated the existence of remediation notices for a site identified as No. 128 Barker Street, Randwick, NSW 2642 (a 7 Eleven Service Station). The site is located on the corner of Barker and Botany Street approximately 500m down-gradient from the subject site. Based on the

distance and topography, the potential risk of migration of contamination onto the subject site is considered to be very low.

5.3 Potential Receptors

The main potential contamination receptors are considered to include:

- Site visitors, workers and adjacent property owners, who may come into contact with contaminated soil and/or be exposed to contaminated dust arising from construction activity; and
- Future site occupants.

5.4 Contaminant Laydown and Transport Mechanisms

At this site, mobile contaminants would be expected to move down to the rock surface and migrate laterally down-slope from the source. The movement of contaminants would be expected to be associated with groundwater flow and seepage at the top of the bedrock.

6 ASSESSMENT CRITERIA DEVELOPMENT

6.1 Regulatory Background

In 1997 the NSW Government introduced the CLM Act. This Act has recently been amended by the *Contaminated Land Management Amendment Act* (2008[10]).

The CLM Act 1997, associated regulations, SEPP55 and NSW DECCW (EPA) guidelines, were designed to provide uniform state-wide control of the management, investigation and remediation of contaminated land.

Prior to granting consent for any proposed rezoning or development, SEPP55 requires the consent authority to:

- Consider whether the land is contaminated;
- Consider whether the site is suitable, or if contaminated, can be made suitable by remediation, for the proposed land use; and
- Be satisfied that remediation works will be undertaken prior to use of the site for the proposed use.

Should the assessment indicate that the site poses a risk to human health or the environment, remediation of the site may be required prior to occupation of the proposed development. SEPP55 requires that the relevant local council be notified of all remediation works, whether or not development consent is required. Where development consent is not required, 30 days written notice of the proposed works must be provided to council. Details of validation of remediation work must also be submitted to Council within one month of completion of remediation works.

The consent authority may request that a site audit be undertaken during, or following the completion of the site assessment process. Under the terms of the CLM Act 1997 the NSW DECCW (EPA) Site Auditor Scheme was developed to provide a system of independent review for assessment reports. An accredited Contaminated Site Auditor is engaged to review reports prepared by suitably qualified consultants to ensure that the investigation has been undertaken in accordance with the guidelines and confirm that the sites are suitable for their intended use.

Section 59(2) of the CLM Act 1997 states that specific notation relating to contaminated land issues must be included on Section149 (s149) planning certificates prepared by Council where the land to which the certificate relates is:

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[10] *Contaminated Land Management Amendment Act,* NSW Government Legislation, 2008 (CLM Amendment Act 2008)

- Within an investigation or remediation area;
- Subject to an investigation or remediation order by the DECCW (EPA);
- The subject of a voluntary investigation or remediation proposal; and/or
- The subject of a site audit statement.

Submission of contaminated site investigation and validation reports to council as part of rezoning or development application submissions may also result in notation of actual or potential site contamination on future s149 certificates prepared for the site.

Section 60 of the CLM Amendment Act 2008 sets out a positive duty on a land owner, or person whose activities have caused contamination, to notify the DECCW if they are or become aware that contamination exists on a site that generally poses *"an unacceptable risk to human health or the environment, given the site's current or approved use"*. This duty to report is based on trigger values, above which notification is required.

Off-site disposal of fill, contaminated material and excess soil/rock excavated as part of the proposed development works is regulated by the provisions of the *Protection of the Environment Operations Act* (1997[11]) and associated regulations and guidelines including the *NSW DECC (now DECCW) Waste Classification Guidelines - Part 1: Classifying Waste* (2009[12]). All materials should be classified in accordance with these guidelines prior to disposal.

Section 143 of the POEO Act 1997 states that if waste is transported to a place that cannot lawfully be used as a waste facility for that waste, then the transporter and owner of the waste are each guilty of an offence. The transporter and owner of the waste have a duty to ensure that the waste is disposed of in an appropriate manner.

6.2 Soil Contaminant Threshold Concentrations

The soil investigation levels adopted for this investigation are derived from the NSW DEC (now DECCW) document *Guidelines for the NSW Site Auditor Scheme, 2nd Edition* (2006[13]) and the National Environmental Protection Council document *National Environmental Protection (Assessment of Site Contamination) Measure* (1999[14]). The contaminant thresholds listed below are levels at which further investigation and

[11] *Protection of Environment Operations Act,* NSW Government, 1997 (POEO Act 1997)

[12] *Waste Classification Guidelines, Part 1: Classifying Waste,* NSW DECC, 2009 (Waste Classification Guidelines 2009)

[13] *Guidelines for the NSW Site Auditor Scheme, 2nd ed.,* NSW DEC, 2006 (Site Auditor Guidelines 2006)

[14] *National Environmental Protection (Assessment of Site Contamination) Measure,* National Environment Protection Council (NEPC), 1999 (NEPM 1999)

evaluation is required to assess whether the site is considered suitable for the proposed urban land use.

To accommodate the range of human and ecological exposure settings, a number of generic settings are used on which the Health based Investigation Levels (HILs) can be based. Four categories of HILs are adopted for urban site assessments. Contaminant levels for a standard residential site with gardens and accessible soil (Column A) are based on protection of a young child resident at the site. The remaining categories (Columns D to F) present alternative exposure settings where there is reduced access to soil or reduced exposure time. These categories include residential land use with limited soil access, recreational and public open space and commercial/industrial use. Where the proposed land use will include more than one land use category (eg. mixed residential/commercial development) the exposure setting of the most "sensitive" land use is adopted for the site.

Threshold concentrations for petroleum hydrocarbon contaminants including total TPH and BTEX compounds have previously been established in the *NSW EPA (now DECCW) Contaminated Sites: Guidelines for Assessing Service Station Sites* (1994[15]) publication and this document is referenced in the Site Auditor Guidelines 2006. Heavy fraction petroleum hydrocarbon aliphatic/aromatic component threshold concentrations have also been introduced in NEPM 1999.

Soil samples for this investigation have been analysed for total recoverable hydrocarbons (TRH) rather than TPH. TRH analysis is undertaken without a preliminary silica gel clean-up of the sample. Consequently the TRH result may include other compounds such as phthalates, humic acids, fatty acids and sterols (if present). For comparative purposes in relation to the threshold concentrations, we have referred to TRH as TPH within this report.

6.2.1 Asbestos in Soil

NEPM 1999 does not provide numeric guidelines for the assessment of asbestos in soil. NSW DECCW (EPA) advice (2006) has indicated that consultants should use their 'professional judgement' regarding determination of appropriate investigation and remediation levels for asbestos in soils; however the NSW DECCW (EPA) have not published numerical guidelines for the assessment of asbestos in subsurface soils.

[15] *Guidelines for Assessing Service Station Sites,* NSW EPA, 1994 (Service Station Guidelines 1994)

The WorkCover publication *Working with Asbestos Guide* (2008[16]) states that, where buried asbestos is encountered, "A competent occupational hygienist should assess the site to determine:

- If asbestos material is bonded or friable
- The extent of asbestos contamination
- Safe work procedures for the remediation of the site"

"Any asbestos cement products that have been subjected to weathering, or damaged by hail, fire or water blasting are considered to be friable asbestos and an asbestos removal contractor with a WorkCover license for friable asbestos removal is required for its removal". Under the *NSW Occupational Health and Safety (OHS) Regulations 2001*[17] and WorkCover requirements all necessary disturbance works associated with friable asbestos containing materials must be conducted by a licensed AS-1 Asbestos Removal Contractor.

6.2.2 Site Assessment Criteria (SAC) for Soil Contaminants

The 'commercial/industrial' (Column F) exposure setting has been adopted for this assessment and the appropriate soil criteria are listed in the following table:

[16] *Working with Asbestos Guide,* NSW WorkCover, 2008 (WorkCover Working with Asbestos Guide 2008)
[17] *Occupational Health and Safety Regulation,* NSW Government, 2001 (NSW OH&S Regulation 2001)

Contaminant	SAC - HILs Column F (mg/kg)
Heavy Metals	
Arsenic (total)	500
Cadmium	100
Chromium (III)	60%
Copper	5000
Lead	1500
Mercury (inorganic)	75
Nickel	3000
Zinc	35000
Petroleum Hydrocarbons	
TPH (C_6-C_9)	65 [a]
TPH (C_{10}-C_{36})	1000 [a]
Benzene	1 [a]
Toluene	1.4 [a]
Ethylbenzene	3.1 [a]
Total Xylenes	14 [a]
PAHs	
Total PAHs	100
Benzo(a)pyrene	5
Pesticides (OCPs & OPPs)	
Aldrin + Dieldrin	50
Chlordane	250
DDT+ DDD + DDE	1000
Heptachlor	50
Total OPPs	0.1[b]
Others	
PCBs (Total)	50
Asbestos	NDLR [c]

Note:

[a] Service Station Guidelines 1994

[b] Due to the absence of locally endorsed guideline criteria, the laboratory practical quantitation limit (PQL) has been adopted.

[c] Not Detected at Limit of Reporting (NDLR)

6.2.3 Waste Classification Assessment Criteria

For the purpose of off-site disposal, the classification of soil into 'General Solid Waste (non-putrescible)', 'Restricted Solid Waste (non-putrescible)' and 'Hazardous Waste (non-putrescible)' categories is defined by chemical contaminant criteria outlined in the

Waste Classification Guidelines 2009. The contaminant criteria are summarised in Table A-2.

6.3 Evaluation of Soil Analysis Data and Contaminant Threshold Concentrations

Assessment of the soil analytical data using the soil contaminant threshold concentrations has been undertaken in accordance with the methodology outlined in the NEPM 1999 Schedule 7(a) and the statistical analysis methods outlined in the *NSW EPA (now DECCW) Contaminated Sites Sampling Design Guidelines* (1995[18]).

The following criteria have been adopted for assessment of the analytical data:

- For a site to be considered suitable for the proposed land use, the 95% Upper Confidence Limit (UCL) value of the arithmetic mean concentration of each contaminant should be less than the applicable contaminant threshold concentration;
- The relevance of localised elevated values must also be considered and should not be obscured by consideration only of the arithmetic mean of the results. The results must also meet the following criteria:
  - the standard deviation of the results must be less than 50% of the soil assessment criteria; and
  - no single value exceeds 250% of the relevant soil assessment criteria.
- Where the concentration of each contaminant is less than the applicable contaminant threshold concentration (site assessment criteria) in all samples, UCL calculations may not be required and the suitability of the site for the proposed use may be assessed based solely on individual analytical results.

Where contamination results exceed the SAC, a method of remediating the site is to physically and selectively remove the contamination hotspots from the site. This process should be continued until statistical analysis of the data meets the SAC. Validation of the remediated site is generally required to demonstrate that the site is suitable for the proposed land use.

[18] *Contaminated Sites Sampling Design Guidelines,* NSW EPA, 1995 (EPA Sampling Design Guidelines 1995)

7 ASSESSMENT PLAN

7.1 Soil Sampling Density

The *NSW EPA (now DECCW) Contaminated Sites Sampling Design Guidelines* (1995[19])/EPA Sampling Design Guidelines 1995 for contaminated site investigations state that samples should be obtained from a minimum of 7 evenly spaced sampling points for the subject site (approximately 1,500m^2).

Samples were obtained from 6 sampling locations for this investigation. This density represents approximately 85% of the minimum sampling density. Due to the existing building, the boreholes were drilled in accessible areas of the subject site as shown in Figure 3.

Sampling was not undertaken beneath existing buildings as access was not possible during the field investigation.

7.2 Data Quality Objectives (DQOs)

The DQOs for the assessment were developed with reference to the US EPA document *Data Quality Objectives Process for Hazardous Waste Site Investigations* (2000[20]). The document includes seven steps as follows:

1. State the problem
2. Identify the decision
3. Identify inputs into the decision
4. Study Boundaries
5. Develop a Decision Rule
6. Specify Limits on Decision Errors
7. Optimise the Design for Obtaining data

Field investigations are undertaken generally in accordance with EIS sampling protocols outlined in Appendix D.

7.3 Data Quality Indicators (DQIs) and Quality Assurance

The validation, as part of the DQOs, involves the technical review of the data using defined QA Assessment Criteria. The success of the DQIs is based on assessment of

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[19] *Contaminated Sites Sampling Design Guidelines,* NSW EPA, 1995 (EPA Sampling Design Guidelines 1995)

[20] *Data Quality Objectives Process for Hazardous Waste Site Investigations,* US EPA, *2000* (US EPA 2000)

the data set as a whole and not on individual acceptance or exceedance within the data set.

Review of QA criteria was based on laboratory data including surrogate recovery, repeat analysis, duplicates, matrix spikes and method blanks.

Field QA/QC included collection and analysis of the following for the contaminants of concern:

- approximately 17% of field soil samples as intra-laboratory duplicates for heavy metals, PAHs, TPH and BTEX; and
- field blank sample.

Success of field DQIs is based on the following criteria:

- Relative percentage differences (RPDs) were calculated for the intra-laboratory duplicates. The RPD was calculated as the absolute value of the difference between the initial and repeat result divided by the average value, expressed as a percentage. The following acceptance criteria were used to assess the RPD results:
  - For results that were greater than 10 times the Practical Quantitation Limit (PQL) RPDs less than 50% were considered acceptable.
  - For results that were between 5 and 10 times PQL RPDs less than 75% were considered acceptable.
  - For results that were less than 5 times the PQL RPDs less than 100% were considered acceptable.
- Acceptable concentrations in blank samples

8 INVESTIGATION PROCEDURE

8.1 Soil Sampling Methods

Subsurface investigation was undertaken using a track mounted hydraulically operated drill rig equipped with spiral flight augers. Soil samples were obtained from a Standard Penetration Test (SPT) sampler or directly from the auger when conditions did not allow use of the SPT sampler.

The SPT sampler was washed with phosphate free detergent and rinsed following each sampling event. The spiral flight augers were decontaminated using a scrubbing brush and potable water and Decon 90 solution (phosphate free detergent) followed by rinsing with potable water. Details of the decontamination procedure adopted during sampling are presented in Appendix D.

Due to access restrictions, sampling at location BH6 was undertaken using hand equipment. Details of the decontamination procedure adopted during sampling are presented in Appendix D.

Soil and rock samples were obtained at various depths, based on observations made during the field investigation. During sampling, soil at selected depths was split into initial and duplicate samples for QA/QC assessment.

All samples were placed in glass jars with plastic caps and teflon seals with minimal headspace. Samples for asbestos analysis were placed in zip-lock plastic bags. Sampling personnel used disposable nitrile gloves during sampling activities.

During the investigation, soil samples were preserved by immediate storage in an insulated sample container with ice in accordance with AS 4482.1-2005[21] and AS 4482.2-1999[22] as summarised in the following table:

[21] *Guide to the Investigation and Sampling of sites with Potentially Contaminated Soil,* Standards Australia, 2005 (AS 2005)

[22] *Guide to the Sampling and Investigation of Potentially Contaminated Soil Part2: Volatile Substances,* Standards Australia, 1999 (AS 1999)

Analyte	Preservation	Storage
Heavy metals	Unpreserved glass jar with Teflon lined lid	Store at <4°, analysis within 28 days (mercury and Cr[VI]) and 180 days (other metals).
VOCs (TPH/BTEX)		Store at <4°, nil headspace, extract within 14 days, analysis within forty days
PAHs, OCP, OPP & PCBs		
Asbestos	Sealed plastic bag	None

The samples were labelled with the job number, sampling location, sampling depth and date. All samples were recorded on the borehole logs presented in Appendix A and on the laboratory chain of custody (COC) record presented in Appendix B.

On completion of the fieldwork, the samples were delivered in the insulated sample container to a NATA registered laboratory for analysis under standard COC procedures. Detailed EIS field sampling protocols are included in Appendix D.

8.2 Photoionisation Detector (PID) Screening

A portable PID was used to screen the samples for the presence of volatile organic compounds (VOCs).

The sensitivity of the PID is dependent on the organic compound and varies for different mixtures of hydrocarbons. Some compounds give relatively high readings and some can be undetectable even though present in identical concentrations. The portable PID is best used semi-quantitatively to compare samples contaminated by the same hydrocarbon source.

The PID is calibrated before use by measurement of an isobutylene standard gas. All the PID measurements are quoted as parts per million (ppm) isobutylene equivalents.

PID screening of detectable volatile organic compounds (VOCs) was undertaken on soil samples using the soil sample headspace method. VOC data was obtained from partly filled zip-lock plastic bags following equilibration of the headspace gases. The PID headspace data is presented on the COC documents presented in Appendix B.

8.3 Laboratory Analysis

Laboratory analysis was undertaken by Envirolab Services Pty Ltd (NATA Accreditation No. 2901).

Soil samples were analysed using the following analytical methods detailed in Schedule B(3) of NEPM (1999[23]):

- Heavy metals – Nitric acid digestion. Analysis by ICP/AES.
- Low level mercury – cold vapour AAS.
- OC and OP pesticides and PCBs – Extracted with dichloromethane/acetone. Analysis by GC/ECD.
- PAHs – Soil extracted with dichloromethane/acetone. Analysis by GC/MS.
- TPH (volatile) – Soil extracted with methanol. Analysis by P&T GC/MS.
- TPH – Soil extracted with dichloromethane/acetone. Analysis by GC/FID.
- BTEX – Soil extracted with methanol. Analysis by P&T GC/MS.
- Asbestos – Polarizing light microscopy.

Toxicity characteristic leaching procedure (TCLP) leachates were prepared by rotating soil samples in a mild acid solution for 18 hours (NSW EPA WD-3 Method). Leachates were analysed using the analytical procedures outlined above.

[23] *Guideline on Laboratory Analysis of Potentially Contaminated Soils*, Schedule B(3), NEMP, 1999 (Schedule B(3))

9 RESULTS OF INVESTIGATION

9.1 Subsurface Conditions

Borehole locations are shown on Figure 3. For details of the subsurface soil profile reference should be made to the borehole logs in Appendix A. A summary of the subsurface conditions encountered in the boreholes is presented below:

Fill

Fill was encountered from the surface in all the boreholes drilled for the investigation and extended to depths of approximately 0.4m to 1.1m. BH6 was terminated in fill at a depth of approximately 0.55m due to hand auger refusal. The fill typically comprised of fine to coarse grained silty sand. The fill contained inclusions of roots, root fibres, sandstone, igneous and concrete gravel, brick and metal fragments.

Natural Soils

Natural silty sand, clayey sand and/or sand soil was encountered beneath the fill in boreholes BH1 to BH5 to depths of approximately 2.5m to 3.2m. The natural sand was generally fine to coarse grained with various colouring. The natural soil contained inclusions of root fibres and silt and clay fines.

Bedrock

Sandstone bedrock was encountered beneath the natural soil in boreholes BH1 to BH5 and extended to the termination depth of the boreholes. The sandstone was generally fine to coarse grained with various colouring.

Groundwater

Groundwater seepage was encountered during drilling in boreholes BH1 to BH5 at depths of approximately 1m to 1.9m. Some boreholes encountered standing water after the completion of coring. This was the result of water introduced during the coring process and is not considered to be a true representation of the groundwater conditions at the site. Long term monitoring of groundwater conditions has not been undertaken for this investigation.

9.2 Soil Laboratory Results

The laboratory reports are presented in Appendix B. The results have been assessed against the SAC adopted for this investigation.

The soil laboratory results are presented in Tables B and C inclusive. The results of the analyses are summarised below.

Heavy Metals

Six fill and one natural soil samples were analysed for heavy metals. The results of the analyses were below the SAC.

Waste Classification:

The results of all analyses were less than the CT1 criteria outlined in the Waste Classification Guidelines 2009.

Petroleum Hydrocarbons (TPH) and Monocyclic Aromatic Hydrocarbons (BTEX)

PID soil sample headspace readings were all zero ppm equivalent isobutylene. These results indicate a lack of PID detectable volatile organic contaminants.

Six fill and one natural soil samples were analysed for TPH and BTEX compounds. A slight detection of mid to heavy fraction TPH C_{15} to C_{36} of 270mg/kg was encountered in fill sample BH6 (0.2m to 0.3m). All the results of the analyses including the detection in BH6 were below the SAC.

Waste Classification:

The results of all analyses were less than the relevant CT1 and SCC1 criteria outlined in the Waste Classification Guidelines 2009.

Polycyclic Aromatic Hydrocarbons (PAHs)

Six fill and one natural soil samples were analysed for a range of PAHs including Benzo(a)pyrene. The results of the analyses were less than the SAC.

Waste Classification:

The majority of the results were less than the relevant CT1 and SCC1 criteria outlined in the Waste Classification Guidelines 2009. Fill sample BH6 (0.2m to 0.3m) encountered a B(a)P concentration above the CT1 and below the SCC1 criteria.

TCLP leachates was prepared from the fill samples BH6 (0.2m to 0.3m) and analysed for PAHs. The results were less than the TCLP1 criteria.

Organochlorine (OCPs) and Organophosphorous (OPPs) Pesticides

Six fill samples were analysed for a range of OCPs and OPPs. The results of the analyses were below the laboratory PQL and less than the SAC.

Waste Classification:

The results of all analyses were less than the SCC1 criteria outlined in the Waste Classification Guidelines 2009.

Polychlorinated Biphenyls (PCBs)

Six fill samples were analysed for a range of PCBs. The results of the analyses were below the laboratory PQL and less than the SAC.

Waste Classification:

The results of all analyses were less than the SCC1 criteria outlined in the Waste Classification Guidelines 2009.

Asbestos

Six fill samples were screened for the presence of asbestos fibres. The results of the analyses indicated that asbestos fibres were not encountered within the samples and no respirable fibres were detected.

10 ASSESSMENT OF ANALYTICAL QA/QC

The DQOs and DQIs established for the investigation have been assessed in this section of the report. The assessment includes a review of the laboratory QA/QC procedure to assess whether the sample data is reliable.

The laboratory reports for this investigation have been checked and issued as final by:

- Envirolab Services Pty Ltd
  NATA Accreditation No. 2901
  Report numbers: 46056 and 46056-A

The RPD results for the field QA/QC duplicate samples are summarised in Table D. An assessment of the DQIs adopted for this investigation is summarised in the following table. A brief explanation of the individual DQI is presented in Appendix D.

DQO	Number of Samples	DQI
Precision:		
Intra-laboratory duplicate Sample Reference: Dup 1 is a duplicate of soil sample BH1 (0.2m to 0.3m)	1 Soil duplicate	The intra-laboratory RPD values indicated that field precision was acceptable.
Field Blank FB1 is a soil blank dated 17/09/2010	1 Soil blank	The field blank was found to be free of analyte concentrations above the PQLs.
Accuracy:		
Surrogate Spikes	All organic analytes	Laboratory accuracy was good and that no outliers were reported.
Matrix Spike	2 Soil samples	Laboratory accuracy was good and that no outliers were reported.
Laboratory Control Sample (LCS)	1 Soil sample	Laboratory accuracy was good and that no outliers were reported.
Representativeness:		
Samples extracted and analysed within holding time	All Samples	All samples were extracted and analysed within the appropriate holding times outlined in the investigation procedure.
Analysis of Laboratory Blanks	1 Soil sample	All laboratory blanks were found to be free of analyte concentrations above the PQLs.
Comparability:		
EIS sampling protocols	All Samples	Sampling was undertaken in accordance with the EIS sampling protocols outlined in Appendix D
Standard laboratory analytical methods used	All Samples	All Samples
Samples obtained by qualified staff	All Samples	All Samples
Completeness:		
Documentation (including site notes, borehole logs and COC etc) was correctly maintained	All Samples	All Samples
Samples obtained were analysed for the contaminants of concern	All Samples	All Samples
Appropriate analytical methods used by the laboratory.	All Samples	All Samples

11 DISCUSSION

The Stage 1 preliminary environmental site assessment undertaken for the proposed mental health intensive care unit at Prince of Wales Hospital, No. 220 Avoca Street, Randwick, NSW, was designed to assess the suitability of the site for the proposed land use.

11.1 Summary of Soil Conditions

Soil samples obtained for the investigation were analysed for the potential contaminants of concern identified at the site.

Elevated concentrations of contaminants were not encountered in the soil samples analysed for the investigation. All results were below the SAC.

Fill sample BH6 (0.2m to 0.3m) encountered a slight detection of mid to heavy fraction TPH C_{15} to C_{36} of 270mg/kg which was below the SAC.

Based on the results, EIS are of the opinion that the potential for significant widespread soil contamination in other sections of the development area is relatively low.

11.1.1 Asbestos in Soil

Asbestos was not detected above the reporting limit in the soil samples analysed for the investigation.

11.2 Summary of Groundwater Conditions

Groundwater seepage was encountered in the majority of the boreholes during drilling. A detailed assessment of the groundwater conditions was outside the scope of this investigation.

11.2.1 Dewatering During Development

In the event groundwater is intercepted during excavation works, dewatering will be required. Council and other relevant approvals will be required prior to disposal of groundwater into the stormwater system.

11.3 Waste Classification

11.3.1 Classification of Fill Soils

Based on the results of the assessment, the fill material is classified as 'General Solid Waste (non-putrescible)' according to the criteria outlined in Waste Classification Guidelines 2009. The material should be disposed of to a suitably licensed NSW DECCW (EPA) landfill.

11.3.2 Classification of Natural Soil and Bedrock

The natural silty sand and underlying sandstone bedrock in the proposed development area is considered to be virgin excavated natural material (VENM). The material is considered suitable for re-use on-site, or alternatively, the information included in this report may be used to assess whether the material is suitable for beneficial reuse at another site as fill material. Where doubt exists about the difference between fill and VENM material an environmental/geotechnical engineer should be contacted.

VENM must not be mixed with any fill material (including building rubble) as this will invalidate the VENM classification.

11.4 Conclusion

Based on the scope of work undertaken for this assessment EIS consider that the site can be made suitable for the proposed development provided that the site is inspected by experienced environmental personnel during demolition and excavation works to assess any unexpected conditions or subsurface facilities that may be discovered between investigation locations. This should facilitate appropriate adjustment of the works programme and schedule in relation to the changed site conditions.

12 LIMITATIONS

The boreholes drilled for the investigation have enabled an assessment to be made of the existence of significant, large quantities of contaminated soils. The conclusions based on this investigation are that, while major contamination of the site is not apparent, problems may be encountered with smaller scale features between boreholes. EIS adopts no responsibility whatsoever for any problems such as underground storage tanks, buried items or contaminated material that may be encountered between sampling locations at the site. The proposed construction activities at the site should be planned on this basis, and any unexpected problem areas that are encountered between boreholes should be immediately inspected by experienced environmental personnel. This should ensure that such problems are dealt with in an appropriate manner, with minimal disruption to the project timetable and budget.

The conclusions developed in this report are based on site conditions which existed at the time of the site assessment and the scope of work outlined previously in this report. They are based on investigation of conditions at specific locations, chosen to be as representative as possible under the given circumstances, and visual observations of the site and vicinity, together with the interpretation of available historical information and documents reviewed as described in this report.

The investigation for this assessment and preparation of this report have been undertaken in accordance with accepted practice for environmental consultants, with reference to applicable environmental regulatory authority and industry standards, guidelines and the assessment criteria outlined previously in this report.

Where information has been provided by third parties, EIS has not undertaken any verification process, except where specifically stated.

EIS has not undertaken any assessment of off-site areas that may be potential contamination sources or may have been impacted by site contamination.

Subsurface soil and rock conditions encountered between investigation locations may be found to be different from those expected. Groundwater conditions may also vary, especially after climatic changes.

Previous use of this site may have involved excavation for the foundations of buildings, services, and similar facilities. In addition, unrecorded excavation and burial of material may have occurred on the site. Backfilling of excavations could have been undertaken

with potentially contaminated material that may be discovered in discrete, isolated locations across the site during construction work.

EIS accept no responsibility for potentially asbestos containing materials that may exist at the site. These materials may be associated with demolition of pre-1990 constructed buildings or fill material at the site.

EIS have not and will not make any determination regarding finances associated with the site.

Changes in the proposed or current site use may result in remediation or further investigation being required at the site.

During construction at the site, soil, fill and any unsuspected materials that are encountered should be monitored by qualified environmental and geotechnical engineers to confirm assumptions made on the basis of the limited investigation data, and possible changes in site level and other conditions since the investigation. Soil materials considered to be suitable from a geotechnical point of view may be unsatisfactory from a soil contamination viewpoint, and vice versa.

This report has been prepared for the particular project described and no responsibility is accepted for the use of any part of this report in any other context or for any other purpose. Copyright in this report is the property of EIS. EIS has used a degree of care, skill and diligence normally exercised by consulting engineers in similar circumstances and locality. No other warranty expressed or implied is made or intended. Subject to payment of all fees due for the investigation, the client alone shall have a licence to use this report.

Should you require any further information regarding the above, please do not hesitate to contact us.

Yours faithfully
For and on behalf of
ENVIRONMENTAL INVESTIGATION SERVICES

Vittal Boggaram
Senior Environmental Scientist

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ABBREVIATIONS

AAS	Atomic Absorption Spectrometry
AGST	Above Ground Storage Tank
AHD	Australian Height Datum
ANZECC	Australian and New Zealand Environment Conservation Council
ASS	Acid Sulfate Soil
B(a)P	Benzo(a)pyrene
BH	Borehole
BTEX	Benzene, Toluene, Ethyl benzene, Xylene
COC	Chain of Custody documentation
CLM	Contaminated Land Management
DECCW	Department of Environment, Climate Change and Water (formerly DECC, DEC and EPA)
DNR	NSW Department of Natural Resources (now split between DWE and DECCW)
DWE	NSW Department of Water and Energy
DP	Deposited Plan
DQO	Data Quality Objective
EC	Electrical Conductivity
EPA NSW	Environment Protection Authority, New South Wales (now part of DECCW)
GC-ECD	Gas Chromatograph-Electron Capture Detector
GC-FID	Gas Chromatograph-Flame Ionisation Detector
GC-MS	Gas Chromatograph-Mass Spectrometer
HIL	Health Based Investigation Level
HM	Heavy Metals
ICP-AES	Inductively Couple Plasma – Atomic Emission Spectra
NATA	National Association of Testing Authorities, Australia
NEPC	National Environmental Protection Council
NHMRC	National Health and Medical Research Council
OCPs	Organochlorine Pesticides
OHS (OH&S)	Occupational Health and Safety
PAH	Polycyclic Aromatic Hydrocarbons
PCBs	Polychlorinated Biphenyls
PID	Photo-ionisation Detector
PPIL	Provisional Phyto-toxicity Investigation Levels
PQL	Practical Quantitation Limit
P&T	Purge & Trap
RAP	Remedial Action Plan
QA/QC	Quality Assurance and Quality Control
RPD	Relative Percentage Difference
SEPP	State Environmental Planning Policy
sPOCAS	suspension Peroxide Oxidation Combined Acidity and Sulfate
SPT	Standard Penetration Test
SWL	Standing Water Level
TCLP	Toxicity Characteristic Leaching Procedure
TP	Test Pit
TPH	Total Petroleum Hydrocarbons
USEPA	United States Environmental Protection Agency
UCL	Upper Confidence Limit
UST	Underground Storage Tank
VOC	Volatile Organic Compounds

IMPORTANT INFORMATION ABOUT THE SITE ASSESSMENT REPORT

These notes have been prepared by EIS to assist with the assessment and interpretation of this report.

An Environmental Assessment Report is Based on a Unique Set of Project Specific Factors:

This report has been prepared in response to specific project requirements as stated in the EIS proposal document which may have been limited by instructions from the client. This report should be reviewed, and if necessary, revised if any of the following occur:

- the proposed land use is altered;
- the defined subject site is increased or sub-divided;
- the proposed development details including size, configuration, location, orientation of the structures are modified;
- the proposed development levels are altered, eg addition of basement levels; or
- ownership of the site changes.

EIS/J&K will not accept any responsibility whatsoever for situations where one or more of the above factors have changed since completion of the assessment. If the subject site is sold, ownership of the assessment report should be transferred by EIS to the new site owners who will be informed of the conditions and limitations under which the assessment was undertaken. No person should apply an assessment for any purpose other than that originally intended without first conferring with the consultant.

Changes in Subsurface Conditions

Subsurface conditions are influenced by natural geological and hydrogeological process and human activities. Groundwater conditions are likely to vary over time with changes in climatic conditions and human activities within the catchment (eg. water extraction for irrigation or industrial uses, subsurface waste water disposal, construction related dewatering). Soil and groundwater contaminant concentrations may also vary over time through contaminant migration, natural attenuation of organic contaminants, ongoing contaminating activities and placement or removal of fill material. The conclusions of an assessment report may have been affected by the above factors if a significant period of time has elapsed prior to commencement of the proposed development.

This Assessment is Based on Professional Interpretations of Factual Data

Site assessments identify actual subsurface conditions at the actual sampling locations at the time of the investigation. Data obtained from the sampling and subsequent laboratory analyses, available site history information and published regional information is interpreted by geologists, engineers or environmental scientists and opinions are drawn about the overall subsurface conditions, the nature and extent of contamination, the likely impact on the proposed development and appropriate remediation measures.

Actual conditions may differ from those inferred, because no professional, no matter how qualified, and no subsurface exploration program, no matter how comprehensive, can reveal what is hidden by earth, rock and time. The actual interface between materials may be far more gradual or abrupt than an assessment indicates. Actual conditions in areas not sampled may differ from predictions. Nothing can be done to prevent the unanticipated, but steps can be taken to help minimise the impact. For this reason, site owners should retain the services of their consultants throughout the development stage of the project, to identify variances, conduct additional tests which may be needed, and to recommend solutions to problems encountered on site.

Environmental Site Assessment Limitations

Although information provided by an environmental site assessment can reduce exposure to the risk of the presence of contamination, no environmental site assessment can eliminate the risk. Even a rigorous professional assessment may not detect all contamination on a site. Contaminants may be present in areas that were not surveyed or sampled, or may migrate to areas which showed no signs of contamination when sampled. Contaminant analysis cannot possibly cover every type of contaminant which may occur; only the most likely contaminants are screened.

Misinterpretation of Environmental Site Assessments by Design Professionals

Costly problems can occur when other design professionals develop plans based on misinterpretation of an environmental assessment report. To minimise problems associated with misinterpretations, the environmental consultant should be retained to work with appropriate professionals to explain relevant findings and to review the adequacy of plans and specifications relevant to contamination issues.

Logs Should not be Separated from the Environmental Assessment Report

Borehole and test pit logs are prepared by environmental scientists, engineers or geologists based upon interpretation of field conditions and laboratory evaluation of field samples. Logs are normally provided in our reports and these should not be re-drawn for inclusion in site remediation or other design drawings, as subtle but

significant drafting errors or omissions may occur in the transfer process. Photographic reproduction can eliminate this problems, however contractors can still misinterpret the logs during bid preparation if separated from the text of the assessment. If this occurs, delays, disputes and unanticipated costs may result. In all cases it is necessary to refer to the test of the report to obtain a proper understanding of the assessment. Please note that logs with the 'Environmental Log' header are not suitable for geotechnical purposes as they have not been peer reviewed by a Senior Geotechnical Engineer.

To reduce the likelihood of borehole and test pit log misinterpretation, the complete assessment should be available to persons or organisations involved in the project, such as contractors, for their use. Denial of such access and disclaiming responsibility for the accuracy of subsurface information does not insulate an owner from the attendant liability. It is critical that the site owner provides all available site information to persons and organisations such as contractors.

Read Responsibility Clauses Closely

Because an environmental site assessment is based extensively on judgement and opinion, it is necessarily less exact than other disciplines. This situation has resulted in wholly unwarranted claims being lodged against consultants. To help prevent this problem, model clauses have been developed for use in written transmittals. These are definitive clauses designed to indicate consultant responsibility. Their use helps all parties involved recognise individual responsibilities and formulate appropriate action. Some of these definitive clauses are likely to appear in the environmental site assessment, and you are encouraged to read them closely. Your consultant will be pleased to give full and frank answers to any questions.

TABLE A - 2
CHEMICAL CONTAMINANT CRITERIA FOR WASTE CLASSIFICATION
Waste Classification Guidelines. Part 1: Classifying Waste DECC (now DECCW) NSW July 2009

GENERAL SOLID WASTE	RESTRICTED SOLID WASTE	HAZARDOUS WASTE
IF SCC ≤ CT1, TCLP NOT NEEDED TO CLASSIFY AS GENERAL SOLID WASTE	IF SCC ≤ CT2, TCLP NOT NEEDED TO CLASSIFY AS RESTRICTED SOLID WASTE	IF SCC > CT2, TCLP NOT NEEDED TO CLASSIFY AS HAZARDOUS WASTE
IF TCLP ≤ TCLP1 AND SCC ≤ SCC1 TREAT AS GENERAL SOLID WASTE	IF TCLP ≤ TCLP2 AND SCC ≤ SCC2 TREAT AS RESTRICTED SOLID WASTE	IF TCLP > TCLP2 AND/OR SCC > SCC2 TREAT AS HAZARDOUS WASTE

	GENERAL SOLID WASTE			RESTRICTED SOLID WASTE		
CONTAMINANT	CT1 (mg/kg)	TCLP1 (mg/L)	SCC1 (mg/kg)	CT2 (mg/kg)	TCLP2 (mg/L)	SCC2 (mg/kg)
Arsenic	100	5	500	400	20	2,000
Beryllium	20	1.0	100	80	4	400
Cadmium	20	1.0	100	80	4	400
Chromium VI	100	5	1,900	400	20	7,600
Cyanide (total)	320	16	5,900	1280	64	23,600
Cyanide (Amenable)	70	3.5	300	280	14	1,200
Fluoride	3,000	150	10,000	12,000	600	40,000
Lead	100	5	1,500	400	20	6,000
Mercury	4	0.2	50	16	0.8	200
Molybdenum	100	5	1,000	400	20	4,000
Nickel	40	2	1,050	160	8	4,200
Selenium	20	1	50	80	4	200
Silver	100	5.0	180	400	20	720
Benzene	10	0.5	18	40	2	72
Toluene	288	14.4	518	1,152	57.6	2,073
Ethylbenzene	600	30	1,080	2,400	120	4,320
Total xylenes	1,000	50	1,800	4,000	200	7,200
Total petroleum hydrocarbons (C6-C9)	-	-	650	-	-	2,600
Total petroleum hydrocarbons (C10-C36) (C10-C14, C15-C28, C29-C36)	-	-	10,000	-	-	40,000
Benzo(a)pyrene	0.8	0.04	10	3.2	0.16	23
Polycyclic aromatic hydrocarbons (Total)	-	-	200	-	-	800
Polychlorinated biphenyls	-	-	<50	-	-	<50
Phenol (nonhalogenated)	288	14.4	518	1,152	57.6	2,073
Scheduled chemicals	-	-	<50	-	-	<50

NOTE:
SCC – Specific Contaminant Concentration
CT – Contaminant Threshold
TCLP – Toxicity Characteristics Leaching Procedure

TABLE B
SUMMARY OF LABORATORY RESULTS
SOIL ASSESSMENT
All data in mg/kg unless stated otherwise

ANALYTE			HEAVY METALS								PAHs		ORGANOCHLORINE PESTICIDES				OP PESTICIDES	PCBs	PETROLEUM HYDROCARBONS								PID VALUES	ASBESTOS FIBRES
			Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc	Total PAHs	B(a)P	Aldrin & Dieldrin	Chlordane	DDT, DDD & DDE	Heptachlor			Petroleum Hydrocarbons					Benzene	Toluene	Ethyl benzene	Total Xylenes		
																			C_6-C_9	C_{10}-C_{14}	C_{15}-C_{28}	C_{29}-C_{36}	C_{10} - C_{36}					
PQL - Envirolab Services			4	0.5	1	1	1	0.1	1	1	-	0.05	0.1	0.1	0.1	0.1	0.1	0.1	25	50	100	100	250	0.5	0.5	1	3		100
Site Assessment Criteria ^			500 *	100 *	60% *	5000 *	1500 *	75 *	3000 *	35000 *	100 *	5 *	50 *	250 *	1000 *	50 *	0.1 ^^	50 *	65 #	nsl	nsl	nsl	1000 #	1 #	1.4 #	3.1 #	14 #		100^^
General Solid Waste CT1+			100	20	100	nsl	100	4	40	nsl	nsl	0.8	nsl					nsl	nsl	nsl			nsl	10	288	600	1000	-	-
General Solid Waste SCC1+			500	100	1900	nsl	1500	50	1050	nsl	200	10	50					50	650	nsl			10000	18	518	1080	1800	-	-
Restricted Solid Waste CT2+			400	80	400	nsl	400	16	160	nsl	nsl	3.2	nsl					nsl	nsl	nsl			nsl	40	1152	2400	4000	-	-
Restricted Solid Waste SCC2+			2000	400	7600	nsl	6000	200	4200	nsl	800	23	50					50	2600	nsl			40000	72	2073	4320	7200	-	-
Sample Reference	**Sample Depth**	**Sample Description**																											
BH1	0.2-0.3	Fill - Silty sand	LPQL	LPQL	3	7	32	0.1	2	47	5.2	0.6	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0	LPQL
BH1	0.4-0.5	Sand	LPQL	LPQL	2	1	5	LPQL	LPQL	10	LPQL	LPQL	na	na	na	na	na	na	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0	na
BH2	0.2-0.3	Fill - Silty sand	LPQL	LPQL	3	12	73	0.1	2	93	1.9	0.2	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0	LPQL
BH3	0.2-0.3	Fill - Silty sand	6	LPQL	4	15	37	LPQL	2	260	2.7	0.3	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0	LPQL
BH4	0.2-0.3	Fill - Silty sand	LPQL	LPQL	6	9	35	0.1	4	78	5.1	0.5	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0	LPQL
BH5	0.2-0.3	Fill - Silty sand	LPQL	LPQL	3	12	32	0.1	2	56	4.7	0.5	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0	LPQL
BH6	0.2-0.3	Fill - Silty sand	LPQL	LPQL	3	21	72	0.6	11	84	20.9	2.4	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	130	140	270	LPQL	LPQL	LPQL	LPQL	0	LPQL
Total Number of samples			7	7	7	7	7	7	7	7	7	7	6	6	6	6	6	6	7	7	7	7	7	7	7	7	7	7	6
Maximum Value			6	LPQL	6	21	73	0.6	11	260	20.9	2.4	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	130	140	270	LPQL	LPQL	LPQL	LPQL	0	nc

EXPLANATION:

^ Site Assessment Criteria: Guideline concentrations adopted for the investigation as outlined below:
* National Environment Protection (Assessment of Site Contamination) Measure 1999 (NEPC Guidelines)
Health Investigation Levels (HIL) - Column F, Commercial/Industrial
NSW DECC (EPA) Guidelines for Assessing Service Station Sites (1994)
^^ In the absence of Australian guidelines, the laboratory PQL has been adopted as the site assessment criteria
+ NSW DECCW (EPA) Waste Classification Guidelines (2009)

Concentration above the Site Assessment Criteria **VALUE**

ABBREVIATIONS:

PAHs: Polycyclic Aromatic Hydrocarbons
B(a)P: Benzo(a)Pyrene
PQL: Practical Quantitation Limit
LPQL: Less than PQL
OP: Organophosphorus Pesticides
PID: Photoionisation Detector
PCBs: Polychlorinated Biphenyls
UCL: Upper Level Confidence Limit on Mean Value
na: Not Analysed
nc: Not Calculated
nsl: No Set Limit

TABLE C
SUMMARY OF LABORATORY RESULTS
TOXICITY CHARACTERISTICS LEACHING PROCEDURE (TCLP)
All data in mg/L unless stated otherwise

ANALYTE		B(a)P
PQL - Envirolab Services		0.001
TCLP1 - General Solid Waste *		0.04
TCLP2 - Restricted Solid Waste *		0.16
TCLP3 - Hazardous Waste *		>0.16
Sample Reference	**Sample Depth**	
BH6	0.2-0.3	LPQL
Total Number of samples		1
Maximum Value		LPQL

EXPLANATION:

* NSW DECCW (EPA) Waste Classification Guidelines (2009)

Concentration above the General Solid Waste value **VALUE**
Concentration above the Restricted Solid Waste value **VALUE**

ABBREVIATIONS:

PQL: Practical Quantitation Limit
LPQL: Less than PQL
B(a)P: Benzo(a)Pyrene
nc: Not Calculated
na: Not Analysed

TABLE D
SOIL INTRA-LABORATORY DUPLICATE RESULTS
QA/QC - RELATIVE PERCENTAGE DIFFERENCES
All results in mg/kg unless stated otherwise

SAMPLE	ANALYSIS	Envirolab PQL	INITIAL	REPEAT	MEAN	RPD %
Intra-laboratory	Arsenic	4	LPQL	LPQL	nc	nc
Soil	Cadmium	0.5	LPQL	LPQL	nc	nc
sample ID = BH1 (0.2-0.3)	Chromium	1	3	3	3	0
Dup ID = Dup 1	Copper	1	7	7	7	0
	Lead	1	32	31	31.5	3
Envirolab Report: 46056	Mercury	0.1	0.1	0.1	0.1	0
	Nickel	1	2	2	2	0
	Zinc	1	47	44	45.5	7
	Naphthalene	0.1	LPQL	LPQL	nc	nc
	Acenaphthylene	0.1	LPQL	0.1	0.1	nc
	Acenaphthene	0.1	LPQL	LPQL	nc	nc
	Fluorene	0.1	LPQL	LPQL	nc	nc
	Phenanthrene	0.1	0.3	0.3	0.3	0
	Anthracene	0.1	LPQL	LPQL	nc	nc
	Fluoranthene	0.1	0.9	0.8	0.85	12
	Pyrene	0.1	0.9	0.8	0.85	12
	Benzo(a)anthracene	0.1	0.5	0.5	0.5	0
	Chrysene	0.1	0.5	0.5	0.5	0
	Benzo(b)&(k)fluorant	0.2	0.9	0.9	0.9	0
	Benzo(a)pyrene	0.05	0.6	0.6	0.6	0
	Indeno(123-cd)pyrene	0.1	0.3	0.3	0.3	0
	Dibenzo(ah)anthracene	0.1	LPQL	LPQL	nc	nc
	Benzo(ghi)perylene	0.1	0.3	0.3	0.3	0
	Total PAHs	1.55	5.2	5.1	5.15	2
	C_6-C_9 TPH	25	LPQL	LPQL	nc	nc
	C_{10}-C_{14} TPH	50	LPQL	LPQL	nc	nc
	C_{15}-C_{28} TPH	100	LPQL	LPQL	nc	nc
	C_{29}-C_{36} TPH	100	LPQL	LPQL	nc	nc
	Benzene	0.5	LPQL	LPQL	nc	nc
	Toluene	0.5	LPQL	LPQL	nc	nc
	Ethylbenzene	1	LPQL	LPQL	nc	nc
	Total Xylenes	1	LPQL	LPQL	nc	nc

EXPLANATION:

The RPD value is calculated as the absolute value of the difference between the initial and repeat results divided by the average value expressed as a percentage. The following acceptance criteria will be used to assess the RPD results:

- Results > 10 times PQL = RPD value < 50% are acceptable
- Results between 5 & 10 time PQL = RPD value < 75% are acceptable
- Results < 5 times PQL = RPD value < 100% are acceptable

RPD Results Above the Acceptance Criteria **VALUE**

ABBREVIATIONS:

PQL: Practical Quantitation Limit
LPQL: Less than PQL
na: Not Analysed
nc: Not Calculated

TABLE E
LABORATORY RESULTS
QA/QC - TRIP BLANK

ANALYSIS	Envirolab PQL mg/kg	FB1[S] 17/09/2010 46056 mg/kg
Benzene	1	LPQL
Toluene	1	LPQL
Ethylbenzene	1	LPQL
Total Xylenes	1	LPQL

EXPLANATION:

[W] Sample type (water)

[S] Sample type (sand)

BTEX concentrations in trip spikes are presented as % recovery

Results Above the PQLs **VALUE**

ABBREVIATIONS:

PQL: Practical Quantitation Limit

LPQL: Less than PQL

(-) : Not Applicable / Not Analysed

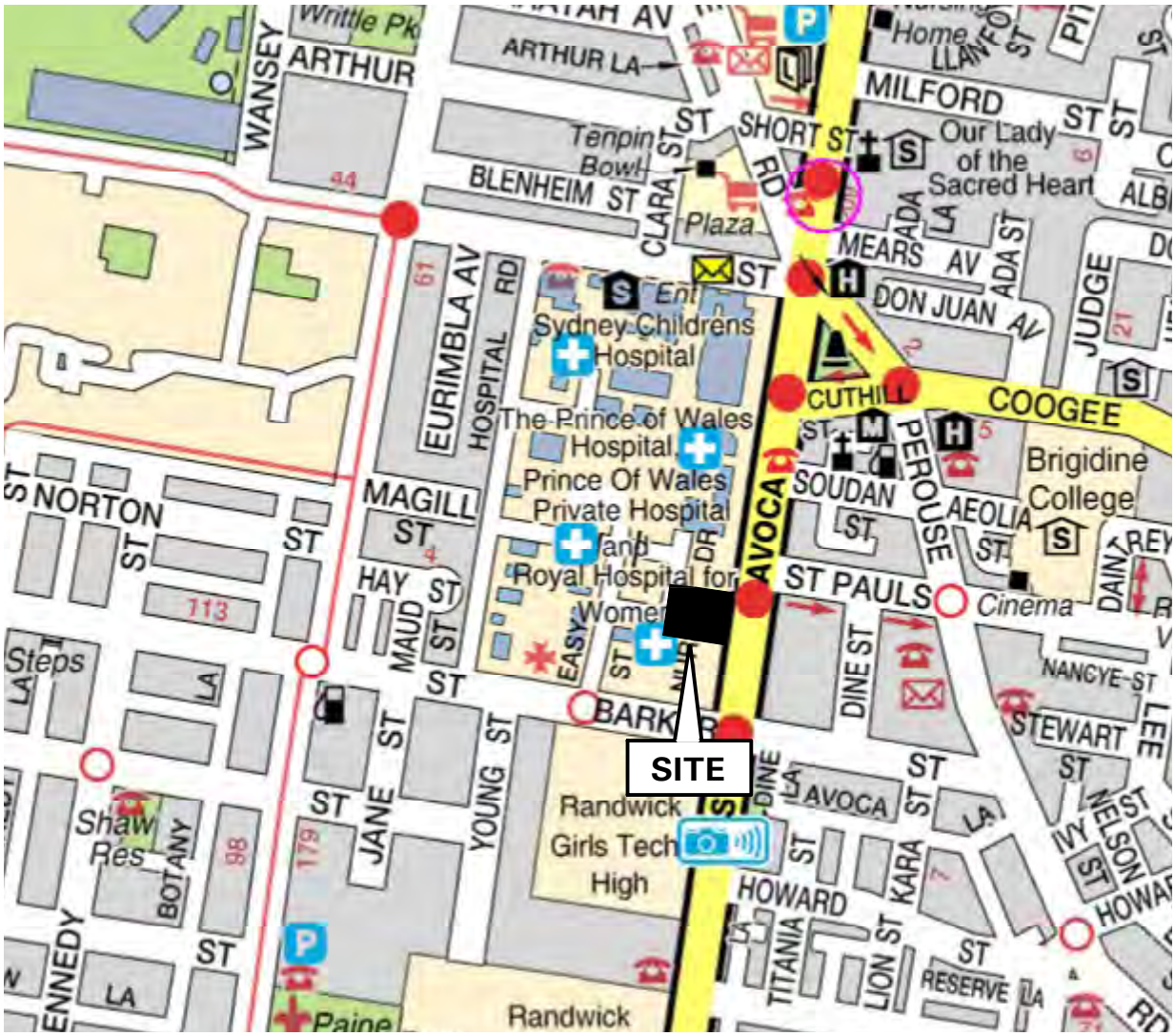
OPP: Organophosphorus Pesticides

OCP: Organochlorine Pesticides

PCBs: Polychlorinated Biphenyls

NA: Not Analysed

NC: Not Calculated



Ref: UBD Street Directory 2008 (44th Ed), Copyright Universal Publisher Pty Ltd.

SITE LOCATION PLAN

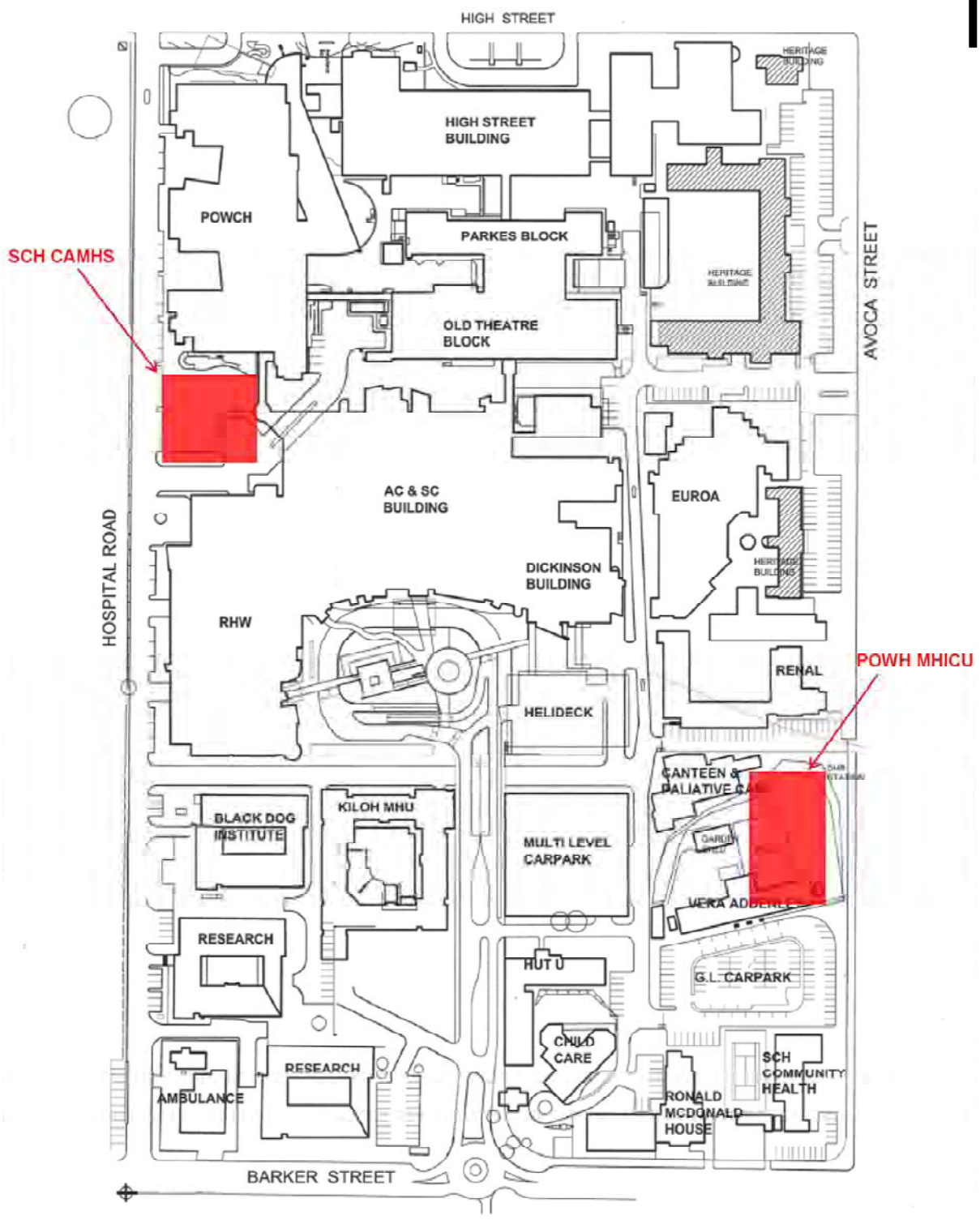
Proposed POWH MHICU Building
No. 220 Avoca Street, Randwick, NSW

NOT TO SCALE

NOTE: Reference should be made to the text for a full understanding of this plan

EIS Ref No: E24288KBrpt
Figure No: 1

ENVIRONMENTAL INVESTIGATION SERVICES



SITE LAYOUT PLAN

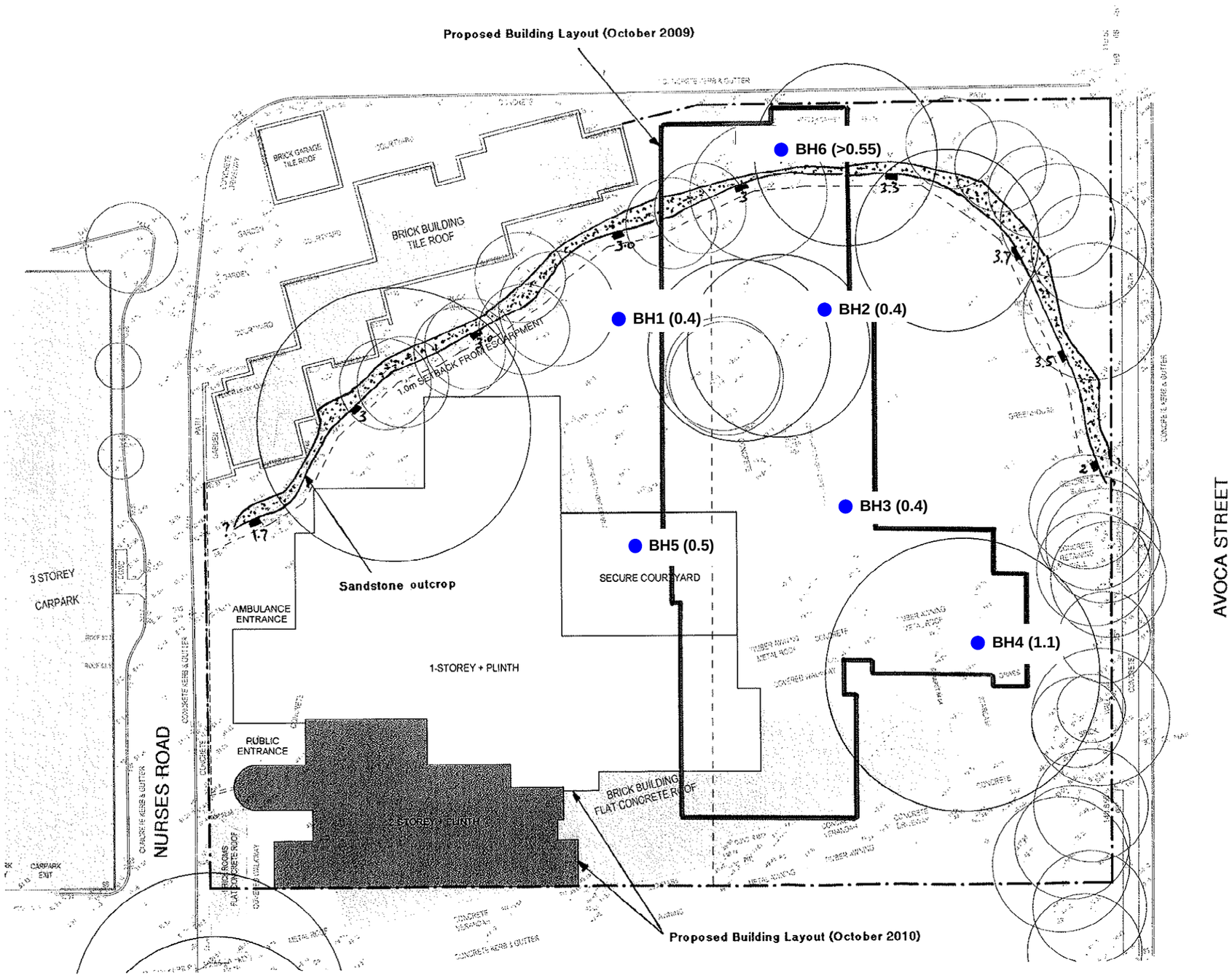
Proposed POWH MHICU Building
No. 220 Avoca Street, Randwick, NSW

NOT TO SCALE

NOTE: Reference should be made to the text for a full understanding of this plan

EIS Ref No: E24288KBrpt
Figure No: 2

ENVIRONMENTAL INVESTIGATION SERVICES



Approximate Scale (m)

0 4 8 12 16 20

NOTE: This plan has been prepared from site measurements and should not be construed as a site survey plan. Boundary and facility locations are considered to be approximate. Reference should be made to the text for a full understanding of this plan.

LEGEND:

● **BH1 (0.4)** Borehole Location, Number & Depth of Fill in metres

BOREHOLE LOCATION PLAN

POWH MHICU, No. 220 Avoca Street, Randwick, NSW

EIS Ref No: E24288KBrpt
Figure No: 3

ENVIRONMENTAL INVESTIGATION SERVICES

APPENDIX A

(Borehole Logs and Geotechnical Explanatory Notes)

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Borehole No. **1** 1/2

BOREHOLE LOG

Client: HEALTH INFRASTRUCTURE

Project: PROPOSED POWH MENTAL HEALTH INTENSIVE CARE UNIT

Location: PRINCE OF WALES HOSPITAL, AVOCA ST, RANDWICK, NSW

Job No. 24288WH **Method:** SPIRAL AUGER JK250 **R.L. Surface:** ≈ 49.7m

Date: 17-9-10 **Datum:** AHD

Logged/Checked by: A.P.C./ASH

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
	■					0			FILL: Silty sand, fine to coarse grained, dark brown, with root fibres.	M			GRAVEL COVER
			■		N = 8 4,3,5	1		SP	SAND: fine to coarse grained, yellow brown, with a trace of root fibres and silt fines.	M	L	-	AEOLIAN
			■		N = 2 1,1,1						VL		
						2				W			
								-	SANDSTONE: fine to medium grained, light grey.	FR	M	-	MODERATE TO HIGH 'TC' BIT RESISTANCE
						3			REFER TO CORED BOREHOLE LOG				
						4							
						5							
						6							
						7							

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Borehole No. **2** 1/2

BOREHOLE LOG

Client: HEALTH INFRASTRUCTURE

Project: PROPOSED POWH MENTAL HEALTH INTENSIVE CARE UNIT

Location: PRINCE OF WALES HOSPITAL, AVOCA ST, RANDWICK, NSW

Job No. 24288WH **Method:** SPIRAL AUGER JK250 **R.L. Surface:** ≈ 49.8m

Date: 16-9-10 **Datum:** AHD

Logged/Checked by: A.P.C./ AM

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
						0			FILL: Silty sand, fine to medium grained, dark brown.	M			GRAVEL COVER
					N = 15 6,8,7			SP	SAND: fine to coarse grained, yellow brown, with a trace of silt fines.	M	MD	-	AEOLIAN
ON COMPLETION OF CORING						1							
					N = 5 3,2,3						L		
						2				W			
					N > 5 9,5/50mm REFUSAL	3							
								-	SANDSTONE: fine to medium grained, light grey.	FR	M	-	MODERATE 'TC' BIT RESISTANCE
									REFER TO CORED BOREHOLE LOG				50MM DIA. PVC STANDPIPE INSTALLED TO 6. 5M DEPTH. SLOTTED 8ETWEEN 0.9M AND 6.5M. BENTONITE PLUG TO 0.5M DEPTH THEN BACKFILL TO SURFACE. REFER TO TEXT OF REPORT FOR ADDITIONAL GROUNDWATER MEASUREMENTS DURING THE FIELDWORK
						4							
						5							
						6							
						7							

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Borehole No. **3** 1/2

BOREHOLE LOG

Client: HEALTH INFRASTRUCTURE

Project: PROPOSED POWH MENTAL HEALTH INTENSIVE CARE UNIT

Location: PRINCE OF WALES HOSPITAL, AVOCA ST, RANDWICK, NSW

Job No. 24288WH **Method:** SPIRAL AUGER JK250 **R.L. Surface:** ≈ 49.6m

Date: 17-9-10 **Datum:** AHD

Logged/Checked by: A.P.C./AJH

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
	■					0			FILL: Silty sand, fine to coarse grained, dark brown, with coarse grained igneous gravel, concrete and metal fragments, roots and root fibres.	M			GRAVEL COVER
ON COMPLETION OF CORING ▼			■		N = 8 4,4,4	1		SP	SAND: fine to coarse grained, orange brown and yellow brown.	M	L	-	AEOLIAN
▼								SM	SILTY SAND: fine to medium grained, light grey and orange brown, with a trace of clay fines.	W			
ON COMPLETION OF AUGERING ▼			■		N = 9 4,4,5	2							
			■					-	SANDSTONE: fine to medium grained, light grey.	FR	M		MODERATE 'TC' BIT RESISTANCE
									REFER TO CORED BOREHOLE LOG				
						3							
						4							
						5							
						6							
						7							

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Borehole No. **4** 1/2

BOREHOLE LOG

Client: HEALTH INFRASTRUCTURE

Project: PROPOSED POWH MENTAL HEALTH INTENSIVE CARE UNIT

Location: PRINCE OF WALES HOSPITAL, AVOCA ST, RANDWICK, NSW

Job No. 24288WH
Date: 17-9-10
Method: SPIRAL AUGER JK250
Logged/Checked by: A.P.C./ ASH
R.L. Surface: ≈ 49.9m
Datum: AHD

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
						0			FILL: Silty sand, fine to coarse grained, dark brown, with coarse grained sandstone and igneous gravel, roots and root fibres.	M			GRAVEL COVER APPEARS MODERATELY COMPACTED
					N = 8 3,5,3	1							
					N = 9 3,4,5			SP	SAND: fine to coarse grained, yellow brown.	M W	L	-	AEOLIAN
						2		-	SANDSTONE: fine to medium grained, grey and orange brown.	SW-FR	M	-	LOW TO MODERATE 'TC' BIT RESISTANCE
						3			REFER TO CORED BOREHOLE LOG				
						4							
						5							
						6							
						7							

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Borehole No. **5** 1/1

BOREHOLE LOG

Client: HEALTH INFRASTRUCTURE

Project: PROPOSED POWH MENTAL HEALTH INTENSIVE CARE UNIT

Location: PRINCE OF WALES HOSPITAL, AVOCA ST, RANDWICK, NSW

Job No. 24288WH **Method:** SPIRAL AUGER JK250 **R.L. Surface:** ≈ 49.6m

Date: 16-9-10 **Datum:** AHD

Logged/Checked by: A.P.C./MW

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
						0			FILL: Silty sand, fine to coarse grained, dark grey brown, with root fibres.	M			
				■	N = 10 4,5,5			SP	SAND: fine to medium grained, yellow brown.	M	L	-	AEOLIAN
▶						1				W			
					N = 2 2,1,1						VL		
						2							
								SC	CLAYEY SAND: fine to medium grained, dark grey.	M			POSSIBLY RESIDUAL ?
				■	SPT 5/50mm REFUSAL	3		-	SANDSTONE: fine to medium grained, light grey.	SW-FR	M	-	MODERATE 'TC' BIT RESISTANCE
									END OF BOREHOLE AT 3.5m				
						4							
						5							
						6							
						7							

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Borehole No. 6 1/1

BOREHOLE LOG

Client: HEALTH INFRASTRUCTURE

Project: PROPOSED POWH MENTAL HEALTH INTENSIVE CARE UNIT

Location: PRINCE OF WALES HOSPITAL, AVOCA ST, RANDWICK, NSW

Job No. 24288WH **Method:** HAND AUGER **R.L. Surface:** ≈ 55.1m

Date: 17-9-10 **Datum:** AHD

Logged/Checked by: A.P.C./AJH

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLETION					REFER TO DCP TEST RESULTS	0			FILL: Silty sand, fine to coarse grained, dark brown, with fine to coarse grained sandstone and igneous gravel, brick fragments and roots.	M			WEED COVER APPEARS POORLY COMPACTED
									END OF BOREHOLE AT 0.55m				HAND AUGER REFUSAL ON OBSTRUCTION IN FILL
						1							
						2							
						3							
						4							
						5							
						6							
						7							

Jeffery and Katauskas Pty Ltd

CONSULTING GEOTECHNICAL AND ENVIRONMENTAL ENGINEERS
ABN 17 003 550 801

REPORT EXPLANATION NOTES

INTRODUCTION

These notes have been provided to amplify the geotechnical report in regard to classification methods, field procedures and certain matters relating to the Comments and Recommendations section. Not all notes are necessarily relevant to all reports.

The ground is a product of continuing natural and man-made processes and therefore exhibits a variety of characteristics and properties which vary from place to place and can change with time. Geotechnical engineering involves gathering and assimilating limited facts about these characteristics and properties in order to understand or predict the behaviour of the ground on a particular site under certain conditions. This report may contain such facts obtained by inspection, excavation, probing, sampling, testing or other means of investigation. If so, they are directly relevant only to the ground at the place where and time when the investigation was carried out.

DESCRIPTION AND CLASSIFICATION METHODS

The methods of description and classification of soils and rocks used in this report are based on Australian Standard 1726, the SAA Site Investigation Code. In general, descriptions cover the following properties – soil or rock type, colour, structure, strength or density, and inclusions. Identification and classification of soil and rock involves judgement and the Company infers accuracy only to the extent that is common in current geotechnical practice.

Soil types are described according to the predominating particle size and behaviour as set out in the attached Unified Soil Classification Table qualified by the grading of other particles present (eg sandy clay) as set out below:

Soil Classification	Particle Size
Clay	less than 0.002mm
Silt	0.002 to 0.06mm
Sand	0.06 to 2mm
Gravel	2 to 60mm

Non-cohesive soils are classified on the basis of relative density, generally from the results of Standard Penetration Test (SPT) as below:

Relative Density	SPT 'N' Value (blows/300mm)
Very loose	less than 4
Loose	4 – 10
Medium dense	10 – 30
Dense	30 – 50
Very Dense	greater than 50

Cohesive soils are classified on the basis of strength (consistency) either by use of hand penetrometer, laboratory testing or engineering examination. The strength terms are defined as follows.

Classification	Unconfined Compressive Strength kPa
Very Soft	less than 25
Soft	25 – 50
Firm	50 – 100
Stiff	100 – 200
Very Stiff	200 – 400
Hard	Greater than 400
Friable	Strength not attainable – soil crumbles

Rock types are classified by their geological names, together with descriptive terms regarding weathering, strength, defects, etc. Where relevant, further information regarding rock classification is given in the text of the report. In the Sydney Basin, 'Shale' is used to describe thinly bedded to laminated siltstone.

SAMPLING

Sampling is carried out during drilling or from other excavations to allow engineering examination (and laboratory testing where required) of the soil or rock.

Disturbed samples taken during drilling provide information on plasticity, grain size, colour, moisture content, minor constituents and, depending upon the degree of disturbance, some information on strength and structure. Bulk samples are similar but of greater volume required for some test procedures.

Undisturbed samples are taken by pushing a thin-walled sample tube, usually 50mm diameter (known as a U50), into the soil and withdrawing it with a sample of the soil contained in a relatively undisturbed state. Such samples yield information on structure and strength, and are necessary for laboratory determination of shear strength and compressibility. Undisturbed sampling is generally effective only in cohesive soils.

Details of the type and method of sampling used are given on the attached logs.

INVESTIGATION METHODS

The following is a brief summary of investigation methods currently adopted by the Company and some comments on their use and application. All except test pits, hand auger drilling and portable dynamic cone penetrometers require the use of a mechanical drilling rig which is commonly mounted on a truck chassis.

Test Pits: These are normally excavated with a backhoe or a tracked excavator, allowing close examination of the insitu soils if it is safe to descend into the pit. The depth of penetration is limited to about 3m for a backhoe and up to 6m for an excavator. Limitations of test pits are the problems associated with disturbance and difficulty of reinstatement and the consequent effects on close-by structures. Care must be taken if construction is to be carried out near test pit locations to either properly recompact the backfill during construction or to design and construct the structure so as not to be adversely affected by poorly compacted backfill at the test pit location.

Hand Auger Drilling: A borehole of 50mm to 100mm diameter is advanced by manually operated equipment. Premature refusal of the hand augers can occur on a variety of materials such as hard clay, gravel or ironstone, and does not necessarily indicate rock level.

Continuous Spiral Flight Augers: The borehole is advanced using 75mm to 115mm diameter continuous spiral flight augers, which are withdrawn at intervals to allow sampling and insitu testing. This is a relatively economical means of drilling in clays and in sands above the water table. Samples are returned to the surface by the flights or may be collected after withdrawal of the auger flights, but they can be very disturbed and layers may become mixed. Information from the auger sampling (as distinct from specific sampling by SPTs or undisturbed samples) is of relatively lower reliability due to mixing or softening of samples by groundwater, or uncertainties as to the original depth of the samples. Augering below the groundwater table is of even lesser reliability than augering above the water table.

Rock Augering: Use can be made of a Tungsten Carbide (TC) bit for auger drilling into rock to indicate rock quality and continuity by variation in drilling resistance and from examination of recovered rock fragments. This method of investigation is quick and relatively inexpensive but provides only an indication of the likely rock strength and predicted values may be in error by a strength order. Where rock strengths may have a significant impact on construction feasibility or costs, then further investigation by means of cored boreholes may be warranted.

Wash Boring: The borehole is usually advanced by a rotary bit, with water being pumped down the drill rods and returned up the annulus, carrying the drill cuttings. Only major changes in stratification can be determined from the cuttings, together with some information from "feel" and rate of penetration.

Mud Stabilised Drilling: Either Wash Boring or Continuous Core Drilling can use drilling mud as a circulating fluid to stabilise the borehole. The term 'mud' encompasses a range of products ranging from bentonite to polymers such as Revert or Biogel. The mud tends to mask the cuttings and reliable identification is only possible from intermittent intact sampling (eg from SPT and U50 samples) or from rock coring, etc.

Continuous Core Drilling: A continuous core sample is obtained using a diamond tipped core barrel. Provided full core recovery is achieved (which is not always possible in very low strength rocks and granular soils), this technique provides a very reliable (but relatively expensive) method of investigation. In rocks, an NMLC triple tube core barrel, which gives a core of about 50mm diameter, is usually used with water flush. The length of core recovered is compared to the length drilled and any length not recovered is shown as CORE LOSS. The location of losses are determined on site by the supervising engineer; where the location is uncertain, the loss is placed at the top end of the drill run.

Standard Penetration Tests: Standard Penetration Tests (SPT) are used mainly in non-cohesive soils, but can also be used in cohesive soils as a means of indicating density or strength and also of obtaining a relatively undisturbed sample. The test procedure is described in Australian Standard 1289, "Methods of Testing Soils for Engineering Purposes" – Test F3.1.

The test is carried out in a borehole by driving a 50mm diameter split sample tube with a tapered shoe, under the impact of a 63kg hammer with a free fall of 760mm. It is normal for the tube to be driven in three successive 150mm increments and the 'N' value is taken as the number of blows for the last 300mm. In dense sands, very hard clays or weak rock, the full 450mm penetration may not be practicable and the test is discontinued.

The test results are reported in the following form:

- In the case where full penetration is obtained with successive blow counts for each 150mm of, say, 4, 6 and 7 blows, as

  N = 13
  4, 6, 7

- In a case where the test is discontinued short of full penetration, say after 15 blows for the first 150mm and 30 blows for the next 40mm, as

  N>30
  15, 30/40mm

The results of the test can be related empirically to the engineering properties of the soil.

Occasionally, the drop hammer is used to drive 50mm diameter thin walled sample tubes (U50) in clays. In such circumstances, the test results are shown on the borehole logs in brackets.

A modification to the SPT test is where the same driving system is used with a solid 60° tipped steel cone of the same diameter as the SPT hollow sampler. The solid cone can be continuously driven for some distance in soft clays or loose sands, or may be used where damage would otherwise occur to the SPT. The results of this Solid Cone Penetration Test (SCPT) are shown as "N_c" on the borehole logs, together with the number of blows per 150mm penetration.

Static Cone Penetrometer Testing and Interpretation: Cone penetrometer testing (sometimes referred to as a Dutch Cone) described in this report has been carried out using an Electronic Friction Cone Penetrometer (EFCP). The test is described in Australian Standard 1289, Test F5.1.

In the tests, a 35mm diameter rod with a conical tip is pushed continuously into the soil, the reaction being provided by a specially designed truck or rig which is fitted with an hydraulic ram system. Measurements are made of the end bearing resistance on the cone and the frictional resistance on a separate 134mm long sleeve, immediately behind the cone. Transducers in the tip of the assembly are electrically connected by wires passing through the centre of the push rods to an amplifier and recorder unit mounted on the control truck.

As penetration occurs (at a rate of approximately 20mm per second) the information is output as incremental digital records every 10mm. The results given in this report have been plotted from the digital data.

The information provided on the charts comprise:

- Cone resistance – the actual end bearing force divided by the cross sectional area of the cone – expressed in MPa.
- Sleeve friction – the frictional force on the sleeve divided by the surface area – expressed in kPa.
- Friction ratio – the ratio of sleeve friction to cone resistance, expressed as a percentage.

The ratios of the sleeve resistance to cone resistance will vary with the type of soil encountered, with higher relative friction in clays than in sands. Friction ratios of 1% to 2% are commonly encountered in sands and occasionally very soft clays, rising to 4% to 10% in stiff clays and peats. Soil descriptions based on cone resistance and friction ratios are only inferred and must not be considered as exact.

Correlations between EFCP and SPT values can be developed for both sands and clays but may be site specific.

Interpretation of EFCP values can be made to empirically derive modulus or compressibility values to allow calculation of foundation settlements.

Stratification can be inferred from the cone and friction traces and from experience and information from nearby boreholes etc. Where shown, this information is presented for general guidance, but must be regarded as interpretive. The test method provides a continuous profile of engineering properties but, where precise information on soil classification is required, direct drilling and sampling may be preferable.

Portable Dynamic Cone Penetrometers: Portable Dynamic Cone Penetrometer (DCP) tests are carried out by driving a rod into the ground with a sliding hammer and counting the blows for successive 100mm increments of penetration.

Two relatively similar tests are used:

- Cone penetrometer (commonly known as the Scala Penetrometer) – a 16mm rod with a 20mm diameter cone end is driven with a 9kg hammer dropping 510mm (AS1289, Test F3.2). The test was developed initially for pavement subgrade investigations, and correlations of the test results with California Bearing Ratio have been published by various Road Authorities.
- Perth sand penetrometer – a 16mm diameter flat ended rod is driven with a 9kg hammer, dropping 600mm (AS1289, Test F3.3). This test was developed for testing the density of sands (originating in Perth) and is mainly used in granular soils and filling.

LOGS

The borehole or test pit logs presented herein are an engineering and/or geological interpretation of the subsurface conditions, and their reliability will depend to some extent on the frequency of sampling and the method of drilling or excavation. Ideally, continuous undisturbed sampling or core drilling will enable the most reliable assessment, but is not always practicable or possible to justify on economic grounds. In any case, the boreholes or test pits represent only a very small sample of the total subsurface conditions.

The attached explanatory notes define the terms and symbols used in preparation of the logs.

Interpretation of the information shown on the logs, and its application to design and construction, should therefore take into account the spacing of boreholes or test pits, the method of drilling or excavation, the frequency of sampling and testing and the possibility of other than "straight line" variations between the boreholes or test pits. Subsurface conditions between boreholes or test pits may vary significantly from conditions encountered at the borehole or test pit locations.

GROUNDWATER

Where groundwater levels are measured in boreholes, there are several potential problems:

- Although groundwater may be present, in low permeability soils it may enter the hole slowly or perhaps not at all during the time it is left open.
- A localised perched water table may lead to an erroneous indication of the true water table.
- Water table levels will vary from time to time with seasons or recent weather changes and may not be the same at the time of construction.
- The use of water or mud as a drilling fluid will mask any groundwater inflow. Water has to be blown out of the hole and drilling mud must be washed out of the hole or 'reverted' chemically if water observations are to be made.

More reliable measurements can be made by installing standpipes which are read after stabilising at intervals ranging from several days to perhaps weeks for low permeability soils. Piezometers, sealed in a particular stratum, may be advisable in low permeability soils or where there may be interference from perched water tables or surface water.

FILL

The presence of fill materials can often be determined only by the inclusion of foreign objects (eg bricks, steel etc) or by distinctly unusual colour, texture or fabric. Identification of the extent of fill materials will also depend on investigation methods and frequency. Where natural soils similar to those at the site are used for fill, it may be difficult with limited testing and sampling to reliably determine the extent of the fill.

The presence of fill materials is usually regarded with caution as the possible variation in density, strength and material type is much greater than with natural soil deposits. Consequently, there is an increased risk of adverse engineering characteristics or behaviour. If the volume and quality of fill is of importance to a project, then frequent test pit excavations are preferable to boreholes.

LABORATORY TESTING

Laboratory testing is normally carried out in accordance with Australian Standard 1289 *'Methods of Testing Soil for Engineering Purposes'*. Details of the test procedure used are given on the individual report forms.

ENGINEERING REPORTS

Engineering reports are prepared by qualified personnel and are based on the information obtained and on current engineering standards of interpretation and analysis. Where the report has been prepared for a specific design proposal (eg. a three storey building) the information and interpretation may not be relevant if the design proposal is changed (eg to a twenty storey building). If this happens, the company will be pleased to review the report and the sufficiency of the investigation work.

Every care is taken with the report as it relates to interpretation of subsurface conditions, discussion of geotechnical aspects and recommendations or suggestions for design and construction. However, the Company cannot always anticipate or assume responsibility for:

- Unexpected variations in ground conditions – the potential for this will be partially dependent on borehole spacing and sampling frequency as well as investigation technique.
- Changes in policy or interpretation of policy by statutory authorities.
- The actions of persons or contractors responding to commercial pressures.

If these occur, the company will be pleased to assist with investigation or advice to resolve any problems occurring.

SITE ANOMALIES

In the event that conditions encountered on site during construction appear to vary from those which were expected from the information contained in the report, the company requests that it immediately be notified. Most problems are much more readily resolved when conditions are exposed that at some later stage, well after the event.

REPRODUCTION OF INFORMATION FOR CONTRACTUAL PURPOSES

Attention is drawn to the document *'Guidelines for the Provision of Geotechnical Information in Tender Documents'*, published by the Institution of Engineers, Australia. Where information obtained from this investigation is provided for tendering purposes, it is recommended that all information, including the written report and discussion, be made available. In circumstances where the discussion or comments section is not relevant to the contractual situation, it may be appropriate to prepare a specially edited document. The company would be pleased to assist in this regard and/or to make additional report copies available for contract purposes at a nominal charge.

REVIEW OF DESIGN

Where major civil or structural developments are proposed or where only a limited investigation has been completed or where the geotechnical conditions/ constraints are quite complex, it is prudent to have a joint design review which involves a senior geotechnical engineer.

SITE INSPECTION

The company will always be pleased to provide engineering inspection services for geotechnical aspects of work to which this report is related.

Requirements could range from:

i) a site visit to confirm that conditions exposed are no worse than those interpreted, to

ii) a visit to assist the contractor or other site personnel in identifying various soil/rock types such as appropriate footing or pier founding depths, or

iii) full time engineering presence on site.

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GRAPHIC LOG SYMBOLS FOR SOILS AND ROCKS

SOIL


FILL


TOPSOIL


CLAY (CL, CH)


SILT (ML, MH)


SAND (SP, SW)


GRAVEL (GP, GW)


SANDY CLAY (CL, CH)


SILTY CLAY (CL, CH)


CLAYEY SAND (SC)


SILTY SAND (SM)


GRAVELLY CLAY (CL, CH)


CLAYEY GRAVEL (GC)


SANDY SILT (ML)


PEAT AND ORGANIC SOILS

ROCK


CONGLOMERATE


SANDSTONE


SHALE


SILTSTONE, MUDSTONE, CLAYSTONE


LIMESTONE


PHYLLITE, SCHIST


TUFF


GRANITE, GABBRO


DOLERITE, DIORITE


BASALT, ANDESITE


QUARTZITE

DEFECTS AND INCLUSIONS


CLAY SEAM


SHEARED OR CRUSHED SEAM


BRECCIATED OR SHATTERED SEAM/ZONE


IRONSTONE GRAVEL


ORGANIC MATERIAL

OTHER MATERIALS


CONCRETE


BITUMINOUS CONCRETE, COAL


COLLUVIUM

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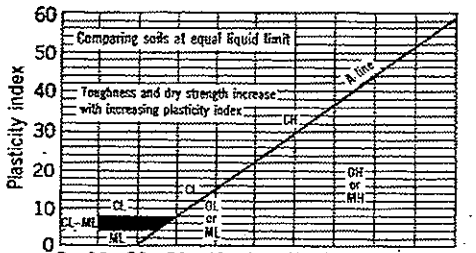
UNIFIED SOIL CLASSIFICATION TABLE

Field Identification Procedures (Excluding particles larger than 75 μm and basing fractions on estimated weights)						Group Symbols[a]	Typical Names	Information Required for Describing Soils	Laboratory Classification Criteria
Coarse-grained soils: More than half of material is *larger* than 75 μm sieve size[b] (The 75 μm sieve size is about the smallest particle visible to naked eye)	Gravels: More than half of coarse fraction is larger than 4 mm sieve size	Clean gravels (little or no fines)	Wide range in grain size and substantial amounts of all intermediate particle sizes			*GW*	Well-graded gravels, gravel-sand mixtures, little or no fines	Give typical name; indicate approximate percentages of sand and gravel; maximum size; angularity, surface condition, and hardness of the coarse grains; local or geologic name and other pertinent descriptive information; and symbols in parentheses For undisturbed soils add information on stratification, degree of compactness, cementation, moisture conditions and drainage characteristics Example: *Silty sand*, gravelly; about 20% hard, angular gravel particles 12 mm maximum size; rounded and subangular sand grains coarse to fine, about 15% non-plastic fines with low dry strength; well compacted and moist in place; alluvial sand; (*SM*)	Determine percentages of gravel and sand from grain size curve. Depending on percentage of fines (fraction smaller than 75 μm sieve size) coarse grained soils are classified as follows: Less than 5%: *GW, GP, SW, SP* More than 12%: *GM, GC, SM, SC* 5% to 12%: *Borderline* cases requiring use of dual symbols Use grain size curve in identifying the fractions as given under field identification
			Predominantly one size or a range of sizes with some intermediate sizes missing			*GP*	Poorly graded gravels, gravel-sand mixtures, little or no fines		
		Gravels with fines (appreciable amount of fines)	Nonplastic fines (for identification procedures see *ML* below)			*GM*	Silty gravels, poorly graded gravel-sand-silt mixtures		
			Plastic fines (for identification procedures, see *CL* below)			*GC*	Clayey gravels, poorly graded gravel-sand-clay mixtures		
	Sands: More than half of coarse fraction is smaller than 4 mm sieve size	Clean sands (little or no fines)	Wide range in grain sizes and substantial amounts of all intermediate particle sizes			*SW*	Well graded sands, gravelly sands, little or no fines		$C_U = \frac{D_{60}}{D_{10}}$ Greater than 4 $C_C = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ Between 1 and 3 Not meeting all gradation requirements for *GW* Atterberg limits below "A" line, or *PI* less than 4 — Above "A" line with *PI* between 4 and 7 are *borderline* cases requiring use of dual symbols Atterberg limits above "A" line, with *PI* greater than 7
			Predominantly one size or a range of sizes with some intermediate sizes missing			*SP*	Poorly graded sands, gravelly sands, little or no fines		
		Sands with fines (appreciable amount of fines)	Nonplastic fines (for identification procedures, see *ML* below)			*SM*	Silty sands, poorly graded sand-silt mixtures		
			Plastic fines (for identification procedures, see *CL* below)			*SC*	Clayey sands, poorly graded sand-clay mixtures		$C_U = \frac{D_{60}}{D_{10}}$ Greater than 6 $C_C = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ Between 1 and 3 Not meeting all gradation requirements for *SW* Atterberg limits below "A" line or *PI* less than 5 — Above "A" line with *PI* between 4 and 7 are *borderline* cases requiring use of dual symbols Atterberg limits below "A" line with *PI* greater than 7
Fine-grained soils: More than half of material is *smaller* than 75 μm sieve size (The 75 μm sieve size is about the smallest particle visible to naked eye)	Identification Procedures on Fraction Smaller than 380 μm Sieve Size		Dry Strength (crushing characteristics)	Dilatancy (reaction to shaking)	Toughness (consistency near plastic limit)				
	Silts and clays: liquid limit less than 50		None to slight	Quick to slow	None	*ML*	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands with slight plasticity	Give typical name; indicate degree and character of plasticity, amount and maximum size of coarse grains; colour in wet condition, odour if any, local or geologic name, and other pertinent descriptive information, and symbol in parentheses For undisturbed soils add information on structure, stratification, consistency in undisturbed and remoulded states, moisture and drainage conditions Example: *Clayey silt*, brown; slightly plastic; small percentage of fine sand; numerous vertical root holes; firm and dry in place; loess; (*ML*)	
			Medium to high	None to very slow	Medium	*CL*	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays		
			Slight to medium	Slow	Slight	*OL*	Organic silts and organic silty clays of low plasticity		
	Silts and clays: liquid limit greater than 50		Slight to medium	Slow to none	Slight to medium	*MH*	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts		
			High to very high	None	High	*CH*	Inorganic clays of high plasticity, fat clays		
			Medium to high	None to very slow	Slight to medium	*OH*	Organic clays of medium to high plasticity		
Highly Organic Soils			Readily identified by colour, odour, spongy feel and frequently by fibrous texture			*Pt*	Peat and other highly organic soils		



Plasticity chart
for laboratory classification of fine grained soils

NOTE: 1) Soils possessing characteristics of two groups are designated by combinations of group symbols (e.g. GW-GC, well graded gravel-sand mixture with clay fines).

2) Soils with liquid limits of the order of 35 to 50 may be visually classified as being of medium plasticity.

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A.B.N. 17 003 550 801 A.C.N. 003 550 801

LOG SYMBOLS

LOG COLUMN	SYMBOL	DEFINITION
Groundwater Record		Standing water level. Time delay following completion of drilling may be shown.
		Extent of borehole collapse shortly after drilling.
		Groundwater seepage into borehole or excavation noted during drilling or excavation.
Samples	ES	Soil sample taken over depth indicated, for environmental analysis.
	U50	Undisturbed 50mm diameter tube sample teken over depth indicated.
	DB	Bulk disturbed sample taken over depth indicated.
	DS	Small disturbed bag sample taken over depth indicated.
Field Tests	N = 17 4, 7, 10	Standard Penetration Test (SPT) performed between depths indicated by lines. Individual figures show blows per 150mm penetration. 'R' as noted below.
	N_c = 5 7 3R	Solid Cone Penetration Test (SCPT) performed between depths indicated by lines. Individual figures show blows per 150mm penetration for 60 degree solid cone driven by SPT hammer. 'R' refers to apparent hammer refusal within the corresponding 150mm depth increment.
	VNS = 25	Vane shear reading in kPa of Undrained Shear Strength.
	PID = 100	Photoionisation detector reading in ppm (Soil sample headspace test).
Moisture Condition (Cohesive Soils)	MC > PL	Moisture content estimated to be greator than plastic limit.
	MC ≈ PL	Moisture content estimated to be approximately equal to plastic limit.
	MC < PL	Moisture content estimated to be less then plastic limit.
(Cohesionless Soils)	D	DRY - runs freely through fingers.
	M	MOIST - does not run freely but no free water visible on soil surface.
	W	WET - free water visible on soil surface.
Strength (Consistency) Cohesive Soils	VS	VERY SOFT - Unconfined compressive strength less than 25kPa
	S	SOFT - Unconfined compressive strength 25-50kPa
	F	FIRM - Unconfined compressive strength 50-100kPa
	St	STIFF - Unconfined compressive strength 100-200kPa
	VSt	VERY STIFF - Unconfined compressive strength 200-400kPa
	H	HARD - Unconfined compressive strength greater than 400kPa
	( )	Bracketed symbol indicates estimated consistency based on tactile examination or other tests.
Density Index/ Relative Density (Cohesionless Soils)		**Density Index (Id) Range (%)** / **SPT 'N' Value Range (Blows/300mm)**
	VL	Very Loose < 15 — 0-4
	L	Loose 15-35 — 4-10
	MD	Medium Dense 35-65 — 10-30
	D	Dense 65-85 — 30-50
	VD	Very Dense > 85 — > 50
	( )	Bracketed symbol indicates estimated density based on ease of drilling or other tests.
Hand Penetrometer Readings	300 250	Numbers indicate individual test results in kPa on representative undisturbed material unless noted otherwise.
Remarks	'V' bit	Hardened steel 'V' shaped bit.
	'TC' bit	Tungsten carbide wing bit.
	T 60	Penetration of auger string in mm under static load of rig applied by drill head hydraulics without rotation of augers.

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LOG SYMBOLS

ROCK MATERIAL WEATHERING CLASSIFICATION

TERM	SYMBOL	DEFINITION
Residual Soil	RS	Soil developed on extremely weathered rock; the mass structure and substance fabric are no longer evident; there is a large change in volume but the soil has not been significantly transported.
Extremely weathered rock	XW	Rock is weathered to such an extent that it has "soil" properties, ie it either disintegrates or can be remoulded, in water.
Distinctly weathered rock	DW	Rock strength usually changed by weathering. The rock may be highly discoloured, usually by ironstaining. Porosity may be increased by leaching, or may be decreased due to deposition of weathering products in pores.
Slightly weathered rock	SW	Rock is slightly discoloured but shows little or no change of strength from fresh rock.
Fresh rock	FR	Rock shows no sign of decomposition or staining.

ROCK STRENGTH

Rock strength is defined by the Point Load Strength Index (Is 50) and refers to the strength of the rock substance in the direction normal to the bedding. The test procedure is described by the International Journal of Rock Mechanics, Mining, Science and Geomechanics. Abstract Volume 22, No 2, 1985.

TERM	SYMBOL	Is (50) MPa	FIELD GUIDE
Extremely Low:	EL	0.03	Easily remoulded by hand to a material with soil properties.
Very Low:	VL	0.1	May be crumbled in the hand. Sandstone is "sugary" and friable.
Low:	L	0.3	A piece of core 150mm long x 50mm dia. may be broken by hand and easily scored with a knife. Sharp edges of core may be friable and break during handling.
Medium Strength:	M	1	A piece of core 150mm long x 50mm dia. can be broken by hand with difficulty. Readily scored with knife.
High:	H	3	A piece of core 150mm long x 50mm dia. core cannot be broken by hand, can be slightly scratched or scored with knife; rock rings under hammer.
Very High:	VH	10	A piece of core 150mm long x 50mm dia. may be broken with hand-held pick after more than one blow. Cannot be scratched with pen knife; rock rings under hammer.
Extremely High:	EH		A piece of core 150mm long x 50mm dia. is very difficult to break with hand-held hammer. Rings when struck with a hammer.

ABBREVIATIONS USED IN DEFECT DESCRIPTION

ABBREVIATION	DESCRIPTION	NOTES
Be	Bedding Plane Parting	Defect orientations measured relative to the normal to the long core axis (ie relative to horizontal for vertical holes)
CS	Clay Seam	
J	Joint	
P	Planar	
Un	Undulating	
S	Smooth	
R	Rough	
IS	Ironstained	
XWS	Extremely Weathered Seam	
Cr	Crushed Seam	
60t	Thickness of defect in millimetres	

APPENDIX B

(Laboratory Reports and Chain of Custody Documents)

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
enquiries@envirolabservices.com.au
www.envirolabservices.com.au

CERTIFICATE OF ANALYSIS 46056

Client:
Environmental Investigation Services
PO Box 976
North Ryde BC
NSW 1670

Attention: Vittal Boggaram

Sample log in details:

Your Reference:	**E24288KB, Randwick**
No. of samples:	12 Soils
Date samples received:	20/09/10
Date completed instructions received:	20/09/10

Analysis Details:
Please refer to the following pages for results, methodology summary and quality control data.
Samples were analysed as received from the client. Results relate specifically to the samples as received.
Results are reported on a dry weight basis for solids and on an as received basis for other matrices.
Please refer to the last page of this report for any comments relating to the results.

Report Details:

Date results requested by:	27/09/10
Date of Preliminary Report:	Not Issued
Issue Date:	27/09/10

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vTPH & BTEX in Soil Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ---------- ----------	46056-1 BH1 0.2-0.3 17/09/2010 Soil	46056-2 BH1 0.4-0.5 17/09/2010 Soil	46056-3 BH2 0.2-0.3 17/09/2010 Soil	46056-5 BH3 0.2-0.3 17/09/2010 Soil	46056-6 BH4 0.2-0.3 17/09/2010 Soil
Date extracted	-	21/09/2010	21/09/2010	21/09/2010	21/09/2010	21/09/2010
Date analysed	-	21/09/2010	21/09/2010	21/09/2010	21/09/2010	21/09/2010
vTPH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0
m+p-xylene	mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0
o-Xylene	mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0
Surrogate aaa-Trifluorotoluene	%	107	105	107	106	110

vTPH & BTEX in Soil Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ---------- ----------	46056-7 BH5 0.2-0.3 17/09/2010 Soil	46056-9 BH6 0.2-0.3 17/09/2010 Soil	46056-10 DUP1 - 17/09/2010 Soil	46056-12 FB1 - 17/09/2010 Soil
Date extracted	-	21/09/2010	21/09/2010	21/09/2010	21/09/2010
Date analysed	-	21/09/2010	21/09/2010	21/09/2010	21/09/2010
vTPH C_6 - C_9	mg/kg	<25	<25	<25	[NA]
Benzene	mg/kg	<0.5	<0.5	<0.5	<0.5
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1.0	<1.0	<1.0	<1.0
m+p-xylene	mg/kg	<2.0	<2.0	<2.0	<2.0
o-Xylene	mg/kg	<1.0	<1.0	<1.0	<1.0
Surrogate aaa-Trifluorotoluene	%	109	108	98	107

sTPH in Soil (C10-C36)						
Our Reference:	UNITS	46056-1	46056-2	46056-3	46056-5	46056-6
Your Reference	----------	BH1	BH1	BH2	BH3	BH4
Depth	----------	0.2-0.3	0.4-0.5	0.2-0.3	0.2-0.3	0.2-0.3
Date Sampled		17/09/2010	17/09/2010	17/09/2010	17/09/2010	17/09/2010
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	21/09/2010	21/09/2010	21/09/2010	21/09/2010	21/09/2010
Date analysed	-	21/09/2010	21/09/2010	21/09/2010	21/09/2010	21/09/2010
TPH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TPH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100	<100
TPH C_{29} - C_{36}	mg/kg	<100	<100	<100	<100	<100
Surrogate o-Terphenyl	%	94	91	94	93	92

sTPH in Soil (C10-C36)				
Our Reference:	UNITS	46056-7	46056-9	46056-10
Your Reference	----------	BH5	BH6	DUP1
Depth	----------	0.2-0.3	0.2-0.3	-
Date Sampled		17/09/2010	17/09/2010	17/09/2010
Type of sample		Soil	Soil	Soil
Date extracted	-	21/09/2010	21/09/2010	21/09/2010
Date analysed	-	21/09/2010	21/09/2010	21/09/2010
TPH C_{10} - C_{14}	mg/kg	<50	<50	<50
TPH C_{15} - C_{28}	mg/kg	<100	130	<100
TPH C_{29} - C_{36}	mg/kg	<100	140	<100
Surrogate o-Terphenyl	%	93	97	95

PAHs in Soil Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ---------- ----------	46056-1 BH1 0.2-0.3 17/09/2010 Soil	46056-2 BH1 0.4-0.5 17/09/2010 Soil	46056-3 BH2 0.2-0.3 17/09/2010 Soil	46056-5 BH3 0.2-0.3 17/09/2010 Soil	46056-6 BH4 0.2-0.3 17/09/2010 Soil
Date extracted	-	21/09/2010	21/09/2010	21/09/2010	21/09/2010	21/09/2010
Date analysed	-	22/09/2010	22/09/2010	22/09/2010	22/09/2010	22/09/2010
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.3	<0.1	0.1	0.1	0.5
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.1
Fluoranthene	mg/kg	0.9	<0.1	0.3	0.4	0.9
Pyrene	mg/kg	0.9	<0.1	0.4	0.5	0.9
Benzo(a)anthracene	mg/kg	0.5	<0.1	0.2	0.2	0.4
Chrysene	mg/kg	0.5	<0.1	0.2	0.3	0.5
Benzo(b+k)fluoranthene	mg/kg	0.9	<0.2	0.3	0.5	0.7
Benzo(a)pyrene	mg/kg	0.6	<0.05	0.2	0.3	0.5
Indeno(1,2,3-c,d)pyrene	mg/kg	0.3	<0.1	0.1	0.2	0.3
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	0.3	<0.1	0.1	0.2	0.3
Surrogate p-Terphenyl-d_{14}	%	111	106	110	115	110

PAHs in Soil Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ---------- ---------- 	46056-7 BH5 0.2-0.3 17/09/2010 Soil	46056-9 BH6 0.2-0.3 17/09/2010 Soil	46056-10 DUP1 - 17/09/2010 Soil
Date extracted	-	21/09/2010	21/09/2010	21/09/2010
Date analysed	-	22/09/2010	22/09/2010	22/09/2010
Naphthalene	mg/kg	<0.1	0.1	<0.1
Acenaphthylene	mg/kg	<0.1	0.3	0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.3	1.9	0.3
Anthracene	mg/kg	<0.1	0.5	<0.1
Fluoranthene	mg/kg	0.8	3.4	0.8
Pyrene	mg/kg	0.8	3.3	0.8
Benzo(a)anthracene	mg/kg	0.4	1.7	0.5
Chrysene	mg/kg	0.5	1.7	0.5
Benzo(b+k)fluoranthene	mg/kg	0.8	3.2	0.9
Benzo(a)pyrene	mg/kg	0.5	2.4	0.6
Indeno(1,2,3-c,d)pyrene	mg/kg	0.3	1.1	0.3
Dibenzo(a,h)anthracene	mg/kg	<0.1	0.2	<0.1
Benzo(g,h,i)perylene	mg/kg	0.3	1.1	0.3
Surrogate p-Terphenyl-d_{14}	%	112	113	113

Organochlorine Pesticides in soil						
Our Reference:	UNITS	46056-1	46056-3	46056-5	46056-6	46056-7
Your Reference	----------	BH1	BH2	BH3	BH4	BH5
Depth	----------	0.2-0.3	0.2-0.3	0.2-0.3	0.2-0.3	0.2-0.3
Date Sampled		17/09/2010	17/09/2010	17/09/2010	17/09/2010	17/09/2010
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	21/09/2010	21/09/2010	21/09/2010	21/09/2010	21/09/2010
Date analysed	-	23/09/2010	23/09/2010	23/09/2010	23/09/2010	23/09/2010
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	100	100	104	101	107

Organochlorine Pesticides in soil		
Our Reference:	UNITS	46056-9
Your Reference	----------	BH6
Depth	----------	0.2-0.3
Date Sampled		17/09/2010
Type of sample		Soil
Date extracted	-	21/09/2010
Date analysed	-	23/09/2010
HCB	mg/kg	<0.1
alpha-BHC	mg/kg	<0.1
gamma-BHC	mg/kg	<0.1
beta-BHC	mg/kg	<0.1
Heptachlor	mg/kg	<0.1
delta-BHC	mg/kg	<0.1
Aldrin	mg/kg	<0.1
Heptachlor Epoxide	mg/kg	<0.1
gamma-Chlordane	mg/kg	<0.1
alpha-chlordane	mg/kg	<0.1
Endosulfan I	mg/kg	<0.1
pp-DDE	mg/kg	<0.1
Dieldrin	mg/kg	<0.1
Endrin	mg/kg	<0.1
pp-DDD	mg/kg	<0.1
Endosulfan II	mg/kg	<0.1
pp-DDT	mg/kg	<0.1
Endrin Aldehyde	mg/kg	<0.1
Endosulfan Sulphate	mg/kg	<0.1
Methoxychlor	mg/kg	<0.1
Surrogate TCLMX	%	107

Organophosphorus Pesticides Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ---------- ----------	46056-1 BH1 0.2-0.3 17/09/2010 Soil	46056-3 BH2 0.2-0.3 17/09/2010 Soil	46056-5 BH3 0.2-0.3 17/09/2010 Soil	46056-6 BH4 0.2-0.3 17/09/2010 Soil	46056-7 BH5 0.2-0.3 17/09/2010 Soil
Date extracted	-	21/09/2010	21/09/2010	21/09/2010	21/09/2010	21/09/2010
Date analysed	-	23/09/2010	23/09/2010	23/09/2010	23/09/2010	23/09/2010
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	100	100	104	101	107

Organophosphorus Pesticides Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ---------- ----------	46056-9 BH6 0.2-0.3 17/09/2010 Soil
Date extracted	-	21/09/2010
Date analysed	-	23/09/2010
Diazinon	mg/kg	<0.1
Dimethoate	mg/kg	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1
Ronnel	mg/kg	<0.1
Chlorpyriphos	mg/kg	<0.1
Fenitrothion	mg/kg	<0.1
Bromophos-ethyl	mg/kg	<0.1
Ethion	mg/kg	<0.1
Surrogate TCLMX	%	107

PCBs in Soil Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ---------- ----------	46056-1 BH1 0.2-0.3 17/09/2010 Soil	46056-3 BH2 0.2-0.3 17/09/2010 Soil	46056-5 BH3 0.2-0.3 17/09/2010 Soil	46056-6 BH4 0.2-0.3 17/09/2010 Soil	46056-7 BH5 0.2-0.3 17/09/2010 Soil
Date extracted	-	21/09/2010	21/09/2010	21/09/2010	21/09/2010	21/09/2010
Date analysed	-	23/09/2010	23/09/2010	23/09/2010	23/09/2010	23/09/2010
Arochlor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1221*	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	100	100	104	101	107

PCBs in Soil Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ---------- ----------	46056-9 BH6 0.2-0.3 17/09/2010 Soil
Date extracted	-	21/09/2010
Date analysed	-	23/09/2010
Arochlor 1016	mg/kg	<0.1
Arochlor 1221*	mg/kg	<0.1
Arochlor 1232	mg/kg	<0.1
Arochlor 1242	mg/kg	<0.1
Arochlor 1248	mg/kg	<0.1
Arochlor 1254	mg/kg	<0.1
Arochlor 1260	mg/kg	<0.1
Surrogate TCLMX	%	107

Acid Extractable metals in soil						
Our Reference:	UNITS	46056-1	46056-2	46056-3	46056-5	46056-6
Your Reference	----------	BH1	BH1	BH2	BH3	BH4
Depth	----------	0.2-0.3	0.4-0.5	0.2-0.3	0.2-0.3	0.2-0.3
Date Sampled		17/09/2010	17/09/2010	17/09/2010	17/09/2010	17/09/2010
Type of sample		Soil	Soil	Soil	Soil	Soil
Date digested	-	21/09/2010	21/09/2010	21/09/2010	21/09/2010	21/09/2010
Date analysed	-	21/09/2010	21/09/2010	21/09/2010	21/09/2010	21/09/2010
Arsenic	mg/kg	<4	<4	<4	6	<4
Cadmium	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Chromium	mg/kg	3	2	3	4	6
Copper	mg/kg	7	1	12	15	9
Lead	mg/kg	32	5	73	37	35
Mercury	mg/kg	0.1	<0.1	0.1	<0.1	0.1
Nickel	mg/kg	2	<1	2	2	4
Zinc	mg/kg	47	10	93	260	78

Acid Extractable metals in soil				
Our Reference:	UNITS	46056-7	46056-9	46056-10
Your Reference	----------	BH5	BH6	DUP1
Depth	----------	0.2-0.3	0.2-0.3	-
Date Sampled		17/09/2010	17/09/2010	17/09/2010
Type of sample		Soil	Soil	Soil
Date digested	-	21/09/2010	21/09/2010	21/09/2010
Date analysed	-	21/09/2010	21/09/2010	21/09/2010
Arsenic	mg/kg	<4	<4	<4
Cadmium	mg/kg	<0.5	<0.5	<0.5
Chromium	mg/kg	3	3	3
Copper	mg/kg	12	21	7
Lead	mg/kg	32	72	31
Mercury	mg/kg	0.1	0.6	0.1
Nickel	mg/kg	2	11	2
Zinc	mg/kg	56	84	44

Moisture Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ---------- ----------	46056-1 BH1 0.2-0.3 17/09/2010 Soil	46056-2 BH1 0.4-0.5 17/09/2010 Soil	46056-3 BH2 0.2-0.3 17/09/2010 Soil	46056-5 BH3 0.2-0.3 17/09/2010 Soil	46056-6 BH4 0.2-0.3 17/09/2010 Soil
Date prepared	-	21/09/2010	21/09/2010	21/09/2010	21/09/2010	21/09/2010
Date analysed	-	22/09/2010	22/09/2010	22/09/2010	22/09/2010	22/09/2010
Moisture	%	6.4	12	12	7.3	6.1

Moisture Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ---------- ----------	46056-7 BH5 0.2-0.3 17/09/2010 Soil	46056-9 BH6 0.2-0.3 17/09/2010 Soil	46056-10 DUP1 - 17/09/2010 Soil	46056-12 FB1 - 17/09/2010 Soil
Date prepared	-	21/09/2010	21/09/2010	21/09/2010	22/09/2010
Date analysed	-	22/09/2010	22/09/2010	22/09/2010	23/09/2010
Moisture	%	7.1	11	6.9	10

Asbestos ID - soils						
Our Reference:	UNITS	46056-1	46056-3	46056-5	46056-6	46056-7
Your Reference	----------	BH1	BH2	BH3	BH4	BH5
Depth	----------	0.2-0.3	0.2-0.3	0.2-0.3	0.2-0.3	0.2-0.3
Date Sampled		17/09/2010	17/09/2010	17/09/2010	17/09/2010	17/09/2010
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	22/9/2010	22/9/2010	22/9/2010	22/9/2010	22/9/2010
Sample Description	-	Approx 30g Soil	Approx 30g Soil	Approx 30g Soil	Approx 30g Soil	Approx 30g Soil
Asbestos ID in soil	-	No asbestos found at reporting limit of 0.1g/kg	No asbestos found at reporting limit of 0.1g/kg	No asbestos found at reporting limit of 0.1g/kg	No asbestos found at reporting limit of 0.1g/kg	No asbestos found at reporting limit of 0.1g/kg
Trace Analysis	-	Respirable fibres not detected	Respirable fibres not detected	Respirable fibres not detected	Respirable fibres not detected	Respirable fibres not detected

Asbestos ID - soils		
Our Reference:	UNITS	46056-9
Your Reference	----------	BH6
Depth	----------	0.2-0.3
Date Sampled		17/09/2010
Type of sample		Soil
Date analysed	-	22/9/2010
Sample Description	-	Approx 30g Soil
Asbestos ID in soil	-	No asbestos found at reporting limit of 0.1g/kg
Trace Analysis	-	Respirable fibres not detected

Method ID	Methodology Summary
GC.16	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS.
GC.3	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID.
GC.12 subset	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS.
GC-5	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
GC.8	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
GC-6	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Metals.20 ICP-AES	Determination of various metals by ICP-AES.
Metals.21 CV-AAS	Determination of Mercury by Cold Vapour AAS.
LAB.8	Moisture content determined by heating at 105 deg C for a minimum of 4 hours.
AS4964-2004	Asbestos ID - Qualitative identification of asbestos type fibres in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques.

QUALITY CONTROL vTPH & BTEX in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base || Duplicate || %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			21/09/2010	46056-1	21/09/2010 || 21/09/2010	LCS-6	21/09/2010
Date analysed	-			21/09/2010	46056-1	21/09/2010 || 21/09/2010	LCS-6	21/09/2010
vTPH C_6 - C_9	mg/kg	25	GC.16	<25	46056-1	<25 || <25	LCS-6	79%
Benzene	mg/kg	0.5	GC.16	<0.5	46056-1	<0.5 || <0.5	LCS-6	65%
Toluene	mg/kg	0.5	GC.16	<0.5	46056-1	<0.5 || <0.5	LCS-6	76%
Ethylbenzene	mg/kg	1	GC.16	<1.0	46056-1	<1.0 || <1.0	LCS-6	82%
m+p-xylene	mg/kg	2	GC.16	<2.0	46056-1	<2.0 || <2.0	LCS-6	85%
o-Xylene	mg/kg	1	GC.16	<1.0	46056-1	<1.0 || <1.0	LCS-6	88%
Surrogate aaa-Trifluorotoluene	%		GC.16	110	46056-1	107 || 114 || RPD: 6	LCS-6	106%

QUALITY CONTROL sTPH in Soil (C10-C36)	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base || Duplicate || %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			21/09/2010	46056-1	21/09/2010 || 21/09/2010	LCS-6	21/09/2010
Date analysed	-			21/09/2010	46056-1	21/09/2010 || 21/09/2010	LCS-6	21/09/2010
TPH C_{10} - C_{14}	mg/kg	50	GC.3	<50	46056-1	<50 || <50	LCS-6	76%
TPH C_{15} - C_{28}	mg/kg	100	GC.3	<100	46056-1	<100 || <100	LCS-6	87%
TPH C_{29} - C_{36}	mg/kg	100	GC.3	<100	46056-1	<100 || <100	LCS-6	103%
Surrogate o-Terphenyl	%		GC.3	95	46056-1	94 || 95 || RPD: 1	LCS-6	94%

QUALITY CONTROL PAHs in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base || Duplicate || %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			21/09/2010	46056-1	21/09/2010 || 21/09/2010	LCS-6	21/09/2010
Date analysed	-			22/09/2010	46056-1	22/09/2010 || 22/09/2010	LCS-6	21/09/2010
Naphthalene	mg/kg	0.1	GC.12 subset	<0.1	46056-1	<0.1 || <0.1	LCS-6	99%
Acenaphthylene	mg/kg	0.1	GC.12 subset	<0.1	46056-1	<0.1 || 0.2	[NR]	[NR]
Acenaphthene	mg/kg	0.1	GC.12 subset	<0.1	46056-1	<0.1 || <0.1	[NR]	[NR]
Fluorene	mg/kg	0.1	GC.12 subset	<0.1	46056-1	<0.1 || <0.1	LCS-6	89%
Phenanthrene	mg/kg	0.1	GC.12 subset	<0.1	46056-1	0.3 || 1.0 || RPD: 108	LCS-6	102%
Anthracene	mg/kg	0.1	GC.12 subset	<0.1	46056-1	<0.1 || 0.2	[NR]	[NR]
Fluoranthene	mg/kg	0.1	GC.12 subset	<0.1	46056-1	0.9 || 2.8 || RPD: 103	LCS-6	91%
Pyrene	mg/kg	0.1	GC.12 subset	<0.1	46056-1	0.9 || 2.5 || RPD: 94	LCS-6	94%

QUALITY CONTROL PAHs in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base || Duplicate || %RPD	Spike Sm#	Spike % Recovery
Benzo(a)anthracene	mg/kg	0.1	GC.12 subset	<0.1	46056-1	0.5 || 1.3 || RPD: 89	[NR]	[NR]
Chrysene	mg/kg	0.1	GC.12 subset	<0.1	46056-1	0.5 || 1.3 || RPD: 89	LCS-6	109%
Benzo(b+k)fluoranthene	mg/kg	0.2	GC.12 subset	<0.2	46056-1	0.9 || 2.1 || RPD: 80	[NR]	[NR]
Benzo(a)pyrene	mg/kg	0.05	GC.12 subset	<0.05	46056-1	0.6 || 1.5 || RPD: 86	LCS-6	85%
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	GC.12 subset	<0.1	46056-1	0.3 || 0.7 || RPD: 80	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	0.1	GC.12 subset	<0.1	46056-1	<0.1 || 0.1	[NR]	[NR]
Benzo(g,h,i)perylene	mg/kg	0.1	GC.12 subset	<0.1	46056-1	0.3 || 0.6 || RPD: 67	[NR]	[NR]
Surrogate p-Terphenyl-d14	%		GC.12 subset	110	46056-1	111 || 111 || RPD: 0	LCS-6	110%

QUALITY CONTROL Organochlorine Pesticides in soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base || Duplicate || %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			21/09/2010	46056-1	21/09/2010 || 21/09/2010	LCS-6	21/09/2010
Date analysed	-			23/09/2010	46056-1	23/09/2010 || 23/09/2010	LCS-6	23/09/2010
HCB	mg/kg	0.1	GC-5	<0.1	46056-1	<0.1 || <0.1	[NR]	[NR]
alpha-BHC	mg/kg	0.1	GC-5	<0.1	46056-1	<0.1 || <0.1	LCS-6	135%
gamma-BHC	mg/kg	0.1	GC-5	<0.1	46056-1	<0.1 || <0.1	[NR]	[NR]
beta-BHC	mg/kg	0.1	GC-5	<0.1	46056-1	<0.1 || <0.1	LCS-6	107%
Heptachlor	mg/kg	0.1	GC-5	<0.1	46056-1	<0.1 || <0.1	LCS-6	118%
delta-BHC	mg/kg	0.1	GC-5	<0.1	46056-1	<0.1 || <0.1	[NR]	[NR]
Aldrin	mg/kg	0.1	GC-5	<0.1	46056-1	<0.1 || <0.1	LCS-6	117%
Heptachlor Epoxide	mg/kg	0.1	GC-5	<0.1	46056-1	<0.1 || <0.1	LCS-6	128%
gamma-Chlordane	mg/kg	0.1	GC-5	<0.1	46056-1	<0.1 || <0.1	[NR]	[NR]
alpha-chlordane	mg/kg	0.1	GC-5	<0.1	46056-1	<0.1 || <0.1	[NR]	[NR]
Endosulfan I	mg/kg	0.1	GC-5	<0.1	46056-1	<0.1 || <0.1	[NR]	[NR]
pp-DDE	mg/kg	0.1	GC-5	<0.1	46056-1	<0.1 || <0.1	LCS-6	106%
Dieldrin	mg/kg	0.1	GC-5	<0.1	46056-1	<0.1 || <0.1	LCS-6	130%
Endrin	mg/kg	0.1	GC-5	<0.1	46056-1	<0.1 || <0.1	LCS-6	120%
pp-DDD	mg/kg	0.1	GC-5	<0.1	46056-1	<0.1 || <0.1	LCS-6	108%
Endosulfan II	mg/kg	0.1	GC-5	<0.1	46056-1	<0.1 || <0.1	[NR]	[NR]
pp-DDT	mg/kg	0.1	GC-5	<0.1	46056-1	<0.1 || <0.1	[NR]	[NR]
Endrin Aldehyde	mg/kg	0.1	GC-5	<0.1	46056-1	<0.1 || <0.1	[NR]	[NR]
Endosulfan Sulphate	mg/kg	0.1	GC-5	<0.1	46056-1	<0.1 || <0.1	LCS-6	117%
Methoxychlor	mg/kg	0.1	GC-5	<0.1	46056-1	<0.1 || <0.1	[NR]	[NR]
Surrogate TCLMX	%		GC-5	105	46056-1	100 || 108 || RPD: 8	LCS-6	107%

QUALITY CONTROL Organophosphorus Pesticides	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			21/09/2010	46056-1	21/09/2010 || 21/09/2010	LCS-6	21/09/2010
Date analysed	-			23/09/2010	46056-1	23/09/2010 || 23/09/2010	LCS-6	23/09/2010
Diazinon	mg/kg	0.1	GC.8	<0.1	46056-1	<0.1 || <0.1	[NR]	[NR]
Dimethoate	mg/kg	0.1	GC.8	<0.1	46056-1	<0.1 || <0.1	[NR]	[NR]
Chlorpyriphos-methyl	mg/kg	0.1	GC.8	<0.1	46056-1	<0.1 || <0.1	[NR]	[NR]
Ronnel	mg/kg	0.1	GC.8	<0.1	46056-1	<0.1 || <0.1	[NR]	[NR]
Chlorpyriphos	mg/kg	0.1	GC.8	<0.1	46056-1	<0.1 || <0.1	LCS-6	130%
Fenitrothion	mg/kg	0.1	GC.8	<0.1	46056-1	<0.1 || <0.1	LCS-6	121%
Bromophos-ethyl	mg/kg	0.1	GC.8	<0.1	46056-1	<0.1 || <0.1	[NR]	[NR]
Ethion	mg/kg	0.1	GC.8	<0.1	46056-1	<0.1 || <0.1	LCS-6	128%
Surrogate TCLMX	%		GC.8	105	46056-1	100 || 108 || RPD: 8	LCS-6	106%

QUALITY CONTROL PCBs in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			21/09/2010	46056-1	21/09/2010 || 21/09/2010	LCS-6	21/09/2010
Date analysed	-			21/09/2010	46056-1	23/09/2010 || 23/09/2010	LCS-6	23/09/2010
Arochlor 1016	mg/kg	0.1	GC-6	<0.1	46056-1	<0.1 || <0.1	[NR]	[NR]
Arochlor 1221*	mg/kg	0.1	GC-6	<0.1	46056-1	<0.1 || <0.1	[NR]	[NR]
Arochlor 1232	mg/kg	0.1	GC-6	<0.1	46056-1	<0.1 || <0.1	[NR]	[NR]
Arochlor 1242	mg/kg	0.1	GC-6	<0.1	46056-1	<0.1 || <0.1	[NR]	[NR]
Arochlor 1248	mg/kg	0.1	GC-6	<0.1	46056-1	<0.1 || <0.1	[NR]	[NR]
Arochlor 1254	mg/kg	0.1	GC-6	<0.1	46056-1	<0.1 || <0.1	LCS-6	110%
Arochlor 1260	mg/kg	0.1	GC-6	<0.1	46056-1	<0.1 || <0.1	[NR]	[NR]
Surrogate TCLMX	%		GC-6	105	46056-1	100 || 108 || RPD: 8	LCS-6	97%

QUALITY CONTROL Acid Extractable metals in soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date digested	-			21/09/2010	46056-1	21/09/2010 || 21/09/2010	LCS-4	21/09/2010
Date analysed	-			21/09/2010	46056-1	21/09/2010 || 21/09/2010	LCS-4	21/09/2010
Arsenic	mg/kg	4	Metals.20 ICP-AES	<4	46056-1	<4 || <4	LCS-4	100%
Cadmium	mg/kg	0.5	Metals.20 ICP-AES	<0.5	46056-1	<0.5 || <0.5	LCS-4	100%
Chromium	mg/kg	1	Metals.20 ICP-AES	<1	46056-1	3 || 2 || RPD: 40	LCS-4	101%
Copper	mg/kg	1	Metals.20 ICP-AES	<1	46056-1	7 || 7 || RPD: 0	LCS-4	103%

QUALITY CONTROL Acid Extractable metals in soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Lead	mg/kg	1	Metals.20 ICP-AES	<1	46056-1	32 || 32 || RPD: 0	LCS-4	99%
Mercury	mg/kg	0.1	Metals.21 CV-AAS	<0.1	46056-1	0.1 || 0.1 || RPD: 0	LCS-4	108%
Nickel	mg/kg	1	Metals.20 ICP-AES	<1	46056-1	2 || 2 || RPD: 0	LCS-4	102%
Zinc	mg/kg	1	Metals.20 ICP-AES	<1	46056-1	47 || 54 || RPD: 14	LCS-4	101%

QUALITY CONTROL Moisture	UNITS	PQL	METHOD	Blank
Date prepared	-			[NT]
Date analysed	-			[NT]
Moisture	%	0.1	LAB.8	<0.10

QUALITY CONTROL Asbestos ID - soils	UNITS	PQL	METHOD	Blank
Date analysed	-			[NT]

Report Comments:
PAH in soil: The RPD for duplicate results is accepted due to the non homogenous nature of the sample/s.

Asbestos ID was analysed by Approved Identifier:	Paul Ching
Asbestos ID was authorised by Approved Signatory:	Matt Mansfield
Asbestos counting was analysed by Approved Counter:	@ERROR
Asbestos counting was authorised by Approved Signatory:	@ERROR

INS: Insufficient sample for this test	PQL: Practical Quantitation Limit	NT: Not tested
NA: Test not required	RPD: Relative Percent Difference	NA: Test not required
<: Less than	>: Greater than	LCS: Laboratory Control Sample

Quality Control Definitions
Blank: This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate: This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike: A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample): This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike: Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Laboratory Acceptance Criteria
Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batched of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.
Matrix Spikes and LCS: Generally 70-130% for inorganics/metals; 60-140% for organics and 10-140% for SVOC and speciated phenols is acceptable.

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
enquiries@envirolabservices.com.au
www.envirolabservices.com.au

SAMPLE RECEIPT ADVICE

Client:

Environmental Investigation Services
PO Box 976
North Ryde BC NSW 1670

ph: 02 9888 5000
Fax: 02 9888 5001

Attention: Vittal Boggaram

Sample log in details:

Your reference:	**E24288KB, Randwick**
Envirolab Reference:	**46056**
Date received:	20/09/10
Date results expected to be reported:	**27/09/10**

Samples received in appropriate condition for analysis:	YES
No. of samples provided	12 Soils
Turnaround time requested:	Standard
Temperature on receipt	Cool
Cooling Method:	Ice Pack

Comments:

Samples will be held for 1 month for water samples and 2 months for soil samples from date of receipt of samples.

Contact details:

Please direct any queries to Aileen Hie or Jacinta Hurst
ph: 02 9910 6200 fax: 02 9910 6201
email: ahie@envirolabservices.com.au or jhurst@envirolabservices.com.au

SAMPLE AND CHAIN OF CUSTODY FORM

TO:		FROM:
Envirolab Services Pty Ltd 12 Ashley Street Chatswood NSW 2067 Phone: (02) 99106200 Fax: (02) 99106201 Attention: Aileen	EIS Job Number: E24288KB Date Results Required: STANDARD Sheet 1 / 1	Environmental Investigation Services Rear 115 Wicks Road Macquarie Park NSW 2113 Phone: (02) 9888 5000 Fax: (02) 9888 5004 Contact: Vittal Boggaram

Project: Proposed Development

Location: Randwick

Sampler: Adrian Callus

Sample Preservation: In esky on ice

Tests Required

Date Sampled	Lab Ref:	Borehole/ Sample Number	Depth (m)	Sample Container	PID	Sample Description	Heavy Metals (8)	TPH/BTEX	PAH	OC/OP/ PCB	Asbestos	TCLP Prep + M6, PAH	Phenols	VOC	sVOC	sPOCAS	BTEX	
17/9/10	1	BH1	0.2/0.3	Glass jar + Asb Bag	0	Fill	X	X	X	X	X							
↓	2	↓	0.4/0.5	Glass jar + Asb Bag	0	Sand	X	X	X									
	3	BH2	0.2/0.3	Glass jar + Asb Bag	0	Fill	X	X	X	X	X							
	4	↓	0.8/0.9	Glass jar + Asb Bag	0	Sand												
	5	BH3	0.2/0.3	Glass jar + Asb Bag	0	Fill	X	X	X	X	X							
	6	BH4	0.2/0.3	Glass jar + Asb Bag	0	↓	X	X	X	X	X							
	7	BH5	0.2/0.3	Glass jar + Asb Bag	0	Fill	X	X	X	X	X							
	8	↓	2.8/2.9	Glass jar + Asb Bag	0	Sand												
	9	BH6	0.2/0.3	Glass jar + Asb Bag	0	Fill	X	X	X	X	X							
	10	DUP1	—	Glass jar + Asb Bag	—	—	X	X	X									
	11	DUP2	—	Glass jar + Asb Bag	—	—												
↓	12	FB1	-	Glass jar + Asb Bag	-	Sand											X	
				Glass jar + Asb Bag														
				Glass jar + Asb Bag														
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				Glass jar + Asb Bag														

Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: 9910 6200
Job No: 46056
Date received: 20/9/10
Time received: 12PM
Received by: Z.L.
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

Remarks (comments/detection limits required):

Relinquished By:	Date: 20/9/10 Time: 10:30	Received By:	Relinquished By:	Date: 20/9/10 Time: 12pm	Received By:
Vittal.B.S					Z.L.

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
enquiries@envirolabservices.com.au
www.envirolabservices.com.au

CERTIFICATE OF ANALYSIS 46056-A

Client:
Environmental Investigation Services
PO Box 976
North Ryde BC
NSW 1670

Attention: Vittal Boggaram

Sample log in details:

Your Reference:	**E24288KB, Randwick**
No. of samples:	Additional Testing on 1 Soil
Date samples received:	20/09/10
Date completed instructions received:	28/09/10

Analysis Details:
Please refer to the following pages for results, methodology summary and quality control data.
Samples were analysed as received from the client. Results relate specifically to the samples as received.
Results are reported on a dry weight basis for solids and on an as received basis for other matrices.
Please refer to the last page of this report for any comments relating to the results.

Report Details:

Date results requested by:	6/10/10
Date of Preliminary Report:	Not Issued
Issue Date:	1/10/10

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Accredited for compliance with ISO/IEC 17025.
Tests not covered by NATA are denoted with *.

Results Approved By:

Sandra Taylor
Assistant Lab Manager

PAHs in TCLP (USEPA 1311) Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ---------- ---------- 	46056-A-9 BH6 0.2-0.3 17/09/2010 Soil
pH of soil for fluid# determ.	pH units	8.20
pH of soil for fluid # determ. (acid)	pH units	1.70
Extraction fluid used	-	1
pH of final Leachate	pH units	5.00
Date extracted	-	29/09/2010
Date analysed	-	29/09/2010
Naphthalene in TCLP	mg/L	<0.001
Acenaphthylene in TCLP	mg/L	<0.001
Acenaphthene in TCLP	mg/L	<0.001
Fluorene in TCLP	mg/L	<0.001
Phenanthrene in TCLP	mg/L	<0.001
Anthracene in TCLP	mg/L	<0.001
Fluoranthene in TCLP	mg/L	<0.001
Pyrene in TCLP	mg/L	<0.001
Benzo(a)anthracene in TCLP	mg/L	<0.001
Chrysene in TCLP	mg/L	<0.001
Benzo(b+k)fluoranthene in TCLP	mg/L	<0.002
Benzo(a)pyrene in TCLP	mg/L	<0.001
Indeno(1,2,3-c,d)pyrene - TCLP	mg/L	<0.001
Dibenzo(a,h)anthracene in TCLP	mg/L	<0.001
Benzo(g,h,i)perylene in TCLP	mg/L	<0.001
Surrogate p-Terphenyl-d_{14}	%	118

Method ID	Methodology Summary
LAB.4	Toxicity Characteristic Leaching Procedure (TCLP).
EXTRACT.7	Toxicity Characteristic Leaching Procedure (TCLP).
LAB.1	pH - Measured using pH meter and electrode in accordance with APHA 20th ED, 4500-H+.
GC.12 subset	Leachates are extracted with Dichloromethane and analysed by GC-MS.
GC.12 subset	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS.
GC.12	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS.

QUALITY CONTROL PAHs in TCLP (USEPA 1311)	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			29/09/2010	[NT]	[NT]	LCS-W1	29/09/2010
Date analysed	-			29/09/2010	[NT]	[NT]	LCS-W1	29/09/2010
Naphthalene in TCLP	mg/L	0.001	GC.12 subset	<0.001	[NT]	[NT]	LCS-W1	113%
Acenaphthylene in TCLP	mg/L	0.001	GC.12 subset	<0.001	[NT]	[NT]	[NR]	[NR]
Acenaphthene in TCLP	mg/L	0.001	GC.12 subset	<0.001	[NT]	[NT]	[NR]	[NR]
Fluorene in TCLP	mg/L	0.001	GC.12 subset	<0.001	[NT]	[NT]	LCS-W1	120%
Phenanthrene in TCLP	mg/L	0.001	GC.12 subset	<0.001	[NT]	[NT]	LCS-W1	122%
Anthracene in TCLP	mg/L	0.001	GC.12 subset	<0.001	[NT]	[NT]	[NR]	[NR]
Fluoranthene in TCLP	mg/L	0.001	GC.12 subset	<0.001	[NT]	[NT]	LCS-W1	115%
Pyrene in TCLP	mg/L	0.001	GC.12 subset	<0.001	[NT]	[NT]	LCS-W1	120%
Benzo(a)anthracene in TCLP	mg/L	0.001	GC.12 subset	<0.001	[NT]	[NT]	[NR]	[NR]
Chrysene in TCLP	mg/L	0.001	GC.12 subset	<0.001	[NT]	[NT]	LCS-W1	117%
Benzo(b+k)fluoranthene in TCLP	mg/L	0.002	GC.12 subset	<0.002	[NT]	[NT]	[NR]	[NR]
Benzo(a)pyrene in TCLP	mg/L	0.001	GC.12 subset	<0.001	[NT]	[NT]	LCS-W1	132%
Indeno(1,2,3-c,d)pyrene - TCLP	mg/L	0.001	GC.12 subset	<0.001	[NT]	[NT]	[NR]	[NR]
Dibenzo(a,h)anthracene in TCLP	mg/L	0.001	GC.12 subset	<0.001	[NT]	[NT]	[NR]	[NR]
Benzo(g,h,i)perylene in TCLP	mg/L	0.001	GC.12 subset	<0.001	[NT]	[NT]	[NR]	[NR]
Surrogate p-Terphenyl-d_{14}	%		GC.12	109	[NT]	[NT]	LCS-W1	110%

Report Comments:

Asbestos ID was analysed by Approved Identifier:	Not applicable for this job
Asbestos ID was authorised by Approved Signatory:	Not applicable for this job
Asbestos counting was analysed by Approved Counter:	@ERROR
Asbestos counting was authorised by Approved Signatory:	@ERROR

INS: Insufficient sample for this test	PQL: Practical Quantitation Limit	NT: Not tested
NA: Test not required	RPD: Relative Percent Difference	NA: Test not required
<: Less than	>: Greater than	LCS: Laboratory Control Sample

Quality Control Definitions

Blank: This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate: This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
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LCS (Laboratory Control Sample): This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike: Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batched of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.
Matrix Spikes and LCS: Generally 70-130% for inorganics/metals; 60-140% for organics and 10-140% for SVOC and speciated phenols is acceptable.

Aileen Hie

From: Vittal Boggaram [vboggaram@jkgroup.net.au]
Sent: Tuesday, 28 September 2010 11:20 AM
To: Aileen Hie
Subject: Additional TCLP Leachate analysis, '46056 - E24288KB, Randwick'
Importance: High

Hi Aileen,

Could you please schedule the following additional testing on a standard turnaround for the above job:

- BH6 (0.2m to 0.3m) – TCLP PAHs.

-9

Regards,
For and on behalf of
ENVIRONMENTAL INVESTIGATION SERVICES

Vittal Boggaram
Senior Environmental Scientist

115 Wicks Road, Macquarie Park, NSW, 2113
PO Box 976, North Ryde BC, NSW, 1670
Tel: 02 9888 5000 Fax: 02 9888 5004 email: vboggaram@jkgroup.net.au Web: www.jkgroup.net.au

From: Rhian Morgan [mailto:RMorgan@envirolabservices.com.au]
Sent: Monday, 27 September 2010 5:08 PM
To: vittal Boggaram
Subject: Results for registration '46056 - E24288KB, Randwick'

Envirolab Ref, 46056A
Due: [illegible] 6/10/10
Std TAT.

Please refer to attached for:
a copy of the Certificate of Analysis
a copy of the Invoice
a copy of the COC
an excel file containing the results

Please note that a hard copy will not be posted.

Enquiries should be made directly to:
Jacinta Hurst on jhurst@envirolabservices.com.au
or
David Springer on dspringer@envirolabservices.com.au
or
Tania Notaras on tnotaras@envirolabservices.com.au

Regards

Envirolab Services
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201

28/09/2010

www.envirolabservices.com.au

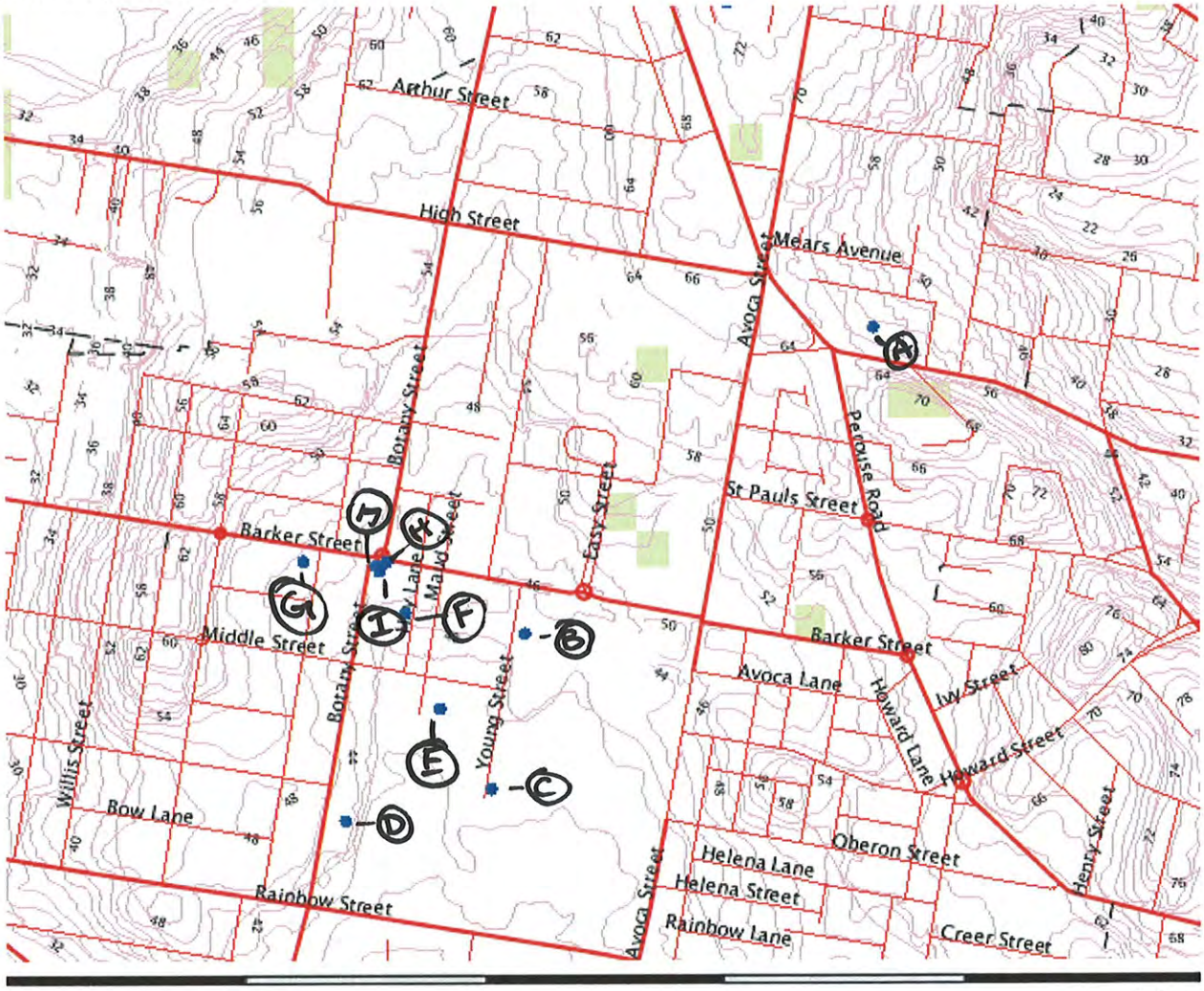
APPENDIX C

(Site History Documents – Groundwater Bore Records)

Map from the NSW Natural Resource Atlas

Map created with NSW Natural Resource Atlas - http://nratlas.nsw.gov.au

Wednesday, October 27, 2010



0 1 Km

Legend

Symbol	Layer	Custodian
	Cities and large towns renderImage: Cannot build image from features	
Cowra	Populated places renderImage: Cannot build image from features	
	Towns	
	Groundwater Bores	
	Catchment Management Authority boundaries	
	Major rivers	
	Topographic base map	

Groundwater Works Summary

For information on the meaning of fields please see Glossary
Document Generated on Wednesday, October 27, 2010

Print Report

Works Details Site Details Form A Licensed Construction Water Bearing Zones Drillers Log

Work Requested -- GW106158

Works Details (top)

GROUNDWATER NUMBER	GW106158
LIC-NUM	10BL162658
AUTHORISED-PURPOSES	DOMESTIC
INTENDED-PURPOSES	
WORK-TYPE	Bore
WORK-STATUS	
CONSTRUCTION-METHOD	
OWNER-TYPE	
COMMENCE-DATE	
COMPLETION-DATE	2005-06-29
FINAL-DEPTH (metres)	
DRILLED-DEPTH (metres)	
CONTRACTOR-NAME	
DRILLER-NAME	
PROPERTY	GIDDINGS
GWMA	-
GW-ZONE	-
STANDING-WATER-LEVEL	
SALINITY	
YIELD	

Site Details (top)

REGION	10 - SYDNEY SOUTH COAST
RIVER-BASIN	213 - SYDNEY COAST - GEORGES RIVER
AREA-DISTRICT	
CMA-MAP	9130-3S
GRID-ZONE	56/1
SCALE	1:25,000
ELEVATION	
ELEVATION-SOURCE	(Unknown)
NORTHING	6245607.00
EASTING	337556.00
LATITUDE	33 55' 3"
LONGITUDE	151 14' 34"
GS-MAP	

AMG-ZONE	56
COORD-SOURCE	
REMARK	

Form-A (top)

COUNTY	CUMBERLAND
PARISH	ALEXANDRIA
PORTION-LOT-DP	PT1 73744

Licensed (top)

COUNTY	CUMBERLAND
PARISH	ALEXANDRIA
PORTION-LOT-DP	PT1 73744

Water Bearing Zones (top)

no details

Drillers Log (top)

no details

Groundwater Works Summary

For information on the meaning of fields please see Glossary
Document Generated on Wednesday, October 27, 2010

Print Report

Works Details Site Details Form A Licensed Construction Water Bearing Zones Drillers Log

Work Requested -- GW072463

Works Details (top)

GROUNDWATER NUMBER	GW072463
LIC-NUM	10BL156227
AUTHORISED-PURPOSES	INDUSTRIAL
INTENDED-PURPOSES	INDUSTRIAL
WORK-TYPE	Bore
WORK-STATUS	(Unknown)
CONSTRUCTION-METHOD	Rot. Rev. Circ. Air
OWNER-TYPE	
COMMENCE-DATE	
COMPLETION-DATE	1994-11-14
FINAL-DEPTH (metres)	
DRILLED-DEPTH (metres)	43.00
CONTRACTOR-NAME	
DRILLER-NAME	
PROPERTY	NEWMARKET STABLE NO 1
GWMA	-
GW-ZONE	-
STANDING-WATER-LEVEL	
SALINITY	
YIELD	

Site Details (top)

REGION	10 - SYDNEY SOUTH COAST
RIVER-BASIN	
AREA-DISTRICT	
CMA-MAP	
GRID-ZONE	
SCALE	
ELEVATION	
ELEVATION-SOURCE	
NORTHING	6245100.00
EASTING	337093.00
LATITUDE	33 55' 19"
LONGITUDE	151 14' 16"
GS-MAP	

B

AMG-ZONE	56
COORD-SOURCE	
REMARK	

Form-A (top)

COUNTY	CUMBERLAND
PARISH	ALEXANDRIA
PORTION-LOT-DP	A//330407

Licensed (top)

COUNTY	CUMBERLAND
PARISH	ALEXANDRIA
PORTION-LOT-DP	A 330407

Construction (top)

Negative depths indicate Above Ground Level;H-Hole;P-Pipe;OD-Outside Diameter; ID-Inside Diameter;C-Cemented;SL-Slot Length;A-Aperture;GS-Grain Size;Q-Quantity

HOLE-NO	PIPE-NO	COMPONENT-CODE	COMPONENT-TYPE	DEPTH-FROM (metres)	DEPTH-TO (metres)	OD (mm)	ID (mm)	INTERVAL	DETAIL
1		Hole	Hole	0.00	43.00	150			Rotary
1	1	Casing	Steel	0.00	10.00	168	156		Driven into Hole

Water Bearing Zones (top)

FROM-DEPTH (metres)	TO-DEPTH (metres)	THICKNESS (metres)	ROCK-CAT-DESC	S-W-L	D-D-L	YIELD	TEST-HOLE-DEPTH (metres)	DURATION	SALINITY
18.00	21.00	3.00		8.60	9.10	1.87	43.00	4.00	Good

Drillers Log (top)

FROM	TO	THICKNESS	DESC	GEO-MATERIAL	COMMENT
0.00	7.00	7.00	GREY SAND		
7.00	8.00	1.00	GREY CLAY		
8.00	10.50	2.50	BROWN SANDSTONE		
10.50	11.00	0.50	BROWN SOFT SANDSTONE		
11.00	17.00	6.00	GREY SANDSTONE		
17.00	17.50	0.50	GREY CLAY		
17.50	43.00	25.50	WHITE SANDSTONE		

Groundwater Works Summary

For information on the meaning of fields please see Glossary
Document Generated on Wednesday, October 27, 2010

Print Report

Works Details Site Details Form A Licensed Construction Water Bearing Zones Drillers Log

Work Requested -- GW104947

Works Details (top)

GROUNDWATER NUMBER	GW104947
LIC-NUM	10BL160513
AUTHORISED-PURPOSES	TEST BORE
INTENDED-PURPOSES	TEST BORE
WORK-TYPE	Bore
WORK-STATUS	
CONSTRUCTION-METHOD	
OWNER-TYPE	
COMMENCE-DATE	
COMPLETION-DATE	2002-02-21
FINAL-DEPTH (metres)	5.00
DRILLED-DEPTH (metres)	5.00
CONTRACTOR-NAME	
DRILLER-NAME	
PROPERTY	RANDWICK BOYS & GIRLS HIGH SCH
GWMA	-
GW-ZONE	-
STANDING-WATER-LEVEL	2.71
SALINITY	210.00
YIELD	0.65

Site Details (top)

REGION	10 - SYDNEY SOUTH COAST
RIVER-BASIN	213 - SYDNEY COAST - GEORGES RIVER
AREA-DISTRICT	
CMA-MAP	9130-3S
GRID-ZONE	56/1
SCALE	1:25,000
ELEVATION	
ELEVATION-SOURCE	(Unknown)
NORTHING	6244847.00
EASTING	337052.00
LATITUDE	33 55' 27"
LONGITUDE	151 14' 14"
GS-MAP	

AMG-ZONE	56
COORD-SOURCE	
REMARK	

Form-A (top)

COUNTY	CUMBERLAND
PARISH	ALEXANDRIA
PORTION-LOT-DP	LT1738 DP48445

Licensed (top)

COUNTY	CUMBERLAND
PARISH	ALEXANDRIA
PORTION-LOT-DP	1 121453

Construction (top)

Negative depths indicate Above Ground Level;H-Hole;P-Pipe;OD-Outside Diameter; ID-Inside Diameter;C-Cemented;SL-Slot Length;A-Aperture;GS-Grain Size;Q-Quantity

HOLE-NO	PIPE-NO	COMPONENT-CODE	COMPONENT-TYPE	DEPTH-FROM (metres)	DEPTH-TO (metres)	OD (mm)	ID (mm)	INTERVAL	DETAIL
1		Hole	Hole	0.00	5.00	150			Cable Tool
1	1	Casing	Steel	0.00	3.50	150	142		Screwed; Driven into Hole
1	1	Opening	Slots	3.50	5.00	130			Steel

Water Bearing Zones (top)

FROM-DEPTH (metres)	TO-DEPTH (metres)	THICKNESS (metres)	ROCK-CAT-DESC	S-W-L	D-D-L	YIELD	TEST-HOLE-DEPTH (metres)	DURATION	SALINITY
2.71	4.80	2.09		2.71	4.36	0.65		4.00	210.00

Drillers Log (top)

FROM	TO	THICKNESS	DESC	GEO-MATERIAL	COMMENT
0.00	0.30	0.30	TOPSOIL		
0.30	1.20	0.90	WHITE SAND		
1.20	1.40	0.20	ROCK COFFEE		
1.40	4.80	3.40	YELLOW SAND MG.		
4.80	5.00	0.20	YELLOW SILTY SAND		

Groundwater Works Summary

For information on the meaning of fields please see Glossary
Document Generated on Wednesday, October 27, 2010

Print Report

Works Details Site Details Form A Licensed Construction Water Bearing Zones Drillers Log

Work Requested -- GW108861

Works Details (top)

GROUNDWATER NUMBER	GW108861
LIC-NUM	10BL601893
AUTHORISED-PURPOSES	RECREATION (GROUNDWATER)
INTENDED-PURPOSES	RECREATION (GROUNDWATER)
WORK-TYPE	Bore
WORK-STATUS	Supply Obtained
CONSTRUCTION-METHOD	Rotary Air
OWNER-TYPE	Local Govt
COMMENCE-DATE	
COMPLETION-DATE	2008-05-08
FINAL-DEPTH (metres)	114.00
DRILLED-DEPTH (metres)	114.00
CONTRACTOR-NAME	
DRILLER-NAME	
PROPERTY	PAINE RESERVE
GWMA	-
GW-ZONE	-
STANDING-WATER-LEVEL	20.00
SALINITY	
YIELD	2.21

Site Details (top)

REGION	10 - SYDNEY SOUTH COAST
RIVER-BASIN	
AREA-DISTRICT	
CMA-MAP	
GRID-ZONE	
SCALE	
ELEVATION	
ELEVATION-SOURCE	
NORTHING	6244791.00
EASTING	336854.00
LATITUDE	33 55' 29"
LONGITUDE	151 14' 6"
GS-MAP	

AMG-ZONE	56
COORD-SOURCE	
REMARK	

Form-A (top)

COUNTY	CUMBERLAND
PARISH	ALEXANDRIA
PORTION-LOT-DP	1532 752011

Licensed (top)

COUNTY	CUMBERLAND
PARISH	ALEXANDRIA
PORTION-LOT-DP	1532 752011

Construction (top)

Negative depths indicate Above Ground Level;H-Hole;P-Pipe;OD-Outside Diameter; ID-Inside Diameter;C-Cemented;SL-Slot Length;A-Aperture;GS-Grain Size;Q-Quantity

HOLE-NO	PIPE-NO	COMPONENT-CODE	COMPONENT-TYPE	DEPTH-FROM (metres)	DEPTH-TO (metres)	OD (mm)	ID (mm)	INTERVAL	DETAIL
1		Hole	Hole	0.00	12.00	200			Rotary Air
1		Hole	Hole	12.00	114.00	152			Rotary Air
1	1	Casing	PVC Class 6	-0.30	18.00	152			Screwed and Glued; Driven into Hole

Water Bearing Zones (top)

FROM-DEPTH (metres)	TO-DEPTH (metres)	THICKNESS (metres)	ROCK-CAT-DESC	S-W-L	D-D-L	YIELD	TEST-HOLE-DEPTH (metres)	DURATION	SALINITY
37.00	37.30	0.30		20.00		1.10		0.50	
63.00	63.10	0.10		20.00		0.40		0.50	
98.00	98.50	0.50		20.00		0.30		0.50	
105.00	105.50	0.50		20.00		0.41		0.50	

Drillers Log (top)

FROM	TO	THICKNESS	DESC	GEO-MATERIAL	COMMENT
0.00	0.10	0.10	TOPSOIL		
0.10	0.80	0.70	SANDY CLAY		
0.80	0.90	0.10	GREY CLAY		
0.90	4.00	3.10	RED YELLOW SANDSTONE		
4.00	114.00	110.00	WHITE SANDSTONE		

Groundwater Works Summary

For information on the meaning of fields please see Glossary
Document Generated on Wednesday, October 27, 2010

Print Report

Works Details Site Details Form A Licensed Construction Water Bearing Zones Drillers Log

Work Requested -- GW110240

Works Details (top)

GROUNDWATER NUMBER	GW110240
LIC-NUM	10BL602332
AUTHORISED-PURPOSES	RECREATION (GROUNDWATER) STOCK
INTENDED-PURPOSES	RECREATION (GROUNDWATER)
WORK-TYPE	Bore
WORK-STATUS	
CONSTRUCTION-METHOD	Down Hole Hammer
OWNER-TYPE	Private
COMMENCE-DATE	
COMPLETION-DATE	2008-11-12
FINAL-DEPTH (metres)	150.00
DRILLED-DEPTH (metres)	150.00
CONTRACTOR-NAME	
DRILLER-NAME	
PROPERTY	WILLIAM INGLIS & SON LIMITED
GWMA	-
GW-ZONE	-
STANDING-WATER-LEVEL	16.50
SALINITY	100.00
YIELD	0.50

Site Details (top)

REGION	10 - SYDNEY SOUTH COAST
RIVER-BASIN	
AREA-DISTRICT	
CMA-MAP	
GRID-ZONE	
SCALE	
ELEVATION	
ELEVATION-SOURCE	
NORTHING	6244976.00
EASTING	336979.00
LATITUDE	33 55' 23"
LONGITUDE	151 14' 11"
GS-MAP	

AMG-ZONE	56
COORD-SOURCE	
REMARK	

Form-A (top)

COUNTY	CUMBERLAND
PARISH	ALEXANORIA
PORTION-LOT-DP	3 1102370

Licensed (top)

COUNTY	CUMBERLAND
PARISH	ALEXANDRIA
PORTION-LOT-DP	3 1102370

Construction (top)

Negative depths indicate Above Ground Level;H-Hole;P-Pipe;OD-Outside Diameter; ID-Inside Diameter;C-Cemented;SL-Slot Length;A-Aperture;GS-Grain Size;Q-Quantity

HOLE-NO	PIPE-NO	COMPONENT-CODE	COMPONENT-TYPE	DEPTH-FROM (metres)	DEPTH-TO (metres)	OD (mm)	ID (mm)	INTERVAL	DETAIL
1		Hole	Hole	0.00	18.00	200			Down Hole Hammer
1		Hole	Hole	18.00	150.00	161			Down Hole Hammer
1	1	Casing	PVC Class 9	-0.30	24.00	160	148		Riveted and Glued; Driven into Hole

Water Bearing Zones (top)

FROM-DEPTH (metres)	TO-DEPTH (metres)	THICKNESS (metres)	ROCK-CAT-DESC	S-W-L	D-D-L	YIELD	TEST-HOLE-DEPTH (metres)	DURATION	SALINITY
58.00	58.20	0.20		16.50		0.50			
122.00	122.10	0.10				0.60			
140.00	140.10	0.10				0.50		2.00	100.00

Drillers Log (top)

FROM	TO	THICKNESS	DESC	GEO-MATERIAL	COMMENT
0.00	0.50	0.50	TOPSOIL		
0.50	10.70	10.20	SAND COLOURED		
10.70	17.00	6.30	SOFT SANDSTONE		

E

17.00	150.00	133.00	HARD SANDSTONE

Groundwater Works Summary

For information on the meaning of fields please see Glossary
Document Generated on Wednesday, October 27, 2010

Print Report

Works Details Site Details Form A Licensed Construction Water Bearing Zones Drillers Log

Work Requested -- GW017851

Works Details (top)

GROUNDWATER NUMBER	GW017851
LIC-NUM	10BL008581
AUTHORISED-PURPOSES	COMMERCIAL
INTENDED-PURPOSES	COMMERCIAL
WORK-TYPE	Bore
WORK-STATUS	Supply Obtained
CONSTRUCTION-METHOD	Cable Tool
OWNER-TYPE	Private
COMMENCE-DATE	
COMPLETION-DATE	1958-03-01
FINAL-DEPTH (metres)	4.50
DRILLED-DEPTH (metres)	4.60
CONTRACTOR-NAME	
DRILLER-NAME	
PROPERTY	N/A
GWMA	603 - SYDNEY BASIN
GW-ZONE	-
STANDING-WATER-LEVEL	
SALINITY	
YIELD	

Site Details (top)

REGION	10 - SYDNEY SOUTH COAST
RIVER-BASIN	213 - SYDNEY COAST - GEORGES RIVER
AREA-DISTRICT	
CMA-MAP	9130-3S
GRID-ZONE	56/1
SCALE	1:25,000
ELEVATION	
ELEVATION-SOURCE	(Unknown)
NORTHING	6245131.00
EASTING	336929.00
LATITUDE	33 55' 18"
LONGITUDE	151 14' 9"
GS-MAP	0055A4

(F)

AMG-ZONE	56
COORD-SOURCE	GD.,PR. MAP
REMARK	

Form-A (top)

COUNTY	CUMBERLAND
PARISH	ALEXANDRIA
PORTION-LOT-DP	380

Licensed (top)

COUNTY	CUMBERLAND
PARISH	ALEXANDRIA
PORTION-LOT-DP	380

Construction (top)

Negative depths indicate Above Ground Level;H-Hole;P-Pipe;OD-Outside Diameter; ID-Inside Diameter;C-Cemented;SL-Slot Length;A-Aperture;GS-Grain Size;Q-Quantity

HOLE-NO	PIPE-NO	COMPONENT-CODE	COMPONENT-TYPE	DEPTH-FROM (metres)	DEPTH-TO (metres)	OD (mm)	ID (mm)	INTERVAL	DETAIL
1	1	Casing	(Unknown)	0.00	3.60	38			(Unknown)
1	1	Opening	Screen	3.60	4.50	0		1	Copper Alloy; SL: 0mm; A: 0mm

Water Bearing Zones (top)

FROM-DEPTH (metres)	TO-DEPTH (metres)	THICKNESS (metres)	ROCK-CAT-DESC	S-W-L	D-O-L	YIELD	TEST-HOLE-DEPTH (metres)	DURATION	SALINITY
3.00	3.90	0.90	Unconsolidated						(Unknown)

Drillers Log (top)

FROM	TO	THICKNESS	DESC	GEO-MATERIAL	COMMENT
0.00	4.57	4.57	Sand Water Supply		

Groundwater Works Summary

For information on the meaning of fields please see Glossary
Document Generated on Wednesday, October 27, 2010

Print Report

Works Details Site Details Form A Licensed Construction Water Bearing Zones Drillers Log

Work Requested -- GW110524

Works Details (top)

GROUNDWATER NUMBER	GW110524
LIC-NUM	10BL601622
AUTHORISED-PURPOSES	DOMESTIC
INTENDED-PURPOSES	DOMESTIC
WORK-TYPE	Bore
WORK-STATUS	
CONSTRUCTION-METHOD	
OWNER-TYPE	Private
COMMENCE-DATE	
COMPLETION-DATE	2009-11-18
FINAL-DEPTH (metres)	1.50
DRILLED-DEPTH (metres)	1.50
CONTRACTOR-NAME	
DRILLER-NAME	
PROPERTY	UTHAPPA
GWMA	-
GW-ZONE	-
STANDING-WATER-LEVEL	
SALINITY	
YIELD	

Site Details (top)

REGION	10 - SYDNEY SOUTH COAST
RIVER-BASIN	
AREA-DISTRICT	
CMA-MAP	
GRID-ZONE	
SCALE	
ELEVATION	
ELEVATION-SOURCE	
NORTHING	6245213.00
EASTING	336790.00
LATITUDE	33 55' 15"
LONGITUDE	151 14' 4"
GS-MAP	

AMG-ZONE	56
COORD-SOURCE	
REMARK	

Form-A (top)

COUNTY	CUMBERLAND
PARISH	ALEXANDRIA
PORTION-LOT-DP	1//310365

Licensed (top)

COUNTY	CUMBERLAND
PARISH	ALEXANDRIA
PORTION-LOT-DP	1 310365

Construction (top)

Negative depths indicate Above Ground Level;H-Hole;P-Pipe;OD-Outside Diameter;
ID-Inside Diameter;C-Cemented;SL-Slot Length;A-Aperture;GS-Grain Size;Q-Quantity

HOLE-NO	PIPE-NO	COMPONENT-CODE	COMPONENT-TYPE	DEPTH-FROM (metres)	DEPTH-TO (metres)	OD (mm)	ID (mm)	INTERVAL DETAIL
1		Hole	Hole	0.00	1.50	100		

Water Bearing Zones (top)

no details

Drillers Log (top)

FROM	TO	THICKNESS	DESC	GEO-MATERIAL	COMMENT
0.00	1.50	1.50		ROCK	

Groundwater Works Summary

For information on the meaning of fields please see Glossary
Document Generated on Wednesday, October 27, 2010

Print Report

Works Details Site Details Form A Licensed Construction Water Bearing Zones Drillers Log

Work Requested -- GW109679

Works Details (top)

GROUNDWATER NUMBER	GW109679
LIC-NUM	10BL602763
AUTHORISED-PURPOSES	GROUNDWATER REMEDIATION
INTENDED-PURPOSES	GROUNDWATER REMEDIATION
WORK-TYPE	Well
WORK-STATUS	
CONSTRUCTION-METHOD	Auger - Solid Flight
OWNER-TYPE	Private
COMMENCE-DATE	
COMPLETION-DATE	2008-10-13
FINAL-DEPTH (metres)	6.00
DRILLED-DEPTH (metres)	6.00
CONTRACTOR-NAME	
DRILLER-NAME	
PROPERTY	R G WITHERS NOMINEES P/L
GWMA	-
GW-ZONE	-
STANDING-WATER-LEVEL	
SALINITY	
YIELD	

Site Details (top)

REGION	10 - SYDNEY SOUTH COAST
RIVER-BASIN	
AREA-DISTRICT	
CMA-MAP	
GRID-ZONE	
SCALE	
ELEVATION	
ELEVATION-SOURCE	
NORTHING	6245214.00
EASTING	336903.00
LATITUDE	33 55' 15"
LONGITUDE	151 14' 8"
GS-MAP	

AMG-ZONE	56
COORD-SOURCE	
REMARK	

Form-A (top)

COUNTY	CUMBERLAND
PARISH	ALEXANDRIA
PORTION-LOT-DP	1//226586

Licensed (top)

COUNTY	CUMBERLAND
PARISH	ALEXANDRIA
PORTION-LOT-DP	1 226586

Construction (top)

Negative depths indicate Above Ground Level;H-Hole;P-Pipe;OD-Outside Diameter;
ID-Inside Diameter;C-Cemented;SL-Slot Length;A-Aperture;GS-Grain Size;Q-Quantity

HOLE-NO	PIPE-NO	COMPONENT-CODE	COMPONENT-TYPE	DEPTH-FROM (metres)	DEPTH-TO (metres)	OD (mm)	ID (mm)	INTERVAL	DETAIL
1		Hole	Hole	0.00	6.00	100			Auger - Solid Flight

Water Bearing Zones (top)

no details

Drillers Log (top)

FROM	TO	THICKNESS	DESC	GEO-MATERIAL	COMMENT
0.00	0.10	0.10	CONCRETE		
0.10	1.00	0.90	FILL, MOIST,SAND, GRAVEL		
1.00	4.00	3.00	SAND, MOIST GREY BROWN		
4.00	6.00	2.00	SANDSTONE,ORANGE BROWN		

Groundwater Works Summary

For information on the meaning of fields please see Glossary
Document Generated on Wednesday, October 27, 2010

Print Report

Works Details Site Details Form A Licensed Construction Water Bearing Zones Drillers Log

Work Requested -- GW109680

Works Details (top)

GROUNDWATER NUMBER	GW109680
LIC-NUM	10BL602763
AUTHORISED-PURPOSES	GROUNDWATER REMEDIATION
INTENDED-PURPOSES	GROUNDWATER REMEDIATION
WORK-TYPE	Well
WORK-STATUS	
CONSTRUCTION-METHOD	Auger - Solid Flight
OWNER-TYPE	Private
COMMENCE-DATE	
COMPLETION-DATE	2008-10-14
FINAL-DEPTH (metres)	5.50
DRILLED-DEPTH (metres)	5.50
CONTRACTOR-NAME	
DRILLER-NAME	
PROPERTY	R G WITHERS NOMINEES P/L
GWMA	-
GW-ZONE	-
STANDING-WATER-LEVEL	
SALINITY	
YIELD	

Site Details (top)

REGION	10 - SYDNEY SOUTH COAST
RIVER-BASIN	
AREA-DISTRICT	
CMA-MAP	
GRID-ZONE	
SCALE	
ELEVATION	
ELEVATION-SOURCE	
NORTHING	6245207.00
EASTING	336888.00
LATITUDE	33 55' 15"
LONGITUDE	151 14' 8"
GS-MAP	

AMG-ZONE	56
COORD-SOURCE	
REMARK	

Form-A (top)

COUNTY	CUMBERLAND
PARISH	ALEXANDRIA
PORTION-LOT-DP	1//226586

Licensed (top)

COUNTY	CUMBERLAND
PARISH	ALEXANDRIA
PORTION-LOT-DP	1 226586

Construction (top)

Negative depths indicate Above Ground Level;H-Hole;P-Pipe;OD-Outside Diameter; ID-Inside Diameter;C-Cemented;SL-Slot Length;A-Aperture;GS-Grain Size;Q-Quantity

HOLE-NO	PIPE-NO	COMPONENT-CODE	COMPONENT-TYPE	DEPTH-FROM (metres)	DEPTH-TO (metres)	OD (mm)	ID (mm)	INTERVAL	DETAIL
1		Hole	Hole	0.00	5.50	100			Auger - Solid Flight

Water Bearing Zones (top)

no details

Drillers Log (top)

FROM	TO	THICKNESS	DESC	GEO-MATERIAL	COMMENT
0.00	0.50	0.50	CONCRETE		
0.50	0.70	0.20	FILL,PALE,ORANGE		
0.70	1.50	0.80	SAND		
1.50	1.90	0.40	SANDSTONE		
1.90	3.90	2.00	SAND		
3.90	5.50	1.60	SANDSTONE,MOIST,PALE,GREY		

Groundwater Works Summary

For information on the meaning of fields please see Glossary
Document Generated on Wednesday, October 27, 2010

Print Report

Works Details Site Details Form A Licensed Construction Water Bearing Zones Drillers Log

Work Requested -- GW109681

Works Details (top)

GROUNDWATER NUMBER	GW109681
LIC-NUM	10BL602763
AUTHORISED-PURPOSES	GROUNDWATER REMEDIATION
INTENDED-PURPOSES	GROUNDWATER REMEDIATION
WORK-TYPE	Well
WORK-STATUS	
CONSTRUCTION-METHOD	Auger - Solid Flight
OWNER-TYPE	Private
COMMENCE-DATE	
COMPLETION-DATE	2008-10-13
FINAL-DEPTH (metres)	6.00
DRILLED-DEPTH (metres)	6.00
CONTRACTOR-NAME	
DRILLER-NAME	
PROPERTY	R G WITHERS NOMINEES P/L
GWMA	-
GW-ZONE	-
STANDING-WATER-LEVEL	
SALINITY	
YIELD	

Site Details (top)

REGION	10 - SYDNEY SOUTH COAST
RIVER-BASIN	
AREA-DISTRICT	
CMA-MAP	
GRID-ZONE	
SCALE	
ELEVATION	
ELEVATION-SOURCE	
NORTHING	6245198.00
EASTING	336894.00
LATITUDE	33 55' 16"
LONGITUDE	151 14' 8"
GS-MAP	

AMG-ZONE	56
COORD-SOURCE	
REMARK	

Form-A (top)

COUNTY	CUMBERLAND
PARISH	ALEXANDRIA
PORTION-LOT-DP	1//226586

Licensed (top)

COUNTY	CUMBERLAND
PARISH	ALEXANDRIA
PORTION-LOT-DP	1 226586

Construction (top)

Negative depths indicate Above Ground Level;H-Hole;P-Pipe;OD-Outside Diameter; ID-Inside Diameter;C-Cemented;SL-Slot Length;A-Aperture;GS-Grain Size;Q-Quantity

HOLE-NO	PIPE-NO	COMPONENT-CODE	COMPONENT-TYPE	DEPTH-FROM (metres)	DEPTH-TO (metres)	OD (mm)	ID (mm)	INTERVAL	DETAIL
1		Hole	Hole	0.00	6.00	100			Auger - Solid Flight

Water Bearing Zones (top)

no details

Drillers Log (top)

FROM	TO	THICKNESS	DESC	GEO-MATERIAL	COMMENT
0.00	1.00	1.00	CONCRETE,FILL,MOIST ORANGE		
1.00	1.30	0.30	SAND		
1.30	2.10	0.80	SANDSTONE,MOIST,DARK		
2.10	3.50	1.40	SAND,WET,PALE		
3.50	6.00	2.50	SANDSTONE,SLIGHLY MOIST,WEATHERED		

(Site History Documents – Historical Land Title Records)

VB

17 SEP 2010

ADVANCE LEGAL SEARCH PTY LIMITED

(ACN 077 067 068)
ABN 49 077 067 068

PO Box 149
Yagoona NSW 2199

Telephone: +612 9754 1590
Mobile: 0412 169 809
Facsimile: +612 9754 1364
Email: alsearch@optusnet.com.au

16th September, 2010

ENVIRONMENTAL INVESTIGATION SERVICES
PO Box 976,
NORTH RYDE BC NSW **1670**

Attention: Vittal Boggaram,

RE: **220 Avoca Street,**
Randwick
Job No. E24287KB

Note search over Lot 1 DP 870720 is for subject site area.

Current Search

Folio Identifier 1/870720 (title attached)
DP 870720 (plan attached)
Dated 12th September, 2010
Registered Proprietor:
SOUTH EASTERN SYDNEY AND ILLAWARRA AREA HEALTH SERVICES

Title Tree
Lot 1 DP 870720

Folio Identifier 1/870720

PA 65300

Government Gazette 15th October 1997 Fol 8559 & 8560

Vested in the Crown by the Destitute Children Society (vesting) Act No 82, 1916

Government Gazette 02nd July 1863

Special Grant Registrar No 3 Pages 170 & 176

****

Summary of Proprietor(s)
Lot 1 DP 870720

Year	Proprietor
	(Lot 1 DP 870720)
2005 – todate	South Eastern Sydney and Illawarra Area Health Services
(1998 – todate)	*(various current commercial leases see Folio Identifier 1/870720)*
1997 – 2005	South Eastern Sydney Area Health Service
(1997 – todate)	*(various commercial leases see Historical Folio 1/870720)*
	(Portions 401, 1483 & 1485 Parish Alexandria – PA 65300)
1997 – 1997	South Eastern Sydney Area Health Services
	(Portion 401 Parish Alexandria – Area 31 Acres 3 Roods 38 Perches)
1916 – 1997	Crown Land
(1947 – 1997)	*(Dedicated to The Prince of Wales Repatriation Hospital)*
(1915 – 1947)	*(Requisition by Commonwealth for Hospital & Convalescent accommodation)*
	(Portion 401 Parish Alexandria – Area 31 Acres 3 Roods 38 Perches – Special Grant Registrar No 3 Pages 170 & 176)
1863 – 1916	Destitute Children's Society

****

Land & Property Management Authority
Land & Property Information

Cadastral Records Enquiry Report

Ref : BOX 97 - RANDWICK

Requested Parcel : Lot 1 DP 870720

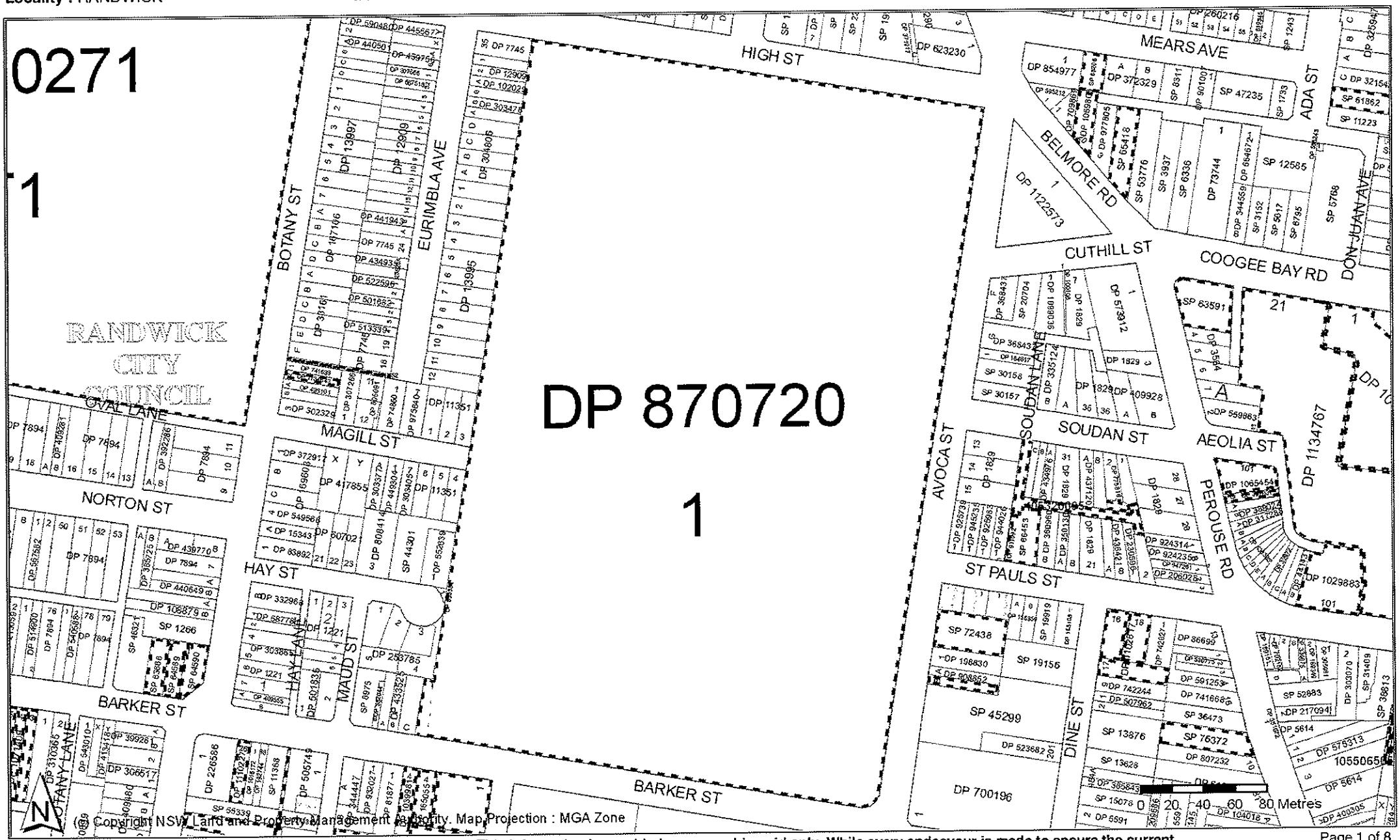
Identified Parcel : Lot 1 DP 870720

Locality : RANDWICK

LGA : RANDWICK

Parish : ALEXANDRIA

County : CUMBERLAND



Report Generated 1:00:30 PM, 13 September, 2010

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.

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - TITLE SEARCH

FOLIO: 1/870720

SEARCH DATE	TIME	EDITION NO	DATE
13/9/2010	11:07 AM	20	9/7/2009

LAND

LOT 1 IN DEPOSITED PLAN 870720
AT RANDWICK
LOCAL GOVERNMENT AREA RANDWICK
PARISH OF ALEXANDRIA COUNTY OF CUMBERLAND
TITLE DIAGRAM DP870720

FIRST SCHEDULE

SOUTH EASTERN SYDNEY AND ILLAWARRA AREA HEALTH SERVICE (CN AB587329)

SECOND SCHEDULE (19 NOTIFICATIONS)

1 F32574 EASEMENT FOR OVERHANGING EAVES & GUTTERING APPURTENANT TO THE PART OF THE LAND ABOVE DESCRIBED COMPRISED IN D/433525 AFFECTING THE LAND SHOWN AS 8 INCH EAVES & GUTTERING 41 FEET 4 INCHES LONG WITHIN LOT C IN DP433525

2 5313850 LEASE TO MAYNE NICKLESS LIMITED OF THE PART OF LEVELS 5,6 & 7 SHOWN HATCHED IN PLAN WITH 5313850. EXPIRES: 20/10/2037.

- 8143877 LEASE OF LEASE 5313850 TO BENATHON PTY LIMITED OF SUITE 11, LEVEL 7, PRINCE OF WALES PRIVATE HOSPITAL, BARKER ST, RANDWICK SHOWN HATCHED IN PLAN (PAGE 57) WITH 8143877. EXPIRES: 29/8/2004. OPTION OF RENEWAL: 5 YEARS.
- AA640499 CHANGE OF NAME AFFECTING LEASE 5313850 LESSEE NOW MAYNE GROUP LIMITED
- AA932356 LEASE OF LEASE 5313850 TO MARK GIANOUTSOS OF SUITE 1 , LEVEL 7, AT PRINCE OF WALES PRIVATE HOSPITAL, BARKER ST. RANDWICK. EXPIRES: 17/5/2008. OPTION OF RENEWAL: 5 YEARS.
- AB388731 LEASE OF LEASE 5313850 TO GNATHIC PTY LTD OF SUITE 21, LEVEL 7, PRINCE OF WALES PRIVATE HOSPITAL, BARKER STREET, RANDWICK. EXPIRES: 15/1/2008.
- AB524526 TRANSFER OF LEASE 5313850 LESSEE NOW P. O. W. HOSPITAL PTY LIMITED
- AB524527 VARIATION OF LEASE 5313850
- AB524528 MORTGAGE OF LEASE 5313850 TO SOUTH EASTERN SYDNEY AND ILLAWARRA AREA HEALTH SERVICE
- AB524529 LEASE OF LEASE 5313850 TO SOUTH EASTERN SYDNEY

END OF PAGE 1 - CONTINUED OVER

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - TITLE SEARCH

FOLIO: 1/870720 PAGE 2

SECOND SCHEDULE (19 NOTIFICATIONS) (CONTINUED)

AND ILLAWARRA AREA HEALTH SERVICE OF SUITE 28, LEVEL 7, CAMPUS CENTRE BUILDING, PRINCE OF WALES HOSPITAL, BARKER STREET, RANDWICK. EXPIRES: 17/4/2010. OPTION OF RENEWAL: 5 YEARS.

AC751481 VARIATION OF MORTGAGE AB524528

AC751482 VARIATION OF LEASE 5313850

AC954958 LEASE OF LEASE 5313850 TO MARLAW PTY LIMITED, WEACH PTY LIMITED & GARRY BUCKLAND OF SUITE 8, LEVEL 7, PRINCE OF WALES PRIVATE HOSPITAL, BARKER STREET, RANDWICK. EXPIRES: 31/10/2010. OPTION OF RENEWAL: 2 YEARS.

AD470476 LEASE OF LEASE 5313850 TO SYDNEY COLORECTAL ASSOCIATES PTY LIMITED OF SUITES 17 & 19, LEVEL 7, PRINCE OF WALES PRIVATE HOSPITAL, BARKER STREET RANDWICK. EXPIRES: 30/11/2010. OPTION OF RENEWAL: 3 YEARS WITH A FURTHER 2 YEAR OPTION.

AD635175 LEASE OF LEASE 5313850 TO HUDSONS LATROBE PTY LIMITED OF CAFE, LEVEL 7, PRINCE OF WALES PRIVATE HOSPITAL, 149 BARKER STREET, RANDWICK. EXPIRES: 19/11/2009. OPTION OF RENEWAL: 3 YEARS (WITH A FURTHER OPTION OF 4 YEARS).

AE39754 LEASE OF LEASE 5313850 TO CHARLES TEO OF SUITE 3, LEVEL 7, PRINCE OF WALES PRIVATE HOSPITAL, 149 BARKER STREET RANDWICK. EXPIRES: 31/3/2013.

AE78315 LEASE OF LEASE 5313850 TO ENNACOMBE PTY LIMITED & BOBBY CHOON KERN TEOH OF SUITE 25, LEVEL 7, PRINCE OF WALES PRIVATE HOSPITAL, 149 BARKER ST, RANDWICK. EXPIRES: 26/11/2010.

AE97174 LEASE OF LEASE 5313850 TO KIRSTEN AMANDA BOYCE & SAMANTHA GREAVES OF LEVEL 6, FOYER PHARMACY, PRINCE OF WALES PRIVATE HOSPITAL, 149 BARKER ST, RANDWICK. EXPIRES: 30/9/2012.

AE113584 LEASE OF LEASE 5313850 TO THE CHEST & SLEEP CENTRE PTY. LIMITED OF SUITE 20, LEVEL 7, PRINCE OF WALES PRIVATE HOSPITAL, 149 BARKER STREET, RANDWICK. EXPIRES: 30/4/2013.

AE157046 LEASE OF LEASE 5313850 TO ROBERT HOUSLEY FARNSWORTH & EVELYN MARGARET GOODISON-FARNSWORTH OF SUITE 7, LEVEL 7, PRINCE OF WALES PRIVATE HOSPITAL, 149 BARKER STREET, RANDWICK. EXPIRES: 31/5/2011.

AE118506 LEASE OF LEASE 5313850 TO DAVID THOMPSON PTY LTD OF SUITE 9, LEVEL 7, PRINCE OF WALES PRIVATE HOSPITAL, 149 BARKER STREET, RANDWICK. EXPIRES: 17/2/2011.

AE138227 LEASE OF LEASE 5313850 TO W A STENNING PTY LTD & MARC DOMINIC COUGHLAN OF SUITE 13, LEVEL 7, PRINCE

END OF PAGE 2 - CONTINUED OVER

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LAND AND PROPERTY INFORMATION NEW SOUTH WALES - TITLE SEARCH

FOLIO: 1/870720 PAGE 3

SECOND SCHEDULE (19 NOTIFICATIONS) (CONTINUED)

OF WALES PRIVATE HOSPITAL, 149 BARKER STREET, RANDWICK. EXPIRES: 6/4/2011.

AE164506 LEASE OF LEASE 5313850 TO COLIN PETER CAMPBELL & HOWARD WILLIAM CHILTON OF SUITE 16, LEVEL 7, PRINCE OF WALES PRIVATE HOSPITAL, 149 BARKER STREET, RANDWICK. EXPIRES: 15/4/2011. OPTION OF RENEWAL: 2 YEARS.

AE186228 LEASE OF LEASE 5313850 TO ECROAX PTY LTD OF SUITE 10, LEVEL 7, PRINCE OF WALES PRIVATE HOSPITAL, 149 BARKER STREET, RANDWICK. EXPIRES: 20/11/2010. OPTION OF RENEWAL: 2 YEARS.

AE186558 LEASE OF LEASE 5313850 TO DALLTIN PTY LIMITED OF SUITE 15, LEVEL 7, PRINCE OF WALES PRIVATE HOSPITAL, 149 BARKER STREET, RANDWICK. EXPIRES: 15/11/2012.

AE239585 LEASE OF LEASE 5313850 TO ALISTAIR CAMERON-STRANGE, STUART RICHARD EHSMAN & RICHARD JOHN MILLARD OF SUITE 23, LEVEL 7, PRINCE OF WALES PRIVATE HOSPITAL, 149 BARKER STREET, RANDWICK. EXPIRES: 2/5/2011. OPTION OF RENEWAL: 2 YEARS.

AE342965 LEASE OF LEASE 5313850 TO AAA MEDICAL MANAGEMENT PTY LTD OF SUITE 26, LEVEL 7, PRINCE OF WALES PRIVATE HOSPITAL, 149 BARKER STREET, RANDWICK SHOWN HATCHED IN PLAN WITH AE342965. EXPIRES: 17/5/2013.

AE346967 LEASE OF LEASE 5313850 TO WALES CARDIOLOGY PTY LIMITED OF SUITES 5 & 6, LEVEL 7, PRINCE OF WALES PRIVATE HOSPITAL, 149 BARKER STREET, RANDWICK SHOWN CROSSHATCHED IN PLAN WITH AE346967. EXPIRES: 12/4/2013.

AE452273 LEASE OF LEASE 5313850 TO G. H. M. R. PTY LIMITED OF SUITE 24, LEVEL 7, PRINCE OF WALES PRIVATE HOSPITAL, 149 BARKER STREET, RANDWICK SHOWN HATCHED IN PLAN WITH AE452273. EXPIRES: 19/11/2011.

* AF450176 LEASE OF LEASE 5313850 TO LUCY BOWYER SUITE 30, LEVEL 7, PRINCE OF WALES PRIVATE HOSPITAL, 149 BARKER STREET, RANDWICK. EXPIRES: 13/12/2012. OPTION OF RENEWAL: 3 YEARS.

* AF554027 LEASE OF LEASE 5313850 TO DENDRAVA PTY LIMITED & HAWKE COOGAN PTY LIMITED OF SUITE 2, LEVEL 7, PRINCE OF WALES PRIVATE HOSPITAL, 149 BARKER STREET, RANDWICK. EXPIRES: 16/11/2012. OPTION OF RENEWAL: 3 YEARS.

3 5360419 LEASE TO GLAXO WELLCOME AUSTRALIA LTD OF WARD PARKES 10 EAST, PRINCE OF WALES HOSPITAL, HIGH ST, RANDWICK & ROOMS GWA 1, 2 & 3. EXPIRES: 6/9/2008. OPTION OF

RENEWAL: 2 OPTIONS OF 5 YEARS.

END OF PAGE 3 - CONTINUED OVER

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LAND AND PROPERTY INFORMATION NEW SOUTH WALES - TITLE SEARCH

FOLIO: 1/870720 PAGE 4

SECOND SCHEDULE (19 NOTIFICATIONS) (CONTINUED)

4	7458603	LEASE TO POWMRI LIMITED OF VILLAS 1 AND 2, RANDWICK HOSPITALS CAMPUS. BARKER STREET, RANDWICK. EXPIRES: 30/6/2025. OPTION OF RENEWAL: 25 YEARS.
5	8317684	LEASE TO PETER S WARREN PTY LIMITED & GLENN R MCNALLY PTY LIMITED OF UNIT 10, ULTRASOUND FACILITY, RANDWICK HOSPITALS CAMPUS RETAIL COMPLEX, CORNER BARKER STREET & AVOCA STREET, RANDWICK. EXPIRES: 31/12/2005. OPTION OF RENEWAL: 5 YEARS.
	9489324	TRANSFER OF LEASE 8317684 LESSEE NOW HEALTHCARE IMAGING SERVICES PTY LIMITED
	9489325	VARIATION OF LEASE 8317684
6	DP1044128	RESTRICTION(S) ON THE USE OF LAND
7	DP1044128	POSITIVE COVENANT
8	AA801175	LEASE TO EASTERN HEART CLINIC PTY LIMITED OF SUITE 1, LEVEL 3, CAMPUS CENTRE, PRINCE OF WALES HOSPITAL, HIGH STREET, RANDWICK. EXPIRES: 31/5/2009. OPTION OF RENEWAL: 5 YEARS.
9	AB395673	LEASE TO ROYAL HOSPITAL FOR WOMEN FOUNDATION OF SHOP 1, FOUNDATION COFFEE SHOP, RANDWICK HOSPITALS CAMPUS RETAIL COMPLEX, CNR BARKER & AVOCA STREETS, RANDWICK. EXPIRES: 30/4/2008.
	AB967760	LEASE OF LEASE AB395673 TO TOTAL AMBITION PTY LIMITED OF SHOP 1, RANDWICK HOSPITAL'S CAMPUS RETAIL COMPLEX, CNR BARKER STREET & AVOCA STREET, RANDWICK. EXPIRES: 29/4/2008.
10	AB395674	LEASE TO ROYAL HOSPITAL FOR WOMEN FOUNDATION OF SHOP 2, FOUNDATION BABY SHOP, RANDWICK HOSPITALS CAMPUS RETAIL COMPLEX, CNR BARKER & AVOCA STREETS, RANDWICK. EXPIRES: 30/4/2008.
	AB967761	LEASE OF LEASE AB395674 TO TOTAL AMBITION PTY LIMITED OF SHOP 2, RANDWICK HOSPITAL'S CAMPUS RETAILS COMPLEX, CNR BARKER STREET & AVOCA STREET, RANDWICK. EXPIRES: 29/4/2008.
* 11	AD122511	CAVEAT BY VODAFONE NETWORK PTY LIMITED AFFECTING THE PART SHOWN HATCHED IN PLAN WITH AD122511
* 12	AD294243	CAVEAT BY OPTUS MOBILE PTY LIMITED OF PART OF THE ROOFTOP OF VERA ADDERLEY BUILDING, RANDWICK HOSPITAL CAMPUS, BARKER STREET, RANDWICK SHOWN HATCHED IN PLAN WITH AD294243
13	AD937968	LEASE TO POWCH HOUSE INC. OF 'RONALD MCDONALD HOUSE' RANDWICK HOSPITALS CAMPUS,149 BARKER STREET, RANDWICK. EXPIRES: 31/12/2012.

14 AD937969 LEASE TO POWCH HOUSE INC. OF 'RONALD MCDONALD HOUSE' RANDWICK HOSPITALS CAMPUS,149 BARKER STREET, RANDWICK, COMMENCING DATE 1/1/2013.. EXPIRES: 31/12/2017.

15 AD937970 LEASE TO POWCH HOUSE INC. OF 'RONALD MCDONALD HOUSE'

END OF PAGE 4 - CONTINUED OVER

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LAND AND PROPERTY INFORMATION NEW SOUTH WALES - TITLE SEARCH

FOLIO: 1/870720 PAGE 5

SECOND SCHEDULE (19 NOTIFICATIONS) (CONTINUED)

RANDWICK HOSPITALS CAMPUS,149 BARKER STREET, RANDWICK, COMMENCING DATE 1/1/2018.. EXPIRES: 31/12/2022.

16 AD937971 LEASE TO POWCH HOUSE INC. OF 'RONALD MCDONALD HOUSE' RANDWICK HOSPITALS CAMPUS,149 BARKER STREET, RANDWICK, COMMENCING DATE 1/1/2023.. EXPIRES: 31/12/2027.

17 AD937972 LEASE TO POWCH HOUSE INC. OF 'RONALD MCDONALD HOUSE' RANDWICK HOSPITALS CAMPUS,149 BARKER STREET, RANDWICK, COMMENCING DATE 1/1/2028.. EXPIRES: 31/12/2032.

18 AE460065 LEASE TO TELSTRA CORPORATION LIMITED OF THE AREA SHOWN HATCHED IN PLAN WITH AE460065. EXPIRES: 28/2/2013. OPTION OF RENEWAL: 5 YEARS WITH 2 FURTHER OPTIONS OF 5 YEARS EACH.

19 AE681663 LEASE TO THE PRINCE OF WALES HOSPITAL FOUNDATION LIMITED OF SHOP 8, GROUND FLOOR, CAMPUS CENTRE, PRINCE OF WALES HOSPITAL, BARKER ST, RANDWICK. EXPIRES: 30/11/2011. OPTION OF RENEWAL: 3 YEARS.

NOTATIONS

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - HISTORICAL SEARCH

SEARCH DATE
13/9/2010 11:16AM

FOLIO: 1/870720

First Title(s): OLD SYSTEM
Prior Title(s): D/433525 PA65300

Recorded	Number	Type of Instrument	C.T. Issue
11/9/1997	DP870720	DEPOSITED PLAN	LOT RECORDED FOLIO NOT CREATED
1/12/1997	PA65300	PRIMARY APPLICATION	FOLIO CREATED EDITION 1
24/7/1998	5151009	LEASE	
24/7/1998	5151010	LEASE	
24/7/1998	5151011	LEASE	EDITION 2
17/8/1998	5202706	CAVEAT	
16/9/1998	5269985	LEASE	EDITION 3
28/9/1998	5278502	LEASE	EDITION 4
13/10/1998	5313850	LEASE	EDITION 5
2/11/1998	5360419	LEASE	EDITION 6
15/9/1999	6073649	LEASE	EDITION 7
9/11/2000	7209514	DEPARTMENTAL DEALING	
1/12/2000	7171166	SUB-LEASE	
1/12/2000	7171167	SUB-LEASE	
1/12/2000	7171168	SUB-LEASE	
1/12/2000	7171169	SUB-LEASE	
1/12/2000	7171170	SUB-LEASE	
1/12/2000	7171171	SUB-LEASE	
1/12/2000	7171172	SUB-LEASE	
1/12/2000	7171173	SUB-LEASE	
1/12/2000	7171174	SUB-LEASE	
1/12/2000	7171175	SUB-LEASE	
1/12/2000	7171176	SUB-LEASE	
1/12/2000	7171177	SUB-LEASE	
1/12/2000	7171178	SUB-LEASE	
6/3/2001	7455917	DEPT DEALING TO UPLIFT CT	EDITION 8

END OF PAGE 1 - CONTINUED OVER

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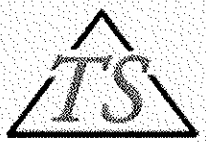

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - HISTORICAL SEARCH

SEARCH DATE
13/9/2010 11:16AM

FOLIO: 1/870720 PAGE 2

Recorded	Number	Type of Instrument	C.T. Issue
9/3/2001	7458603	LEASE	EDITION 9
2/4/2001	7398271	TRANSFER OF LEASE	
4/5/2001	7584262	VARIATION OF LEASE	
18/5/2001	7623402	LEASE	
18/5/2001	7623403	LEASE	EDITION 10
10/8/2001	7843774	SUB-LEASE	
12/10/2001	7901712	SUB-LEASE	
22/10/2001	8043305	SUB-LEASE	
15/11/2001	8117500	SUB-LEASE	
19/12/2001	8143877	SUB-LEASE	
19/12/2001	8200179	SUB-LEASE	
31/1/2002	8317684	LEASE	EDITION 11
24/6/2002	8634780	SUB-LEASE	
22/11/2002	DP1044128	DEPOSITED PLAN	EDITION 12
17/1/2003	9046247	WITHDRAWN - SUB-LEASE	
28/3/2003	9489324	TRANSFER OF LEASE	
28/3/2003	9489325	VARIATION OF LEASE	
5/3/2004	AA470525	SUB-LEASE	
5/3/2004	AA470526	SUB-LEASE	
5/3/2004	AA470527	SUB-LEASE	EDITION 13
17/5/2004	AA640499	CHANGE OF NAME	
17/5/2004	AA527989	SUB-LEASE	
17/5/2004	AA527990	SUB-LEASE	
17/5/2004	AA527991	SUB-LEASE	
17/5/2004	AA527992	SUB-LEASE	
17/5/2004	AA527993	SUB-LEASE	
17/5/2004	AA527994	SUB-LEASE	
17/5/2004	AA527995	SUB-LEASE	EDITION 14

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LAND AND PROPERTY INFORMATION NEW SOUTH WALES - HISTORICAL SEARCH

SEARCH DATE
13/9/2010 11:16AM

FOLIO: 1/870720 PAGE 3

Recorded	Number	Type of Instrument	C.T. Issue
15/7/2004	AA801175	LEASE	EDITION 15
16/9/2004	AA932355	SUB-LEASE	
16/9/2004	AA932356	SUB-LEASE	
7/4/2005	AB395673	LEASE	
7/4/2005	AB395674	LEASE	
28/6/2005	AB388730	WITHDRAWN - SUB-LEASE	
28/6/2005	AB388734	WITHDRAWN - SUB-LEASE	
18/7/2005	AB388731	SUB-LEASE	
18/7/2005	AB388732	SUB-LEASE	
18/7/2005	AB388733	SUB-LEASE	
18/7/2005	AB524526	TRANSFER OF LEASE	
18/7/2005	AB587329	CHANGE OF NAME	
18/7/2005	AB524527	VARIATION OF LEASE	
18/7/2005	AB524528	MORTGAGE OF LEASE	
18/7/2005	AB524529	SUB-LEASE	EDITION 16
7/12/2005	AB967760	SUB-LEASE	
7/12/2005	AB967761	SUB-LEASE	
21/11/2006	AC751481	VARIATION OF MORTGAGE	
21/11/2006	AC751482	VARIATION OF LEASE	
22/2/2007	AC954958	SUB-LEASE	
21/5/2007	AD122511	CAVEAT	
20/8/2007	AD294243	CAVEAT	
9/10/2007	AD470476	SUB-LEASE	
21/11/2007	AD473922	CAVEAT	
27/2/2008	AD635175	SUB-LEASE	
1/5/2008	AD922405	APPLN FOR REPLACEMENT CT	EDITION 17
9/5/2008	AD937968	LEASE	
9/5/2008	AD937969	LEASE	

9/5/2008 AD937970 LEASE

END OF PAGE 3 - CONTINUED OVER

EIS - Randwick PRINTED ON 13/9/2010

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - HISTORICAL SEARCH

SEARCH DATE
13/9/2010 11:16AM

FOLIO: 1/870720 PAGE 4

Recorded	Number	Type of Instrument	C.T. Issue
9/5/2008	AD937971	LEASE	
9/5/2008	AD937972	LEASE	EDITION 18
7/7/2008	AE39754	SUB-LEASE	
9/7/2008	AE78315	SUB-LEASE	
22/7/2008	AE97174	SUB-LEASE	
29/7/2008	AE113584	SUB-LEASE	
2/9/2008	AE157046	SUB-LEASE	
17/9/2008	AE118506	SUB-LEASE	
17/9/2008	AE138227	SUB-LEASE	
17/9/2008	AE164506	SUB-LEASE	
17/9/2008	AE186228	SUB-LEASE	
17/9/2008	AE186558	SUB-LEASE	
29/9/2008	AE239585	SUB-LEASE	
14/1/2009	AE342965	SUB-LEASE	
14/1/2009	AE346967	SUB-LEASE	
22/1/2009	AE449679	DEPARTMENTAL DEALING	
4/2/2009	AE452273	SUB-LEASE	
16/2/2009	AE460065	LEASE	EDITION 19
9/7/2009	AE681663	LEASE	EDITION 20
23/4/2010	AF450176	SUB-LEASE	
15/6/2010	AF554027	SUB-LEASE	

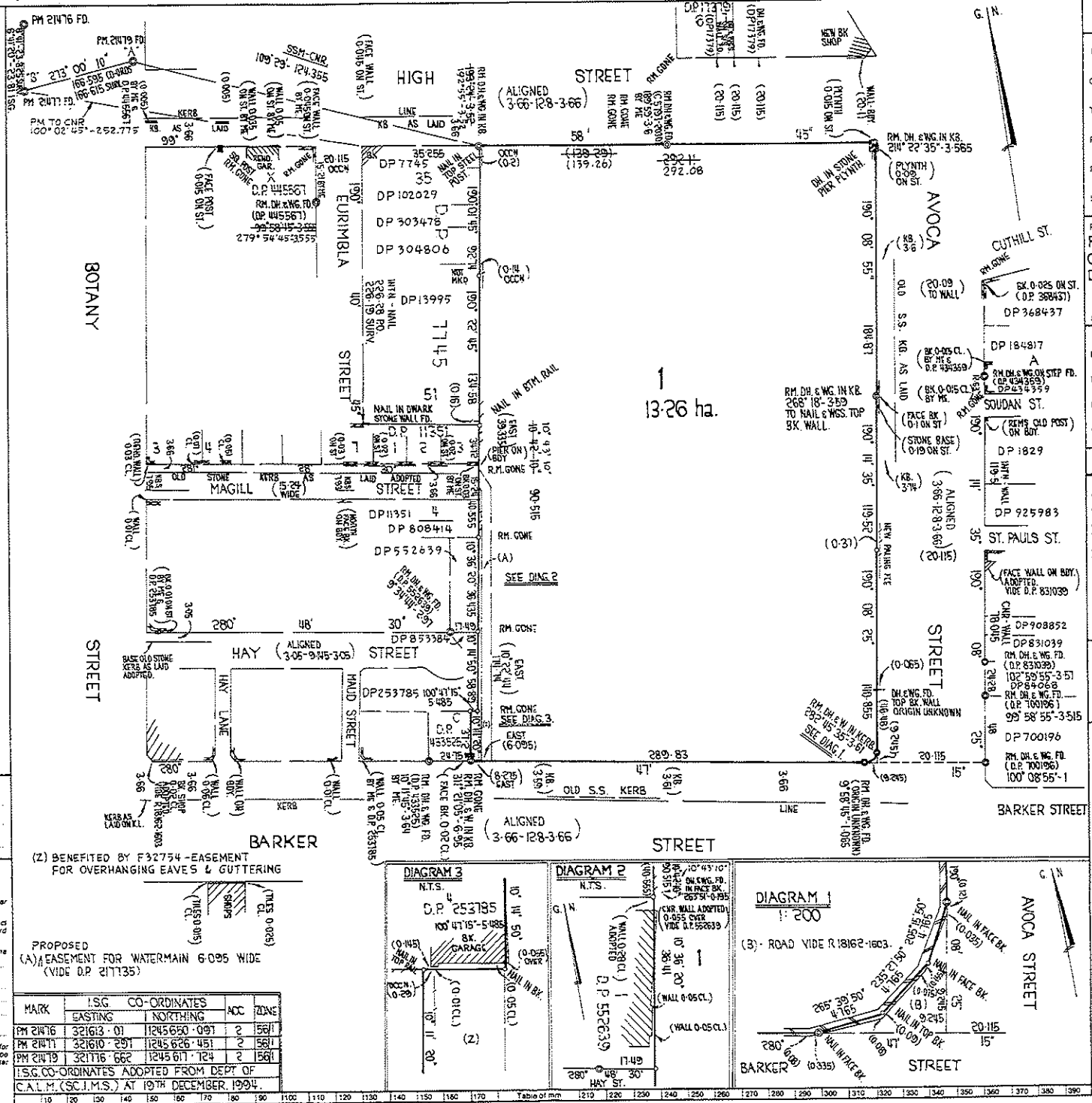
*** END OF SEARCH ***

PLAN FORM 2

Plan Drawing only to appear in this space

*OFFICE USE ONLY

SIGNATURE AND SEALS ONLY



MARK	I.S.G. CO-ORDINATES EASTING	NORTHING	ACC	ZONE
PM 21476	321613·01	6245650·091	2	56
PM 21477	321610·291	6245626·451	2	56
PM 21479	321716·662	6245617·124	2	56

I.S.G. CO-ORDINATES ADOPTED FROM DEPT OF C.A.L.M. (SC.I.M.S.) AT 10TH DECEMBER 1994.

Table of mm

WARNING: CREASING OR FOLDING WILL LEAD TO REJECTION

SURVEYOR'S REFERENCE 93/0831/1" CHECK LIST"

MPD

DP 870720 (E)

Registered 11·9·1997

CA

Title System TORRENS & CROWN LAND

Purpose ACQUISITION

Ref Map RANDWICK SH 53*

Last Plan DP433525, C636.690, C5797.2030, C6236.2030

PLAN OF POR 401, C 636-690 POR 1483 C 5797-2030, POR1485 C 6236-2030 AND LOT D D.P. 433525.

Lengths are in metres Reduction Ratio 1: 2000

LGA RANDWICK

Locality: RANDWICK

Parish: ALEXANDRIA

County: CUMBERLAND

This is sheet 1 of my plan in sheets (Delete if inapplicable)

I, ROBERT VAN DER TYPEN

of P.O. BOX 508, SUTHERLAND, 2232.

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 in accordance with the Survey Practice Regulation 1990 and was completed on

11TH JANUARY, 1995

Signature

Surveyor registered under Surveyors Act 1929 as amended

Datum Line of Azimuth "A" - "B"

Plans used in preparation of survey/compilation

D.P. 409938, D.P. 434359, D.P. 433525, D.P. 445561, D.P. 368437, D.P. 217135, D.P. 17319, D.P. 84068, D.P. 552639, D.P. 831039, R18162-1603, D.P. 7745, D.P. 700196, D.P. 253785, D.P. 11351.

PANEL FOR USE ONLY for statements of intention to dedicate public roads, to create public reserves, drainage reserves, easements, restrictions on the use of land or positive covenants.

Crown Lands Office Approval

PLAN APPROVED ..... Authorised Officer

Land District .....

Paper No. .....

Field Book ..... pages .....

Council'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 † Part 3 Division 2 of the Water Board Act 1997, or † Part 5 Division 7 of the Hunter Water Board (Corporatisation) Act 1991,

have been complied with by the applicant in relation to the proposed ..... (insert "new road", "subdivision" or "consolidation (cr)" set out hereon)

Subdivision No. .....

Date .....

(Signature) ..... General Manager/Authorised Person

Council File No. .....

†This part of certificate to be deleted where the application is only for a consolidation lot or the opening of a new road or where the land to be subdivided is wholly outside the areas of operations of the Water Board and the Hunter Water Corporation Ltd.

†Delete if inapplicable

DP 870720

(Site History Documents – Section 149 (2) and (5) Certificates)

PLANNING CERTIFICATE

23 SEP 2010

ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979

ABN 77 362 844 121

Randwick City Council
a sense of community

DATE OF CERTIFICATE	22-Sep-2010
CERTIFICATE no.	23263
ASSESSMENT no.	33113
RECEIPT no.	2590912
AMOUNT	100.00

E24287KB

Jeffery & Katauskas Pty Ltd
PO Box 976
NORTH RYDE BC NSW 1670

Description of land

Address: **61 High Street, RANDWICK NSW 2031**

Property Description: **LOT 1 DP 870720 & DP 1044128 FOR RESTRICTION OF USE**, Cumberland

In accordance with the requirements of Section 149 of the Environmental Planning and Assessment Act 1979 (as amended), the following prescribed matters relate to the land at the date of this certificate.

INFORMATION PROVIDED UNDER SECTION 149 (2)

1 Names of relevant planning instruments and DCPs

(1) The name of each environmental planning instrument that applies to the carrying out of development on the land.
(2) The name of each proposed environmental planning instrument that will apply to the carrying out of development on the land and that is or has been the subject of community consultation or on public exhibition under the Act (unless the Director-General has notified the council that the making of the proposed instrument has been deferred indefinitely or has not been approved).
(3) The name of each development control plan that applies to the carrying out of development on the land.
(4) In this clause, proposed environmental planning instrument includes a planning proposal for a LEP or a draft environmental planning instrument

Response

(1) Randwick Local Environmental Plan 1998 (Consolidation) gazetted on 15 January 2010, and relevant State Environmental Planning Policies (SEPPs) applies to the land.Refer to Attachment **A.**

(2) Refer to Attachment **B**

(3) Refer to Attachment **C**

(4) Refer to Attachment **B**

2 Zoning and land use under relevant LEPs

For each environmental planning instrument or proposed instrument referred to in clause 1 (other than a SEPP or proposed SEPP) that includes the land in any zone (however described)

(a) the identity of the zone, whether by reference to a name (such as "Residential Zone" or "Heritage Area") or by reference to a number (such as "Zone No 2 (a)"),

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(b) the purposes for which the instrument provides that development may be carried out within the zone without the need for development consent,
(c) the purposes for which the instrument provides that development may not be carried out within the zone except with development consent,
(d) the purposes for which the instrument provides that development is prohibited within the zone,
(e) whether any development standards applying to the land fix minimum land dimensions for the erection of a dwelling- house on the land, and if so, the minimum land dimensions so fixed,
(f) whether the land includes or comprises critical habitat,
(g) whether the land is in a conservation area (however described),
(h) whether an item of environmental heritage (however described) is situated on the land.

Response

(a) **Zone No. 5** (Special Uses Zone)

(b) & (c) & (d) Refer to Attachment **D**.

(e) There are no dimensions applying in relation to the erection of a dwelling house on the land (for 5).

(f) The land DOES NOT include or comprise a critical habitat area under the provisions of the Threatened Species Conservation Act 1995.

(g) The land **IS** located in a heritage conservation area under the provisions of Randwick Local Environmental Plan 1998 (Consolidation).

(h) The land **IS** listed as a heritage item under the provisions of Randwick local Environmental Plan 1998(Consolidation),

The land IS NOT listed on the State Heritage Register under Heritage Act 1977.

3 Complying Development

(1) Whether or not the land is land on which complying development may be carried out under each of the Codes for complying development because of the provisions of clause 1.19 of State Environmental Planning Policy (Exempt and Complying Development Codes) 2008.
(2) If complying development may not be carried on that land of the provisions of clause 1.19 of that Policy, the reasons why it may not be carried out under that clause.

Response

General Housing Code

(2) Complying development under the General Housing Code **MAY NOT** be carried out on the land. The land is:
- land that comprises, or on which there is, **a heritage item** or a draft heritage item.
- land **within a heritage conservation area** or a draft heritage conservation area.

Housing Internal Alterations Code

(2) Complying development under the Housing Internal Alterations Code **MAY NOT** be carried out on the land. The land is:
- land that comprises, or on which there is, **a heritage item** or a draft heritage item.

General Commercial and Industrial Code

(2) Complying development under the General Commercial and Industrial Code **MAY NOT** be carried out on the land. The land is:

- land that comprises, or on which there is, **a heritage item** or a draft heritage item.

Subdivisions Code

(2) Complying development under the Subdivisions Code **MAY NOT** be carried out on the land. The land is:

- land that comprises, or on which there is, **a heritage item** or a draft heritage item.

A copy of the Codes SEPP is available at www.planning.nsw.gov.au. For further information please call the Department of Planning's Information Centre on Freecall 1300 305 695 or 02 9228 6333.

Note: To be complying development, the development must meet the General requirements set out in clause 1.18 of the Codes SEPP. Development must also meet all development standards set out in the relevant code.

4 Coastal protection

Whether or not the land is affected by the operation of section 38 or 39 of The Coastal Protection Act 1979, but only to the extent that the council has been so notified by the Department of Public Works.

Response

Council HAS NOT been notified by the Department of Public Works that the land is affected by the operation of section 38 or 39 of the Coastal Protection Act 1979.

5 Mine subsidence

Whether or not the land is proclaimed to be a mine subsidence district within the meaning of section 15 of the Mine Subsidence Compensation Act 1961.

Response

The land IS NOT proclaimed to be a mine subsidence district within the meaning of section 15 of the Mine Subsidence Compensation Act 1961.

6 Road widening and road realignment

Whether or not the land is affected by any road widening or road realignment under:

(a) Division 2 of Part 3 of the Roads Act 1993, or
(b) any environmental planning instrument, or
(c) any resolution of the council.

Response

(a) The land IS NOT affected by any road widening or road realignment under Division 2 of Part 3 of the Roads Act 1993.

(b) The land IS NOT affected by any road widening or road realignment under the provisions of Randwick Local Environmental Plan 1998 (Consolidation).

(c) The land IS NOT affected by any resolution of the Council for any road widening or road realignment.

7 Council and other public authority policies on hazard risk restrictions

Whether or not the land is affected by a policy:

(a) adopted by the council, or
(b) adopted by any other public authority and notified to the council for the express purpose of its adoption by that authority being referred to in planning certificates issued by the council that restricts the development of the land because of the likelihood of land slip, bushfire, (other than flooding), tidal inundation, subsidence, acid sulphate soils or any other risk.

Response

(a) The land IS affected by a policy adopted by the Council as follows:

Contaminated Land Policy. This policy does not specifically identify the subject land (or any other land) as contaminated. The policy does, however, apply to all land in the City of Randwick. The policy requires Council to consider the possibility of land contamination and its implications for any proposed or permissible future uses of the land, including all rezoning, subdivision and development applications. This policy will restrict development of land:
(1) which is affected by contamination; or
(2) which has been used for certain purposes; or
(3) in respect of which there is not sufficient information about contamination; or
(4) which is proposed to be used for certain purposes; or
(5) in other circumstances contained in the policy.

The Council HAS NOT adopted by resolution a policy that restricts the development of the subject land by reason of the likelihood of land slip, bush fire, tidal inundation subsidence or any other risk, (other than flooding).

(b) The land IS NOT affected by a policy adopted by any other public authority and notified to the council for the express purpose of its adoption by that authority being referred to in planning certificates issued by the council that restricts the development of the land because of the likelihood of land slip, bushfire, tidal inundation, subsidence, acid sulphate soils or any other risk. (other than flooding).

7A Flood related development controls information

(1) Whether or not development on that land or part of the land for the purposes of dwelling houses, dual occupancies, multi dwelling housing or residential flat buildings (not including development for the purposes of group homes or seniors housing) is subject to flood related development controls.
(2) Whether or not development on that land or part of the land for any other purpose is subject to flood related development controls.
(3) Words and expressions in this clause have the same meanings as in the instrument set out in the Schedule to the Standard Instrument (Local Environmental Plans) Order 2006.

Response

(1), (2) The land IS NOT subject to flood related development controls.

8 Land reserved for acquisition

Whether or not any environmental planning instrument or proposed environmental planning instrument referred to in clause 1 makes provision in relation to the acquisition of the land by a public authority, as referred to in section 27 of the Act.

Response

The land IS NOT affected by any environmental planning instrument or proposed environmental planning instrument referred to in clause 1 that makes provision in relation to the acquisition of the land by a public authority, as referred to in Section 27 of the Act.

9 Contributions plans

The name of each contributions plan applying to the land.

Response

Section 94A Development Contributions Plan (effective July 2007)

10 Biobanking agreements

If the land is land to which a biobanking agreement under Part 7A of the Threatened Species Conservation Act 1995 relates, a statement to that effect (but only if the council has been notified of the existence of the agreement by the Director - General of the Department of Environment, Climate Change and Water).

Response

The land IS NOT land to which a biobanking agreement relates.

11 Bush fire prone land

If any of the land is bush fire prone land (as defined in the Act), a statement that all or, as the case may be, some of the land is bush fire prone land.

If none of the land is bush fire prone land, a statement to that effect.

Response

The land IS NOT bush fire prone land.

12 Property vegetation plans

If the land is land to which a property vegetation plan under the Native Vegetation Act 2003 applies, a statement to that effect (but only if the council has been notified of the existence of the plan by the person or body that approved the plan under that Act).

Response

The land IS NOT land to which a property vegetation plan applies.

13 Orders under Trees (Disputes Between Neighbours) Act 2006

Whether an order has been made under Trees (Disputes Between Neighbours) Act 2006 to carry out work in relation to a tree on the land (but only if the council has been notified of the order).

Response

The land IS NOT land to which an order under Trees (Disputes Between Neighbours) Act 2006 applies.

14 Directions under Part 3A

If there is a direction by the Minister in force under section 75P (2) (c1) of the Act that a provision of an environmental planning instrument prohibiting or restricting the carrying out of a project or a stage of a project on the land under Part 4 of the Act does not have effect, a statement to that effect identifying the provision that does not have effect.

Response

There IS NOT a direction by the Minister under section 75P (2) (c1) of the Act that a provision of an environmental planning instrument does not have effect.

15 Site compatibility certificates and conditions for seniors housing

If the land is land to which State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004 applies:
(a) a statement of whether there is a current site compatibility certificate (of which the council is aware), issued under clause 25 of that Policy in respect of proposed development on the land and, if there is a certificate, the statement is to include:
(i) the period for which the certificate is current, and
(ii) that a copy may be obtained from the head office of the Department of Planning, and
(b) a statement setting out any terms of a kind referred to in clause 18 (2) of that Policy that have been imposed as a condition of consent to a development application granted after 11 October 2007 in respect of the land.

Response

(a) The land IS NOT subject to a current site compatibility certificate (of which the council is aware) issued under clause 25 of the State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004.

16 Site compatibility certificates for infrastructure

A statement of whether there is a valid site compatibility certificate (of which the council is aware), issued under clause 19 of State Environmental Planning Policy (Infrastructure) 2007 in respect of proposed development on the land and, if there is a certificate, the statement is to include:
(a) the period for which the certificate is valid, and
(b) that a copy may be obtained from the head office of the Department of Planning.

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Randwick City Council
a sense of community

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Response

The land IS NOT subject to a valid site compatibility certificate (of which the Council is aware), issued under clause 19 of State Environmental Planning Policy (Infrastructure) 2007.

17 Site compatibility certificates and conditions for affordable rental housing

(1) A statement of whether there is a current site compatibility certificate (affordable rental housing), of which the council is aware, in respect of proposed development on the land and, if there is a certificate, the statement is to include:
(a) the period for which the certificate is current, and
(b) that a copy may be obtained from the head office of the Department of Planning.
(2) A statement setting out any terms of a kind referred to in clause 17 (1) or 37 (1) of State Environmental Planning Policy (Affordable Rental Housing) 2009 that have been imposed as a condition of consent to a development application in respect of the land.

Response

The land IS NOT subject to a valid site compatibility certificate (of which the council is aware) for affordable rental housing.

Contaminated Land Management Act 1997

***Note**. The following matters are prescribed by section 59 (2) of the Contaminated Land Management Act 1997 as additional matters to be specified in a planning certificate:*
(a) that the land to which the certificate relates is significantly contaminated land within the meaning of that Act—if the land (or part of the land) is significantly contaminated land at the date when the certificate is issued,
(b) that the land to which the certificate relates is subject to a management order within the meaning of that Act—if it is subject to such an order at the date when the certificate is issued,
(c) that the land to which the certificate relates is the subject of an approved voluntary management proposal within the meaning of that Act—if it is the subject of such an approved proposal at the date when the certificate is issued,
(d) that the land to which the certificate relates is subject to an ongoing maintenance order within the meaning of that Act—if it is subject to such an order at the date when the certificate is issued,
(e) that the land to which the certificate relates is the subject of a site audit statement within the meaning of that Act—if a copy of such a statement has been provided at any time to the local authority issuing the certificate.

Response on Note

(a) The land IS NOT significantly contaminated land within the meaning of the Contaminated Land Management Act 1997.

(b) The land IS NOT subject to a management order within the meaning of the Contaminated Land Management Act 1997.

(c) The land IS NOT the subject of an approved voluntary management proposal within the meaning of the Contaminated Land Management Act 1997.

(d) The land IS NOT the subject to an ongoing maintenance order within the meaning of the Contaminated Land Management Act 1997.

(e) Council HAS NOT received a copy of a site audit statement, within the meaning of the Contaminated Land Management Act 1997, for this land.

Note. Section 26 of the Nation Building and Jobs Plan (State Infrastructure Delivery) Act 2009 provides that a planning certificate must include advice about any exemption under section 23 or authorisation under section 24 of that Act if the council is provided with a copy of the exemption or authorisation by the Co-ordinator General under that Act.

INFORMATION PROVIDED UNDER SECTION 149(5)

Additional Relevant Matters
At the date of this certificate, the following relevant matters affecting the land are provided in good faith in accordance with the requirements of Section 149(5) of the Environmental Planning and Assessment Act 1979.
NOTE: When information pursuant to Section 149 (5) is requested the Council is under no obligation to furnish any of the information supplied herein pursuant to that Section. Council draws your attention to Section 149(6) of the Act which states that a Council shall not incur any liability in respect of any advice provided in good faith pursuant to subsection 149 (5). The absence of any reference to any matter affecting the land shall not imply that the land is not affected by any matter not referred to in this Certificate.

Council resolutions to prepare draft Local Environmental Plans

Refer to Attachment **E** for advice on Council resolutions under section 54 of the Environmental Planning and Assessment Act 1979 (as amended) to prepare draft Local Environmental Plans.

Development Consents since 1 July 1991

Development consent(s) HAS been granted with respect to the subject land since 1 July 1991.

Tree Preservation Orders

The land IS affected by a Tree Preservation Order made under clause 28 of Randwick Local Environmental Plan 1998 (Consolidation).

Foreshore Scenic Protection Areas

The land IS NOT within a Foreshore Scenic Protection Area as identified in Randwick Local Environmental Plan 1998 (Consolidation).

Foreshore Building Line

The land IS NOT subject to a Foreshore Building Line that restricts development on the land.

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Boarding Houses

The land IS NOT affected by clause 34 of Randwick Local Environmental Plan 1998 (Consolidation) applying to a building or place used for the purposes of a boarding house.

Licences Under The Water Act 1912

The Property IS NOT within the ground water extraction embargo area or the water shortage zone declared under the Water Act 1912 (see attachment).

Aircraft Noise (ANEF)

This property IS NOT affected by aircraft noise levels as measured by the Australian Noise Exposure Forecast (ANEF) identified by Sydney Airport Corporation Limited (SACL), endorsed by Air Services Australia (ASA).

Zoran Curcic
Planning Research Officer

Per:..... Date:22-Sep-2010

Attachments

ATTACHMENT A **Name of each environmental planning instrument that applies to the carrying out of development on the land**
Relevant State Environmental Planning Policy (SEPP)
SEPP No. 1 - Development Standards
SEPP No. 19 - Bushland in Urban Areas
SEPP No. 32 - Urban Consolidation (Redevelopment of Urban Land)
SEPP No. 33 - Hazardous and Offensive Development
SEPP No. 55 - Remediation of Land
SEPP No. 64 - Advertising and Signage
SEPP No. 65 - Design Quality of Residential Flat Development
SEPP No. 70 - Affordable Housing
SEPP No. 71 - Coastal Protection
SEPP - (Housing for Seniors or People with a Disability) 2004
SEPP - BASIX (Building Sustainability Index) 2004
SEPP - (Major Development) 2005
SEPP - (Mining, Petroleum Production and Extractive Industries) 2007
SEPP - (Temporary Structures and Places of Public Entertainment) 2007
SEPP - (Infrastructure) 2007
SEPP - Exempt and Complying Development Order 2008
SEPP - (Affordable Rental Housing) 2009
REP - Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005

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Note: Any questions regarding State Environmental Planning Policies and Regional Environmental Plans should also be directed to the Department of Planning (02) 9228 6111 or www.planning.nsw.gov.au.

Local Environmental Plan (LEP)

Randwick LEP 1998

Amendment No. and Subject Land	Purpose
Randwick LEP 1998 (Consolidation) Amendment No 41 Gazetted 15 January 2010	To update and consolidate Randwick LEP 1998 and previous amendments
Randwick LEP 1998 (Consolidation) Amendment No 42 Gazetted 13 August 2010 64-66 Minneapolis Crescent, Maroubra (Lot 102 DP 855181) and 3/90-98 King Street, Randwick (Lot 3 SP 75411)	Reclassification of land from community to operational lands to facilitate Randwick City Council's affordable housing program.

Updated 13 August 2010

ATTACHMENT B
Name of each proposed environmental planning instrument that applies to the carrying out of development on the land

Name	Purpose
Planning proposal: Rezoning of Newmarket site bounded with Barker, Jane, Young and Botany Streets, Randwick	Rezoning proposal to allow mixed residential and neighbourhood uses.

Note: Draft Local Environmental Plan that is subject to community consultation or that has been placed on public exhibition under the Environmental Planning and Assessment Act, 1979.

Updated 13 August 2010

ATTACHMENT C
Name of each Development Control Plan that applies to the carrying out of development on the land

Name of DCP and Effective Date	Purpose of DCP
Development Control Plan No. 6 Land bounded by Kemmis Street, Frenchmans Road and Clovelly Road, Randwick 20 June 1986	Redevelopment controls: height, floor space ratio, design guidelines.
Development Control Plan No. 8 Military Road & Bunnerong Road, Matraville 25 March 1987	Industrial development: access, landscaping, setbacks.
Development Control Plan No. 13 Bunnerong Power Station, Matraville 11 March 1990	Heritage Gardens, landscaped buffer zones, bushland, access restrictions.
Development Control Plan No. 16 Kingsford Commercial Centre 7 May 1996	Comprehensive DCP for commercial centre.
Development Control Plan No. 18 Randwick Bus Depot, cnr King & Dangar Streets, Randwick 14 July 1993 (amended 6 June 1995)	Comprehensive redevelopment controls.
Development Control Plan No. 21 Amusement Centres 2 May 1995	Requirements for installation of amusement machines.
Development Control Plan No. 22 The Spot & surrounds	Comprehensive DCP for The Spot commercial centre.

24 October 1995	
Outdoor Advertising 4 August 1998	Guidelines and controls for outdoor advertising throughout the City of Randwick.
Parking 24 December 1998	Standards, guidelines and design parameters for parking, car parks and vehicle manoeuvering and access.
Randwick Junction Business Centre 18 February 1999.	Guidelines and controls for development in the Randwick Junction business centre. The centre is also a Heritage Conservation Area.
Eastern Suburbs Memorial Park 3 February 2000	Guidelines and controls for development of the Memorial Park.
Multi -unit Housing 20 December 2002.	Guidelines and controls for all multi-unit housing in the Residential 2B and 2C zones.
Dwelling Houses and Dual Occupancy 20 December 2002	Guidelines and controls for development for dwelling houses in all Residential zones and for Attached Dual Occupancy in the Residential 2A Zone.
Maroubra Beach Commercial Precinct 26 May 2000	Guidelines and controls for development in the Maroubra Beach Commercial Precinct.
Backpacker Accommodation 26 May 2000	Guidelines and controls for the establishment of backpacker accommodation.
Kensington Town Centre (2002) 22 January 2003	Guidelines and controls for development in the Kensington Town Centre.
Public Notification of Development Proposals 25 February 2003	Requirements for notifying the public about all development proposals, including master plans, lodged with Council.
Defence site Kingsford 21 May 2003	Guidelines and controls for the surplus Department of Defence land-Bundock Street, Randwick.
Maroubra Junction Town Centre 18 May 2004	Guidelines and controls for development in the Maroubra Junction Town Centre
Footpath Dining and Trading 27 July 2004	Guidelines for objectives & performance criteria for outdoor dining and trading activities on public footpaths, & associated public access.
Prince Henry Hospital Site –Little Bay 8 December 2004	Guidelines and controls for the redevelopment of the former Prince Henry Hospital Site at Little Bay.
Matraville Town Centre 29 August 2006	Guidelines and controls for development in the Matraville Town Centre
Royal Randwick Racecourse 8 May 2007	Planning provisions for land uses and development within the Royal Randwick Racecourse.
University of New South Wales- Kensington Campus 16 April 2007	Detailed planning provisions for land uses and development within the UNSW Kensington Campus.
Telecommunications and Radio-communications 1 October 2007	Controls and guidelines for the sitting, design and installation of telecommunication and radio-communication facilities that require development consent
Exempt and Complying Development 15 January 2008	Detailed requirements for exempt and complying development
Adopted Master Plans/Now a Deemed DCP	
NIL	NIL

Updated 15 January 2010

PLANNING CERTIFICATE

ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979

ABN 77 362 844 121

Randwick City Council
a sense of community

DATE OF CERTIFICATE	22-Sep-2010
CERTIFICATE no.	23263
ASSESSMENT no.	»33113
RECEIPT no.	2590912
AMOUNT	100.00

ATTACHMENT D

Zone No 5 (Special Uses Zone)

1) The objectives of Zone No. 4B are:

a) to accommodate development by public authorities on publicly owned land, and
b) to accommodate development for educational, religious public transport or similar purposes on both publicly and privately owned land, and
c) to enable associated and ancillary development, and
d) to allow for a range of community uses to be provided to serve the needs of residents, workers and visitors, and
e) to allow for the redevelopment of land no longer required for a special use.

2) Development for the purpose of the following does not require development consent:

Bushfire Hazard reduction	Recreation
Public Utility undertakings	Roads

3) Development for the purpose of the following requires development consent:

Animal establishments	Bed and breakfast accommodation
Boarding houses	Car parks
Cemeteries	Child care centres
Clubs	Communication facilities
Community facilities	Dwellings
Dwelling houses	Earthworks
Educational establishments	Health consulting rooms
Helicopter landing sites	Home activities
Hospitals	Markets
Multi-unit housing	Outdoor advertising
Penitentiaries	Places of worship
Plant nurseries	Public transport
Recreation facilities	Restaurants

4) Any development not included in subclause (2) or (3) is prohibited.

Updated 15 January 2010

ATTACHMENT E

Name of proposed environmental planning instrument, that includes a planning proposal for a LEP or a draft environmental planning instrument

DETAILS OF RESOLUTION	DATE OF RESOLUTION
Draft Randwick Comprehensive LEP applying city wide	24 June 2008
Note: Draft Local Environmental Plans that have yet to be placed on public exhibition under the Environmental Planning and Assessment Act, 1979.	

Updated 15 January 2010

OTHER ATTACHMENTS (Note: if applicable)

(Site History Documents – NSW DECCW POEO Records)

Environment, Climate Change & Water

Licence summary

Your search for: **LGA** - RANDWICK

Search again | Return to previous page

Summary of Licence No: 10464

View this licence (PDF document 0 kb)

Licence holder: **P.O.W. HOSPITAL PTY LIMITED**
Trading as : PRINCE OF WALES PRIVATE HOSPITAL

Premises: PRINCE OF WALES PRIVATE HOSPITAL
Barker Street RANDWICK 2031
LGA: Randwick **Catchment:** Sydney Coast-Georges River

Administrative fee: $760.00

Status of licence: No longer in force

Licence type: Premises

Activity type: *Hazardous, Industrial or Group A Waste Generation or Storage

Licence review: Completed 17 Mar 04

Applications

Number	Application type	Current status	Date received
144944 View application	Licence Transfer	Approved	01 May 07

Notices

Number	Issue date	Notice type
1035418 View notice	17 Mar 04	S 58 Licence Variation

Annual Return Information information about non compliance

Start date	End date	Date received	Non-compliance	LBL Data
01 Aug 06	31 Jul 07	25 Sep 07		Not subject to LBL
01 Aug 05	31 Jul 06	26 Sep 06	No	Not subject to LBL
01 Aug 04	31 Jul 05	30 Aug 05	No	Not subject to LBL
01 Aug 03	31 Jul 04	29 Sep 04	No	Not subject to LBL
10 Mar 03	31 Jul 03	29 Sep 03	No	Not subject to LBL
10 Mar 02	09 Mar 03	08 May 03	No	Not subject to LBL
10 Mar 01	09 Mar 02	10 Feb 03	No	Not subject to LBL
10 Mar 00	09 Mar 01	24 May 01	No	Not subject to LBL

27 October 2010

Environment, Climate Change & Water

Licence summary

Your search for: **LGA** - RANDWICK

Search again | Return to previous page

Summary of Licence No: 6606

View this licence (PDF document 0 kb)

Licence holder: **SOUTH EASTERN SYDNEY AND ILLAWARRA AREA HEALTH SERVICE**

Premises: PRINCE OF WALES HOSPITAL
BARKER STREET RANDWICK 2031
LGA: Randwick **Catchment:** Sydney Coast-Georges River

Administrative fee: $1,520.00

Status of licence: No longer in force

Licence type: Premises

Activity type: *Hazardous, Industrial or Group A Waste Generation or Storage

Licence review: Completed 04 Apr 05

Notices

Number	Issue date	Notice type
1044558 View notice	05 Apr 05	S 58 Licence Variation

Annual Return Information Information about non compliance

Start date	End date	Date received	Non-compliance	LBL Data
15 Mar 07	14 Mar 08	09 Apr 08	No	Not subject to LBL
15 Mar 06	14 Mar 07	04 May 07	No	Not subject to LBL
15 Mar 05	14 Mar 06	15 May 06	No	Not subject to LBL
15 Mar 04	14 Mar 05	15 Apr 05	No	Not subject to LBL
15 Mar 03	14 Mar 04	16 Apr 04	No	Not subject to LBL
15 Mar 02	14 Mar 03	28 Mar 03	No	Not subject to LBL
15 Mar 01	14 Mar 02	06 Aug 02	No	Not subject to LBL
15 Mar 00	14 Mar 01	17 May 01	No	Not subject to LBL

27 October 2010

Environment, Climate Change & Water

Notice summary

Your search for: **LGA** - RANDWICK

Search again | Return to previous page

Summary of Notice No: 1035418

View this Notice

Organisation:	**P.O.W. HOSPITAL PTY LIMITED**
Premises:	PRINCE OF WALES PRIVATE HOSPITAL Barker Street RANDWICK 2031
LGA:	Randwick
Issue date:	17 Mar 04
Notice type:	S 58 Licence Variation

Licence No.	Licence Type
10464 View Licence	Premises

27 October 2010

APPENDIX D

(Sampling Protocols and QA/QC Definitions)

SOIL AND GROUNDWATER SAMPLING PROTOCOLS

These protocols specify the basic procedures to be used when sampling soils or groundwater for environmental site assessments undertaken by EIS. The purpose of these protocols is to provide standard methods for: sampling, decontamination procedures for sampling equipment, sample preservation, sample storage and sample handling. Deviations from these procedures must be recorded.

Soil Sampling

a) Prepare a test pit/borehole log.

b) Layout sampling equipment on clean plastic sheeting to prevent direct contact with ground surface. The work area should be at a distance from the drill/rig excavator such that the drill rig/excavator can operate in a safe manner.

c) Ensure all sampling equipment has been decontaminated prior to use.

d) Remove any surface debris from the immediate area of the sampling location.

e) Collect samples and place in glass jar with a Teflon seal. This should be undertaken as quickly as possibly to prevent the loss of volatiles. If possible, fill the glass jars completely.

f) Collect samples for asbestos analysis and place in a zip-lock plastic bag.

g) Label the jar and/or bag with the EIS job number, sample location (eg. BH1), sampling depth interval and date. If more than one sample container is used, this should also be indicated (eg. 2 = Sample jar 1 of 2 jars).

h) Photoionisation detector (PID) screening of volatile organic compounds (VOCs) should be undertaken on samples using the soil sample headspace method. Headspace measurements are taken following equilibration of the headspace gasses in partly filled zip-lock plastic bags. PID headspace data is recorded on the borehole/test pit log and the chain of custody forms.

i) Record the lithology of the sample and sample depth on the borehole/test pit log in accordance with AS1726-1993[24].

j) Store the sample in a sample container cooled with ice or chill packs. On completion of the sampling the sample container should be delivered to the lab immediately or stored in the refrigerator prior to delivery to the lab. All samples are preserved in accordance with AS 4482.1:2005, AS 4482.2:1999 and AS/NZS 5667.1:1998.

k) Check for the presence of groundwater after completion of each borehole using an electronic dip metre or water whistle. Boreholes should be left open until the end of fieldwork. All groundwater levels in the boreholes should be rechecked on the completion of the fieldwork.

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[24] *Geotechnical Site Investigations*, Standards Australia 1993 (AS1726-1993)

l) Backfill the boreholes/test pits with the excavation cuttings or clean sand prior to leaving the site.

Decontamination Procedures for Soil Sampling Equipment

a) All of the equipment associated with the soil sampling procedure should be decontaminated between every sampling location.

b) The following equipment and materials are required for the decontamination procedure:
   - Phosphate free detergent (Decon 90)
   - Potable water
   - Stiff brushes
   - Plastic sheets

c) Ensure the decontamination materials are clean prior to proceeding with the decontamination.

d) Fill both buckets with clean potable water and add phosphate free detergent to one bucket.

e) In the bucket containing the detergent scrub the sampling equipment until all the material attached to the equipment has been removed.

f) Rinse sampling equipment in the bucket containing potable water.

g) Place cleaned equipment on clean plastic sheets.

If all materials are not removed by this procedure, high-pressure water cleaning is recommended. If any equipment is not completely decontaminated by both these processes that equipment should not be used until it has been thoroughly cleaned.

Groundwater Sampling

Groundwater samples are more sensitive to contamination than soil samples and therefore adhesion to this protocol is particularly important to obtain reliable, reproducible results. The recommendations detailed in AS/NZS 5667.1:1998 are considered to form a minimum standard.

The basis of this protocol is to maintain the security of the borehole and obtain accurate and representative groundwater samples. The following procedure should be used for collection of groundwater samples from previously installed groundwater monitoring wells.

a) After monitoring well installation, at least three bore volumes should be pumped from the monitoring wells (well development) to remove any water introduced during the drilling process and/or the water that is disturbed during installation of the monitoring well. This should be completed prior to purging and sampling.

b) Groundwater monitoring wells should then be left to recharge for at least three days before purging and sampling. Prior to purging or sampling the condition of each well should observed and any anomalies recorded on the field data sheets. The following information should be noted: the condition of the well, noting any signs of damage, tampering or complete destruction; the condition and operation of the well lock; the condition of the protective casing and the cement footing (raised or cracked); and, the presence of water between protective casing and well.

c) Take the groundwater level from the collar of the piezometer/monitoring well using an electronic dip meter. The collar level should be taken (if required) during the site visit using a dumpy level and staff.

d) Purging and sampling of piezometers/monitoring wells is done on the same site visit when using micro-purge (or low flow) techniques. Layout and organize all equipment associated with groundwater sampling in a location where they will not interfere with the sampling procedure and will not pose a risk of contaminating samples. Equipment generally required includes:

- Micropore filtration system or Stericup single-use filters (for heavy metals samples).
- Filter paper for Micropore filtration system.
- Bucket with volume increments.
- Sample containers: teflon bottles with 1 ml nitric acid, 75mL glass vials with 1 mL hydrochloric acid, 1 L amber glass bottles.
- Bucket with volume increments.
- Flow cell.
- pH/EC/Eh/T meters.
- Plastic drums used for transportation of purged water.
- Esky and ice.
- Nitrile gloves.
- Distilled water (for cleaning).
- Electronic dip meter.
- Micro-purge pump pack and pump head.
- Air and water tubing for Micro-purge.
- Groundwater sampling forms.

e) If single-use stericup filtration is not being used, clean the Micropore filtration system thoroughly with distilled water prior to use and between each sample. Filter paper should be changed between samples. 0.45um filter paper should be placed below the glass fibre filter paper in the filtration system.

f) Ensure all non-disposable sampling equipment is decontaminated or that new disposable equipment is available prior to any work commencing at a new location. The procedure for decontamination of groundwater equipment is outlined at the end of this section.

g) Disposable gloves should be used whenever samples are taken to protect the sampler and to assist in avoidance of contamination.

h) Groundwater samples are obtained from the monitoring wells using low flow/micro-purge sampling equipment to reduce the disturbance of the water column and loss of volatiles.

i) During pumping to purge the well, the pH, temperature, conductivity, dissolved oxygen, redox potential and groundwater levels are monitored (where possible) using calibrated field instruments to assess the development of steady state conditions. Steady state conditions are generally considered to have been achieved when the difference in the pH measurements was less than 0.2 units and the difference in conductivity was less than 10%.

j) All measurements are recorded on specific data sheets.

k) Once steady state conditions are considered to have been achieved, groundwater samples are obtained directly from the pump tubing and placed in appropriate glass bottles, BTEX vials or plastic bottles.

l) All samples are preserved in accordance with water sampling requirements detailed in the NEPM 1999 and placed in an insulated container with ice. Groundwater samples are preserved by immediate storage in an insulated sample container with ice in accordance with AS/NZS 5667.1:1998.

m) Record the sample on the appropriate log in accordance with AS1726:1993. At the end of each water sampling complete a chain of custody form.

Decontamination Procedures for Groundwater Sampling Equipment

a) All of the equipment associated with the groundwater sampling procedure (other than single-use items) should be decontaminated between every sampling location.

b) The following equipment and materials are required for the decontamination procedure:
   - Phosphate free detergent.
   - Potable water.
   - Distilled water
   - Plastic Sheets or bulk bags (plastic bags)

c) Fill one bucket with clean potable water and phosphate free detergent, and one bucket with distilled water.

d) Flush potable water and detergent through pump head. Wash sampling equipment and pump head using brushes in the bucket containing detergent until all materials attached to the equipment are removed.

e) Flush pump head with distilled water.

f) Change water and detergent solution after each sampling location.

g) Rinse sampling equipment in the bucket containing distilled water.

h) Place cleaned equipment on clean plastic sheets.

i) If all materials are not removed by this procedure that equipment should not be used until it has been thoroughly cleaned

QA/QC DEFINITIONS

The QA/QC terms used in this report are defined below. The definitions are in accordance with US EPA publication SW-846, entitled *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods* (1994[25]) methods and those described in *Environmental Sampling and Analysis, A Practical Guide,* (H. Keith 1991[26]).

Practical Quantitation Limit (PQL), Limit of Reporting (LOR) and Estimated Quantitation Limit (EQL)

These terms all refer to the concentration above which results can be expressed with a minimum 95% confidence level. The laboratory reporting limits are generally set at ten times the standard deviation for the Method Detection limit (MDL) for each specific analyte. For the purposes of this report the LOR, PQL, and EQL are considered to be equivalent.

When assessing laboratory data it should be borne in mind that values at or near the PQL have two important limitations. *"The uncertainty of the measurement value can approach, and even equal, the reported value. Secondly, confirmation of the analytes reported is virtually impossible unless identification uses highly selective methods. These issues diminish when reliably measurable amounts of analytes are present. Accordingly, legal and regulatory actions should be limited to data at or above the reliable detection limit"* Keith 1991.

Precision

The degree to which data generated from repeated measurements differ from one another due to random errors. Precision is measured using the standard deviation or Relative Percent Difference (RPD). Acceptable targets for precision in this report will be less than 50% RPD for concentrations greater than ten times the PQL, less than 75% RPD for concentrations between five and ten times the PQL and less than 100% RPD for concentrations that are less than five times the PQL.

Accuracy

Accuracy is a measure of the agreement between an experimental result and the true value of the parameter being measured. The assessment of accuracy for an analysis can be achieved through the analysis of known reference materials or assessed by the analysis of surrogates, field blanks, trip spikes and matrix spikes.

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[25] *SW-846: Test Methods for Evaluating Solid Waste, Physical/Chemical Methods,* US EPA, 1994 (US EPA SW-846)

[26] *Environmental Sampling and Analysis, A Practical Guide*, Keith, H, 1991 (Keith 1991)

The proximity of an averaged result to the true value, where all random errors have been statistically removed. Accuracy is measured by percent recovery. Acceptable limits for accuracy generally lie between 70% to 130% recoveries. Certain laboratory methods may allow for values that lie outside these limits.

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents a characteristic of a population, parameter variations at a sampling point, or an environmental condition. Representativeness is primarily dependent upon the design and implementation of the sampling program. Representativeness of the data is partially ensured by the avoidance of contamination, adherence to sample handing and analysis protocols and use of proper chain-of-custody and documentation procedures.

Completeness

Completeness is a measure of the number of valid measurements in a data set compared to the total number of measurements made and overall performance against DQIs. The following information is assessed for completeness:

- Chain-of-custody forms;
- Sample receipt form;
- All sample results reported;
- All blank data reported;
- All laboratory duplicate and RPDs calculated;
- All surrogate spike data reported;
- All matrix spike and lab control spike (LCS) data reported and RPDs calculated;
- Spike recovery acceptable limits reported; and
- NATA stamp on reports.

Comparability

Comparability is the evaluation of the similarity of conditions (eg. sample depth, sample homogeneity) under which separate sets of data are produced. Data comparability checks include a bias assessment that may arise from the following sources:

- Collection and analysis of samples by different personnel;
- Use of different techniques;
- Collection and analysis by the same personnel using the same methods but at different times; and
- Spatial and temporal changes (due to environmental dynamics).

Blanks

The purpose of laboratory and field blanks is to check for artifacts and interferences that may arise during sampling and analysis.

Matrix Spikes

Samples are spiked with laboratory grade standards to detect interactive effects between the sample matrix and the analytes being measured. Matrix Spikes are reported as a percent recovery and are prepared for 1 in every 20 samples. Sample batches that contain less than 20 samples may be reported with a Matrix Spike from another batch. The percent recovery is calculated using the formula;

$$\frac{\text{(Spike Sample Result – Sample Result)}}{\text{Concentration of Spike Added}} \times 100$$

Acceptable recovery limits are 70% to 130%.

Surrogate Spikes

Samples are spiked with a known concentration of compounds that are chemically related to the analyte being investigated but unlikely to be detected in the environment. The purpose of the Surrogate Spikes is to check the accuracy of the analytical technique. Surrogate Spikes are reported as percent recovery.

Duplicates

Laboratory duplicates measure precision, expressed as Relative Percent Difference. Duplicates are prepared from a single field sample and analysed as two separate extraction procedures in the laboratory. The RPD is calculated using the formula where D1 is the sample concentration and D2 is the duplicate sample concentration:

$$\frac{(D1 - D2)}{\{(D1 + D2)/2\}} \times 100$$