ENVIRONMENTAL INVESTIGATION SERVICES

REPORT

TO

SYDNEY ADVENTIST HOSPITAL LTD

ON

STAGE 1 ENVIRONMENTAL SITE ASSESSMENT

FOR

PROPOSED HOSPITAL UPGRADE DEVELOPMENT (STAGE 1)

AT

185 FOX VALLEY ROAD, WAHROONGA

APRIL 2009

REF: E22758K-RPT

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1 INTRODUCTION

Sydney Adventist Hospital Ltd commissioned Environmental Investigation Services (EIS), a division of Jeffery & Katauskas Pty Ltd (J&K), to undertake a Stage 1 environmental site assessment to assess the likelihood of contamination of the subsurface soils and groundwater for Stage 1 of a proposed hospital upgrade development at 185 Fox Valley Road, Wahroonga. The site is identified as Lot 621 DP 1128314 and at the time of this investigation was occupied by existing hospital buildings and facilities. The site location is shown on Figure 1 and the investigation was confined to the site boundaries as shown on Figure 2.

The screening was undertaken generally in accordance with an EIS proposal of 2 March 2009 and a consultant's agreement between Sydney Adventist Hospital Ltd (the client) and Jeffery and Katauskas Pty Ltd trading as Environmental Investigation Services of 10 March 2009.

This investigation was targeted at the areas of concern associated with Stage 1 of the proposed hospital re-development. The proposed Stage 1 development works include:

- re-development of the existing on-grade carpark in the north section of the site to include a multi-storey parking structure and entry concourse;
- construction of a new concourse building between the existing San Clinic and CSB buildings; and
- construction of a paved on-grade carpark in the north-east section of the site.

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

A geotechnical investigation was performed concurrently with the environmental site screening by J&K and the results are presented in a separate report (Ref. 22758ZARPT).

2 ASSESSMENT OBJECTIVES

2.1 Investigation Objectives

The primary objective of the investigation was to assess the risk of widespread soil and groundwater contamination of the investigation areas in relation to the suitability of the investigation areas for the proposed land use in accordance with the *Guidelines for Consultants Reporting on Contaminated Sites NSW DECC (formerly the EPA) 1997* and the *State Environmental Planning Policy No.55 – Remediation of Land* (SEPP55).

A secondary investigation objective was to undertake a waste classification assessment for off-site disposal of excavated soil and rock associated with the proposed development works.

2.2 Scope of Work

The scope of work undertaken to achieve the objective included:

1. Assessment of historical site use, including review of historical aerial photographs, land title records search, review of the deposited plan and development applications/building approvals held by Council;
2. Review of regional geology and groundwater conditions, including the location of registered groundwater bores and major underground services in the vicinity of the site;
3. Search of WorkCover records for licenses to store Dangerous Goods and investigation/remediation orders issued by the NSW DECC (EPA).
4. Design and implementation of a field sampling program;
5. Laboratory analysis of selected soil and groundwater samples; and
6. Preparation of a report presenting the results of the assessment of potential soil and groundwater contamination.

Field work for this investigation was undertaken from 12 March 2009 to 27 March 2009.

2.3 Data Quality Objectives

The purpose of Data Quality Objectives is to develop criteria to assess the reliability of the laboratory data. The Data Quality Objectives established for this project are summarised below:

- Collection and analysis of 10% of the field samples as intra-laboratory duplicates.
- Relative percentage differences (RPDs) were calculated for 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.
- Review of laboratory QA/QC data (including surrogate recovery, repeat analysis, duplicates, matrix spikes and method blanks).

The success of the Data Quality Objectives is based on assessment of the data set as a whole and not on individual acceptance or exceedance within the data set.

3 SITE INFORMATION

3.1 Site Description

The site identification details are summarised below:

Site Owner:	Australasian Conference Association Ltd
Site Address:	185 Fox Valley Road, Wahroonga
Lot & Deposited Plan:	Lot 621 DP 1128314
Local Government Authority:	Ku-ring-gai Council
Proposed Development Area:	Area 1 – 11,800m2; and Area 2 – 5,000m2
AHD:	Approximately 160-170m
Geographical Location (MGA):	N: 6265760 E: 323940 (approximately)
Site Locality Plan:	Refer to Figure 1
Site Layout Plan	Refer to Figure 2

The Sydney Adventist Hospital (referred to as 'the San' within this report) is located on the west side of Fox Valley Road, approximately 80m to the north of the intersection with The Comenarra Parkway and lies within an undulating regional topographic setting. The majority of the hospital site is characterised by consistent slopes that typically fall away from the central-east section of the site (presently occupied by the H. E. Clifford Tower Block). The areas to the south of this section typically fall towards the south and south-west at slopes ranging from approximately 3-6°. The areas to the north and west of this section generally fall towards the north-west and west, towards Coups Creek, at slopes ranging from approximately 3-6°. Slightly steeper slopes were observed in the north and west sections of the hospital grounds.

At the time of the investigation, the site was occupied by the San which was comprised of various buildings used to accommodate the services provided by the hospital. A description of the main site buildings and surrounding areas is detailed below. For the building locations, reference should be made to Figure 2.

The investigation was confined to two separate areas of the hospital grounds. Investigation area one included:

- the central north visitors carpark located to the north-west of the San Clinic; and
- The area between and to the north-west of the San Clinic and A.K. Tulloch Theatre Block, into the central north visitors carpark.

Investigation area two was located in the north section of the hospital grounds and included an existing carpark area and surrounding unpaved areas. The investigation areas are shown on the attached Figure 2.

Fox Valley Community Centre and North-East Sector

The Fox Valley Community Centre building was located in the north section of the site, between bushland and the paved carpark area. The building was of sandstone block, timber and metal clad construction. A carpark partially surfaced with gravel and partially paved with asphaltic concrete and was located to the east of the building. The pavement was in relatively poor condition. Mulch stockpiles were located in the west section of the carpark. The area to the north-west of the carpark was grassed, with some scattered trees and extended to adjacent bushland. The carpark generally fell towards the north-west at a slope of approximately 3-4°.

A grassed fill mound was located adjacent to the south-east extent of the carpark and an open grassed area extended further to the east and south of the carpark. The grassed area generally fell towards the north-west at a slope consistent with that of the carpark. Several single storey brick residences bounded the grassed area to the south-east and bushland bounded the grassed area to the north-east. A grassed stormwater basin was located in the west section of the grassed area.

A staff carpark was located to the west and south-west of the grassed area and stormwater basin. The western extent of the carpark fell towards the north-west at a slope of approximately 3-5°.

A.K. Tulloch Theatre Block, San Clinic and the Central-North Sector

The central-north section of the site was occupied by a relatively new multi-storey brick building (A. K. Tulloch Theatre Block also known as Clinic Services Block), a relatively new multi storey brick building over a multi-storey carpark (San Clinic) and an outdoor carpark.

The outdoor carpark was located to the north-west of the buildings and generally fell to the north and north-east at a slope of approximately 5°. The carpark was tiered into three sections to accommodate the slope. Grassed garden beds were located throughout the carpark. The carpark was paved with asphaltic concrete that appeared to be in relatively good condition with only a few cracks/potholes observed.

The staff carpark located in the north-east sector fell towards the north-west creating an unconfined central drainage channel.

Grassed areas and a grassed stormwater basin were located to the north of the outdoor carpark. Bushland was located further to the north and north-west. An above ground liquid oxygen tank was located in the west section of the outdoor carpark.

The A.K. Tulloch Theatre Block and San Clinic were located to the south-east of the carpark and appeared to have been partially cut into the north-west facing hill slope. Several retaining walls were located to the south of the carpark/San Clinic to retain the areas to the south approximately 10-12m above the carpark. Batter slopes were observed to the west and east of the A.K. Tulloch Theatre Block and San Clinic respectively. A concrete paved walkway with stairs extended between the two buildings.

H. E. Clifford Tower Block, Physio Therapy/Maternity Wing and Shannon Building

The H. E. Clifford Tower Block was located to the south-east of the A. K. Tulloch Theatre Block in the central-east section of the site. The Tower block was a multi-storey brick building and was connected with the newer theatre block.

A grassed area known as the 'village green' was located to the north-east of the tower block and generally fell towards the east and north-east at a slope of approximately 3°.

The physiotherapy/maternity wing (Women's Health), located to the south of the tower building, was of brick construction and appeared to be inter-connected to the tower block. An above ground fuel storage tank (possibly containing diesel) was located to the east of the physiotherapy/maternity building, adjacent to the emergency bays. The tank was cylindrical in shape, measuring approximately 3m in length with a diameter of approximately 1.6m, and was surrounded by a brick bund. There were no obvious signs of spills surrounding the tank.

A relatively small liquid oxygen tank was located near the driveway to the south/west of the physiotherapy/maternity building.

Retaining walls were located to the west of the physiotherapy/maternity wing, retaining the site several metres above Fox Valley Road.

The Shannon Building was located to the west of the tower block. The three storey building was of brick construction and appeared comparatively older than the surrounding buildings. Relatively small car parking areas were located in the surrounding areas.

Nurses Residence, Maintenance and Engineering Building
The Nurses Residence (female residence) and Maintenance and Engineering Building (workshops) were located to the west of the tower block and physiotherapy/maternity wing. The buildings were of brick or brick and metal clad construction. Asphaltic paved carparks were located to the north and south of the Maintenance and Engineering Building and to the east of the Nurses Residence.

The Maintenance and Engineering Building was partially used for the storage of machinery such as lawn mowers and trimmers. A small amount of fuel was being stored in jerry-cans within the maintenance building.

Information provided by site staff indicated that a former bowser and underground fuel storage tank was located in the vicinity of the north-west section of the Maintenance and Engineering Building. However, no evidence of the bowser, storage tank or any other fuel infrastructure was identified during the site inspection.

Areas in the vicinity of the Maintenance and Engineering Building generally fell towards the south and south-west at slopes of between 2-4°.

A childcare centre and associated carpark were located to the west of the Nurses Residence.

Materials Management and Business Office, Jacaranda Lodge and the West Sector
The Materials Management and Business Office building (stores) was located in the west section of the site and was of brick and metal clad construction. The areas beneath the north and west sections of the building appeared to have been filled in order to achieve the desired levels.

Paved carparks and a driveway were located to the north and west of the Materials Management and Business Office building. Retaining walls and small gardens/batters

were located between the building and the carpark/driveway. A swimming pool was located to the south.

A grassed stormwater basin was located to the south of the Materials Management and Business Office building and west of the swimming pool. The basin included batter slopes along the south, east and west sides with exposed soil. Some filling appeared to have been undertaken to create the batter slopes.

The Jacaranda Lodge was semi-detached and located to the north-east of the Materials Management and Business Office building. The lodge was a two storey building of brick construction. Small garden and landscaped areas surrounded the building. A tennis court was located to the east of the building, beyond an internal road. The area in the vicinity of the tennis court generally fell towards the north-west at a slope of approximately 4°. The north-west end of the tennis court was retained up to approximately 1.0m above the surrounding area to accommodate the slope.

General

The site is generally expected to drain to the north-west and west, towards Coups Creek. The majority of surface water at the site is expected to be collected by the numerous stormwater drains located throughout the carparks and other hardstand areas. Some infiltration of rainwater into the grassed and landscaped areas is also expected. Excess stormwater would be expected to collect in the grassed stormwater basins located in the central-north, north-east and west sections of the site.

High voltage electricity cables are understood to enter the site from Fox Valley Road in the vicinity of the main entrance driveway and extend towards the north section of the H. E. Clifford Tower Block.

Service pits for electricity and stormwater/sewage, together with hydrants were observed throughout the site.

3.2 Regional Geology and Hydrogeology

The 1:100,000 geological map of Sydney (Map 9130, 1:100,000 Department of Mineral Resources [now the Department of Primary Industries] – 1983) indicates the site to be nearby the boundary of areas underlain by Hawkesbury Sandstone and Ashfield Shale of the Wianamatta Group. Hawkesbury Sandstone typically consists of medium to coarse grained quartz sandstone with minor shale and laminite lenses. Ashfield Shale typically consists of black to dark grey shale and laminite.

Department of Water and Energy (DWE) records were researched for the investigation and indicated that one registered groundwater bore lies within 1km of the site. The well (ref: GW107929), installed to a depth of approximately 180m, was located to the north-west of the site beyond Coups Creek and was registered for recreational use. The well was installed on the portion of land included in Lot 621 DP 1128314 located to the north-west of Coups Creek.

The stratigraphy of the site is expected to consist of residual clayey soils overlying relatively shallow bedrock. Based on these conditions groundwater is not considered to be a significant resource in the immediate area of the site.

4 SITE HISTORY ASSESSMENT

4.1 Aerial Photographs

Aerial photographs were reviewed as part of the assessment of the site history. The following information was obtained:

1930 - A large grassed courtyard area was located in the central-east section of the site, adjacent to Fox Valley Road, which appeared unpaved. A group of small to medium sized buildings was located adjacent and to the south-west of the courtyard. A large area of market gardens/orchards was located to the north and west of the courtyard and group of buildings. An additional large market garden area was located further to the north. A smaller market garden area was located to the south-west of the group of buildings and extended to The Comenarra Parkway, which appeared narrow and unpaved. Some small buildings/sheds were located to the south-west of the group of buildings, to the west of the market gardens. Some small to medium sized areas to the west of the group of buildings appeared unpaved. The remaining vacant areas appeared grassed.

Coups Creek was located to the west of the site, within a larger area of bushland, and extended in a north-west to south-east orientation. Some relatively small cultivated areas and houses were located on the east side of Fox Valley Road. Bushland was located further to the east. Some small buildings/houses were located to the south of The Comenarra Parkway, which terminated approximately 300m to the west of the site. Some small medium density residential areas were located to the north (beyond Coups Creek) and north-east of the site.

1951 - A group of medium to large sized buildings were located adjacent and to the south-west of the central courtyard area. The east and south most buildings appeared similar to part of the existing women's health building. A medium sized building was located in the south-east corner of the site. Additional small buildings/sheds were located to the west of the group of buildings. The former market garden areas appeared vacant and grassed, except for two small areas to the west of the group of buildings. A treed area was located to the south-east of the group of buildings and extended north along the west side of Fox Valley Road.

A row of houses was located to the north-east of the site along the west side of Fox Valley Road. A medium sized building was located to the south of the site on the corner of Fox Valley Road and The Comenarra Parkway. Additional medium density residential areas were located to the south of The Comenarra Parkway. Residential buildings were located to the south-east of the site on the corner of Fox Valley Road and The Comenarra Parkway and appeared similar to the existing buildings.

1961 - Some of the buildings in the central group of buildings appeared to have been extended. The building in the south-east corner of the site appeared to have been demolished. An additional building was located immediately south of the central group of buildings and appeared similar to part of the existing female residence building. Some cultivated land was located west and south-west of the central group of buildings and extended to the small buildings/sheds.

A large building was located to the north of the central courtyard, on the west side of Fox Valley Road, that appeared similar to the existing church. A medium sized building was located to the south-east of the site that appeared similar to the existing school building on the corner of Fox Valley Road and The Comenarra Parkway.

1970 - Some of the buildings in the central section of the site appeared to have been extended. A relatively small building was located in the west section of the central group and appeared similar to the existing male residence building.

Houses were located along the majority of Fox Valley Road. The medium density residential areas to the south of The Comenarra Parkway had

been extended and included houses along the north side of the road, to the south-west of the site. A medium sized building was located to the south-east of the intersection of Fox Valley Road and The Comenarra Parkway and appeared similar to the existing shopping centre.

1978 - A large, tall building had been constructed on the north-east side of the central group that fronted the courtyard. The building appeared similar to the existing tower building. A medium sized building had been constructed to the north of the tower building and was understood to have been the former activities building. The courtyard area appeared similar to the existing Village Green. A new building had been constructed in the south-east corner of the site that appeared similar to the existing Fox Valley Medical and Dental Centre. The south-most building of the group had been extended and appeared similar to the existing female (nurse's) residence building. A large paved carpark had been constructed to the north-west of the Village Green. A swimming pool was located to the west of the central group of buildings. A ring road (internal) had been constructed around the central group of buildings. The majority of small buildings/sheds in the west section of the site had been demolished.

The building to the south-east of the site, on the corner of Fox Valley Road and The Comenarra Parkway had been extended and appeared similar to the existing school building. Some clearing had been undertaken to the north-west of the site, beyond Coups Creek, and Mount Pleasant Avenue appeared to be under construction. The Comenarra Parkway had been completed and extended west from the intersection with Fox Valley Road.

1986 - A new building had been constructed immediately to the south-west of the central group that appeared similar to the existing workshop building. The remainder of the site appeared similar to the 1978 photograph.

Additional clearing had been undertaken to the north-west of the site and buildings had been constructed that appeared similar to the existing retirement village buildings. Mount Pleasant Avenue appeared to have been completed.

1994 - A relatively large building had been constructed to the north-west of the tower building and south-west of the activities building that appeared

similar to the existing clinical services block. A building had been constructed adjacent to the services block building (at the rear of the tower building) that appeared similar to the existing women's health (maternity wing) building. A relatively large building had been constructed to the west of the central group that appeared similar to the existing stores building.

The surrounds appeared similar to the 1986 photograph.

2005 - The activities building had been demolished and a new, slightly larger building had been constructed that appeared similar to the existing San Clinic. A building had been constructed to the south-west of the female residence building that appeared similar to the existing child care centre building. A medium sized building had been constructed adjacent to and to the north-east of the stores building that appeared similar to the existing Jacaranda Lodge. Two small buildings had been constructed to the south of the central group and the ring road. A medium sized building was located to the north of the paved carpark and north-west of the church. Two small paved carparks were located to the north-east and east of the building, respectively.

The surrounds appeared similar to the 1994 photograph, except that the retirement village to the north-west of the site appeared to have been completed and included large areas of residential villas.

4.2 Land Title Search

A limited historical land title search was performed on our behalf by Advance Legal Search. Details are presented in Appendix C and a summary of the relevant information is provided below:

Registration Date	Proprietor
Part Portions 29 & 30 Parish Gordon	
1870	Richard Battleff Evans, labourer
1895	Elizabeth Sharpe Evans, widow
1901	Frederick Lacey Sharp (business manager), John Allen Burbery (business manager), Daniel Kness (physician), Eugene William Farnsworth (minister of gospel) and Merritt Gardiner Kellogg (architect)
1903	The Sydney Sanitarium and Benevolent Association Limited

Part Portion 31 Parish Gordon	
1877	Alexander Bowman, grantee
1885	Austin Torange, esquire
1935	Perpetual Trustee Company (Limited) - 72 Acres
1939	Perpetual Trustee Company (Limited) – 54 Acres 2 Roods 31 ½ Perches
1941	Australasian Conference Association Limited
Part Portion 30 Parish Gordon	
1890	Joshua Reubon Johnson, minor
1901	Frederick Lacey Sharp (business manager), John Allen Burbery (business manager), Daniel Kness (physician), Eugene William Farnsworth (minister of gospel) and Merritt Gardiner Kellogg (architect)
1903	The Sydney Sanitarium and Benevolent Association Limited
Part Portions 29 & 30 Parish Gordon	
1910	Alexander Gordon Waugh, orchardist (17 Acres 0 Roods 10 ½ Perches)
1920	Australasian Conference Association Limited (16 Acres 3 Roods 18 Perches)
Part Portions 29 & 30 Parish Gordon	
1918	Australasian Conference Association Limited (75 Acres 1 Roods 18 Perches)
1931	Australasian Conference Association Limited (74 Acres 0 Roods 3 ¾ Perches)
Grant of Closed – 1 Acre, 2 Rood 4 ½ Perches	
1936	Australasian Conference Association Limited
Portion 30 and part Portions 28, 29 & 31 and 1 Acre 2 Roods 4 ½ Perches Grant, Parish Gordon & South Colah (159 Acres 1 Roods 37 ½ Perches)	
1949	Australasian Conference Association Limited
1955-1958	Lease to Walter George Fredericks, storekeeper, and Margaret Lucy Fredericks, of part
1963	Australasian Conference Association Limited (159 Acres 0 Roods 25 Perches)
1994-1998	Various commercial leases (Lot 14 DP 834969)
1998-2000	Various commercial leases (Lot 53 DP 880017)
2000-2008	Various commercial leases (Lot 62 DP 1017514)
Lot 621 DP 1128314	
2008	Australasian Conference Association Limited
2008-current	Various commercial leases

The land search has not indicated any particular land use that may be considered to have resulted in significant contamination of the soil and groundwater at the site.

4.3 Council Records

A search of Development Application (DA) and Building Approval (BA) records/the property file held by Ku-ring-gai Council was undertaken on behalf of EIS. The results of the search are presented in Appendix D and key information is summarised below:

- 1990 – DA, new building to house laundry facilities;
- 1991 – BA, new carpark;
- 1993 – DA, new hospital wing;
- 1994 – DA, new emergency unit;
- 1994 – DA, construction of cancer support centre;
- 1995 – BA, Centre for Health Management;
- 1998 – BA, roadway for laundry service;
- 1997 – BA, Jacaranda Lodge (Stage 2);
- 1997 – DA, additional carparking;
- 1998 – DA, new multi-level car park structure;
- 2001 – DA, demolition and new medical centre;
- 2001 – DA, community centre;
- 2001 – Construction Certificate (CC), child care centre and carpark;
- 2002 – DA, demolish sheds and fuel storage area;

4.4 WorkCover Database Records

A records search for licenses to store dangerous goods was undertaken on our behalf by WorkCover. The records included licences to store various gases and liquids at the site. The majority of stores on the licenses were associated with general hospital use and included oxygen, carbon dioxide, liquefied petroleum gas (LPG), some acids (roofed store), turpentine and some toxic liquids and pesticides.

The license (ref: 35/014066) included five stores for petroleum fuel. These were:

- An above ground diesel tank (15,000L) at the south-west of the workshop building;
- An above ground diesel tank (20,000L) at the south-west of the workshop building;
- An underground diesel tank (12,000L) adjacent and to the south-west of the clinical services building (theatre block);

- An above ground diesel tank (2,500L) adjacent and to the south-east of the tower building, at the rear of the substation. Two smaller tanks are located within the substation building to power backup generators; and
- A flammable good cabinet in the gardeners section of the workshop building licensed to store 100L of petroleum.

The records also indicated licenses for a 3,000L Underground Storage Tank (UST) that was replaced by a similarly sized UST in 1971. The location these USTs could not be confirmed, however, they appeared to be at the rear (south-west) of the workshop building.

The records did not indicate any licenses to store dangerous goods on either of the investigation area for Stage 1 of the proposed development works.

4.5 NSW EPA Records

A search of the NSW EPA on line database did not indicate the existence of any DECC (EPA) notices for the site under section 58 of the Contaminated Land Management Act (1997).

The database included a license (No. 6546) for the site for hazardous, industrial or group A water generation or storage. The license is related to hospital activities and allows production of 100-500T of waste. The license status is listed as 'no longer in force'.

4.6 SAH Online History and Staff Interviews

Sydney Adventist Hospital website (www.sah.org.au) includes a 'History of the San' section. The information included:

- The hospital opened as 'The Sydney Sanitarium' in 1903 with a 70 bed capacity and became known at 'the San'; and
- The hospital was rebuilt in 1973 and is currently licensed for a 342 bed capacity.

Information provided to EIS by staff of the San indicated the following:

- The women's health (maternity) wing was constructed in the 1930's and was extended in the 1980's;
- The tower building was constructed in 1973;
- The linen building was added as an extension to the services block in 1980;
- The CSB was constructed in 1993; and

- The San Clinic building was constructed in 2002

4.7 Assessment of Historical Information Integrity

The site history assessment has generally been obtained from: government records including the NSW land titles office, historical archives, historical aerial photographs and NSW WorkCover records. The veracity of the information from these sources is considered to be high, however, given the age of the development and the lack of information available on activities prior to 1930'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.

4.8 Summary of Historical Site Use

The search of historical information has indicated the following:

- The site has been used for hospital purposes since approximately 1903;
- Several hospital buildings were constructed and demolished between 1903 and 1973 in the central-east section of the site;
- Areas of market gardens and agriculture were located to the south-west and west of the central group of building at the site prior to the 1980's;
- The existing 'tower building' was constructed in 1973;
- There are no recorded notices listed on the NSW DECC CLM register and WorkCover have no records of underground storage tank licenses issued for the investigation areas for Stage 1 of the proposed development works.

4.9 Potential Contamination Sources

4.9.1 General Contamination Processes

Contamination of surface and subsurface soils generally arises from previous land use that can include petroleum hydrocarbon and warehouse storage, manufacturing processes and pesticide and fertiliser usage. Imported fill soils may contain contaminants derived from unknown sources. Migration of contaminants can occur in permeable subsurface soil or fill materials and via man-made and natural drainage systems. The extent of contamination migration is dependent on the hydro-geological environment and the chemical and physical characteristics of the contaminants. Contamination migration in clayey soils can be expected to be limited, whilst sandy soils are conducive to greater spatial migration.

Backfill to service trenches can form contamination migration pathways via poorly compacted or permeable backfill. Backfill may also be contaminated.

The general history of contamination of sites in the Sydney region indicates that analysis for heavy metals including lead, copper and zinc should be incorporated in the schedule of laboratory testing. In addition screening tests should be performed on selected samples for polycyclic aromatic hydrocarbons (PAHs), organochlorine pesticides (OCs), polychlorinated biphenyls (PCBs), petroleum hydrocarbons (TPH), monocyclic aromatic hydrocarbons (BTEX) and asbestos.

4.9.2 Potential Site Specific Contamination

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

- Potentially contaminated, imported fill material;
- Historical use of pesticides in areas of former agricultural use; and
- Migration of contaminants associated with storage of fuel in the central section of the site.

4.9.3 Site Specific Contaminants of Concern

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

- Heavy metals: arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc;
- Total petroleum hydrocarbons (TPH);
- Monocyclic aromatic hydrocarbon (BTEX) compounds: Benzene, Toluene, Ethyl Benzene and Xylenes;
- Polycyclic aromatic hydrocarbons (PAHs) including Benzo(a)pyrene;
- Organochlorine pesticides (OCPs): Aldrin, dieldrin, DDT, chlordane, etc;
- Organophosphorus pesticides (OPPs);
- Polychlorinated Biphenyls (PCBs); and
- Asbestos.

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

- Heavy metals: arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc;
- Total petroleum hydrocarbons (TPH); and

- Monocyclic aromatic hydrocarbon (BTEX) compounds: Benzene, Toluene, Ethyl Benzene and Xylenes.

4.10 Potential Receptors

The main potential contamination receptors are considered to include:

- Coups Creek located adjacent and to the north-west and west of the site.
- 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.
- Future site occupants.

4.11 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.

5 ASSESSMENT CRITERIA DEVELOPMENT

5.1 Regulatory Background

In 1997 the NSW Government introduced the *Contaminated Land Management Act, 1997* (CLM Act). This act, associated regulations, State Environmental Planning Policy (SEPP) No.55 – Remediation of Land (1998) and associated NSW DECC (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;
- 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 is required prior to commencement of the proposed development works. 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 the NSW DECC (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 states that specific notation relating to contaminated land issues must be included on S.149 planning certificates prepared by Council where the land to which the certificate relates is:

- within an investigation or remediation area.
- subject to an investigation or remediation order by the DECC (EPA).
- the subject of a voluntary investigation or remediation proposal.
- 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 S.149 certificates prepared for the site.

Section 60 of the CLM Act sets out a positive duty on an owner, or person whose activities cause contamination, to notify the DECC if they are aware that the contamination presents a significant risk of harm.

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 (POEO Act 1997) and associated regulations and guidelines including the *Waste Classification Guidelines Part 1: Classifying Waste. DECC NSW 2008.* All materials should be classified in accordance with these guidelines prior to disposal.

Section 143 of the *Protection of the Environment Operations 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.

In 2008 the NSW Government introduced the *Protection of the Environment Operations (Underground Petroleum Storage Systems) Regulation 2008* under the *Protection of the Environment Operations Act 1997*. This Regulation is designed to regulate the storage of petroleum in underground storage systems so as to minimise the risk of the discharge of substances that cause significant damage to the environment. The regulation has specific criteria that must be met for the: design and modification of new and existing storage systems; and repair and decommissioning of existing systems.

For new and existing storage systems this includes installation of ground water monitoring wells and preparation of environmental management plans. The regulations states that '*A storage system must not be used unless groundwater monitoring wells are installed on the storage site*' and that the wells should be located '*with a view to maximising the likelihood that the wells will intercept contaminated groundwater*'. The regulation makes a distinction between old and new storage systems. The following are defined as 'old storage systems':

- a storage system for which development consent had been obtained under the *Environmental and Planning Assessment Act 1979* before 1 June 2008; or
- a storage system for which installation had lawfully commenced before 1 June 2008; or
- a storage system that had been commissioned before 1 June 2008.

Installation of groundwater wells and subsequent monitoring does not apply to 'old storage systems' until 1 June 2011. For new storage systems installation of groundwater wells and subsequent monitoring is a requirement as of 1 June 2008.

5.2 Soil Contaminant Threshold Concentrations

The soil investigation levels adopted for this investigation are derived from the NSW DEC (now DECC) document *Guidelines for the NSW Site Auditor Scheme (2nd Edition) 2006* and the National Environmental Protection Council document *National Environmental Protection (Assessment of Site Contamination) Measure 1999*. The contaminant thresholds listed below are levels at which further investigation and 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 in Table A-1) 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 petroleum hydrocarbons (TPH) and monocyclic aromatic hydrocarbon (BTEX) compounds have previously been established in the *NSW DECC (EPA) Contaminated Sites: Guidelines for Assessing Service Station Sites* (1994) publication and this document is referenced in the 2006 Site Auditor Guidelines. Heavy fraction petroleum hydrocarbon aliphatic/aromatic component threshold concentrations have also been introduced in the *National Environmental Protection (Assessment of Site Contamination) Measure 1999* (NEPC Guidelines).

The Provisional Phyto-toxicity Investigation Levels (PPILs) are generic values based on phytotoxicity data for plant response to specific contaminants in a sandy loam matrix and are included in the contaminated site assessment where the proposed land use includes gardens and accessible soils.

The *National Environmental Protection (Assessment of Site Contamination) Measure 1999* (NEPC Guidelines) do not provide numeric guidelines for the assessment of asbestos in soil. NSW DECC (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 DECC (EPA) have not published numerical guidelines for the assessment of asbestos in subsurface soils.

The WorkCover publication *Working with Asbestos Guide* (NSW WorkCover 2008) states that, where buried asbestos in 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* and WorkCover requirements all necessary disturbance works associated with asbestos containing materials must be conducted by a licensed AS-1 Asbestos Removal Contractor.

5.2.1 Site Assessment Criteria for Soil Contaminants

The 'park and recreational open spaces' exposure setting has been adopted for this assessment and the appropriate soil criteria are listed in the following table:

Site Soil Assessment Criteria (mg/kg)			
Contaminant	**HIL Column E Exposure Setting**	**Guidelines for Assessing Service Station Sites (1994)**	**Phyto-toxicity Investigation Levels**
Inorganics			
Arsenic (total)	200		20
Cadmium	100		3
Chromium (III)	24%		400
Copper	2000		100
Lead	600		600
Mercury (inorganic)	30		1
Nickel	600		60
Zinc	14000		200
Organic Contaminants			
TPH (C_6-C_9)		65	
TPH (C_{10}-C_{36})		1000	
Benzene		1	
Toluene		1.4	
Ethylbenzene		3.1	
Total Xylenes		14	
Total PAHs	40		
Benzo(a)pyrene	2		
Aldrin + Dieldrin	20		
Chlordane	100		
DDT+ DDD + DDE	400		
Heptachlor	20		
PCBs (Total)	20		

For the purpose of off-site disposal, the classification of soil into 'General Solid Waste', "Restricted Solid Waste" and 'Hazardous Waste" categories is defined by chemical

contaminant criteria outlined in *Waste Classification Guidelines Part 1: Classifying Waste. DECC NSW 2008.* These chemical contaminant criteria are summarised in Table A-2.

5.3 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 *National Environmental Protection (Assessment of Site Contamination) Measure (1999) Schedule 7(a) Soil Investigation Levels* and the statistical analysis methods outlined in the *NSW EPA Contaminated Sites Sampling Design Guidelines (1995).*

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 site criteria developed above 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 above criteria. Validation of the remediated site is generally required to demonstrate that the site is suitable for the proposed land use.

5.4 Groundwater Contaminant Trigger Values

Groundwater resources in NSW are managed and regulated by environmental and planning legislation, including the Protection of the Environment Operations (POEO) Act 1997, the Environmental Planning and Assessment Act (1979) and the Water Management Act (2000).

The 1999 NEPC Guidelines refer to trigger values presented in the ANZECC Australian Water Quality Guidelines (1992) and the NHMRC Australian Drinking Water Guidelines (2004). These guideline values define water quality parameters at the point of use including aquatic ecosystems (fresh and marine waters), drinking water, industrial and agricultural/irrigation uses.

In 2000, ANZECC released the Australian and New Zealand Guidelines for Fresh and Marine Water Quality which supersede the previous guideline documents. The ANZECC 2000 guidelines include a complete framework for the development of appropriate guidelines for aquifer assessment.

The appropriate settings for current and potential uses of groundwater should be identified in establishing applicable groundwater trigger values:

- raw drinking water source;
- agricultural use – stock watering;
- agricultural and domestic use – irrigation;
- protection of aquatic ecosystems – freshwater; and
- protection of aquatic ecosystems – marine.

5.4.1 Site Assessment Criteria for Groundwater Contaminants

The presence of elevated contaminant concentrations in groundwater triggers further investigation of aquifer conditions to assess the source(s) of contamination and the lateral and vertical extent of the contamination. The fresh groundwater trigger values have been adopted for this investigation. These concentrations are presented in the following table:

Site Groundwater Assessment Criteria (mg/L)		
Contaminant	**95% Trigger Value for fresh water**	**Australian Drinking Water Guidelines**
Inorganics		
Arsenic	0.024	0.007
Cadmium	0.0002	0.002
Chromium	0.0033[1]	0.05
Copper	0.0014	2.0
Lead	0.0034	0.01
Mercury	0.0006	0.001
Nickel	0.011	0.02
Zinc	0.008	3.0^^
Organics		
Benzene	0.95	0.001
Toluene	0.18	0.8
Ethyl benzene	0.08	0.3
o-Xylene	0.35	
m+p Xylene	0.03	
Total Xylenes	-	0.6
TPH C_{10}-C_{36}		0.6 *

* In the absence of locally endorsed guidelines, the Dutch intervention levels specified in *'Circular on target values and intervention values for soil remediation' (Ministry of Housing, Spatial Planning and the Environment 2000)* have been quoted.

^^ In the absence of a health based guideline the aesthetic guideline has been quoted.

[1] In the absence of high reliability guideline concentration, a low or moderate reliability value has been adopted

6 ASSESSMENT PLAN AND METHODOLOGY

This investigation was targeted at the areas of concern associated with Stage 1 of the proposed hospital re-development. For the purposes of determining the area of the proposed developments the site was split into:

- Area 1 – The existing on-grade carpark and proposed concourse building area in the north section of the site; and
- Area 2 – The proposed on-grade carpark area in the north-east section of the site.

The *NSW DECC (EPA) Sampling Design Guidelines (1995)* for contaminated site investigations states the minimum recommended sampling density for sites of various sizes. The guideline states that samples should be obtained at the following densities:

- Area 1 – 11,800m2, 22 evenly spaced sampling points; and
- Area 2 – 5,000m2, 13 evenly spaced sampling points.

Samples were obtained from approximately 50% of the recommended sampling location which included:

- Area 1 – 12 boreholes; and
- Area 2 – 6 boreholes.

This sampling density was considered adequate for a Stage 1 environmental site assessment.

The boreholes were drilled on a systematic sampling plan with a spacing of up to 40m between sampling points. A systematic sampling plan was considered most appropriate for this investigation as:

- no specific potential contaminant sources were identified by the available site history.
- the distribution of contamination is expected to be associated with imported potentially contaminated fill material and is therefore likely to be random.

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

7 INVESTIGATION PROCEDURE

7.1 Subsurface Investigation and Soil Sampling Methods

Subsurface investigations for the geotechnical investigation were 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. Sampling personnel used disposable Nitrile gloves during sampling activities.

Additional environmental boreholes were drilled using a four-wheel-drive (4wd) mounted hydraulically push tube rig. Soil samples were obtained from disposable polyethylene push tube samplers. Sampling personnel used disposable Nitrile gloves during sampling activities.

Soil and rock samples were obtained at various depths, based on observations made during the field investigation. 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. During the investigation, soil samples were preserved by immediate storage in an insulated sample container with ice in accordance with AS 4482.1-2005 and AS 4482.2-1999 as summarised in the following table:

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, OC/PCBs		
Asbestos	Sealed plastic bag	None

Each sample was labelled with a unique job number, the sampling location, sampling depth and date. All samples were recorded on the borehole logs presented in Appendix A and on the 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 chain of custody procedures. Detailed EIS field sampling protocols are included in Appendix D.

7.1.1 Photoionisation Detector (PID) Screening

A portable PID was used in this investigation to assist with selection of samples for laboratory hydrocarbon (TPH/BTEX) analysis. The PID is sensitive to volatile organic compounds. 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.

Photoionisation detector (PID) screening of detectable volatile organic compounds (VOC) was undertaken on soil samples using the soil sample headspace method. VOC

data was obtained from partly filled glass jar samples following equilibration of the headspace gases. The PID headspace data is included on the COC documents.

7.2 Groundwater Monitoring Well Installation and Water Sampling Methods

7.2.1 Drilling and Well (Temporary Standpipe) Installation

Two monitoring wells were installed at borehole locations (BH3 and BH17) as shown on Figure 2. The monitoring wells were installed as follows:

- Boreholes BH3 and BH17 were drilled to depths of approximately 6.97m and 6m, respectively.
- 50mm diameter Class 18 PVC was installed in the boreholes and consisted of unslotted PVC casing from the surface to 3m and machine slotted PVC screen from 3m to 6m.
- A 2mm graded sand filter pack was installed around the PVC to a height of 0.5m above the slotted PVC section.
- A bentonite seal was installed above the filter pack.
- Borehole cuttings were installed above the bentonite seal to approximately 0.5m below the ground surface.
- A concrete/cement grout was then used to seal the monitoring well with a gatic cover installed flush with the surrounding pavement.

The monitoring well construction details are documented on appropriate borehole logs presented in Appendix A.

7.2.2 Monitoring Well Development

Groundwater was purged from the monitoring wells using a submersible electric pump. During purging the pH, temperature, conductivity and redox potential were monitored (where possible) using calibrated field instruments to assess the development of steady state conditions. Both monitoring wells were purged until effectively dry to remove stagnant water and sediment from the monitoring wells prior to sampling to obtain samples representative of the general aquifer conditions.

The monitoring wells were allowed to recharge prior to sampling.

Groundwater removed from the wells during purging was transported to EIS, where the water is stored in a holding drum prior to collection by licensed waste water contractors. When the drum is filled a composite sample is analysed to classify the waste water for disposal.

7.2.3 Groundwater Sampling

Groundwater samples were obtained from the monitoring wells using disposable polyethylene bailers. During sampling, the pH, temperature, conductivity, redox potential and groundwater levels were monitored using calibrated field instruments. The sampling data sheets are presented in Appendix E and the calibration documentation for the instruments are presented in Appendix E.

Groundwater samples were obtained directly from the bailer and placed in appropriate glass bottles, BTEX vials or plastic bottles.

All samples were preserved in accordance with water sampling requirements detailed in the NEPC Guidelines (1999) and placed in an insulated container with ice. During the investigation, groundwater samples were preserved by immediate storage in an insulated sample container with ice in accordance with AS/NZS 5667.1-1998 as summarised in the following table:

Analyte	Preservation	Storage Period
Heavy metals	45μm Filter, acidify with nitric acid to pH 1-2.	Store at <4°, analysis within 30 days
VOCs (TPH)	Zero headspace, teflon seal	Store at <4°, analysis within 7 days
VOCs (BTEX + Light TPH)	Zero headspace, Teflon seal, acidify with HCl to pH 1-2.	Store at <4°, analysis within 7 days

An intra-laboratory field duplicate sample was obtained during water sampling by alternate filling of sample containers during low-flow pumping activities. This technique was adopted to minimise disturbance of the samples and loss of volatile contaminants associated with mixing of liquids in secondary containers, etc.

On completion of the fieldwork, the samples were delivered in the insulated sample container to a NATA registered laboratory for analysis under standard chain of custody procedures.

7.3 Laboratory Analysis

7.3.1 Soil Samples

Analysis of soil samples was undertaken by NATA registered laboratories using analytical methods detailed in the Schedule B(3) NEPC (1999) Guideline on Laboratory Analysis of Potentially Contaminated Soils. Laboratory analysis was undertaken by Envirolab Services Pty Ltd (NATA Accreditation No. 2901).

For this investigation selected soil samples were analysed for contaminants using the following laboratory techniques:

- Heavy metals – Nitric acid digestion. Analysis by ICP.
- Low level mercury – cold vapour AAS.
- OC and OP pesticides and PCBs - Extracted with acetone/hexane. 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/PID.
- TPH – Soil extracted with dichloromethane/acetone. Analysis by GC/FID.
- BTEX – Soil extracted with methanol. Analysis by P&T PID. Confirmed with column flame ionisation detection.
- 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.

7.3.2 Groundwater samples

Analysis of water samples for this assessment was undertaken by NATA registered laboratories using analytical techniques endorsed by the NSW EPA (Schedule B(3) of NEPC 1999 does not apply to water samples). Laboratory analysis was undertaken by Envirolab Services Pty Ltd (NATA Accreditation No. 2901).

For this investigation selected groundwater samples were analysed for contaminants using the following laboratory techniques:

- Heavy metals – Direct injection. Analysis by ICP-AES.
- Low level mercury – Direct injection. Analysis by flow injection AAS.
- TPH (volatile) – P&T. Analysis by GC/FID.
- TPH – Solvent (dichloromethane) extraction. Analysis GC/FID.
- BTEX – Direct P&T. Analysis by GC/PID. Confirmed with column flame ionisation detection.

8 RESULTS OF INVESTIGATION

8.1 Subsurface Conditions

Eighteen boreholes were drilled for this investigation. This included 6 boreholes in the proposed on-grade carpark area and 12 boreholes in the proposed multi-storey carpark and concourse building area. Site details and borehole locations are shown on Figure

2. 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 by the boreholes is presented below:

8.1.1 On-grade Carpark

BH16 to BH21, inclusive were drilled in the area of the proposed on-grade carpark.

Pavement

Asphaltic concrete pavement was encountered at the surface in BH18, BH20 and BH21 and extended to depths of approximately 20mm to 50mm.

Fill

Fill material and/or topsoil was encountered at the surface or beneath the pavement in all six boreholes and extended to depths of approximately 0.1m to 1.2m. Fill was shallower than 0.5m in all boreholes except BH21, where it extended to 1.2m. The fill material was typically silty clay with inclusions of sandstone, shale, ironstone and igneous gravel. The fill in BH19 contained a trace of ash.

Natural Soils

Silty clay was encountered beneath the fill material in all boreholes and extended to the termination of all boreholes, except BH17, at a maximum depth of approximately 1.95m. The silty clay was typically orange brown or grey with some red mottling and contained inclusions of ironstone gravel. Light grey silty sandy clay was encountered beneath the silty clay in BH17 and extended to a depth of approximately 2.3m. The silty sandy clay was mottled orange and contained inclusions of ironstone gravel and root fibres.

Bedrock

Light grey sandstone bedrock was encountered beneath the natural soil in BH17 and extended to the termination at a depth of approximately 6m.

Groundwater

A monitoring well was installed to a depth of approximately 6m in BH17. The well was dry on completion of drilling, however the standing water level was measured at a depth of approximately 2.94m after approximately 6 days. The standing water level was measured at 3.29m approximately 7 days after installation and 1 day after purging.

8.1.2 Multi-storey Carpark and Concourse Building

BH1 to BH15, inclusive, were drilled in the proposed multi-storey carpark and concourse building area.

Pavement

Asphaltic concrete pavement was encountered at the surface in BH4 to BH10, inclusive, and BH14. The asphaltic concrete pavement extended to depths of approximately 30mm to 200mm. Roadbase was encountered beneath the asphaltic concrete in BH6, BH7, BH9 and BH10 and extended to depths of approximately 0.2m to 0.25m. Concrete pavement was encountered at the surface in BH11 to BH13, inclusive, and extended to depths of approximately 0.1m to 0.13m.

Fill

Wood chips/mulch was encountered at the surface in BH3 and extended to a depth of approximately 0.1m. Fill material was encountered beneath the pavement, wood chips or at the surface in all fifteen boreholes and extended to depths of approximately 0.15m to 4.3m. BH2 and BH15 were terminated in the fill material at depths of approximately 1.5m and 2m, respectively. The fill material included silty clay, clayey sand, clayey silt, sandy gravel, sandy clay, silty sand, sand and sandstone boulders. The fill material contained inclusions of igneous, sandstone, shale and ironstone gravel. Ash was encountered in the fill material in BH6 and BH10.

Natural Soils

Clayey sand, sandy clay or silty clay was encountered beneath the fill material in BH1, BH3, BH6, BH7, BH8, BH10 and BH12 to BH14, inclusive and extended to depths of approximately 0.7m to 6.4m. Typically the natural material extended to depths of 0.7m to 2.9m, except in BH14 where the soil extended to 6.4m. The natural soil contained inclusions of ironstone gravel and, in some boreholes, organic material.

Bedrock

Sandstone bedrock was encountered beneath the fill material or natural soil in all boreholes, except BH2, BH14 and BH15. Shale bedrock was encountered beneath the natural soil in BH14. The sandstone bedrock extended to the termination of all the boreholes (except BH2, BH14 and BH15) at a maximum depth of approximately 6.98m. Interbedded shale and sandstone bedrock was

encountered in BH14 and extended to the termination of the borehole at a depth of approximately 12.78m.

Groundwater

All the boreholes were dry on completion of augering. A monitoring well was installed to a depth of approximately 6m in BH3. The well was dry on completion of drilling, however the standing water level was measured at a depth of approximately 4.47m after approximately 6 days. The standing water level was measured at 4.43m approximately 7 days after installation and 1 day after purging.

8.2 Laboratory Results - Soil

The laboratory analysis results for soil samples are summarised in Table B and Table C inclusive and analysis reports are presented in Appendix B. The site soil assessment criteria for this investigation are specified in the "Site Assessment Criteria for Soil Contaminants" section earlier in this report. The results of the analyses are summarised below.

Heavy Metals

Eighteen selected fill and three selected natural soil samples were analysed for heavy metals. The nickel concentrations in fill samples BH8 (0.05-0.3m) and BH14 (0.4-0.5m) were slightly above the PPIL of 60mg/kg. The arsenic concentration in the BH2 (0.2-0.4m) sample was slightly above the PPIL of 20mg/kg. All the results of the analyses were below the health based site assessment criteria.

The results of all analyses were less than the SCC1 criteria outlined in the Waste Classification Guidelines Part 1: Classifying Waste DECC NSW 2008.

TCLP leachates were prepared from fourteen samples and analysed for chromium, lead and nickel and from three samples and analysed for arsenic. The results were all below the TCLP1 criteria outlined in the Waste Classification Guidelines Part 1: Classifying Waste DECC NSW 2008.

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. Eighteen selected fill and three selected natural soil samples were analysed for

petroleum hydrocarbons and BTEX compounds. The results of the analyses were below the site assessment criteria.

The results of all analyses were less than the relevant CT1 and SCC1 criteria outlined in the Waste Classification Guidelines Part 1: Classifying Waste DECC NSW 2008.

Polycyclic Aromatic Hydrocarbons (PAHs)

Eighteen selected fill and three selected natural soil samples were analysed for a range of PAHs including Benzo(a)pyrene. The results of the analyses were less than the site assessment criteria.

The results of all analyses were all less than the relevant SCC1 criteria outlined in the Waste Classification Guidelines Part 1: Classifying Waste DECC NSW 2008.

TCLP leachates were prepared and analysed from four samples for PAHs. The results were all below the TCLP1 criteria outlined in the Waste Classification Guidelines Part 1: Classifying Waste DECC NSW 2008.

Organochlorine (OC) and Organophosphorus (OP) Pesticides and Polychlorinated Biphenyls (PCBs)

Eighteen selected fill and three selected natural soil samples were analysed for a range of OC and OP pesticides and PCBs. The results of the analyses were less than the site assessment criteria.

The results of all analyses were less than the SCC1 criteria outlined in the Waste Classification Guidelines Part 1: Classifying Waste DECC NSW 2008.

Asbestos

Eighteen selected fill and three selected natural soil 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.

Toxicity Characteristics Leaching Procedure (TCLP)

TCLP leachates (acid) were prepared for seventeen selected fill samples based on the initial laboratory heavy metal and Benzo(a)pyrene results. Fourteen sample extracts were analysed for chromium, lead and nickel and three samples were analysed for arsenic. Four extracts were analysed for PAHs. The results of the analyses were less than the TCLP criteria for 'inert waste' outlined in the

Environmental Guidelines: Assessment, Classification and Management of Liquid and Non-liquid Waste, NSW EPA (now DECC) 1999.

8.3 Laboratory Results - Groundwater

The laboratory analysis results for groundwater samples are summarised in Table D and the analysis reports are presented in Appendix B. The site groundwater assessment criteria are presented in Section 5.4.1. The results of the analysis are summarised below:

Heavy Metals

Two groundwater samples were analysed for heavy metals. Slightly elevated concentrations of lead and nickel (both at 0.05mg/L) were encountered in the MW17 sample. Elevated concentrations of zinc were encountered in both samples. The remaining results of the analyses were below the site assessment criteria.

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

Two groundwater samples were analysed for petroleum hydrocarbons and BTEX compounds. The results of the analyses were below the site assessment criteria.

Miscellaneous Parameters

Two groundwater samples were analysed for pH, Electrical Conductivity (EC) and hardness.

- The pH ranged from 6.2 to 6.5 and was considered to be slightly acidic;
- EC ranged from 0.34mS/cm to 0.61mS/cm and were generally non-saline; and
- Hardness ranged from 77mg$CaCO_3$/L to 89mg$CaCO_3$/L.

Field Measurements

- pH results ranged from 5.97 to 5.98 and were considered to be slightly acidic acidic.
- EC results ranged from 0.131mS/cm to 0.888mS/cm and were considered to be non-saline.
- The redox potential (Eh) results ranged from -11.7mV (indicating slightly reducing conditions) to 331mV (indicating predominately oxidising conditions).

8.4 Assessment of Analytical QA/QC

The objective of the assessment of the laboratory QA/QC is to ensure that the sample data is reliable. All laboratory reports for project E22758K have been checked and issued as final by Envirolab Services Pty Ltd, NATA Accreditation No. 2901, Report numbers: 27443, 27443-A, 27715 and 27715-A.

Chain of custody documentation and/or sample receipt advice notices were signed and dated by Envirolab Services laboratories stating that all samples were received cool, in good order and in suitable containers. Compliance of holding times was met for all analyses undertaken by the above laboratory. EIS and laboratory QA/QC procedures for the site screening are summarised in the following table:

Contaminant	QA/QC Procedure							
	Total no. of Samples	Intra-lab Duplicate	Repeat Analysis	Matrix Spike	LCS	Lab Blank	Surrogate Spike	Field Blank
Heavy metals	21	2	2	1	2	1	-	-
TPH	21	-	2	1	1	1	21	-
BTEX	21	-	2	1	1	1	21	1
PAH	21	2	2	1	1	1	21	-
OCP/OPP	21	-	2	1	1	1	21	-
PCB	21	-	2	1	1	1	21	-
TCLP PAH	4	-	-	1	1	1	4	-
TCLP Metals	17	-	1		2	1	-	-

Field QA/QC samples for soil/fill assessment are specified below:

Intra-laboratory duplicates	- Dup 1 is a duplicate of BH10 (0.2-0.5m); and
	- Dup 2 is a duplicate of BH7 (0.4-0.7m).
Field blank	- FB1 (12 March 2009)
Field rinsate	- rinsate 1 (12 March 2009); and
	- rinsate 2 (13 March 2009).

Field QA/QC samples for groundwater assessment are specified below:

Intra-laboratory duplicate	- Dup A is a duplicate of MW17.

The RPD results for the field QA/QC soil duplicate samples are summarised in Tables E-1 and E-2 and groundwater duplicate samples are summarised in Table F. The following comments are an overall summary of the quality of the analytical component of the project:

1. Sample integrity and container requirements were documented as satisfactory.

2. All sample extraction analyses were performed within the required holding times.
3. Matrix spike, laboratory control sample (LCS) and surrogate recovery values indicated that the laboratory accuracy was very good, and that no outliers were reported.
4. Laboratory duplicate RPD results indicated that the sample precision was acceptable.
5. All method, rinsate and field blanks were found to be free of analyte concentrations above the PQLs.
6. The intra -laboratory RPD values indicated that field precision was acceptable. The RPD for mercury from Dup 2 was 120%, which is above the acceptable limit of 100%. This result was considered to be due to low concentrations close to or below laboratory PQL. Neither of the results were above the site assessment criteria, therefore, this result is not considered to have had an adverse impact on the data set as a whole.

The QA/QC data reported by Envirolab Services laboratories for the documented soil and water samples were assessed to be of sufficient quality to be considered acceptable for the environmental assessment of EIS project E22758K.

The QA/QC data including the RPD results are considered to meet the Data Quality Objectives developed for this project.

9 COMMENTS AND RECOMMENDATIONS

The environmental site assessment undertaken for the Stage 1 of the proposed hospital redevelopment at the Sydney Adventist Hospital, 185 Fox Valley Road, Wahroonga was designed to assess the risk of widespread contamination of the investigation areas and the suitability for the proposed land use and provide a classification of soils that may require off-site disposal during the development works.

This investigation was targeted at the areas of concern associated with Stage 1 of the proposed hospital re-development. The proposed Stage 1 development works include:

- re-development of the existing on-grade carpark in the north section of the site to include a multi-storey parking structure and entry concourse;
- construction of a new concourse building between the existing San Clinic and CSB buildings; and
- construction of a paved on-grade carpark in the north-east section of the site.

The site assessment included performance of a site inspection, review of historical site use, including examination of regional aerial photographs and review of geology and groundwater conditions. Historical information and inspection of the site and surrounding areas did not indicate any obvious on-site or nearby off-site activity that could be expected to generate significant soil or groundwater contamination apart from:

- Potentially contaminated, imported fill material;
- Historical use of pesticides in areas of former agricultural use; and
- Migration of contaminants associated with storage of fuel in the central section of the site (outside the investigation areas).

The site soil/fill sampling was subsequently undertaken on the basis of a relatively uniform exploration spacing.

9.1 Soil Contamination

The results of the laboratory tests on selected soils samples covered a range of contaminants commonly encountered in the Sydney region. All the soil results were less than the appropriate Health Investigation Levels.

The BH8 (0.05-0.3m) and BH14 (0.4-0.5m) fill samples encountered elevated concentrations of nickel above the Provisional Phyto-toxicity Investigation Level (PPIL) specified in the *National Environmental Protection (Assessment of Site Contamination)* Measure 1999 *(NEPC Guidelines).* The BH2 (0.2-0.4m) fill sample encountered an elevated concentration of arsenic above the PPIL. The PPILs are principally concerned with phytotoxicity (i.e. adverse effects on plant growth in established and proposed areas of landscaping) and are described in the *NEPC Guidelines* as *"somewhat arbitrary"*, as the effect of these compounds on plant growth will depend on the soil and plant type. These elevations should be taken into consideration for this site as EIS understand that the proposed development may include landscaped areas and therefore elevated levels of nickel and arsenic in these areas may influence plant growth. In the event that landscaped areas are located in the vicinity of the boreholes, advice should be sought from a horticultural specialist on measures that can be adopted to mitigate any adverse effects.

The investigation undertaken by EIS included the analysis of eighteen fill and three natural soil samples for the presence of asbestos fibres using NATA accredited microscopic screening techniques. Asbestos, neither apparent to the naked eye nor apparent using microscopic techniques were not detected within the samples. The scope of work undertaken was designed to assess widespread surficial contamination

and has not included an exhaustive assessment of the site for the presence of small scale asbestos contamination. EIS adopts no responsibility for small scale or buried asbestos features at the site which may be encountered during future earth or construction works at the site.

The WorkCover publication *Working with Asbestos Guide* (NSW WorkCover 2008) states that, where buried asbestos in 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"

9.2 Waste Classification

The fill soils are classified as 'General Solid Waste (non-putrescible)' according to the criteria outlined in *NSW DECC (EPA) Waste Classification Guidelines, Part 1: Classifying Waste, 2008*. Any excess excavated soils should be disposed of to a suitable NSW DECC (EPA) licensed landfill.

The natural silty clay soil and sandstone (and shale) bedrock can be considered to be virgin excavated natural material (VENM). The material is considered suitable for re-use on-site, or alternatively, the material can be disposed to a NSW DECC licensed landfill. The VENM may be suitable for reuse on another site, however the material should be assessed for geotechnical suitability. Where doubt exists about the difference between fill and VENM material an environmental/geotechnical engineer should be contacted.

The fill material also meets the requirement for 'inert waste' under the (former waste guidelines) *Environmental Guidelines: Assessment, Classification and Management of Liquid and Non-liquid Waste, NSW EPA (now DECC) 1999*. Although this classification and these guidelines have been superseded, EIS note that some NSW DECC (EPA) licensed landfills are still able to accept 'inert waste'. There may be a cost benefit associated with disposal of fill soil at such a landfill.

9.3 Groundwater Assessment

Monitoring wells were installed to a depth of approximately 6m in BH3 and BH17 (MW3 and MW17, respectively). MW3 and MW17 were dry on completion of drilling, however the standing water levels were measured at depths of approximately 4.47m and 2.94m, respectively, after approximately 6 days (prior to purging). The standing

water level was measured at 4.43m and 3.29m, respectively, approximately 7 days after installation and 1 day after purging.

A sample was obtained from each of the two monitoring wells. Both the samples contained minor elevations of zinc above the site assessment criteria. The MW17 sample also contained minor elevations of lead and nickel. The samples were also analysed for TPH/BTEX; these results were all below the laboratory practical quantitation limits and the site assessment criteria.

The slightly elevated concentrations of heavy metals (lead, nickel and zinc) in the samples are considered to be the results of regional factors rather than site specific contamination based on the following:

- TCLP heavy metals analysis (acid) indicated that potentially very low metal concentrations could be leached from the fill material;
- Elevated concentrations of heavy metals are often encountered in bedrock groundwater aquifers; and
- Elevated levels of some metals (nickel and zinc in particular) are often associated with leaking water infrastructure.

The high redox potential measured in sample MW17 suggests the groundwater in this section of the site is recharged regularly with relatively fresh water. The low redox potential measured in MW3 (-11.7mV) on 27 March 2009 suggests that either groundwater in this section of the site is not regularly recharged or that elevated concentrations of organic material may be present in this sample (e.g. dilute sewage).

Based on the above rationale, some further groundwater analysis for nutrients (e.g. ammonia, organic carbon) should be included in the subsequent rounds of groundwater monitoring.

9.4 General Recommendations and Conclusions

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.

During demolition and excavation works, the site should be inspected by experienced environmental personnel 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.

Based on the scope of work undertaken, the site is considered to be suitable for the proposed development provided that regular inspections are undertaken during the development works to assess any unexpected conditions and that further assessment of groundwater in the vicinity of MW3 is undertaken during any subsequent investigations.

Normal good engineering site management practice including control of run-off and dust suppression is recommended during earthworks and construction.

10 LIMITATIONS

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.

This investigations 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-1970 constructed buildings or fill material at the site.

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

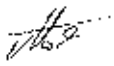
Changes in the proposed or current site use may result in remediation or further investigation being required at the site.

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



Todd Hore
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ENVIRONMENTAL INVESTIGATION SERVICES

IMPORTANT INFORMATION ABOUT YOUR ENVIRONMENTAL SITE ASSESSMENT

These notes have been prepared by Environmental Investigation Services (EIS) to assist with the assessment and interpretation of this assessment report.

An Environmental Assessment Report is Based on a Unique Set of Project Specific Factors
This assessment report has been prepared in response to specific project requirements as stated in the EIS proposed 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 subdivided;
- 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

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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.

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.

ABBREVIATIONS

AAS	Atomic Absorption Spectrometry
ADWG	Australian Drinking Water Guidelines
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
DECC	Department of Environment and Climate Change (formerly DEC and EPA)
DNR	NSW Department of Natural Resources (now split between DWE and DECC)
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 DECC)
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
WP	Work Plan

REFERENCE DOCUMENTS

- ANZECC/ARMCANZ (2000) Australian and New Zealand Guidelines for Fresh and Marine Water Quality (and updates).
- NSW DEC (2007) (now DECC) Guidelines for the Assessment and Management of Groundwater Contamination.
- Australian Government, National Occupational Health and Safety Commission (2005) Code of Practice for the Safe Removal of Asbestos.
- Australian Government, National Occupational Health and Safety Commission (2005) Code of Practice for the Management and Control of Asbestos in Workplaces.
- Australian Standard (2004) Storage and Handling of Flammable and Combustible Liquids. AS1940-2004.
- DUAP/NSW EPA (1998) (now NSW Department of Planning / NSW Department of Environment and Climate Change (DECC) incorporating the EPA) Managing Land Contamination: Planning Guidelines SEPP 55 - Remediation of Land.
- Dutch Ministry of Housing, Spatial Planning and the Environment (2000) Circular on target values for soil remediation.
- NEPM. (1999) National Environmental Protection (Assessment of Site Contamination) Measure (NEPC. Guidelines).
- NSW EPA (1994) (now NSW DECC) Contaminated Sites: Guidelines for Assessing Service Station Sites.
- NSW EPA (1995) (now NSW DECC) Contaminated Sites: Sampling Design Guidelines.
- NSW EPA (1996) (now NSW DECC) Guidelines for Solid Waste Landfills.
- NSW EPA (1997) (now NSW DECC) Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites.
- NSW DEC (2006) (now DECC) Contaminated Sites: Guidelines for the NSW Site Auditor Scheme (2nd Edition).
- NSW EPA (1999) (now NSW DECC) Contaminated Sites: Guidelines on Significant Risk of Harm and the Duty to Report.
- NSW DECC (2008) Waste Classification Guidelines Part 1: Classifying Waste and Part 2: Immobilisation of Waste.
- NSW Legislation (1948) Rivers and Foreshores Improvement Act.
- NSW Legislation (1975) Dangerous Goods Act.
- NSW Legislation (1994) Environmental Planning and Assessment Act (EP&AA) and associated Regulations.
- NSW Legislation (1997) Contaminated Land Management Act.
- NSW Legislation (1997) Protection of the Environment Operations Act No156 which includes Schedule 2 of the Clean Waters Regulations 1972 made under the Clean Waters Act (1970).
- NSW Legislation (2000) Occupational Health and Safety Act.
- NSW Regulation (2001) Occupation Health and Safety Regulation.
- NSW WorkCover (2008) Working With Asbestos Guide.
- NSW WorkCover Code of Practice (2005) Storage and Handling of Dangerous Goods.
- US EPA (2004) Region 9 Preliminary Remediation Goals.
- NSW Government, Protection of the Environment Operations (Underground Petroleum Storage Systems) Regulation (2008).
- Australian Standard A4976 – 2008: The removal and disposal of underground petroleum storage tanks.

TABLE A-1
ENVIRONMENTAL AND HEALTH-BASED SOIL INVESTIGATION LEVELS (mg/kg)

Substances	Health Investigation Levels (HILs)[1]				Provisional Phyto-toxicity Investigation Levels (PPILs)[1]	NSW EPA Guidelines for Assessing Service Station Sites[2]	Back-ground Ranges[1]
	A	D	E	F			
	'Standard' residential with garden/ accessible soil (home-grown produce contributing less than 10% of vegetable and fruit intake; no poultry); includes children's day-care centres, kindergartens, preschools and primary schools	Residential with minimal opportunities for soil access: includes dwellings with fully and permanently paved yard space such as high-rise apartments and flats	Parks, recreational open space and playing fields: includes secondary schools	Commercial/industrial. Includes premises such as shops and offices as well as factories and industrial sites			
METALS/METALLOIDS							
Arsenic (total)	100	400	200	500	20		1-50
Barium					300		100-3000
Beryllium	20	80	40	100			
Cadmium	20	80	40	100	3		1
Chromium(III)	12%	48%	24%	60%	400		
Chromium(VI)	100	400	200	500	1		
Chromium (total)							5-1000
Cobalt	100	400	200	500			1-40
Copper	1000	4000	2000	5000	100		2-100
Lead	300	1200	600	1500	600		2-200
Manganese	1500	6000	3000	7500	500		850
Methyl mercury	10	40	20	50			
Mercury (inorganic)	15	60	30	75	1		0.03
Nickel	600	2400	600	3000	60		5-500
Vanadium					50		20-500
Zinc	7000	28000	14000	35000	200		10-300
ORGANICS							
Aldrin + Dieldrin	10	40	20	50			
Chlordane	50	200	100	250			
DDT + DDD + DDE	200	800	400	1000			
Heptachlor	10	40	20	50			
Polycyclic aromatic hydrocarbons (PAHs)	20	80	40	100			
Benzo(a)pyrene	1	4	2	5			
Phenol	8500	34000	17000	42500			
PCBs (total)	10	40	20	50			
Petroleum Hydrocarbon Components (constituents):							
>C16 - C35 Aromatics	90	360	180	450			
>C16 - C35 Aliphatics	5600	22400	11200	28000			
>C35 Aliphatics	56000	224000	112000	280000			
C6-C9						65	
C10-C40						1000	
Benzene						1	
Toluene						1.4	
Ethyl Benzene						3.1	
Total Xylenes						14	
OTHER							
Boron	3000	12000	6000	15000			
Cyanides (complexed)	500	2000	1000	2500			
Cyanides (free)	250	1000	500	1250			
Phosphorus					2000		
Sulfur					600		
Sulfate					2000		

Reference should be made to the following guidelines for further details (as referenced in the above table):

1 National Environment Protection (Assessment of Site Contamination) Measure - 1999, National Environment Protection Council. Human exposure settings based on land use have been established for HILs and details are outlined in Taylor and Langley 1998.

2 NSW DECC (formerly EPA) Guidelines for Assessing Service station Sites - 1994.

TABLE A - 2
CHEMICAL CONTAMINANT CRITERIA FOR WASTE CLASSIFICATION
Waste Classification Guidelines, Part 1: Classifying Waste DECC NSW April 2008

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 > SCC2 TREAT 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 > TCLP2 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

TABLE A - 3
SUMMARY ORGANIC AND INORGANIC GROUNDWATER CONTAMINANT GUIDELINE LEVELS

ANALYTE		Drinking Water[1]	ANZECC 2000 95% Values[2]		Dutch Intervention Values[3]
			Fresh Water	Marine Water	
Arsenic (As) (As III)		0.007	0.024	0.0023[5]	–
Cadmium (Cd)		0.002	0.0002	0.0055	–
Chromium III		–	0.0033[5]	0.01[5]	–
Chromium (Cr) (Hexavalent)		0.05	0.001	0.0044	–
Copper (Cu)		2.0	0.0014	0.0013	–
Iron (Fe) (Filtrable)		0.3[4]	0.3[5]	–	–
Lead (Pb)		0.01	0.0034	0.0044	–
Mercury (Hg) - inorganic		0.001	0.0006	0.0004	–
Nickel (Ni)		0.02	0.011	0.07	–
Zinc (Zn)		3[4]	0.008	0.015	–
C10-C36 Petroleum Hydrocarbons		–	–	–	0.6
BTEX	Benzene	0.001	0.95	0.7	–
	Toluene	0.8	0.18[5]	0.18[5]	–
	Ethyl Benzene	0.3	0.08[5]	0.005[5]	–
	o-Xylene	–	0.35[5]	0.35[5]	–
	p-Xylene	–	0.2[5]	0.2[5]	–
	m-Xylene	–	0.075[5]	0.075[5]	–
	Total Xylenes	0.6	–	–	–
Polycyclic Aromatic Hydrocarbons	Naphthalene	–	0.016	0.07	–
	Anthracene	–	0.0004[5]	0.0004[5]	–
	Phenanthrene	–	0.002[5]	0.002[5]	–
	Fluoranthrene	–	0.0014[5]	0.0014[5]	–
	Benzo(a)pyrene	$1*10^{-5}$	0.0002[5]	0.0002[5]	–
Total Phenol		–	0.32[5]	0.4[5]	–
PCB – Aroclor 1242		–	0.0006	–	–
PCB – Aroclor 1254		–	$3*10^{-5}$	–	
Organochlorine Pesticides	Aldrin	$1*10^{-5}$	$1*10^{-5}$[5]	$3*10^{-6}$[5]	–
	Dieldrin	$1*10^{-5}$	$1*10^{-5}$[5]	$1*10^{-5}$[5]	–
	Chlordane	$1*10^{-5}$	$8*10^{-5}$[5]	$1*10^{-6}$[5]	–
	DDT	$6*10^{-5}$	$1*10^{-5}$[5]	$4*10^{-7}$[5]	–
	Endosulfan	$9*10^{-5}$	$2*10^{-4}$[5]	$1*10^{-5}$[5]	–
	Endrin	–	$2*10^{-5}$[5]	$8*10^{-7}$[5]	–
	Heptachlor	$5*10^{-5}$	$9*10^{-5}$[5]	$4*10^{-7}$[5]	–
	Lindane	$5*10^{-5}$	$2*10^{-4}$[5]	$7*10^{-6}$[5]	–
	Methoxychlor	$2*10^{-4}$	$5*10^{-6}$[5]	$4*10^{-6}$[5]	
pH		6.5-8.5	6.5-8.5[6]	7-8.5[@]	–
Sulphate (SO_4)		500	–	–	–
Fluoride (F)		1.5	–	–	–
Chloride (Cl)		250	–	–	–
Nitrate (as N)		–	0.7[5]	0.7[5]	–

Notes:

1 NHMRC Australian Drinking Water Guidelines (2004).

2 ANZECC Australian Water Quality Guidelines for Fresh and Marine Waters, 2000 – Trigger values for protection of 95% of species.

3 In the absence of locally endorsed guidelines, the Dutch intervention levels specified in *'Circular on target values and intervention values for soil remediation' (Ministry of Housing, Spatial Planning and the Environment 2000)* have been quoted.

4 In the absence of a health guideline the aesthetic guideline concentration has been quoted.

5 In the absence of a high reliability guideline concentration, the moderate or low reliability guideline concentration has been used.

6 ANZECC Australian Water Quality Guidelines for Fresh and Marine Waters, 2000 – Level for NSW Lowland Rivers.

@ ANZECC Australian Water Quality Guidelines for Fresh and Marine Waters, 2000 – Level for South-East Australian estuaries.

[illegible] mg/kg unless stated otherwise

	HEAVY METALS								PAHs		ORGANOCHLORINE PESTICIDES				OP PESTICIDES	PCBs	PETROLEUM HYDROCARBONS							
	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc	Total PAHs	B(a)P	Aldrin and Dieldrin	Chlordane	DDT, DDD & DDE	Heptachlor			Petroleum Hydrocarbons C_6-C_9	C_{10}-C_{14}	C_{15}-C_{28}	C_{29}-C_{36}	C_{10}-C_{36}	Benzene	Toluene	Ethyl Benzene
	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
	200 *	40 *	24% *	2000 *	600 *	30 *	600 *	14000 *	40 *	2 *	20 *	100 *	400 *	20 *	0.1 **	20 *	65 ^	NSL	NSL	NSL	1000 ^	1 ^	1.4 ^	3.1 ^
ls	20 **	3 **	400 **	100 **	600 **	1 **	60 **	200 **	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL
	100	20	100	NSL	100	4	60	NSL	NSL	0.8	NSL					NSL	NSL	NSL			NSL	10	288	600
	500	100	1900	NSL	1500	50	1050	NSL	200	10	50					50	650	NSL			10000	18	518	1080
	LPQL	LPQL	9	2	7	0.1	1	7	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
	26	LPQL	9	11	25	0.1	7	68	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
	5	LPQL	21	12	29	0.2	15	45	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
e	4	LPQL	34	7	15	LPQL	16	18	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
	5	LPQL	15	5	14	0.2	5	12	0.05	0.06	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
	14	LPQL	14	12	36	LPQL	5	32	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
	11	LPQL	18	18	29	0.2	5	32	1.3	0.1	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
nd	LPQL	0.5	120	45	5	LPQL	130	62	0.3	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
	LPQL	LPQL	2	1	1	LPQL	LPQL	7	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
y	5	LPQL	21	29	29	LPQL	16	43	3.4	0.3	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
w	4	LPQL	19	38	21	LPQL	3	29	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
	LPQL	LPQL	72	25	16	LPQL	56	47	10.9	1	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
	5	LPQL	14	31	36	LPQL	10	47	11.4	1	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
	7	LPQL	21	14	26	LPQL	2	3	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
	7	LPQL	26	15	21	LPQL	5	14	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
	5	LPQL	17	5	19	LPQL	3	9	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
	7	LPQL	22	17	25	LPQL	9	12	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
	5	LPQL	20	3	14	LPQL	LPQL	3	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
	5	0.5	33	34	250	0.1	5	100	0.27	0.07	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
ay	5	LPQL	12	15	20	LPQL	3	15	LPQL	LPQL	LPQL	0.1	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
	LPQL	LPQL	9	5	15	LPQL	5	17	0.2	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21
	26	0.5	120	45	250	0.2	130	100	11.4	1	LPQL	0.1	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
	7	LPQL	24	17	21	LPQL	13	32	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
	5.4	NC	25.7	12.9	50.9	NC	22.7	35.2	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
	2.8	NC	1.1	0.7	1.6	NC	2.0	1.1	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC

...ertations adopted for the investigation as outlined below
...ssment of Site Contamination) Measure 1999 (NEPC Guidelines)
...mn D: Residential with minimal soil access
... Levels (EILs)
...essing Service Station Sites - 1994
... the laboratory PQL has been adopted as the site assessment criteria
...1: Classifying Waste (2005)

...Criteria | VALUE (boxed)
VALUE

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

ANALYTE		Arsenic	Chromium	Lead	Nickel	B(a)P
PQL - Envirolab		0.05	0.01	0.03	0.02	0.001
TCLP1 - General Solid Waste *		5	5	5	2	0.04
TCLP - Former Inert Waste **		0.5	0.5	0.5	0.2	0.004
SAMPLE	(Depth in metres)					
BH2	0.2-0.4	LPQL	NA	NA	NA	NA
BH3	0.1-0.2	NA	LPQL	LPQL	LPQL	NA
BH4	0.1-0.2	NA	LPQL	LPQL	LPQL	NA
BH5	0.9-1.0	NA	LPQL	LPQL	LPQL	NA
BH6	0.5-0.7	NA	LPQL	LPQL	LPQL	NA
BH7	0.4-0.7	NA	LPQL	LPQL	LPQL	LPQL
BH8	0.05-0.3	LPQL	LPQL	NA	0.02	NA
BH10	0.2-0.5	LPQL	LPQL	0.04	LPQL	LPQL
BH11	0.2-0.3	NA	LPQL	LPQL	LPQL	NA
BH14	0.4-0.5	NA	LPQL	LPQL	0.07	LPQL
BH14	2.5-2.8	NA	LPQL	0.06	LPQL	LPQL
BH16	0.3-0.5	NA	NA	NA	LPQL	NA
BH17	0.1-0.2	NA	LPQL	LPQL	NA	NA
BH18	0.1-0.3	NA	LPQL	LPQL	LPQL	NA
BH19	0.0-0.1	NA	LPQL	0.05	LPQL	NA
BH20	0.02-0.2	NA	LPQL	LPQL	NA	NA
BH21	0.2-0.4	NA	NA	LPQL	LPQL	NA
Total no. of samples		3	14	14	14	4
Maximum Value		LPQL	LPQL	0.05	0.07	LPQL

EXPLANATION:
* NSW DECC (EPA) Waste Classification Guidelines - Part 1: Classifying Waste - April 2008
** NSW EPA (now DECC) Environmental Guidelines: Assessment, Classification and Management of Liquid and Non-liquid Waste 1999

Concentration above the General Solid Waste guideline level **VALUE**

ABBREVIATIONS:
PQL: Practical Quantitation Limit
LPQL: Less than PQL
B(a)P: Benzo(a)Pyrene
NA: Not Analysed
NC: Not Calculated

TABLE D
GROUNDWATER MONITORING ANALYSIS
All results in mg/L unless stated otherwise.

Contaminant	PQL Envirolab	Guideline Concentration ANZECC 2000 Fresh Waters	Guideline Concentration Hardness Adjusted Assessment Criteria	Guideline Concentration Drinking Water [2]	MW3	MW17
Field Measurements [4]						
Redox potential (mV)	-	NSL	-	NSL	-11.7	134.4
pH	-	6.5 - 8.5 [5]	-	6.5 - 8.5 [A]	5.73	5.9
Conductivity (mS/cm)	-	NSL	-	NSL	0.474	0.842
Temperature °C	-	NSL	-	NSL	22.6	21.2
Inorganic Compounds						
pH	0.1	6.5 - 8.5 [5]	-	6.5 - 8.5 [A]	6.5	6.2
Electrical Conductivity (mS/cm)	0.001	NSL	-	NSL	0.34	0.61
Hardness (mgCaCO3/L)	1.0	NSL	-	NSL	89	77
Heavy Metals						
Arsenic (As III)	0.001	0.024	-	0.007	0.0033	0.0092
Cadmium	0.0001	0.0002	0.0005	0.002	LPQL	0.0002
Chromium	0.001	0.001	0.0023	0.05	LPQL	LPQL
Copper	0.001	0.0014	0.0033	2	LPQL	LPQL
Lead	0.001	0.0034	0.012	0.01	LPQL	0.05
Mercury	0.0005	0.0006	-	0.001	LPQL	LPQL
Nickel	0.001	0.011	0.026	0.02	0.0065	0.05
Zinc	0.001	0.008	0.019	3 [A]	0.021	0.11
Petroleum Hydrocarbons						
Hydrocarbons C6-C9	0.01	NSL	-	NSL	LPQL	LPQL
Hydrocarbons C10-C14	0.05	0.6 [**]	-	NSL	LPQL	LPQL
Hydrocarbons C15-C28	0.1					
Hydrocarbons C29-C36	0.1					
Volatile Organic Contaminants (VOCs)						
Benzene	0.001	0.95	-	0.001	LPQL	LPQL
Toluene	0.001	0.18 [1]	-	0.8	LPQL	LPQL
Ethyl Benzene	0.001	0.08 [1]	-	0.3	LPQL	LPQL
Total xylenes	0.003	0.35 [#]	-	0.6	LPQL	LPQL
o-xylene	0.001	0.35 [1]	-	NSL	LPQL	LPQL
m+p-xylene	0.002	0.275 [1]	-	NSL	LPQL	LPQL

EXPLANATION:

1 ANZECC Australian Water Quality Guidelines for Fresh Waters, 2000 - Trigger Values for protection of 95% of species

2 NHMRC Australian Drinking Water Guidelines (2004)

[4] Field Measurements Undertaken on 27 March 2009

[5] ANZECC Australian Water Quality Guidelines for Fresh and Marine Waters, 2000 - Level for NSW Lowland Rivers.

[**] ANZECC Australian Water Quality Guidelines for Fresh and Marine Waters, 2000 - Level for South-East Australian Estuaries

[A] In the absence of a health guideline the aesthetic guideline concentration has been quoted

[**] In the absence of locally endorsed guidelines, the Dutch intervention levels specified in *'Circular on target values and intervention values for soil remediation' (Ministry of Housing and the Environment 2000)* have been quoted

[1] In the absence of a high reliability guideline concentration, the moderate or low reliability guideline concentration has been used.

[#] NSW DECC (EPA) Guidelines for Assessing Service Station Sites (1994).

[^^] In the absence of Australian guidelines, the laboratory practical quantitation limit has been used.

Concentration above the Site Assessment Criteria — VALUE

ABBREVIATIONS:

NA : Not Analysed
NSL : No set limit
PQL: Practical Quantitation Limit
LPQL: - Less than Practical Quantitation Limit
ALPQL: - all results less than the Practical Quantitation Limit

TABLE E-1
SOIL INTRA-LABORATORY DUPLICATE RESULTS
QA/QC - RELATIVE PERCENTAGE DIFFERENCES

SAMPLE	ANALYSIS	INITIAL (mg/kg)	REPEAT (mg/kg)	MEAN (mg/kg)	RPD %
Intra-laboratory Soil sample ID = BH10 (0.2-0.5) Dup ID = Dup 1 Envirolab Report: 27442	Arsenic	8	9	8.5	12
	Cadmium	LPQL	LPQL	LPQL	NC
	Chromium	21	26	23.5	21
	Copper	29	30	29.5	3
	Lead	29	30	29.5	3
	Mercury	LPQL	LPQL	LPQL	NC
	Nickel	16	21	18.5	27
	Zinc	43	44	43.5	2
	Naphthalene	LPQL	LPQL	LPQL	NC
	Acenaphthylene	LPQL	LPQL	LPQL	NC
	Acenaphthene	LPQL	LPQL	LPQL	NC
	Fluorene	LPQL	LPQL	LPQL	NC
	Phenanthrene	0.2	0.1	0.15	67
	Anthracene	LPQL	LPQL	LPQL	NC
	Fluoranthene	0.6	0.7	0.65	15
	Pyrene	0.6	0.7	0.65	15
	Benzo(a)anthracene	0.4	0.5	0.45	22
	Chrysene	0.5	0.5	0.5	0
	Benzo(b)&(k)fluorant	0.5	0.7	0.6	33
	Benzo(a)pyrene	0.3	0.4	0.35	29
	Indeno(123-cd)pyrene	0.2	0.2	0.2	0
	Dibenzo(ah)anthracene	LPQL	LPQL	LPQL	NC
	Benzo(ghi)perylene	0.1	0.2	0.15	67
	Total PAHs	3.4	4	3.7	16

ABBREVIATIONS:
PQL: Practical Quantitation Limit
LPQL: Less than PQL
NC: Not Calculated

E22758K
April 2009

TABLE E-2
SOIL INTRA-LABORATORY DUPLICATE RESULTS
QA/QC - RELATIVE PERCENTAGE DIFFERENCES

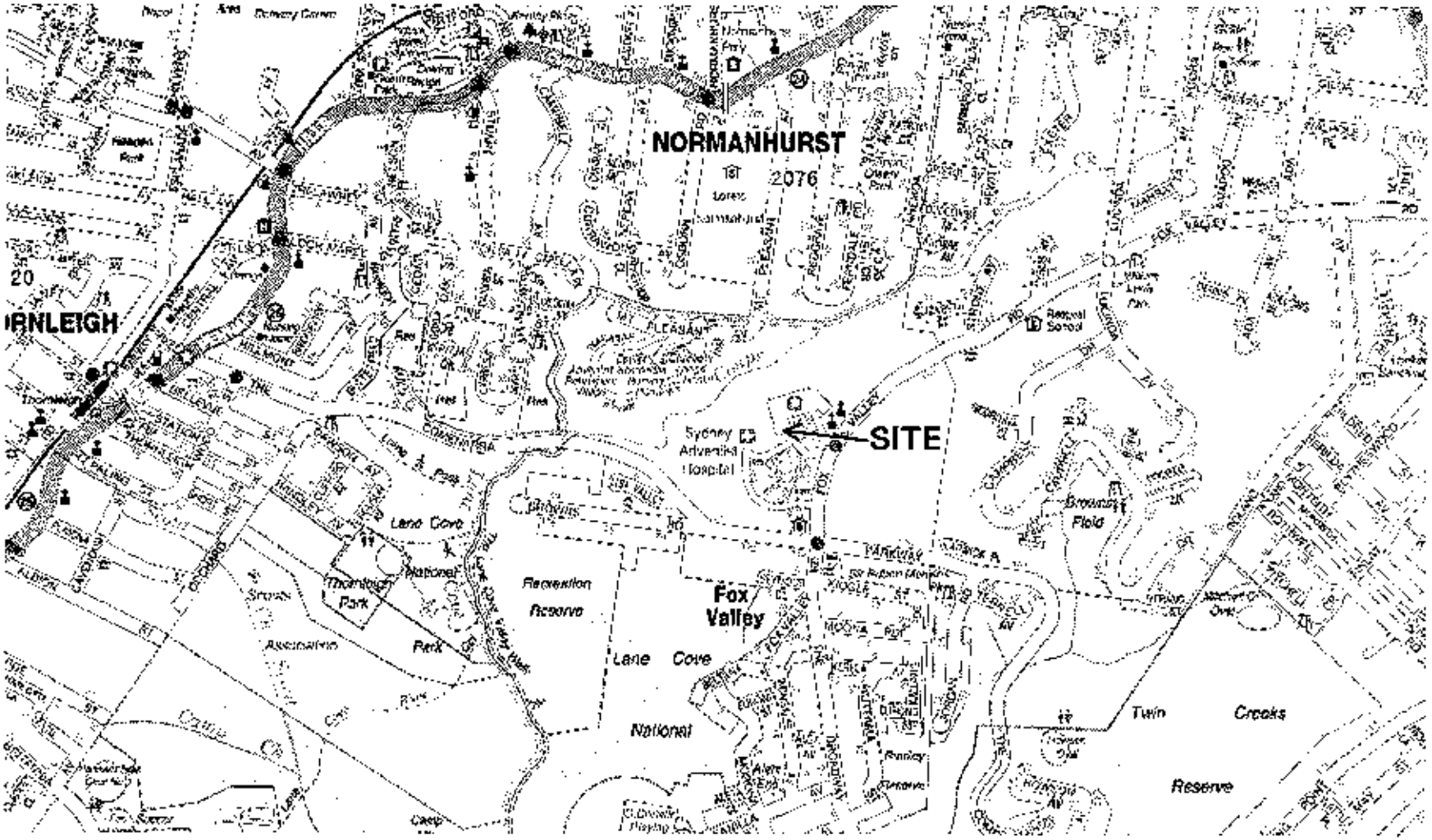
SAMPLE	ANALYSIS	INITIAL (mg/kg)	REPEAT (mg/kg)	MEAN (mg/kg)	RPD %
Intra-laboratory Soil sample ID = BH7 (0.4-0.7) Dup ID = Dup 2 Envirolab Report: 27442	Arsenic	11	7	9	44
	Cadmium	LPQL	LPQL	LPQL	NC
	Chromium	18	19	18.5	5
	Copper	18	21	19.5	15
	Lead	29	24	26.5	19
	Mercury	0.2	LPQL	0.125	120
	Nickel	6	13	9.5	74
	Zinc	32	40	36	22
	Naphthalene	LPQL	LPQL	LPQL	NC
	Acenaphthylene	LPQL	LPQL	LPQL	NC
	Acenaphthene	LPQL	LPQL	LPQL	NC
	Fluorene	LPQL	LPQL	LPQL	NC
	Phenanthrene	LPQL	LPQL	LPQL	NC
	Anthracene	LPQL	LPQL	LPQL	NC
	Fluoranthene	0.2	0.3	0.25	40
	Pyrene	0.2	0.3	0.25	40
	Benzo(a)anthracene	0.1	0.1	0.1	0
	Chrysene	0.2	0.2	0.2	0
	Benzo(b)&(k)fluorant	0.3	0.3	0.3	0
	Benzo(a)pyrene	0.1	0.2	0.15	67
	Indeno(123-cd)pyrene	0.1	0.1	0.1	0
	Dibenzo(ah)anthracene	LPQL	LPQL	LPQL	NC
	Benzo(ghi)perylene	0.1	0.1	0.1	0
	Total PAHs	1.3	1.6	1.45	21

ABBREVIATIONS:
PQL: Practical Quantitation Limit
LPQL: Less than PQL
NA: Not Analysed
NC: Not Calculated

TABLE F
GROUNDWATER INTRA-LABORATORY DUPLICATE RESULTS
QA/QC - RELATIVE PERCENTAGE DIFFERENCES

SAMPLE	ANALYSIS	INITIAL (mg/L)	REPEAT (mg/L)	MEAN (mg/L)	RPD %
Intra-laboratory Groundwater sample ID = MW17 Dup ID = Dup A Envirolab Report: 27715	Arsenic	0.0092	0.0092	0.0092	0
	Cadmium	0.0002	0.0002	0.0002	0
	Chromium	LPQL	LPQL	LPQL	NC
	Copper	LPQL	LPQL	LPQL	NC
	Lead	0.05	0.055	0.0525	10
	Mercury	LPQL	LPQL	LPQL	NC
	Nickel	0.05	0.05	0.05	0
	Zinc	0.11	0.09	0.1	20
	C_6-C_9 TPH	LPQL	LPQL	LPQL	NC
	C_{10}-C_{14} TPH	LPQL	LPQL	LPQL	NC
	C_{15}-C_{28} TPH	LPQL	LPQL	LPQL	NC
	C_{29}-C_{36} TPH	LPQL	LPQL	LPQL	NC
	Benzene	LPQL	LPQL	LPQL	NC
	Toluene	LPQL	LPQL	LPQL	NC
	Ethylbenzene	LPQL	LPQL	LPQL	NC
	Total Xylenes	LPQL	LPQL	LPQL	NC

ABBREVIATIONS:
PQL: Practical Quantitation Limit
LPQL: Less than PQL
NA: Not Analysed
NC: Not Calculated



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SITE LOCATION PLAN

SYDNEY ADVENTIST HOSPITAL
185 FOX VALLEY ROAD, WAHROONGA

ENVIRONMENTAL
INVESTIGATION
SERVICES

Report No. E22758K
Figure: 1

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


BH21 (1.2)
BH20 (0.2)
BH16 (0
BH2 (>1.5)
BH7 (2.0)
BH6 (1.8)
BH1 (0.8)
INVESTIGATION AREA 1
BH5 (1.2)
BH4 (0.8)
BH10 (1.7)
BH3 (0.3)
BH9 (1.9)
BH12 (0.8)
BH11 (1.2)
BH8 (0.35)
BH13 (0.15)
LEGEND:
BH1 (1.2) BOREH
AND FI
BH1 (1.2) BOREH
WELL I
APPRO
INVEST
BOREHOLE
SYDNEY ADVENT

APPENDIX A

Jeffery and Katauskas Pty Ltd
CONSULTING GEOTECHNICAL AND ENVIRONMENTAL ENGINEERS

BOREHOLE LOG

Borehole No. JK1 1/1

Client: SYDNEY ADVENTIST HOSPITAL LIMITED

Project: HOSPITAL UPGRADE AND EXTENSIONS - STAGE 1

Location: SAN HOSPITAL, FOX VALLEY ROAD, WAHROONGA, NSW

Job No. 22758Z **Method:** SPIRAL AUGER JK300 **R.L. Surface:** ≈ 159.8m

Date: 17-3-09 **Datum:** AHD

Logged/Checked by: G.F./

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						0			TOPSOIL/FILL: Silty clay, low to medium plasticity, brown, with fine to medium grained sand and gravel and a trace of root fibres.	MC≥PL			GRASS COVER
					N = 6 3,3,3			SC	FILL: Clayey sand, fine to medium grained, light brown, with a trace of clay nodules and fine to medium grained sandstone gravel.	M	(VL)	-	POSSIBLY FILL
						1		CL	CLAYEY SAND: fine to medium grained, light brown.	MC > PL	(St)		
									SANDY CLAY: medium plasticity, yellow brown.	XW	E	-	VERY LOW "TC" BIT RESISTANCE
									SANDSTONE: fine to medium grained, light grey and orange brown, with iron indurated bands.	DW	L		LOW TO MODERATE RESISTANCE
						2			END OF BOREHOLE AT 2.0m				
						3							
						4							
						5							
						6							
						7							

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Borehole No.
JK2
1/1

BOREHOLE LOG

Client: SYDNEY ADVENTIST HOSPITAL LIMITED

Project: HOSPITAL UPGRADE AND EXTENSIONS - STAGE 1

Location: SAN HOSPITAL, FOX VALLEY ROAD, WAHROONGA, NSW

Job No. 22758Z **Method:** SPIRAL AUGER JK300 **R.L. Surface:** ≈ 157.9m

Date: 17-3-09 **Datum:** AHD

Logged/Checked by: G.F./

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	■					0			FILL: Silty clay, low to medium plasticity, brown, with root fibres and a trace of fine to coarse grained gravel and fine to medium grained sand.	MC≥PL			GRASS COVER
				■	N = 6 3,5,3					M			APPEARS POORLY COMPACTED
	■					1			FILL: Clayey sand, fine to medium grained, brown and grey, with fine to medium grained gravel, with a trace of clay nodules.				
									FILL: Sand, fine to medium grained, yellow brown.				
									END OF BOREHOLE AT 1.5m				BOREHOLE TERMINATED DUE TO PROXIMITY TO ELECTRICAL CABLES
						2							
						3							
						4							
						5							
						6							
						7							

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Borehole No. **JK3** 1/2

BOREHOLE LOG

Client: SYDNEY ADVENTIST HOSPITAL LIMITED

Project: HOSPITAL UPGRADE AND EXTENSIONS - STAGE 1

Location: SAN HOSPITAL, FOX VALLEY ROAD, WAHROONGA, NSW

Job No. 22758Z **Method:** SPIRAL AUGER JK300 **R.L. Surface:** ≈ 161.6m

Date: 16-3-09 **Datum:** AHD

Logged/Checked by: G.F./

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 OF AUGERING					N = 10 2,3,7	0		CL	WOOD CHIPS	-	-	-	
									FILL: Clayey silt, low plasticity, dark brown, with a trace of wood chips, fine to medium grained gravel and clay nodules.	MC>PL	VSt	240 280 310	
						1			SANDY CLAY: medium plasticity, light brown.	XW	St		
									SANDSTONE: fine to medium grained, light grey and orange brown.	XW-DW	EL-VL		VERY LOW 'TC' BIT RESISTANCE
						2					VL-L		LOW TO MODERATE RESISTANCE
						3			REFER TO CORED BOREHOLE LOG				
						4							
						5							
						6							
						7							

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Borehole No. **JK3** 2/2

CORED BOREHOLE LOG

Client: SYDNEY ADVENTIST HOSPITAL LIMITED

Project: HOSPITAL UPGRADE AND EXTENSIONS - STAGE 1

Location: SAN HOSPITAL, FOX VALLEY ROAD, WAHROONGA, NSW

Job No. 22758Z **Core Size:** NMLC **R.L. Surface:** ≈ 161.6m

Date: 16-3-09 **Inclination:** VERTICAL **Datum:** AHD

Drill Type: JK300 **Bearing:** - **Logged/Checked by:** G.F./

Water Loss/Level	Barrel Lift	Depth (m)	Graphic Log	CORE DESCRIPTION (Rock Type, grain characteristics, colour, structure, minor components.)	Weathering	Strength	POINT LOAD STRENGTH INDEX $I_S(50)$	DEFECT DETAILS: DEFECT SPACING (mm)	DEFECT DETAILS: DESCRIPTION (Type, inclination, thickness, planarity, roughness, coating.) Specific / General
		2		START CORING AT 2.89m					
		3		SANDSTONE: fine to medium grained, light grey and orange brown, with iron indurated bands.	DW	L	×		
				CORE LOSS 0.47m					
				SANDSTONE: fine to medium grained, red brown, orange brown and light grey.	DW	VL-L	×		- J, 40-50°, P, S
		4		SANDSTONE: fine to medium grained, light grey, with occasional red brown and orange brown iron indurated bands.		L	×		- J, 40-80°, Un, R
90% RET-URN						VL-L			
		5				L-M	×		- CS, 80mm t
									- XWS, 210mm t
									- J, 80-90°, P, S - XWS, 70mm t
		6							- J, 50-60°, P, S
									- Be, 15-20°, P
				SANDSTONE: fine to medium grained, light grey, red brown and orange brown, with iron indurated bands and occasional laminae, bedded at 0-5°.			×		- Be, 0-5°, P, IS - XWS/CS, 10mm t - XWS, 5mm t
		7		SANDSTONE: fine to medium grained, light grey and orange brown, with occasional darker laminae, bedded at 0-5°.					
				END OF BOREHOLE AT 6.87m					
		8							
		9							

CLASS 18 50mm DIAMETER PVC STANDPIPE PIEZOMETER INSTALLED TO 6.97m. MACHINE SLOTTED FROM 6.97m TO 3.97m CASING FROM, 3.97m TO SURFACE. 2mm SAND FILTER PACK FROM 6.97m TO 3.5m, BENTONITE SEAL FROM 3.5m TO 2.5m, BACKFILLED TO SURFACE WITH CAST IRON GATIC COVER AND LOCKABLE CAP AT SURFACE

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Borehole No. **JK4** 1/2

BOREHOLE LOG

Client: SYDNEY ADVENTIST HOSPITAL LIMITED

Project: HOSPITAL UPGRADE AND EXTENSIONS - STAGE 1

Location: SAN HOSPITAL, FOX VALLEY ROAD, WAHROONGA, NSW

Job No. 22758Z **Method:** SPIRAL AUGER JK300 **R.L. Surface:** ≈ 161.2m

Date: 16-3-09 **Datum:** AHD

Logged/Checked by: G.F./

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 OF AUGERING					N = 16 8,7,9	0			ASPHALTIC CONCRETE: 30mm. FILL: Sandy silty gravel, fine to medium grained, grey, igneous gravel.	D M MC>PL	-	-	APPEARS WELL COMPACTED
						1			FILL: Clayey sand, fine to medium grained, light brown, with a trace of fine to medium grained sandstone and igneous gravel and clay nodules. FILL: Sandy clay, low to medium grained, yellow brown, with a trace of fine to medium grained sandstone and ironstone gravel.	XW DW	EL L		LOW 'TC' BIT RESISTANCE
						2			SANDSTONE: fine to medium grained, light grey and orange brown.				
									REFER TO CORED BOREHOLE LOG				
						3							
						4							
						5							
						6							
						7							

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Borehole No. **JK4** 2/2

CORED BOREHOLE LOG

Client: SYDNEY ADVENTIST HOSPITAL LIMITED
Project: HOSPITAL UPGRADE AND EXTENSIONS - STAGE 1
Location: SAN HOSPITAL, FOX VALLEY ROAD, WAHROONGA, NSW

Job No. 22758Z **Core Size:** NMLC **R.L. Surface:** ≈ 161.2m
Date: 16-3-09 **Inclination:** VERTICAL **Datum:** AHD
Drill Type: JK300 **Bearing:** - **Logged/Checked by:** G.F./

Water Loss/Level	Barrel Lift	Depth (m)	Graphic Log	CORE DESCRIPTION (Rock Type, grain characteristics, colour, structure, minor components.)	Weathering	Strength	POINT LOAD STRENGTH INDEX $I_S(50)$	DEFECT DETAILS: DEFECT SPACING (mm)	DEFECT DETAILS: DESCRIPTION (Type, inclination, thickness, planarity, roughness, coating.) Specific / General
		2		START CORING AT 2.77m					
		3		SANDSTONE: fine to medium grained, light grey and orange brown.	DW	L-M / L	×		- J, 15°, P, S
				SANDSTONE: fine to medium grained, light grey, with occasional dark grey laminae, bedded at 0-10°.			× ×		- Be, 0°, P, S - Be, 0°, P, S
		4							
		5		CORE LOSS 0.28m					
				SHALE: grey, with light grey laminae, bedded at 0-5°.	XW	EL			
				SANDSTONE: fine to medium grained, light grey, red brown and orange brown, with iron indurated bands.	DW	M	×		- Cr, 15mm t - Be, 5-10°, P - Be, 5-10°, P
		6		SANDSTONE: fine to medium grained, light grey and orange brown, with grey laminae, bedded at 0-15°.			×		- Be, 0°, P, IS
		7		END OF BOREHOLE AT 6.98m					
		8							
		9							

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BOREHOLE LOG

Borehole No. **JK5** 1/2

Client: SYDNEY ADVENTIST HOSPITAL LIMITED
Project: HOSPITAL UPGRADE AND EXTENSIONS - STAGE 1
Location: SAN HOSPITAL, FOX VALLEY ROAD, WAHROONGA, NSW

Job No. 22758Z **Method:** SPIRAL AUGER JK300 **R.L. Surface:** ≈ 160.1m
Date: 13-3-09 **Datum:** AHD
Logged/Checked by: G.F./

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 OF AUGERING					N = 19 7,10,9	0		-	ASPHALTIC CONCRETE: 30mm.t / FILL: Silty sandy gravel, fine to medium grained, grey, igneous. FILL: Clayey silt, low plasticity, brown, with a trace of fine to medium grained gravel and clay nodules.	D	-	-	APPEARS MODERATELY TO WELL COMPACTED
						1		-	SANDSTONE: fine to medium grained, light grey, orange brown, with iron indurated bands.	XW-DW	EL-VL	-	MODERATE 'TC' BIT RESISTANCE WITH VERY LOW BANDS
						2			SANDSTONE: fine to medium grained, light grey, red brown and orange brown, with iron indurated bands.	DW	L		LOW TO MODERATE RESISTANCE
									REFER TO CORED BOREHOLE LOG				
						3							
						4							
						5							
						6							
						7							

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Borehole No. **JK5** 2/2

CORED BOREHOLE LOG

Client: SYDNEY ADVENTIST HOSPITAL LIMITED
Project: HOSPITAL UPGRADE AND EXTENSIONS - STAGE 1
Location: SAN HOSPITAL, FOX VALLEY ROAD, WAHROONGA, NSW

Job No. 22758Z **Core Size:** NMLC **R.L. Surface:** ≈ 160.1m
Date: 13-3-09 **Inclination:** VERTICAL **Datum:** AHD
Drill Type: JK300 **Bearing:** - **Logged/Checked by:** G.F./

Water Loss/Level	Barrel Lift	Depth (m)	Graphic Log	CORE DESCRIPTION (Rock Type, grain characteristics, colour, structure, minor components.)	Weathering	Strength	POINT LOAD STRENGTH INDEX $I_S(50)$	DEFECT SPACING (mm)	DEFECT DETAILS DESCRIPTION (Type, inclination, thickness, planarity, roughness, coating.) Specific	General
		2		START CORING AT 2.75m						
				SANDSTONE: fine to medium grained, light grey and red brown.	DW	L-M				
		3		CORE LOSS 0.20m	DW	L			- J, 20°, P, S	
				SANDSTONE: fine to medium grained, light grey and red brown, with iron indurated bands.	XW	EL			- Cr, 70mm t	
					DW	L-M	×		- Be, 0°, P, S, IS - Be, 0°, P, S, IS	
		4		SANDSTONE: fine to medium grained, light grey and yellow brown.		M			- Be, 0°, P, S, IS - Be, 0°, P, S, IS - Be, 0°, P, S, IS - Be, 0°, P, S, IS - Be, 0°, P, S, IS - J, 40-50°, P, R, IS	
				SANDSTONE: fine to medium grained, light grey, orange brown and red brown, with iron indurated bands.		VL-L	×		- XWS, 30mm t - Cr, 25mm t	
		5		SANDSTONE: fine to medium grained, orange brown, red brown and light grey, with iron indurated bands.		M			- Be, 0°, P, S, IS - XWS, 30mm t	
					XW	EL			- J, 40-55°, P, R	
				SANDSTONE: fine to medium grained, light grey and orange brown.		M	×			
		6					×		- J, 70-85°, P, R	
				END OF BOREHOLE AT 6.04m						
		7								
		8								
		9								

ENVIRONMENTAL INVESTIGATION SERVICES

CONSULTING ENVIRONMENTAL ENGINEERS

ENVIRONMENTAL LOG

Borehole No. 6 1/1

Environmental logs are not to be used for geotechnical purposes

Client: SYDNEY ADVENTIST HOSPITAL

Project: SAH UPGRADE AND EXTENSIONS

Location: FOX VALLEY ROAD, WAHROONGA, NSW

Job No. E22758K **Method:** EZIPROBE **R.L. Surface:** N/A

Date: 12-3-09 **Datum:**

Logged/Checked by: B.P./

Groundwater Record	SAMPLES ES	SAMPLES ASS	SAMPLES ASB	SAMPLES SAL	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLETION						0			ASPHALTIC CONCRETE: 50mm.t over ROADBASE 200mm.t				
									FILL: Silty clay, medium plasticity, brown and orange brown, with a trace of ironstone and sandstone gravel, ash and sand.	MC<PL	-	-	
						1			FILL: Silty sand, fine to medium grained, brown, with a trace of ironstone and sandstone gravel and ash.	D			
						2		CL	SILTY CLAY: medium plasticity, orange brown, with ironstone gravel bands.	MC<PL	-	-	
								-	SANDSTONE: fine to medium grained, light yellow brown.	XW			
						3			as above, but grey and orange brown.				REFUSAL ON SANDSTONE BEDROCK
									END OF BOREHOLE AT 2.5m				
						4							
						5							
						6							
						7							

ENVIRONMENTAL INVESTIGATION SERVICES

CONSULTING ENVIRONMENTAL ENGINEERS

ENVIRONMENTAL LOG

Borehole No. 7 1/1

Environmental logs are not to be used for geotechnical purposes

Client: SYDNEY ADVENTIST HOSPITAL

Project: SAH UPGRADE AND EXTENSIONS

Location: FOX VALLEY ROAD, WAHROONGA, NSW

Job No. E22758K **Method:** EZIPROBE **R.L. Surface:** N/A

Date: 12-3-09 **Datum:**

Logged/Checked by: B.P./BM

Groundwater Record	SAMPLES ES	SAMPLES ASS	SAMPLES ASB	SAMPLES SAL	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLETION	■	■				0			ASPHALTIC CONCRETE: 50mm.t over ROADBASE 150mm.t	MC < PL	-	-	
									FILL: Silty clay, medium to high plasticity, brown and orange brown, with a trace of ironstone, sandstone and igneous gravel.				
						1							
	■	■				2		CL	SANDY CLAY: medium plasticity, orange brown, fine to medium grained sand, with a trace of ash and organic material.	MC < PL	-	-	
						3		-	SANDSTONE: fine to medium grained, light grey.	XW	-	-	
									END OF BOREHOLE AT 3.0m				
						4							
						5							
						6							
						7							

ENVIRONMENTAL INVESTIGATION SERVICES

CONSULTING ENVIRONMENTAL ENGINEERS

ENVIRONMENTAL LOG

Borehole No. 8 1/1

Environmental logs are not to be used for geotechnical purposes

Client: SYDNEY ADVENTIST HOSPITAL

Project: SAH UPGRADE AND EXTENSIONS

Location: FOX VALLEY ROAD, WAHROONGA, NSW

Job No. E22758K **Method:** EZIPROBE **R.L. Surface:** N/A

Date: 12-3-09 **Datum:**

Logged/Checked by: B.P./[illegible]

Groundwater Record	SAMPLES ES	SAMPLES ASS	SAMPLES ASB	SAMPLES SAL	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLETION						0			ASPHALTIC CONCRETE: 50mm.t.	D	-	-	
								CL	FILL: Silty gravelly sand, fine to medium grained, grey, fine to medium grained igneous gravel.	MC < PL	-	-	
								-	SANDY CLAY: medium plasticity, orange brown, fine to medium grained sand.	XW	-	-	REFUSAL ON INFERRED SANDSTONE BEDROCK
						1			SANDSTONE: fine to medium grained, grey and orange.				
									END OF BOREHOLE AT 0.75m				
						2							
						3							
						4							
						5							
						6							
						7							

ENVIRONMENTAL INVESTIGATION SERVICES

CONSULTING ENVIRONMENTAL ENGINEERS

ENVIRONMENTAL LOG

Borehole No. 9 1/1

Environmental logs are not to be used for geotechnical purposes

Client: SYDNEY ADVENTIST HOSPITAL

Project: SAH UPGRADE AND EXTENSIONS

Location: FOX VALLEY ROAD, WAHROONGA, NSW

Job No. E22758K **Method:** EZIPROBE **R.L. Surface:** N/A

Date: 12-3-09 **Datum:**

Logged/Checked by: B.P./

Groundwater Record	SAMPLES ES	SAMPLES ASS	SAMPLES ASB	SAMPLES SAL	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLETION						0			ASPHALTIC CONCRETE: 50mm.t over ROADBASE 150mm.t				
									FILL: Sand, fine to coarse grained, light red brown, with a trace of fine grained sandstone gravel.	D	-	-	
						1			as above, but light yellow brown, sandstone gravel absent.				
						2		-	SANDSTONE: fine to medium grained, light grey and red brown.	XW	-	-	
									END OF BOREHOLE AT 2.0m				REFUSAL ON INFERRED SANDSTONE BEDROCK
						3							
						4							
						5							
						6							
						7							

ENVIRONMENTAL INVESTIGATION SERVICES

CONSULTING ENVIRONMENTAL ENGINEERS

ENVIRONMENTAL LOG

Borehole No. 10 1/1

Environmental logs are not to be used for geotechnical purposes

Client: SYDNEY ADVENTIST HOSPITAL

Project: SAH UPGRADE AND EXTENSIONS

Location: FOX VALLEY ROAD, WAHROONGA, NSW

Job No. E22758K **Method:** EZIPROBE **R.L. Surface:** N/A

Date: 12-3-09 **Datum:**

Logged/Checked by: B.P.

Groundwater Record	SAMPLES ES	SAMPLES ASS	SAMPLES ASB	SAMPLES SAL	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa)	Remarks
DRY ON COMPLETION						0			ASPHALTIC CONCRETE: 100mm.t over ROADBASE 100mm.t				
									FILL: Silty sandy clay, medium plasticity, brown, fine to medium grained sand, with a trace of sandstone and shale gravel and ash.	MC < PL	-	-	
						1			FILL: Silty clay, high plasticity, grey mottled red and orange brown, with a trace of ash and ironstone gravel.				
									as above, but orange brown, with a trace of ironstone gravel, ash, slag and sandstone gravel.	MC < PL	-	-	
								CL	SILTY CLAY: medium plasticity, orange brown, with a trace of ironstone gravel.	XW	-	-	
						2		-	SANDSTONE: fine to medium grained, grey and orange brown.				
									END OF BOREHOLE AT 2.3m				REFUSAL ON INFERRED SANDSTONE BEDROCK
						3							
						4							
						5							
						6							
						7							

Jeffery and Katauskas Pty Ltd
CONSULTING GEOTECHNICAL AND ENVIRONMENTAL ENGINEERS

BOREHOLE LOG

Borehole No. **JK11** 1/2

Client: SYDNEY ADVENTIST HOSPITAL LIMITED

Project: HOSPITAL UPGRADE AND EXTENSIONS - STAGE 1

Location: SAN HOSPITAL, FOX VALLEY ROAD, WAHROONGA, NSW

Job No. 22758Z **Method:** SPIRAL AUGER JK300 **R.L. Surface:** ≈ 161.6m

Date: 12-3-09 **Datum:** AHD

Logged/Checked by: G.F./

Groundwater Record	SAMPLES ES	SAMPLES USG	SAMPLES D/B	SAMPLES S/S	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa)	Remarks
DRY ON COMPLETION OF AUGERING ▼ ON COMPLETION OF CORING					N = 4 2,3,1	0		-	CONCRETE: 100mm.t				8mm DIAMETER REINFORCEMENT, 50mm TOP COVER
						1		-	FILL: Gravelly silty clay, high plasticity, brown, grey, orange brown and red brown, with fine to medium grained shale, igneous and sandstone gravel and fine to medium grained sand.	MC > PL	-	-	APPEARS POORLY COMPACTED
								-	SANDSTONE: fine to medium grained, light grey, with iron indurated bands.	DW	L	-	MODERATE 'TC' BIT RESISTANCE
						2					M-H		MODERATE TO HIGH RESISTANCE
									REFER TO CORED BOREHOLE LOG				
						3							
						4							
						5							
						6							
						7							

Jeffery and Katauskas Pty Ltd
CONSULTING GEOTECHNICAL AND ENVIRONMENTAL ENGINEERS

Borehole No. **JK11** 2/2

CORED BOREHOLE LOG

Client: SYDNEY ADVENTIST HOSPITAL LIMITED

Project: HOSPITAL UPGRADE AND EXTENSIONS - STAGE 1

Location: SAN HOSPITAL, FOX VALLEY ROAD, WAHROONGA, NSW

Job No. 22758Z **Core Size:** NMLC **R.L. Surface:** ≈ 161.6m

Date: 12-3-09 **Inclination:** VERTICAL **Datum:** AHD

Drill Type: JK300 **Bearing:** - **Logged/Checked by:** G.F./

Water Loss/Level	Barrel Lift	Depth (m)	Graphic Log	CORE DESCRIPTION (Rock Type, grain characteristics, colour, structure, minor components.)	Weathering	Strength	POINT LOAD STRENGTH INDEX $I_S(50)$	DEFECT DETAILS: DEFECT SPACING (mm)	DEFECT DETAILS: DESCRIPTION (Type, inclination, thickness, planarity, roughness, coating.) Specific	General
		2		START CORING AT 2.72m						
NO RETURN		3		SANDSTONE: fine to medium grained, orange brown and light grey.	DW	M	×			
				SANDSTONE: fine to medium grained, light grey, with dark grey laminae, bedded at 0-5°.	SW		×		Be, 0°, P, S Be, 0°, P, S Be, 0°, P, S Be, 0°, P, S	
		4							Be, 0°, P, S Be, 0°, P, S	
							×		Be, 5°	
		5							XWS, 10mm t	
									XWS, 5mm t	
		6					×			
									Be, 5°, P, S	
		7		END OF BOREHOLE AT 6.88m						
		8								
		9								

Jeffery and Katauskas Pty Ltd
CONSULTING GEOTECHNICAL AND ENVIRONMENTAL ENGINEERS

Borehole No. **JK12** 1/2

BOREHOLE LOG

Client: SYDNEY ADVENTIST HOSPITAL LIMITED

Project: HOSPITAL UPGRADE AND EXTENSIONS - STAGE 1

Location: SAN HOSPITAL, FOX VALLEY ROAD, WAHROONGA, NSW

Job No. 22758Z **Method:** SPIRAL AUGER JK300 **R.L. Surface:** ≈ 161.2m

Date: 12-3-09 **Datum:** AHD

Logged/Checked by: G.F./

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 OF AUGERING					N = 17 5,10,7	0			CONCRETE: 230mm.t				
								-	FILL: Silty sandy gravel, fine to medium grained, grey, igneous and sandstone gravel.	M MC > PL	-	-	APPEARS WELL COMPACTED
						1		CH	FILL: Silty clay, medium plasticity, grey, orange brown, brown and red brown, with a trace of fine to medium grained shale, igneous and ironstone gravel, with fine to medium grained sand and a trace of ash.	MC > PL	(St)	-	
					SPT 22/150mm REFUSAL			-		XW	EL	-	VERY LOW 'TC' BIT RESISTANCE
						2			SILTY CLAY: high plasticity, orange brown, brown and red brown, with a trace of fine to medium grained ironstone gravel and fine to medium grained sand.	DW	M		MODERATE RESISTANCE
									SANDSTONE: fine to medium grained, light grey and orange brown.				
						3			SANDSTONE: fine to medium grained, orange brown and light grey, with iron indurated bands.				
									REFER TO CORED BOREHOLE LOG				
						4							
						5							
						6							
						7							

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Borehole No. **JK12** 2/2

CORED BOREHOLE LOG

Client: SYDNEY ADVENTIST HOSPITAL LIMITED
Project: HOSPITAL UPGRADE AND EXTENSIONS - STAGE 1
Location: SAN HOSPITAL, FOX VALLEY ROAD, WAHROONGA, NSW

Job No. 22758Z | **Core Size:** NMLC | **R.L. Surface:** ≈ 161.2m
Date: 12-3-09 | **Inclination:** VERTICAL | **Datum:** AHD
Drill Type: JK300 | **Bearing:** - | **Logged/Checked by:** G.F./

Water Loss/Level	Barrel Lift	Depth (m)	Graphic Log	CORE DESCRIPTION: Rock Type, grain characteristics, colour, structure, minor components.	Weathering	Strength	POINT LOAD STRENGTH INDEX $I_S(50)$ (EL VL L M H VH EH)	DEFECT DETAILS: DEFECT SPACING (mm) (600 200 100 60 30 10)	DEFECT DETAILS: DESCRIPTION (Specific / General)
		2		START CORING AT 2.64m					
		3		SANDSTONE: fine to medium grained, orange brown and light grey, with iron indurated bands.	DW	I M			- XWS, 2mm c - XWS, 2mm c
				SANDSTONE: fine to medium grained, light grey, with orange brown laminae, bedded at 0-15° and occasional iron indurated bands.	SW	M			- Be, 5°, P, S, IS - Be, 5°, P, S, IS - Cr, 5mm c
80% RET-URN		4		SANDSTONE: fine to medium grained, light grey, with dark grey laminae, bedded at 0-10°.					Be, 5°, IS, P - Be, 0°, P, S - Be, 0°, P, S
70% RET-URN		5							
		6							- XWSICS, 10mm c
				END OF BOREHOLE AT 6.71m					
		7							
		8							

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Borehole No. **JK13** 1/2

BOREHOLE LOG

Client: SYDNEY ADVENTIST HOSPITAL LIMITED

Project: HOSPITAL UPGRADE AND EXTENSIONS - STAGE 1

Location: SAN HOSPITAL, FOX VALLEY ROAD, WAHROONGA, NSW

Job No. 22758Z **Method:** SPIRAL AUGER JK300 **R.L. Surface:** ≈ 162.5m

Date: 13-3-09 **Datum:** AHD

Logged/Checked by: G.F./

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 OF AUGERING ▼ AFTER CORING					N > 15 5,15/ 150mm REFUSAL	0		-	CONCRETE: 120mm.t		-	-	9mm DIAMETER REINFORCEMENT, 65mm TOP COVER
								CL-CH	FILL: Silty gravelly sand, fine to medium grained, brown, with fine to medium grained igneous gravel and a trace of clay.	M MC>PL	VSt-H	380 460	
						1		-	SILTY CLAY: medium to high plasticity, light grey mottled red brown and orange brown, with a trace of fine grained sand.	DW	H	450 -	HIGH 'TC' BIT RESISTANCE
									SANDSTONE: fine grained, light grey, with iron indurated bands.				
									REFER TO CORED BOREHOLE LOG				
						2							
						3							
						4							
						5							
						6							
						7							

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Borehole No. **JK13** 2/2

CORED BOREHOLE LOG

Client: SYDNEY ADVENTIST HOSPITAL LIMITED
Project: HOSPITAL UPGRADE AND EXTENSIONS - STAGE 1
Location: SAN HOSPITAL, FOX VALLEY ROAD, WAHROONGA, NSW

Job No. 22758Z | **Core Size:** NMLC | **R.L. Surface:** ≈ 162.5m
Date: 12-3-09 | **Inclination:** VERTICAL | **Datum:** AHD
Drill Type: JK300 | **Bearing:** - | **Logged/Checked by:** G.F./

Water Loss/Level	Barrel Lift	Depth (m)	Graphic Log	CORE DESCRIPTION Rock Type, grain characteristics, colour, structure, minor components.	Weathering	Strength	POINT LOAD STRENGTH INDEX $I_S(50)$ (EL VL L M H VH EH)	DEFECT DETAILS DEFECT SPACING (mm)	DESCRIPTION Type, inclination, thickness, planarity, roughness, coating. Specific / General
		1		START CORING AT 1.39m					
				CORE LOSS 0.13m					
90% RET-URN		2		SANDSTONE: fine grained, light grey, with M-H strength iron indurated bands.	DW	VL	×		- VISIBLY FRAGMENTED - J, 60°, P, IS - XWS/CS, 70mm t - J, 80-90°, P, R
				SANDSTONE: fine grained, light grey, orange brown and purple brown, with M-H strength iron indurated bands.		L	×		- XWS, 5mm t - CS, 65mm t
		3		SANDSTONE: fine grained, light grey, with iron indurated bands.		L-M			
				SANDSTONE: fine to medium grained, grey, with dark grey laminae, bedded at 0-10°, and occasional iron indurated bands.		M	×		- J, 45°, P, R - XWS, 5-10°, 5mm t
80% RET-URN		4		SANDSTONE: fine to medium grained, orange brown and light grey, with dark grey laminae, bedded at 0-10°.					
				SANDSTONE: fine to medium grained, light grey, with dark grey laminae, bedded at 0-10°.			×		
		5		SANDSTONE: fine to medium grained, light grey, with occasional dark grey laminae, bedded at 0-10°.			×		
		6		END OF BOREHOLE AT 5.72m					
		7							
		8							

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Borehole No.
JK14
1/3

BOREHOLE LOG

Client: SYDNEY ADVENTIST HOSPITAL LIMITED

Project: HOSPITAL UPGRADE AND EXTENSIONS - STAGE 1

Location: SAN HOSPITAL, FOX VALLEY ROAD, WAHROONGA, NSW

Job No. 22758Z **Method:** SPIRAL AUGER JK300 **R.L. Surface:** ≈ 170.0m

Date: 17-3-09 **Datum:** AHD

Logged/Checked by: G.F./

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES D/S	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa)	Remarks
DRY ON COMPLETION OF AUGERING					0			ASPHALTIC CONCRETE: 200mm.t				
				N = 3 3,1,2			-	FILL: Silty clay, low to medium plasticity, brown and grey, with fine to medium grained sand and a trace of fine to medium grained gravel.	MC≥PL	-	-	APPEARS POORLY COMPACTED
					1			FILL: Sandstone boulder.				LOW TO MODERATE 'TC' BIT RESISTANCE
					2			FILL: Silty clay, medium plasticity, brown and orange brown, with a trace of fine to coarse grained shale, sandstone, igneous and ironstone gravel.	MC≥PL			APPEARS MODERATELY COMPACTED
				N = 10 5,4,6	3							
					4							
				N = 18 5,7,11			CH	SILTY CLAY: high plasticity, orange brown mottled light brown, with a trace of fine grained ironstone gravel.	MC>PL	H	- 410 500 550	
					5							
							CL	SILTY CLAY: medium plasticity, light grey mottled red brown, with a trace of fine to medium grained ironstone gravel.	MC≤PL			
				N = 37 10,15,22	6						> 600 > 600	
							-	SHALE: dark grey, with clay bands.	XW	EL		
					7							

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Borehole No.
JK14
2/3

BOREHOLE LOG

Client: SYDNEY ADVENTIST HOSPITAL LIMITED

Project: HOSPITAL UPGRADE AND EXTENSIONS - STAGE 1

Location: SAN HOSPITAL, FOX VALLEY ROAD, WAHROONGA, NSW

Job No. 22758Z **Method:** SPIRAL AUGER JK300 **R.L. Surface:** ≈ 170.0m

Date: 17-3-09 **Datum:** AHD

Logged/Checked by: G.F./

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
									SHALE: dark grey, with clay bands.	XW	EL VL		LOW "TC" BIT RESISTANCE
									REFER TO CORED BOREHOLE LOG				
						8							
						9							
						10							
						11							
						12							
						13							
						14							

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Borehole No. **JK14** 3/3

CORED BOREHOLE LOG

Client: SYDNEY ADVENTIST HOSPITAL LIMITED

Project: HOSPITAL UPGRADE AND EXTENSIONS - STAGE 1

Location: SAN HOSPITAL, FOX VALLEY ROAD, WAHROONGA, NSW

Job No. 22758Z **Core Size:** NMLC **R.L. Surface:** ≈ 170.0m

Date: 17-3-09 **Inclination:** VERTICAL **Datum:** AHD

Drill Type: JK300 **Bearing:** - **Logged/Checked by:** G.F./

Water Loss/Level	Barrel Lift	Depth (m)	Graphic Log	CORE DESCRIPTION (Rock Type, grain characteristics, colour, structure, minor components.)	Weathering	Strength	POINT LOAD STRENGTH INDEX $I_S(50)$ (EL VL L M H VH EH)	DEFECT DETAILS: DEFECT SPACING (mm) (600 200 100 60 30 10)	DEFECT DETAILS: DESCRIPTION (Type, inclination, thickness, planarity, roughness, coating.) Specific / General
		7		START CORING AT 7.46m					
				CORE LOSS 0.91m					
		8							
				INTERBEDDED SILTY CLAY AND SHALE: medium to high plasticity, light grey, with iron indurated bands.	MC>PL	(VS!! / EL			HP = 380,310,310
		9							HP = 450,410,400
90% RETURN				SHALE: grey, with iron indurated bands.	XW-DW	EL-VL			- J, 60-90°, Un, R
		10							- J, 70-85°, P, S, IS - CS, 20mm t - CS, 60mm t - Be, 0°, P, IS
				SANDSTONE: fine grained, light grey, brown and red brown, with iron indurated bands.	DW	L	×		- Be, 0°, P, IS
									- Be, 0°, P, S - Be, 0°, P, S - XWS, 5mm t
		11		SANDSTONE: fine grained, light grey, with dark grey laminae, bedded at 0-5° and XW seams.		L-M	×		- XWS, 10mm t
		12							Cr, 5mm t - Cr, 5mm t
						VL L-M	×		- XWS, 30mm t - XWS, 20mm t - Cr, 20mm t
		13		END OF BOREHOLE AT 12.78m					

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Borehole No.
JK15
1/1

BOREHOLE LOG

Client: SYDNEY ADVENTIST HOSPITAL LIMITED

Project: HOSPITAL UPGRADE AND EXTENSIONS - STAGE 1

Location: SAN HOSPITAL, FOX VALLEY ROAD, WAHROONGA, NSW

Job No. 22758Z **Method:** SPIRAL AUGER JK300 **R.L. Surface:** ≈ 169.9m

Date: 16-3-09 **Datum:** AHD

Logged/Checked by: G.F./

Groundwater Record	SAMPLES (S, U50, DB, DS)	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa)	Remarks
DRY ON COMPLETION		N = 5 1,2,3	0			FILL: Silty clay, medium plasticity, brown, with fine to medium grained shale, igneous, sandstone and ironstone gravel, with a trace of fine to medium grained sand and root fibres.	MC>PL			GRASS COVER APPEARS POORLY COMPACTED
			1			FILL: Sandstone boulder, orange brown.				MODERATE "TC" BIT RESISTANCE
			2			FILL: Silty clay, medium plasticity, brown, with a trace of fine to medium grained sand and gravel.	MC>PL			SOIL RESISTANCE
						END OF BOREHOLE AT 2.0m				
			3							
			4							
			5							
			6							
			7							

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Borehole No.
JK16
1/1

BOREHOLE LOG

Client: SYDNEY ADVENTIST HOSPITAL LIMITED

Project: HOSPITAL UPGRADE AND EXTENSIONS - STAGE 1

Location: SAN HOSPITAL, FOX VALLEY ROAD, WAHROONGA, NSW

Job No. 22758Z **Method:** SPIRAL AUGER JK300 **R.L. Surface:** ≈ 162.7m

Date: 17-3-09 **Datum:** AHD

Logged/Checked by: G.F./

Groundwater Record	SAMPLES	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa)	Remarks
DRY ON COMPLETION			0			TOPSOIL/FILL: Silty clay, medium plasticity, dark brown, with root fibres.	MC>PL			GRASS COVER
					CL-CH	SILTY CLAY: medium to high plasticity, light brown mottled red brown, with a trace of fine to medium grained ironstone gravel.	MC>PL	H	-	
		N = 8 3,4,4	1						400 410 400	
						SILTY CLAY: medium to high plasticity, light grey mottled red brown and orange brown, with a trace of root fibres and fine to medium grained ironstone gravel.		VSt -H		
		N = 14 8,7,7	2						310 390 420	
						END OF BOREHOLE AT 1.95m				
			3							
			4							
			5							
			6							
			7							

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Borehole No. **JK17** 1/1

BOREHOLE LOG

Client: SYDNEY ADVENTIST HOSPITAL LIMITED

Project: HOSPITAL UPGRADE AND EXTENSIONS - STAGE 1

Location: SAN HOSPITAL, FOX VALLEY ROAD, WAHROONGA, NSW

Job No. 22758Z **Method:** SPIRAL AUGER JK300 **R.L. Surface:** ≈ 162.6m

Date: 17-3-09 **Datum:** AHD

Logged/Checked by: G.F./

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						0			TOPSOIL/FILL: Silty clay, medium plasticity, brown, with a trace of root fibres and fine to medium grained gravel.	MC≥PL			GRASS COVER
					N = 7 2,3,4			CH	SILTY CLAY: high plasticity, light brown mottled red brown, with a trace of fine to medium grained ironstone gravel and root fibres.	MC > PL	H	500 550 >600	CLASS 18 50mm DIAMETER PVC STANDPIPE PIEZOMETER INSTALLED TO 6m MACHINE SLOTTED FROM 6m TO 3m, CASING FROM 3m TO SURFACE. 2mm SAND FILTER PACK FROM 6m TO 2.5m, BENTONITE SEAL FROM 2.5m TO 1.5m, BACKFILLED TO SURFACE WITH CAST IRON GATIC COVER AND LOCKABLE CAP AT SURFACE
					N = 11 7,6,5	1		CL	SILTY SANDY CLAY: low to medium plasticity, light grey mottled orange brown and a trace of fine to medium grained ironstone gravel and root fibres.			310 350 360	
						2			SANDSTONE: fine to medium grained, light grey and orange brown.	XW	EL		
						3			SANDSTONE: fine to medium grained, light grey, orange brown and red brown, with iron indurated bands.	DW	L-M		MODERATE 'TC' BIT RESISTANCE
						4			SANDSTONE: fine to medium grained, light grey.				
						5					M-H		MODERATE TO HIGH RESISTANCE
▶						6			END OF BOREHOLE AT 6.0m				
						7							

ENVIRONMENTAL INVESTIGATION SERVICES

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ENVIRONMENTAL LOG

Borehole No. 18 1/1

Environmental logs are not to be used for geotechnical purposes

Client: SYDNEY ADVENTIST HOSPITAL

Project: SAH UPGRADE AND EXTENSIONS

Location: FOX VALLEY ROAD, WAHROONGA, NSW

Job No. E22758K **Method:** EZIPROBE **R.L. Surface:** N/A

Date: 12-3-09 **Datum:**

Logged/Checked by: B.P./

Groundwater Record	SAMPLES ES	SAMPLES ASS	SAMPLES ASB	SAMPLES SAL	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa)	Remarks
DRY ON COMPLETION	■	■				0			ASPHALTIC CONCRETE: 50mm.t				
									FILL: Silty clay, high plasticity, orange brown, with a trace of	MC≈PL	-	-	
								CH	sandstone, ironstone and igneous gravel.	MC<PL	-	-	
									SILTY CLAY: high plasticity, orange brown, with iron indurated sandstone bands.				REFUSAL
						1			END OF BOREHOLE AT 0.6m				
						2							
						3							
						4							
						5							
						6							
						7							

ENVIRONMENTAL INVESTIGATION SERVICES

CONSULTING ENVIRONMENTAL ENGINEERS

ENVIRONMENTAL LOG

Borehole No. 19 1/1

Environmental logs are not to be used for geotechnical purposes

Client: SYDNEY ADVENTIST HOSPITAL

Project: SAH UPGRADE AND EXTENSIONS

Location: FOX VALLEY ROAD, WAHROONGA, NSW

Job No. E22758K **Method:** EZIPROBE **R.L. Surface:** N/A

Date: 12-3-09 **Datum:**

Logged/Checked by: B.P./

Groundwater Record	SAMPLES ES	SAMPLES ASS	SAMPLES ASB	SAMPLES SAL	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLETION	■		■			0		CH	FILL: Silty clay, medium plasticity, dark brown, with a trace of root fibres, igneous gravel and ash.	MC > PL	-	-	GRASS COVER
									SILTY CLAY: high plasticity, orange brown mottled red brown, with sand and a trace of ironstone gravel.	MC < PL			
						1		CL-CH	as above, but with ironstone bands, sand absent.				
									SILTY CLAY: medium to high plasticity, grey mottled red brown, with iron indurated sandstone bands.				REFUSAL ON INFERRED SANDSTONE BEDROCK
									END OF BOREHOLE AT 1.2m				
						2							
						3							
						4							
						5							
						6							
						7							

ENVIRONMENTAL INVESTIGATION SERVICES

CONSULTING ENVIRONMENTAL ENGINEERS

ENVIRONMENTAL LOG

Borehole No. 20 1/1

Environmental logs are not to be used for geotechnical purposes

Client: SYDNEY ADVENTIST HOSPITAL

Project: SAH UPGRADE AND EXTENSIONS

Location: FOX VALLEY ROAD, WAHROONGA, NSW

Job No. E22758K **Method:** EZIPROBE **R.L. Surface:** N/A

Date: 12-3-09 **Datum:**

Logged/Checked by: B.P./

Groundwater Record	SAMPLES ES	SAMPLES ASS	SAMPLES ASB	SAMPLES SAL	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLETION						0			ASPHALTIC CONCRETE: 20mm.t	MC > PL	-	-	
								CH	FILL: Sandy gravelly clay, medium plasticity, igneous, shale and sandstone gravel.	MC > PL	-	-	
									SILTY CLAY: high plasticity, orange brown.				
						1			as above, but with iron inudrated sandstone bands.				
									END OF BOREHOLE AT 1.3m				REFUSAL ON INFERRED SANDSTONE
						2							
						3							
						4							
						5							
						6							
						7							

ENVIRONMENTAL INVESTIGATION SERVICES

CONSULTING ENVIRONMENTAL ENGINEERS

ENVIRONMENTAL LOG

Borehole No. 21 1/1

Environmental logs are not to be used for geotechnical purposes

Client: SYDNEY ADVENTIST HOSPITAL

Project: SAH UPGRADE AND EXTENSIONS

Location: FOX VALLEY ROAD, WAHROONGA, NSW

Job No. E22758K **Method:** EZIPROBE **R.L. Surface:** N/A

Date: 12-3-09 **Datum:**

Logged/Checked by: B.P./[illegible]

Groundwater Record	SAMPLES ES	SAMPLES ASS	SAMPLES ASB	SAMPLES SAL	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa)	Remarks
DRY ON COMPLETION						0			ASPHALTIC CONCRETE: 50mm.t	MC≈PL	-	-	
						1			FILL: Silty clay, medium plasticity, grey brown, with sand and shale gravel and a trace of igneous gravel.				
								CH	SILTY CLAY: high plasticity, orange brown, with iron indurated sandstone bands.	MC≈PL	-	-	
									END OF BOREHOLE AT 1.5m				REFUSAL
						2							
						3							
						4							
						5							
						6							
						7							

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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.

Jeffery and Katauskas Pty Ltd
CONSULTING GEOTECHNICAL & ENVIRONMENTAL ENGINEERS

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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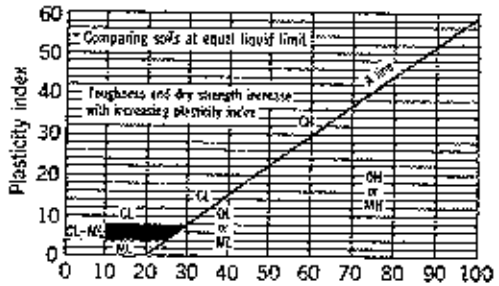
UNIFIED SOIL CLASSIFICATION TABLE

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 (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 sizes 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* *Borderline* cases requiring use of dual symbols $C_U = \frac{D_{60}}{D_{10}}$ 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
		Gravels with fines (appreciable amount of fines)	Predominantly one size or a range of sizes with some intermediate sizes missing		GP	Poorly graded gravels, gravel-sand mixtures, little or no 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 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
			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		
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							Use grain size curve in identifying the fractions as given under field identification
	Silts and clays: liquid limit less than 50	Dry Strength (crushing characteristics)	Dilatancy (reaction to shaking)	Toughness (consistency near plastic limit)				
		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 silt-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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LOG SYMBOLS

LOG COLUMN	SYMBOL	DEFINITION
Groundwater Record	▽	Standing water level. Time delay following completion of drilling may be shown.
	C	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 taken over depth indicated.
	DB	Bulk disturbed sample taken over depth indicated.
	DS	Small disturbed bag sample taken over depth indicated.
	ASB	Soil sample taken over depth indicated, for asbestos screening.
	ASS	Soil sample taken over depth indicated, for acid sulfate soil analysis.
	SAL	Soil sample taken over depth indicated, for salinity analysis.
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 greater than plastic limit.
	MC≈PL	Moisture content estimated to be approximately equal to plastic limit.
	MC<PL	Moisture content estimated to be less than 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 (Is) 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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ABN 17 003 550 801

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

Envirolab Services Pty Ltd
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CERTIFICATE OF ANALYSIS 27443

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

Attention: Todd Hore

Sample log in details:

Your Reference:	**E22758K, Wahroonga**
No. of samples:	55 Soils, 2 Waters
Date samples received:	18/03/09
Date completed instructions received:	18/03/09

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:	25/03/09
Date of Preliminary Report:	Not issued
Issue Date:	26/03/09

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Tests not covered by NATA are denoted with *.

Results Approved By:

David Springer
Business Development & Quality Manager

Jacinta Hurst
Operations Manager

Joshua Yim
Chemist

NATA
ACCREDITED FOR TECHNICAL COMPETENCE

vTPH & BTEX in Soil						
Our Reference:	UNITS	27443-1	27443-2	27443-4	27443-6	27443-10
Your Reference	----------	BH1	BH2	BH3	BH4	BH5
Depth	----------	0.2-0.4	0.2-0.4	0.1-0.2	0.1-0.2	0.9-1.0
Date Sampled		17/03/09	17/03/09	16/03/09	16/03/09	13/03/09
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/03/2009	20/03/2009	20/03/2009	20/03/2009	20/03/2009
Date analysed	-	20/03/2009	20/03/2009	20/03/2009	20/03/2009	20/03/2009
vTPH C6 - C9	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	%	86	86	85	84	89

vTPH & BTEX in Soil						
Our Reference:	UNITS	27443-12	27443-15	27443-17	27443-19	27443-22
Your Reference	----------	BH6	BH7	BH8	BH9	BH10
Depth	----------	0.5-0.7	0.4-0.7	0.05-0.3	0.8-1.0	0.2-0.5
Date Sampled		12/03/09	12/03/09	12/03/09	12/03/09	12/03/09
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/03/2009	20/03/2009	20/03/2009	20/03/2009	20/03/2009
Date analysed	-	20/03/2009	20/03/2009	20/03/2009	20/03/2009	20/03/2009
vTPH C6 - C9	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	%	87	87	87	84	88

vTPH & BTEX in Soil						
Our Reference:	UNITS	27443-26	27443-33	27443-35	27443-37	27443-41
Your Reference	----------	BH11	BH14	BH14	BH14	BH16
Depth	----------	0.2-0.3	0.4-0.5	2.5-2.8	4.5-4.95	0.3-0.5
Date Sampled		12/03/09	17/03/09	17/03/09	17/03/09	17/03/09
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/03/2009	20/03/2009	20/03/2009	20/03/2009	20/03/2009
Date analysed	-	20/03/2009	20/03/2009	20/03/2009	20/03/2009	20/03/2009
vTPH C6 - C9	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	%	81	82	83	82	78

vTPH & BTEX in Soil						
Our Reference:	UNITS	27443-42	27443-44	27443-45	27443-46	27443-48
Your Reference	----------	BH17	BH18	BH18	BH19	BH20
Depth	----------	0.1-0.2	0.1-0.3	0.4-0.6	0.0-0.1	0.02-0.2
Date Sampled		17/03/09	12/03/09	12/03/09	12/03/09	12/03/09
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/03/2009	20/03/2009	20/03/2009	20/03/2009	20/03/2009
Date analysed	-	20/03/2009	20/03/2009	20/03/2009	20/03/2009	20/03/2009
vTPH C6 - C9	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	%	91	87	81	84	87

vTPH & BTEX in Soil			
Our Reference:	UNITS	27443-50	27443-52
Your Reference	----------	BH21	FB1
Depth	----------	0.2-0.4	-
Date Sampled		12/03/09	12/03/09
Type of sample		Soil	Soil
Date extracted	-	20/03/2009	20/03/2009
Date analysed	-	20/03/2009	20/03/2009
vTPH C6 - C9	mg/kg	<25	[NA]
Benzene	mg/kg	<0.5	<0.5
Toluene	mg/kg	<0.5	<0.5
Ethylbenzene	mg/kg	<1.0	<1.0
m+p-xylene	mg/kg	<2.0	<2.0
o-Xylene	mg/kg	<1.0	<1.0
Surrogate aaa-Trifluorotoluene	%	82	89

sTPH in Soil (C10-C36)						
Our Reference:	UNITS	27443-1	27443-2	27443-4	27443-6	27443-10
Your Reference	----------	BH1	BH2	BH3	BH4	BH5
Depth	----------	0.2-0.4	0.2-0.4	0.1-0.2	0.1-0.2	0.9-1.0
Date Sampled		17/03/09	17/03/09	16/03/09	16/03/09	13/03/09
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/03/2009	20/03/2009	20/03/2009	20/03/2009	20/03/2009
Date analysed	-	20/03/2009	20/03/2009	20/03/2009	20/03/2009	20/03/2009
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	%	88	85	84	114	83

sTPH in Soil (C10-C36)						
Our Reference:	UNITS	27443-12	27443-15	27443-17	27443-19	27443-22
Your Reference	----------	BH6	BH7	BH8	BH9	BH10
Depth	----------	0.5-0.7	0.4-0.7	0.05-0.3	0.8-1.0	0.2-0.5
Date Sampled		12/03/09	12/03/09	12/03/09	12/03/09	12/03/09
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/03/2009	20/03/2009	20/03/2009	20/03/2009	20/03/2009
Date analysed	-	20/03/2009	20/03/2009	20/03/2009	20/03/2009	20/03/2009
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	%	97	85	86	86	90

sTPH in Soil (C10-C36)						
Our Reference:	UNITS	27443-26	27443-33	27443-35	27443-37	27443-41
Your Reference	----------	BH11	BH14	BH14	BH14	BH16
Depth	----------	0.2-0.3	0.4-0.5	2.5-2.8	4.5-4.95	0.3-0.5
Date Sampled		12/03/09	17/03/09	17/03/09	17/03/09	17/03/09
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/03/2009	20/03/2009	20/03/2009	20/03/2009	20/03/2009
Date analysed	-	20/03/2009	20/03/2009	20/03/2009	20/03/2009	20/03/2009
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	%	84	82	85	82	85

sTPH in Soil (C10-C36)						
Our Reference:	UNITS	27443-42	27443-44	27443-45	27443-46	27443-48
Your Reference	----------	BH17	BH18	BH18	BH19	BH20
Depth	----------	0.1-0.2	0.1-0.3	0.4-0.6	0.0-0.1	0.02-0 2
Date Sampled		17/03/09	12/03/09	12/03/09	12/03/09	12/03/09
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/03/2009	20/03/2009	20/03/2009	20/03/2009	20/03/2009
Date analysed	-	20/03/2009	20/03/2009	20/03/2009	20/03/2009	20/03/2009
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	%	83	84	82	84	82

sTPH in Soil (C10-C36)		
Our Reference:	UNITS	27443-50
Your Reference	----------	BH21
Depth	----------	0.2-0.4
Date Sampled		12/03/09
Type of sample		Soil
Date extracted	-	20/03/2009
Date analysed	-	20/03/2009
TPH C_{10} - C_{14}	mg/kg	<50
TPH C_{15} - C_{28}	mg/kg	<100
TPH C_{29} - C_{36}	mg/kg	<100
Surrogate o-Terphenyl	%	85

PAHs in Soil						
Our Reference:	UNITS	27443-1	27443-2	27443-4	27443-6	27443-10
Your Reference	----------	BH1	BH2	BH3	BH4	BH5
Depth	----------	0.2-0.4	0.2-0.4	0.1-0.2	0.1-0.2	0.9-1.0
Date Sampled		17/03/09	17/03/09	16/03/09	16/03/09	13/03/09
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/03/2009	20/03/2009	20/03/2009	20/03/2009	20/03/2009
Date analysed	-	20/03/2009	20/03/2009	20/03/2009	20/03/2009	20/03/2009
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	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	0.06
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate p-Terphenyl-d14	%	107	106	105	107	114

PAHs in Soil Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ---------- ----------	27443-12 BH6 0.5-0.7 12/03/09 Soil	27443-15 BH7 0.4-0.7 12/03/09 Soil	27443-17 BH8 0.05-0.3 12/03/09 Soil	27443-19 BH9 0.8-1.0 12/03/09 Soil	27443-22 BH10 0.2-0.5 12/03/09 Soil
Date extracted	-	20/03/2009	20/03/2009	20/03/2009	20/03/2009	20/03/2009
Date analysed	-	20/03/2009	20/03/2009	20/03/2009	20/03/2009	20/03/2009
Naphthalene	mg/kg	<0.1	<0.1	0.2	<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	<0.1	<0.1	0.1	<0.1	0.2
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	0.2	<0.1	<0.1	0.6
Pyrene	mg/kg	<0.1	0.2	<0.1	<0.1	0.6
Benzo(a)anthracene	mg/kg	<0.1	0.1	<0.1	<0.1	0.4
Chrysene	mg/kg	<0.1	0.2	<0.1	<0.1	0.5
Benzo(b+k)fluoranthene	mg/kg	<0.2	0.3	<0.2	<0.2	0.5
Benzo(a)pyrene	mg/kg	<0.05	0.1	<0.05	<0.05	0.3
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	0.1	<0.1	<0.1	0.2
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	0.1	<0.1	<0.1	0.1
Surrogate p-Terphenyl-d14	%	99	114	111	106	108

PAHs in Soil Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ---------- ----------	27443-26 BH11 0.2-0.3 12/03/09 Soil	27443-33 BH14 0.4-0.5 17/03/09 Soil	27443-35 BH14 2.5-2.8 17/03/09 Soil	27443-37 BH14 4.5-4.95 17/03/09 Soil	27443-41 BH16 0.3-0.5 17/03/09 Soil
Date extracted	-	20/03/2009	20/03/2009	20/03/2009	20/03/2009	20/03/2009
Date analysed	-	20/03/2009	20/03/2009	20/03/2009	20/03/2009	20/03/2009
Naphthalene	mg/kg	<0.1	<0.1	0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	0.2	<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	<0.1	1.0	1.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	0.2	0.3	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	2.1	2.0	<0.1	<0.1
Pyrene	mg/kg	<0.1	1.9	2.0	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	0.8	1.0	<0.1	<0.1
Chrysene	mg/kg	<0.1	0.9	1.0	<0.1	<0.1
Benzo(b+k)fluoranthene	mg/kg	<0.2	1.5	1.5	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	1.0	1	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	0.7	0.6	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	0.8	0.5	<0.1	<0.1
Surrogate p-Terphenyl-d_{14}	%	110	104	104	107	109

PAHs in Soil Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ---------- ----------	27443-42 BH17 0.1-0.2 17/03/09 Soil	27443-44 BH18 0.1-0.3 12/03/09 Soil	27443-45 BH18 0.4-0.6 12/03/09 Soil	27443-46 BH19 0.0-0.1 12/03/09 Soil	27443-48 BH20 0.02-0.2 12/03/09 Soil
Date extracted	-	20/03/2009	20/03/2009	20/03/2009	20/03/2009	20/03/2009
Date analysed	-	20/03/2009	20/03/2009	20/03/2009	20/03/2009	20/03/2009
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	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	0.07	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate p-Terphenyl-d14	%	106	106	105	108	114

PAHs in Soil Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ---------- ---------- 	27443-50 BH21 0.2-0.4 12/03/09 Soil	27443-56 Dup1 - - Soil	27443-57 Dup2 - - Soil
Date extracted	-	20/03/2009	20/03/2009	20/03/2009
Date analysed	-	20/03/2009	20/03/2009	20/03/2009
Naphthalene	mg/kg	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.1	0.7	0.3
Pyrene	mg/kg	0.1	0.7	0.3
Benzo(a)anthracene	mg/kg	<0.1	0.5	0.1
Chrysene	mg/kg	<0.1	0.5	0.2
Benzo(b+k)fluoranthene	mg/kg	<0.2	0.7	0.3
Benzo(a)pyrene	mg/kg	<0.05	0.4	0.2
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	0.2	0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	0.2	0.1
Surrogate p-Terphenyl-d14	%	101	111	112

Organochlorine Pesticides in soil						
Our Reference:	UNITS	27443-1	27443-2	27443-4	27443-6	27443-10
Your Reference	----------	BH1	BH2	BH3	BH4	BH5
Depth	----------	0.2-0.4	0.2-0.4	0.1-0.2	0.1-0.2	0.9-1.0
Date Sampled		17/03/09	17/03/09	16/03/09	16/03/09	13/03/09
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/03/2009	20/03/2009	20/03/2009	20/03/2009	20/03/2009
Date analysed	-	20/03/2009	20/03/2009	20/03/2009	20/03/2009	20/03/2009
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	%	67	74	79	80	73

Organochlorine Pesticides in soil						
Our Reference:	UNITS	27443-12	27443-15	27443-17	27443-19	27443-22
Your Reference	----------	BH6	BH7	BH8	BH9	BH10
Depth	----------	0.5-0.7	0.4-0.7	0.05-0.3	0.8-1.0	0.2-0.5
Date Sampled		12/03/09	12/03/09	12/03/09	12/03/09	12/03/09
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/03/2009	20/03/2009	20/03/2009	20/03/2009	20/03/2009
Date analysed	-	20/03/2009	20/03/2009	20/03/2009	20/03/2009	20/03/2009
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	%	79	74	77	74	81

Organochlorine Pesticides in soil						
Our Reference:	UNITS	27443-26	27443-33	27443-35	27443-37	27443-41
Your Reference	----------	BH11	BH14	BH14	BH14	BH16
Depth	----------	0.2-0.3	0.4-0.5	2.5-2.8	4.5-4.95	0.3-0.5
Date Sampled		12/03/09	17/03/09	17/03/09	17/03/09	17/03/09
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/03/2009	20/03/2009	20/03/2009	20/03/2009	20/03/2009
Date analysed	-	20/03/2009	20/03/2009	20/03/2009	20/03/2009	20/03/2009
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	%	74	73	81	75	78

Organochlorine Pesticides in soil						
Our Reference:	UNITS	27443-42	27443-44	27443-45	27443-46	27443-48
Your Reference	----------	BH17	BH18	BH18	BH19	BH20
Depth	----------	0.1-0.2	0.1-0.3	0.4-0.6	0.0-0.1	0.02-0.2
Date Sampled		17/03/09	12/03/09	12/03/09	12/03/09	12/03/09
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/03/2009	20/03/2009	20/03/2009	20/03/2009	20/03/2009
Date analysed	-	20/03/2009	20/03/2009	20/03/2009	20/03/2009	20/03/2009
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	%	80	75	78	76	76

Organochlorine Pesticides in soil		
Our Reference:	UNITS	27443-50
Your Reference	----------	BH21
Depth	----------	0.2-0.4
Date Sampled		12/03/09
Type of sample		Soil
Date extracted	-	20/03/2009
Date analysed	-	20/03/2009
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	%	78

Organophosphorus Pesticides						
Our Reference:	UNITS	27443-1	27443-2	27443-4	27443-6	27443-10
Your Reference	----------	BH1	BH2	BH3	BH4	BH5
Depth	----------	0.2-0.4	0.2-0.4	0.1-0.2	0.1-0.2	0.9-1.0
Date Sampled		17/03/09	17/03/09	16/03/09	16/03/09	13/03/09
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/03/2009	20/03/2009	20/03/2009	20/03/2009	20/03/2009
Date analysed	-	20/03/2009	20/03/2009	20/03/2009	20/03/2009	20/03/2009
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	%	67	74	79	80	73

Organophosphorus Pesticides						
Our Reference:	UNITS	27443-12	27443-15	27443-17	27443-19	27443-22
Your Reference	----------	BH6	BH7	BH8	BH9	BH10
Depth	----------	0.5-0.7	0.4-0.7	0.05-0.3	0.8-1.0	0.2-0.5
Date Sampled		12/03/09	12/03/09	12/03/09	12/03/09	12/03/09
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/03/2009	20/03/2009	20/03/2009	20/03/2009	20/03/2009
Date analysed	-	20/03/2009	20/03/2009	20/03/2009	20/03/2009	20/03/2009
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	%	79	74	77	74	81

Organophosphorus Pesticides						
Our Reference:	UNITS	27443-26	27443-33	27443-35	27443-37	27443-41
Your Reference	----------	BH11	BH14	BH14	BH14	BH16
Depth	----------	0.2-0.3	0.4-0.5	2.5-2.8	4.5-4.95	0.3-0.5
Date Sampled		12/03/09	17/03/09	17/03/09	17/03/09	17/03/09
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/03/2009	20/03/2009	20/03/2009	20/03/2009	20/03/2009
Date analysed	-	20/03/2009	20/03/2009	20/03/2009	20/03/2009	20/03/2009
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	%	74	73	81	75	78

Organophosphorus Pesticides						
Our Reference:	UNITS	27443-42	27443-44	27443-45	27443-46	27443-48
Your Reference	----------	BH17	BH18	BH18	BH19	BH20
Depth	----------	0.1-0.2	0.1-0.3	0.4-0.6	0.0-0.1	0.02-0.2
Date Sampled		17/03/09	12/03/09	12/03/09	12/03/09	12/03/09
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/03/2009	20/03/2009	20/03/2009	20/03/2009	20/03/2009
Date analysed	-	20/03/2009	20/03/2009	20/03/2009	20/03/2009	20/03/2009
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	%	80	75	78	76	76

Organophosphorus Pesticides		
Our Reference:	UNITS	27443-50
Your Reference	----------	BH21
Depth	----------	0.2-0.4
Date Sampled		12/03/09
Type of sample		Soil
Date extracted	-	20/03/2009
Date analysed	-	20/03/2009
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	%	78

PCBs in Soil						
Our Reference:	UNITS	27443-1	27443-2	27443-4	27443-6	27443-10
Your Reference	----------	BH1	BH2	BH3	BH4	BH5
Depth	----------	0.2-0.4	0.2-0.4	0.1-0.2	0.1-0.2	0.9-1.0
Date Sampled		17/03/09	17/03/09	16/03/09	16/03/09	13/03/09
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/03/2009	20/03/2009	20/03/2009	20/03/2009	20/03/2009
Date analysed	-	20/03/2009	20/03/2009	20/03/2009	20/03/2009	20/03/2009
Arochlor 1016	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	%	67	74	79	80	73

PCBs in Soil						
Our Reference:	UNITS	27443-12	27443-15	27443-17	27443-19	27443-22
Your Reference	----------	BH6	BH7	BH8	BH9	BH10
Depth	----------	0.5-0.7	0.4-0.7	0.05-0.3	0.8-1.0	0.2-0.5
Date Sampled		12/03/09	12/03/09	12/03/09	12/03/09	12/03/09
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/03/2009	20/03/2009	20/03/2009	20/03/2009	20/03/2009
Date analysed	-	20/03/2009	20/03/2009	20/03/2009	20/03/2009	20/03/2009
Arochlor 1016	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	%	79	74	77	74	81

PCBs in Soil						
Our Reference:	UNITS	27443-26	27443-33	27443-35	27443-37	27443-41
Your Reference	----------	BH11	BH14	BH14	BH14	BH16
Depth	----------	0.2-0.3	0.4-0.5	2.5-2.8	4.5-4.95	0.3-0.5
Date Sampled		12/03/09	17/03/09	17/03/09	17/03/09	17/03/09
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/03/2009	20/03/2009	20/03/2009	20/03/2009	20/03/2009
Date analysed	-	20/03/2009	20/03/2009	20/03/2009	20/03/2009	20/03/2009
Arochlor 1016	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	%	74	73	81	75	78

PCBs in Soil Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ---------- ----------	27443-42 BH17 0.1-0.2 17/03/09 Soil	27443-44 BH18 0.1-0.3 12/03/09 Soil	27443-45 BH18 0.4-0.6 12/03/09 Soil	27443-46 BH19 0.0-0.1 12/03/09 Soil	27443-48 BH20 0.02-0.2 12/03/09 Soil
Date extracted	-	20/03/2009	20/03/2009	20/03/2009	20/03/2009	20/03/2009
Date analysed	-	20/03/2009	20/03/2009	20/03/2009	20/03/2009	20/03/2009
Arochlor 1016	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	%	80	75	80	76	76

PCBs in Soil Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ---------- ----------	27443-50 BH21 0.2-0.4 12/03/09 Soil
Date extracted	-	20/03/2009
Date analysed	-	20/03/2009
Arochlor 1016	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	%	78

Acid Extractable metals in soil						
Our Reference:	UNITS	27443-1	27443-2	27443-4	27443-6	27443-10
Your Reference	----------	BH1	BH2	BH3	BH4	BH5
Depth	----------	0.2-0.4	0.2-0.4	0.1-0.2	0.1-0.2	0.9-1.0
Date Sampled		17/03/09	17/03/09	16/03/09	16/03/09	13/03/09
Type of sample		Soil	Soil	Soil	Soil	Soil
Date digested	-	20/03/2009	20/03/2009	20/03/2009	20/03/2009	20/03/2009
Date analysed	-	23/03/2009	23/03/2009	23/03/2009	23/03/2009	23/03/2009
Arsenic	mg/kg	<4	26	5	4	6
Cadmium	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Chromium	mg/kg	9	9	21	24	19
Copper	mg/kg	2	11	12	7	5
Lead	mg/kg	7	25	29	15	14
Mercury	mg/kg	0.1	0.1	0.2	<0.1	0.2
Nickel	mg/kg	1	2	15	16	5
Zinc	mg/kg	7	68	45	19	12

Acid Extractable metals in soil						
Our Reference:	UNITS	27443-12	27443-15	27443-17	27443-19	27443-22
Your Reference	----------	BH6	BH7	BH8	BH9	BH10
Depth	----------	0.5-0.7	0.4-0.7	0.05-0.3	0.8-1.0	0.2-0.5
Date Sampled		12/03/09	12/03/09	12/03/09	12/03/09	12/03/09
Type of sample		Soil	Soil	Soil	Soil	Soil
Date digested	-	20/03/2009	20/03/2009	20/03/2009	20/03/2009	20/03/2009
Date analysed	-	23/03/2009	23/03/2009	23/03/2009	23/03/2009	23/03/2009
Arsenic	mg/kg	14	11	<4	<4	8
Cadmium	mg/kg	<0.5	<0.5	0.6	<0.5	<0.5
Chromium	mg/kg	14	18	120	2	21
Copper	mg/kg	18	18	45	1	29
Lead	mg/kg	26	29	8	3	29
Mercury	mg/kg	<0.1	0.2	<0.1	<0.1	<0.1
Nickel	mg/kg	5	6	130	<1	16
Zinc	mg/kg	33	32	62	2	43

Acid Extractable metals in soil						
Our Reference:	UNITS	27443-26	27443-33	27443-35	27443-37	27443-41
Your Reference	----------	BH11	BH14	BH14	BH14	BH16
Depth	----------	0.2-0.3	0.4-0.5	2.5-2.8	4.5-4.95	0.3-0.5
Date Sampled		12/03/09	17/03/09	17/03/09	17/03/09	17/03/09
Type of sample		Soil	Soil	Soil	Soil	Soil
Date digested	-	20/03/2009	20/03/2009	20/03/2009	20/03/2009	20/03/2009
Date analysed	-	23/03/2009	23/03/2009	23/03/2009	23/03/2009	23/03/2009
Arsenic	mg/kg	4	<4	8	7	7
Cadmium	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Chromium	mg/kg	19	72	14	21	26
Copper	mg/kg	38	25	31	14	15
Lead	mg/kg	21	16	36	26	21
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	9	66	10	2	5
Zinc	mg/kg	29	47	42	3	14

Acid Extractable metals in soil						
Our Reference:	UNITS	27443-42	27443-44	27443-45	27443-46	27443-48
Your Reference	----------	BH17	BH18	BH18	BH19	BH20
Depth	----------	0.1-0.2	0.1-0.3	0.4-0.6	0.0-0.1	0.02-0.2
Date Sampled		17/03/09	12/03/09	12/03/09	12/03/09	12/03/09
Type of sample		Soil	Soil	Soil	Soil	Soil
Date digested	-	20/03/2009	20/03/2009	20/03/2009	20/03/2009	20/03/2009
Date analysed	-	23/03/2009	23/03/2009	23/03/2009	23/03/2009	23/03/2009
Arsenic	mg/kg	6	7	9	9	6
Cadmium	mg/kg	<0.5	<0.5	<0.5	0.5	<0.5
Chromium	mg/kg	17	22	20	23	12
Copper	mg/kg	9	17	3	34	15
Lead	mg/kg	19	25	14	250	20
Mercury	mg/kg	<0.1	<0.1	<0.1	0.1	<0.1
Nickel	mg/kg	3	9	<1	8	3
Zinc	mg/kg	9	12	3	160	15

Acid Extractable metals in soil Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ---------- ----------	27443-50 BH21 0.2-0.4 12/03/09 Soil	27443-56 Dup1 - - Soil	27443-57 Dup2 - - Soil
Date digested	-	20/03/2009	20/03/2009	20/03/2009
Date analysed	-	23/03/2009	23/03/2009	23/03/2009
Arsenic	mg/kg	<4	9	7
Cadmium	mg/kg	<0.5	<0.5	<0.5
Chromium	mg/kg	9	26	19
Copper	mg/kg	9	30	21
Lead	mg/kg	15	30	24
Mercury	mg/kg	<0.1	<0.1	<0.1
Nickel	mg/kg	5	21	13
Zinc	mg/kg	17	44	40

Moisture						
Our Reference:	UNITS	27443-1	27443-2	27443-4	27443-6	27443-10
Your Reference	----------	BH1	BH2	BH3	BH4	BH5
Depth	----------	0.2-0.4	0.2-0.4	0.1-0.2	0.1-0.2	0.9-1.0
Date Sampled		17/03/09	17/03/09	16/03/09	16/03/09	13/03/09
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	20/03/2009	20/03/2009	20/03/2009	20/03/2009	20/03/2009
Date analysed	-	20/03/2009	20/03/2009	20/03/2009	20/03/2009	20/03/2009
Moisture	%	13	9.1	15	13	10

Moisture						
Our Reference:	UNITS	27443-12	27443-15	27443-17	27443-19	27443-22
Your Reference	----------	BH6	BH7	BH8	BH9	BH10
Depth	----------	0.5-0.7	0.4-0.7	0.05-0.3	0.8-1.0	0.2-0.5
Date Sampled		12/03/09	12/03/09	12/03/09	12/03/09	12/03/09
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	20/03/2009	20/03/2009	20/03/2009	20/03/2009	20/03/2009
Date analysed	-	20/03/2009	20/03/2009	20/03/2009	20/03/2009	20/03/2009
Moisture	%	13	14	5.7	0.70	9.0

Moisture						
Our Reference:	UNITS	27443-26	27443-33	27443-35	27443-37	27443-41
Your Reference	----------	BH11	BH14	BH14	BH14	BH16
Depth	----------	0.2-0.3	0.4-0.5	2.5-2.8	4.5-4.95	0.3-0.5
Date Sampled		12/03/09	17/03/09	17/03/09	17/03/09	17/03/09
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	20/03/2009	20/03/2009	20/03/2009	20/03/2009	20/03/2009
Date analysed	-	20/03/2009	20/03/2009	20/03/2009	20/03/2009	20/03/2009
Moisture	%	19	10	12	21	21

Moisture						
Our Reference:	UNITS	27443-42	27443-44	27443-45	27443-46	27443-48
Your Reference	----------	BH17	BH18	BH18	BH19	BH20
Depth	----------	0.1-0.2	0.1-0.3	0.4-0.6	0.0-0.1	0.02-0.2
Date Sampled		17/03/09	12/03/09	12/03/09	12/03/09	12/03/09
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	20/03/2009	20/03/2009	20/03/2009	20/03/2009	20/03/2009
Date analysed	-	20/03/2009	20/03/2009	20/03/2009	20/03/2009	20/03/2009
Moisture	%	20	14	13	20	9.4

Moisture				
Our Reference:	UNITS	27443-50	27443-56	27443-57
Your Reference	----------	BH21	Dup1	Dup2
Depth	----------	0.2-0.4	-	-
Date Sampled		12/03/09	-	-
Type of sample		Soil	Soil	Soil
Date prepared	-	20/03/2009	20/03/2009	20/03/2009
Date analysed	-	20/03/2009	20/03/2009	20/03/2009
Moisture	%	9.3	1.0	14

Asbestos ID - soils						
Our Reference:	UNITS	27443-1	27443-2	27443-4	27443-6	27443-10
Your Reference	----------	BH1	BH2	BH3	BH4	BH5
Depth	----------	0.2-0.4	0.2-0.4	0.1-0.2	0.1-0.2	0.9-1.0
Date Sampled		17/03/09	17/03/09	16/03/09	16/03/09	13/03/09
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	24/03/2009	24/03/2009	24/03/2009	24/03/2009	24/03/2009
Sample Description	-	40g soil	40g soil	40g soil	40g soil	40g 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	27443-12	27443-15	27443-17	27443-19	27443-22
Your Reference	----------	BH6	BH7	BH8	BH9	BH10
Depth	----------	0.5-0.7	0.4-0.7	0.05-0.3	0.8-1.0	0.2-0.5
Date Sampled		12/03/09	12/03/09	12/03/09	12/03/09	12/03/09
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	24/03/2009	24/03/2009	24/03/2009	24/03/2009	24/03/2009
Sample Description	-	40g soil	40g soil	40g soil	40g soil	40g 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	27443-26	27443-33	27443-35	27443-37	27443-41
Your Reference	----------	BH11	BH14	BH14	BH14	BH16
Depth	----------	0.2-0.3	0.4-0.5	2.5-2.8	4.5-4.95	0.3-0.5
Date Sampled		12/03/09	17/03/09	17/03/09	17/03/09	17/03/09
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	24/03/2009	24/03/2009	24/03/2009	24/03/2009	24/03/2009
Sample Description	-	40g soil	40g soil	40g soil	40g soil	40g 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: Your Reference Depth Date Sampled Type of sample	UNITS ---------- ----------	27443-42 BH17 0.1-0.2 17/03/09 Soil	27443-44 BH18 0.1-0.3 12/03/09 Soil	27443-45 BH18 0.4-0.6 12/03/09 Soil	27443-46 BH19 0.0-0.1 12/03/09 Soil	27443-48 BH20 0.02-0.2 12/03/09 Soil
Date analysed	-	24/03/2009	24/03/2009	24/03/2009	24/03/2009	24/03/2009
Sample Description	-	40g soil	40g soil	40g soil	40g soil	40g 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: Your Reference Depth Date Sampled Type of sample	UNITS ---------- ----------	27443-50 BH21 0.2-0.4 12/03/09 Soil
Date analysed	-	24/03/2009
Sample Description	-	40g soil
Asbestos ID in soil	-	No asbestos found at reporting limit of 0.1g/kg
Trace Analysis	-	Respirable fibres not detected

BTEX in Water Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ---------- ---------- 	27443-54 Rinsate 1 - 12/03/09 Water	27443-55 Rinsate 2 - 13/03/09 Water
Date extracted	-	19/03/2009	19/03/2009
Date analysed	-	19/03/2009	19/03/2009
Benzene	µg/L	<1.0	<1.0
Toluene	µg/L	<1.0	<1.0
Ethylbenzene	µg/L	<1.0	<1.0
m+p-xylene	µg/L	<2.0	<2.0
o-xylene	µg/L	<1.0	<1.0
Surrogate Dibromofluoromethane	%	93	88
Surrogate toluene-d8	%	94	101
Surrogate 4-BFB	%	80	83

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	Qualitative identification of asbestos type fibres in bulk using Polarised Light Microscopy and Dispersion Staining Techniques.

QUALITY CONTROL vTPH & BTEX in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			20/03/2009	27443-1	20/03/2009 || 20/03/2009	LCS-1	20/03/20
Date analysed	-			20/03/2009	27443-1	20/03/2009 || 20/03/2009	LCS-1	20/03/20
vTPH C_6 - C_9	mg/kg	25	GC.16	<25	27443-1	<25 || <25	LCS-1	102%
Benzene	mg/kg	0.5	GC.16	<0.5	27443-1	<0.5 || <0.5	LCS-1	103%
Toluene	mg/kg	0.5	GC.16	<0.5	27443-1	<0.5 || <0.5	LCS-1	105%
Ethylbenzene	mg/kg	1	GC.16	<1.0	27443-1	<1.0 || <1.0	LCS-1	103%
m+p-xylene	mg/kg	2	GC.16	<2.0	27443-1	<2.0 || <2.0	LCS-1	99%
o-Xylene	mg/kg	1	GC.16	<1.0	27443-1	<1.0 || <1.0	LCS-1	112%
Surrogate aaa-Trifluorotoluene	%		GC.16	91	27443-1	86 || 85 || RPD: 1	LCS-1	89%

QUALITY CONTROL sTPH in Soil (C10-C36)	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			20/03/2009	27443-1	20/03/2009 || 20/03/2009	LCS-1	20/03/20
Date analysed	-			20/03/2009	27443-1	20/03/2009 || 20/03/2009	LCS-1	20/03/20
TPH C_{10} - C_{14}	mg/kg	50	GC.3	<50	27443-1	<50 || <50	LCS-1	103%
TPH C_{15} - C_{28}	mg/kg	100	GC.3	<100	27443-1	<100 || <100	LCS-1	92%
TPH C_{29} - C_{36}	mg/kg	100	GC.3	<100	27443-1	<100 || <100	LCS-1	93%
Surrogate o-Terphenyl	%		GC.3	85	27443-1	88 || 84 || RPD: 5	LCS-1	83%

QUALITY CONTROL PAHs in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			20/03/2009	27443-1	20/03/2009 || 20/03/2009	LCS-1	20/03/20
Date analysed	-			20/03/2009	27443-1	20/03/2009 || 20/03/2009	LCS-1	20/03/20
Naphthalene	mg/kg	0.1	GC.12 subset	<0.1	27443-1	<0.1 || <0.1	LCS-1	105%
Acenaphthylene	mg/kg	0.1	GC.12 subset	<0.1	27443-1	<0.1 || <0.1	[NR]	[NR]
Acenaphthene	mg/kg	0.1	GC.12 subset	<0.1	27443-1	<0.1 || <0.1	[NR]	[NR]
Fluorene	mg/kg	0.1	GC.12 subset	<0.1	27443-1	<0.1 || <0.1	LCS-1	99%
Phenanthrene	mg/kg	0.1	GC.12 subset	<0.1	27443-1	<0.1 || <0.1	LCS-1	103%
Anthracene	mg/kg	0.1	GC.12 subset	<0.1	27443-1	<0.1 || <0.1	[NR]	[NR]
Fluoranthene	mg/kg	0.1	GC.12 subset	<0.1	27443-1	<0.1 || <0.1	LCS-1	99%
Pyrene	mg/kg	0.1	GC.12 subset	<0.1	27443-1	<0.1 || <0.1	LCS-1	105%

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	27443-1	<0.1 || <0.1	[NR]	[NR]
Chrysene	mg/kg	0.1	GC.12 subset	<0.1	27443-1	<0.1 || <0.1	LCS-1	108%
Benzo(b+k)fluoranthene	mg/kg	0.2	GC.12 subset	<0.2	27443-1	<0.2 || <0.2	[NR]	[NR]
Benzo(a)pyrene	mg/kg	0.05	GC.12 subset	<0.05	27443-1	<0.05 || <0.05	LCS-1	109%
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	GC.12 subset	<0.1	27443-1	<0.1 || <0.1	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	0.1	GC.12 subset	<0.1	27443-1	<0.1 || <0.1	[NR]	[NR]
Benzo(g,h,i)perylene	mg/kg	0.1	GC.12 subset	<0.1	27443-1	<0.1 || <0.1	[NR]	[NR]
Surrogate p-Terphenyl-d14	%		GC.12 subset	110	27443-1	107 || 108 || RPD: 1	LCS-1	109%

QUALITY CONTROL Organochlorine Pesticides in soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base || Duplicate || %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			20/03/09	27443-1	20/03/2009 || 20/03/2009	LCS-1	20/03/0
Date analysed	-			20/03/09	27443-1	20/03/2009 || 20/03/2009	LCS-1	20/03/0
HCB	mg/kg	0.1	GC-5	<0.1	27443-1	<0.1 || <0.1	[NR]	[NR]
alpha-BHC	mg/kg	0.1	GC-5	<0.1	27443-1	<0.1 || <0.1	LCS-1	86%
gamma-BHC	mg/kg	0.1	GC-5	<0.1	27443-1	<0.1 || <0.1	[NR]	[NR]
beta-BHC	mg/kg	0.1	GC-5	<0.1	27443-1	<0.1 || <0.1	LCS-1	88%
Heptachlor	mg/kg	0.1	GC-5	<0.1	27443-1	<0.1 || <0.1	LCS-1	87%
delta-BHC	mg/kg	0.1	GC-5	<0.1	27443-1	<0.1 || <0.1	[NR]	[NR]
Aldrin	mg/kg	0.1	GC-5	<0.1	27443-1	<0.1 || <0.1	LCS-1	100%
Heptachlor Epoxide	mg/kg	0.1	GC-5	<0.1	27443-1	<0.1 || <0.1	LCS-1	89%
gamma-Chlordane	mg/kg	0.1	GC-5	<0.1	27443-1	<0.1 || <0.1	[NR]	[NR]
alpha-chlordane	mg/kg	0.1	GC-5	<0.1	27443-1	<0.1 || <0.1	[NR]	[NR]
Endosulfan I	mg/kg	0.1	GC-5	<0.1	27443-1	<0.1 || <0.1	[NR]	[NR]
pp-DDE	mg/kg	0.1	GC-5	<0.1	27443-1	<0.1 || <0.1	LCS-1	85%
Dieldrin	mg/kg	0.1	GC-5	<0.1	27443-1	<0.1 || <0.1	LCS-1	93%
Endrin	mg/kg	0.1	GC-5	<0.1	27443-1	<0.1 || <0.1	LCS-1	94%
pp-DDD	mg/kg	0.1	GC-5	<0.1	27443-1	<0.1 || <0.1	LCS-1	103%
Endosulfan II	mg/kg	0.1	GC-5	<0.1	27443-1	<0.1 || <0.1	[NR]	[NR]
pp-DDT	mg/kg	0.1	GC-5	<0.1	27443-1	<0.1 || <0.1	[NR]	[NR]
Endrin Aldehyde	mg/kg	0.1	GC-5	<0.1	27443-1	<0.1 || <0.1	[NR]	[NR]
Endosulfan Sulphate	mg/kg	0.1	GC-5	<0.1	27443-1	<0.1 || <0.1	LCS-1	87%
Methoxychlor	mg/kg	0.1	GC-5	<0.1	27443-1	<0.1 || <0.1	[NR]	[NR]
Surrogate TCLMX	%		GC-5	97	27443-1	67 || 79 || RPD: 16	LCS-1	69%

QUALITY CONTROL Organophosphorus Pesticides	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base || Duplicate || %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			20/03/09	27443-1	20/03/2009 || 20/03/2009	LCS-1	20/03/0
Date analysed	-			20/03/09	27443-1	20/03/2009 || 20/03/2009	LCS-1	20/03/0
Diazinon	mg/kg	0.1	GC-8	<0.1	27443-1	<0.1 || <0.1	[NR]	[NR]
Dimethoate	mg/kg	0.1	GC-8	<0.1	27443-1	<0.1 || <0.1	[NR]	[NR]
Chlorpyriphos-methyl	mg/kg	0.1	GC-8	<0.1	27443-1	<0.1 || <0.1	[NR]	[NR]
Ronnel	mg/kg	0.1	GC-8	<0.1	27443-1	<0.1 || <0.1	[NR]	[NR]
Chlorpyriphos	mg/kg	0.1	GC-8	<0.1	27443-1	<0.1 || <0.1	LCS-1	103%
Fenitrothion	mg/kg	0.1	GC-8	<0.1	27443-1	<0.1 || <0.1	LCS-1	87%
Bromophos-ethyl	mg/kg	0.1	GC-8	<0.1	27443-1	<0.1 || <0.1	[NR]	[NR]
Ethion	mg/kg	0.1	GC-8	<0.1	27443-1	<0.1 || <0.1	LCS-1	73%
Surrogate TCLMX	%		GC-8	97	27443-1	67 || 79 || RPD: 16	LCS-1	73%

QUALITY CONTROL PCBs in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base || Duplicate || %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			20/03/09	27443-1	20/03/2009 || 20/03/2009	LCS-1	20/03/0
Date analysed	-			20/03/09	27443-1	20/03/2009 || 20/03/2009	LCS-1	20/03/0
Arochlor 1016	mg/kg	0.1	GC-6	<0.1	27443-1	<0.1 || <0.1	[NR]	[NR]
Arochlor 1232	mg/kg	0.1	GC-6	<0.1	27443-1	<0.1 || <0.1	[NR]	[NR]
Arochlor 1242	mg/kg	0.1	GC-6	<0.1	27443-1	<0.1 || <0.1	[NR]	[NR]
Arochlor 1248	mg/kg	0.1	GC-6	<0.1	27443-1	<0.1 || <0.1	[NR]	[NR]
Arochlor 1254	mg/kg	0.1	GC-6	<0.1	27443-1	<0.1 || <0.1	LCS-1	97%
Arochlor 1260	mg/kg	0.1	GC-6	<0.1	27443-1	<0.1 || <0.1	[NR]	[NR]
Surrogate TCLMX	%		GC-6	97	27443-1	67 || 79 || RPD: 16	LCS-1	93%

QUALITY CONTROL Acid Extractable metals in soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base || Duplicate || %RPD	Spike Sm#	Spike % Recovery
Date digested	-			20/03/09	27443-1	20/03/2009 || 20/03/2009	LCS-2	20/03/0
Date analysed	-			23/03/09	27443-1	23/03/2009 || 23/03/2009	LCS-2	23/03/0
Arsenic	mg/kg	4	Metals-20 ICP-AES	<4	27443-1	<4 || <4	LCS-2	100%
Cadmium	mg/kg	0.5	Metals-20 ICP-AES	<0.5	27443-1	<0.5 || <0.5	LCS-2	104%
Chromium	mg/kg	1	Metals-20 ICP-AES	<1	27443-1	9 || 9 || RPD: 0	LCS-2	102%
Copper	mg/kg	1	Metals-20 ICP-AES	<1	27443-1	2 || 4 || RPD: 67	LCS-2	104%
Lead	mg/kg	1	Metals-20 ICP-AES	<1	27443-1	7 || 8 || RPD: 13	LCS-2	102%

QUALITY CONTROL Acid Extractable metals in soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base || Duplicate || %RPD	Spike Sm#	Spike % Recovery
Mercury	mg/kg	0.1	Metals.21 CV-AAS	<0.1	27443-1	0.1 || 0.1 || RPD: 0	LCS-2	118%
Nickel	mg/kg	1	Metals.20 ICP-AES	<1	27443-1	1 || 2 || RPD: 67	LCS-2	104%
Zinc	mg/kg	1	Metals.20 ICP-AES	<1	27443-1	7 || 11 || RPD: 44	LCS-2	103%

QUALITY CONTROL Moisture	UNITS	PQL	METHOD	Blank
Date prepared	-			20/03/2009
Date analysed	-			20/03/2009
Moisture	%	0.1	LAB.8	<0.10

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

QUALITY CONTROL BTEX in Water	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base || Duplicate || %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			19/03/2009	[NT]	[NT]	LCS-W1	19/03/20
Date analysed	-			19/03/2009	[NT]	[NT]	LCS-W1	19/03/20
Benzene	µg/L	1	GC.16	<1.0	[NT]	[NT]	LCS-W1	81%
Toluene	µg/L	1	GC.16	<1.0	[NT]	[NT]	LCS-W1	94%
Ethylbenzene	µg/L	1	GC.16	<1.0	[NT]	[NT]	LCS-W1	105%
m+p-xylene	µg/L	2	GC.16	<2.0	[NT]	[NT]	LCS-W1	110%
o-xylene	µg/L	1	GC.16	<1.0	[NT]	[NT]	LCS-W1	109%
Surrogate Dibromofluoromethane	%		GC.16	85	[NT]	[NT]	LCS-W1	91%
Surrogate toluene-d8	%		GC.16	71	[NT]	[NT]	LCS-W1	92%
Surrogate 4-BFB	%		GC.16	64	[NT]	[NT]	LCS-W1	115%

QUALITY CONTROL vTPH & BTEX in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	27443-26	20/03/2009 || 20/03/2009	27443-2	20/03/2009
Date analysed	-	27443-26	20/03/2009 || 20/03/2009	27443-2	20/03/2009
vTPH C6 - C9	mg/kg	27443-26	<25 || <25	27443-2	92%
Benzene	mg/kg	27443-26	<0.5 || <0.5	27443-2	97%
Toluene	mg/kg	27443-26	<0.5 || <0.5	27443-2	95%
Ethylbenzene	mg/kg	27443-26	<1.0 || <1.0	27443-2	90%
m+p-xylene	mg/kg	27443-26	<2.0 || <2.0	27443-2	90%
o-Xylene	mg/kg	27443-26	<1.0 || <1.0	27443-2	101%

QUALITY CONTROL vTPH & BTEX in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Surrogate aaa-Trifluorotoluene	%	27443-26	81 || 86 || RPD: 6	27443-2	87%
QUALITY CONTROL sTPH in Soil (C10-C36)	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	27443-26	20/03/2009 || 20/03/2009	27443-2	20/03/2009
Date analysed	-	27443-26	20/03/2009 || 20/03/2009	27443-2	20/03/2009
TPH C10 - C14	mg/kg	27443-26	<50 || <50	27443-2	110%
TPH C15 - C28	mg/kg	27443-26	<100 || <100	27443-2	94%
TPH C29 - C36	mg/kg	27443-26	<100 || <100	27443-2	86%
Surrogate o-Terphenyl	%	27443-26	84 || 82 || RPD: 2	27443-2	83%
QUALITY CONTROL PAHs in Soil	UNITS	Dup Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	27443-26	20/03/2009 || 20/03/2009	27443-2	20/03/2009
Date analysed	-	27443-26	20/03/2009 || 20/03/2009	27443-2	20/03/2009
Naphthalene	mg/kg	27443-26	<0.1 || <0.1	27443-2	98%
Acenaphthylene	mg/kg	27443-26	<0.1 || <0.1	[NR]	[NR]
Acenaphthene	mg/kg	27443-26	<0.1 || <0.1	[NR]	[NR]
Fluorene	mg/kg	27443-26	<0.1 || <0.1	27443-2	100%
Phenanthrene	mg/kg	27443-26	<0.1 || <0.1	27443-2	101%
Anthracene	mg/kg	27443-26	<0.1 || <0.1	[NR]	[NR]
Fluoranthene	mg/kg	27443-26	<0.1 || <0.1	27443-2	98%
Pyrene	mg/kg	27443-26	<0.1 || <0.1	27443-2	103%
Benzo(a)anthracene	mg/kg	27443-26	<0.1 || <0.1	[NR]	[NR]
Chrysene	mg/kg	27443-26	<0.1 || <0.1	27443-2	108%
Benzo(b+k)fluoranthene	mg/kg	27443-26	<0.2 || <0.2	[NR]	[NR]
Benzo(a)pyrene	mg/kg	27443-26	<0.05 || <0.05	27443-2	106%
Indeno(1,2,3-c,d)pyrene	mg/kg	27443-26	<0.1 || <0.1	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	27443-26	<0.1 || <0.1	[NR]	[NR]
Benzo(g,h,i)perylene	mg/kg	27443-26	<0.1 || <0.1	[NR]	[NR]
Surrogate p-Terphenyl-d14	%	27443-26	110 || 102 || RPD: 8	27443-2	108%

QUALITY CONTROL Organochlorine Pesticides in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	27443-26	20/03/2009 || 20/03/2009	27443-2	20/03/09
Date analysed	-	27443-26	20/03/2009 || 20/03/2009	27443-2	20/03/09
HCB	mg/kg	27443-26	<0.1 || <0.1	[NR]	[NR]
alpha-BHC	mg/kg	27443-26	<0.1 || <0.1	27443-2	93%
gamma-BHC	mg/kg	27443-26	<0.1 || <0.1	[NR]	[NR]
beta-BHC	mg/kg	27443-26	<0.1 || <0.1	27443-2	93%
Heptachlor	mg/kg	27443-26	<0.1 || <0.1	27443-2	97%
delta-BHC	mg/kg	27443-26	<0.1 || <0.1	[NR]	[NR]
Aldrin	mg/kg	27443-26	<0.1 || <0.1	27443-2	107%
Heptachlor Epoxide	mg/kg	27443-26	<0.1 || <0.1	27443-2	95%
gamma-Chlordane	mg/kg	27443-26	<0.1 || <0.1	[NR]	[NR]
alpha-chlordane	mg/kg	27443-26	<0.1 || <0.1	[NR]	[NR]
Endosulfan I	mg/kg	27443-26	<0.1 || <0.1	[NR]	[NR]
pp-DDE	mg/kg	27443-26	<0.1 || <0.1	27443-2	89%
Dieldrin	mg/kg	27443-26	<0.1 || <0.1	27443-2	95%
Endrin	mg/kg	27443-26	<0.1 || <0.1	27443-2	100%
pp-DDD	mg/kg	27443-26	<0.1 || <0.1	27443-2	106%
Endosulfan II	mg/kg	27443-26	<0.1 || <0.1	[NR]	[NR]
pp-DDT	mg/kg	27443-26	<0.1 || <0.1	[NR]	[NR]
Endrin Aldehyde	mg/kg	27443-26	<0.1 || <0.1	[NR]	[NR]
Endosulfan Sulphate	mg/kg	27443-26	<0.1 || <0.1	27443-2	91%
Methoxychlor	mg/kg	27443-26	<0.1 || <0.1	[NR]	[NR]
Surrogate TCLMX	%	27443-26	74 || 74 || RPD: 0	27443-2	81%

QUALITY CONTROL Organophosphorus Pesticides	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	27443-26	20/03/2009 || 20/03/2009	27443-2	20/03/09
Date analysed	-	27443-26	20/03/2009 || 20/03/2009	27443-2	20/03/09
Diazinon	mg/kg	27443-26	<0.1 || <0.1	[NR]	[NR]
Dimethoate	mg/kg	27443-26	<0.1 || <0.1	[NR]	[NR]
Chlorpyriphos-methyl	mg/kg	27443-26	<0.1 || <0.1	[NR]	[NR]
Ronnel	mg/kg	27443-26	<0.1 || <0.1	[NR]	[NR]
Chlorpyriphos	mg/kg	27443-26	<0.1 || <0.1	27443-2	100%
Fenitrothion	mg/kg	27443-26	<0.1 || <0.1	27443-2	80%
Bromophos-ethyl	mg/kg	27443-26	<0.1 || <0.1	[NR]	[NR]
Ethion	mg/kg	27443-26	<0.1 || <0.1	27443-2	68%
Surrogate TCLMX	%	27443-26	74 || 74 || RPD: 0	27443-2	78%
QUALITY CONTROL PCBs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	27443-26	20/03/2009 || 20/03/2009	27443-2	20/03/09
Date analysed	-	27443-26	20/03/2009 || 20/03/2009	27443-2	20/03/09
Arochlor 1016	mg/kg	27443-26	<0.1 || <0.1	[NR]	[NR]
Arochlor 1232	mg/kg	27443-26	<0.1 || <0.1	[NR]	[NR]
Arochlor 1242	mg/kg	27443-26	<0.1 || <0.1	[NR]	[NR]
Arochlor 1248	mg/kg	27443-26	<0.1 || <0.1	[NR]	[NR]
Arochlor 1254	mg/kg	27443-26	<0.1 || <0.1	27443-2	100%
Arochlor 1260	mg/kg	27443-26	<0.1 || <0.1	[NR]	[NR]
Surrogate TCLMX	%	27443-26	74 || 74 || RPD: 0	27443-2	94%
QUALITY CONTROL Acid Extractable metals in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date digested	-	27443-26	20/03/2009 || 20/03/2009	LCS-2	20/03/09
Date analysed	-	27443-26	23/03/2009 || 23/03/2009	LCS-2	23/03/09
Arsenic	mg/kg	27443-26	4 || 5 || RPD: 22	LCS-2	104%
Cadmium	mg/kg	27443-26	<0.5 || <0.5	LCS-2	108%
Chromium	mg/kg	27443-26	19 || 12 || RPD: 45	LCS-2	107%
Copper	mg/kg	27443-26	38 || 40 || RPD: 5	LCS-2	110%
Lead	mg/kg	27443-26	21 || 19 || RPD: 10	LCS-2	104%
Mercury	mg/kg	27443-26	<0.1 || <0.1	LCS-2	109%
Nickel	mg/kg	27443-26	9 || 7 || RPD: 25	LCS-2	109%
Zinc	mg/kg	27443-26	29 || 26 || RPD: 11	LCS-2	108%

QUALITY CONTROL Acid Extractable metals in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date digested	-	[NT]	[NT]	27443-26	20/03/09
Date analysed	-	[NT]	[NT]	27443-26	23/03/09
Arsenic	mg/kg	[NT]	[NT]	27443-26	99%
Cadmium	mg/kg	[NT]	[NT]	27443-26	102%
Chromium	mg/kg	[NT]	[NT]	27443-26	104%
Copper	mg/kg	[NT]	[NT]	27443-26	108%
Lead	mg/kg	[NT]	[NT]	27443-26	107%
Mercury	mg/kg	[NT]	[NT]	27443-26	112%
Nickel	mg/kg	[NT]	[NT]	27443-26	105%
Zinc	mg/kg	[NT]	[NT]	27443-26	99%

Report Comments:

Asbestos was analysed by Approved Identifier: Joshua Lim
INS: Insufficient sample for this test NT: Not tested PQL: Practical Quantitation Limit <: Less than >: Greater t
RPD: Relative Percent Difference NA: Test not required LCS: Laboratory Control Sample NR: Not requeste

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 batches of 20. The duplicate sample RPD and matrix spike recoveries for the sample batch were within 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. Surrogates: 60-140% is acceptable for general organics and 10-140% for SVOC and speciated phenols.

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: Todd Hore

Sample log in details:

Your reference:	**E22758K, Wahroonga**
Envirolab Reference:	**27443**
Date received:	18/03/09
Date results expected to be reported:	**25/03/09**

Samples received in appropriate condition for analysis:	YES
No. of samples provided	55 Soils, 2 Waters
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: Allean	EIS Job Number: E22758K Date Results Required: Standard Sheet 1 / 3	Environmental Investigation Services Rear 115 Wicks Road Macquarie Park NSW 2113 Phone: (02) 9888 5000 Fax: (02) 9888 5004 Contact: Todd Hore

Project: Proposed Upgrade and Extensions
Location: Wahroonga
Sampler: BP/GF

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	gPOCAS		
17-03-09	1	BH 1	0.2/0.4	Glass jar + Asb Bag	2	Fill	X	X	X	X	X							
17-03-09	2	BH 2	0.2/0.4	Glass jar + Asb Bag	0	F	X	X	X	X	X							
17-03-09	3	BH 2	1.0/1.2	Glass jar + Asb Bag	1.2	F												
16-03-09	4	BH 3	0.1/0.2	Glass jar + Asb Bag	0	F	X	X	X	X	X							
16-03-09	5	BH 3	0.5/0.8	Glass jar + Asb Bag	0	Natural												
16-03-09	6	BH 4	0.1/0.2	Glass jar + Asb Bag	0	F	X	X	X	X	X							
16-03-09	7	BH 4	0.5/0.8	Glass jar + Asb Bag	0	F												
16-03-09	8	BH 4	0.8/0.95	Glass jar + Asb Bag	0	N												
13-03-09	9	BH 5	0.2/0.4	Glass jar + Asb Bag	0	F												
13-03-09	10	BH 6	0.9/1.0	Glass jar + Asb Bag	0	F	X	X	X	X	X							
13-03-09	11	BH 5	1.2/1.5	Glass jar + Asb Bag	0	N												
12-03-09	12	BH 6	0.5/0.7	Glass jar + Asb Bag	0	F	X	X	X	X	X							
12-03-09	13	BH 6	1.1/1.3	Glass jar + Asb Bag	0	F												
12-03-09	14	BH 6	2.1/2.3	Glass jar + Asb Bag	0	N												
12-03-09	15	BH 7	0.9/0.7	Glass jar + Asb Bag	0	F	X	X	X	X	X							
12-03-09	16	BH 7	2.2/2.4	Glass jar + Asb Bag	0	N												
12-03-09	17	BH 8	0.05/0.3	Glass jar + Asb Bag	0	F	X	X	X	X	X							
12-03-09	18	BH 8	0.9/0.12	Glass jar + Asb Bag	0	N												
12-03-09	19	BH 9	0.9/1.0	Glass jar + Asb Bag	0	F	X	X	X	X	X							
12-03-09	20	BH 9	1.3/1.5	Glass jar + Asb Bag	0	F												
12-03-09	21	BH 9	1.9/2.0	Glass jar + Asb Bag	0	N												
12-03-09	22	BH 10	0.2/0.5	Glass jar + Asb Bag	0	F	X	X	X	X	X							
12-03-09	23	BH 10	0.5/0.6	Glass jar + Asb Bag	0	F												
12-03-09	24	BH 10	1.3/1.5	Glass jar + Asb Bag	0	F												

Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: 9910 6200

Job No: 27443
Date received: 18/3/09
Time received: 2:20
Temp: Cool / Ambient
Security: Intact/Broken/None

Remarks (comments/detection limits required):

Relinquished By:	Date: 18/3/09 Time: 2pm	Received By: Simon. S	Relinquished By:	Date: Time:		Received By:

SAMPLE AND CHAIN OF CUSTODY FORM

TO:		FROM:
Envirolab Services Pty Ltd 12 Ashley Street Chatswood NSW 2067 Phone: (02) 99106200 Fax: (02) 99100201 Attention: Aileen	EIS Job Number: E22758K Date Results Required: Standard Sheet 2 / 3	Environmental Investigation Services Rear 115 Wicks Road Macquarie Park NSW 2113 Phone: (02) 9888 5000 Fax: (02) 9888 5004 Contact: Todd Hore

Project: Proposed Upgrade and Extensions
Location: Wahroonga
Sampler: BP/GF

Sample Preservation: Ice 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		
12-03-09	25	BH 10	1.9/2.1	Glass jar + [illegible]	0	N												
17-03-09	26	BH 11	0.2/0.3	Glass jar + Asb Bag	0	F	X	X	X	X	X							
12-03-09	27	BH 11	0.8/0.9	Glass jar + [illegible]	0	F												
12-03-09	28	BH 12	0.25/0.35	Glass jar + Asb Bag	0	F												
17-03-09	29	BH 12	0.5/1.0	Glass jar + Asb Bag	0	N												
17-03-09	30	BH 12	1.4/1.5	Glass jar + Asb Bag	0	N												
13-03-09	31	BH 13	0.12/0.17	Glass jar + Asb Bag	0	F												
13-03-09	32	BH 13	0.4/0.5	Glass jar + Asb Bag	0	N												
17-03-09	33	BH 14	0.4/0.5	Glass jar + Asb Bag	0	F	X	X	X	X	X							
17-03-09	34	BH 14	1.2/1.3	Glass jar + Asb Bag	0	F												
17-03-09	35	BH 14	2.5/2.6	Glass jar + Asb Bag	0	F	X	X	X	X	X							
17-03-09	36	BH 14	3.9/4.0	Glass jar + Asb Bag	0	F												
17-03-09	37	BH 14	4.5/4.6	Glass jar + Asb Bag	0	N	X	X	X	X	X							
16-03-09	38	BH 15	0.4/0.5	Glass jar + Asb Bag	0	F												
16-03-09	39	BH 15	1.3/1.5	Glass jar + Asb Bag	0	F												
16-03-09	40	BH 15	1.9/2.0	Glass jar + Asb Bag	0	F												
17-03-09	41	BH 16	0.3/0.5	Glass jar + Asb Bag	2.1	N	X	X	X	X	X							
17-03-09	42	BH 17	0.1/0.2	Glass jar + Asb Bag	3.0	F	X	X	X	X	X							
17-03-09	43	BH 17	0.5/0.95	Glass jar + Asb Bag	3.5	N												
12-03-09	44	BH 18	0.2/0.3	Glass jar + Asb Bag	0	F	X	X	X	X	X							
12-03-09	45	BH 18	0.4/0.6	Glass jar + Asb Bag	0	N	X	X	X	X	X							
12-03-09	46	BH 19	0.0/0.1	Glass jar + Asb Bag	0	F	X	X	X	X	X							
12-03-09	47	BH 19	0.4/0.5	Glass jar + Asb Bag	0	N												
12-03-09	48	BH 20	0.0/0.2	Glass jar + Asb Bag	0	F	X	X	X	X	X							

Remarks (comments/detection limits required):

Relinquished By:	Date: 18/3/09 Time: 2pm	Received By: Simon. S	Relinquished By:	Date: Time:		Received By:

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: E22758K Date Results Required: Standard Sheet 3 / 3	Environmental Investigation Services Rear 115 Wicks Road Macquarie Park NSW 2113 Phone: (02) 9888 5000 Fax: (02) 9888 5004 Contact: Todd Hore

Project: Proposed Upgrade and Extensions
Location: Wahroonga
Sampler: BP/GF

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 + M8, PAH	Phenols	VOC	sVOC	sPOCAS	BTEX	
12-03-09	49	BH 20	0.3-0.5	Glass jar + Asb Bag	0	N												
12-03-09	50	BH 21	0.2-0.4	Glass jar + Asb Bag	0	F	X	X	X	X	X							
12-03-09	51	BH 21	1.3-1.5	Glass jar + ~~Asb Bag~~	0	N												
12-03-09	52	~~BH~~ FB1		Glass jar + ~~Asb Bag~~		Sand											X	
13-03-09	53	BH FB2		Glass jar + Asb Bag		Sand												
12-03-09	54	Rinsate ~~BH~~ 1		~~Glass jar + Asb Bag~~	2 BTEX Vials												X	
13-03-09	55	Rinsate ~~BH~~ 2		~~Glass jar + Asb Bag~~	2 BTEX Vials												X	
-03-09	56	~~BH~~ DUP 1		Glass jar + ~~Asb Bag~~			X		X									
-03-09	57	~~BH~~ DUP 2		Glass jar + ~~Asb Bag~~			X		X									
-03-09		BH		Glass jar + Asb Bag														
-03-09		BH		Glass jar + Asb Bag														
-03-09		BH		Glass jar + Asb Bag														
-03-09		BH		Glass jar + Asb Bag														
-03-09		BH		Glass jar + Asb Bag														
-03-09		BH		Glass jar + Asb Bag														
-03-09		BH		Glass jar + Asb Bag														
-03-09		BH		Glass jar + Asb Bag														
-03-09		BH		Glass jar + Asb Bag														
-03-09		BH		Glass jar + Asb Bag														
-03-09		BH		Glass jar + Asb Bag														
-03-09		BH		Glass jar + Asb Bag														
-03-09		BH		Glass jar + Asb Bag														
-03-09		BH		Glass jar + Asb Bag														
-03-09		BH		Glass jar + Asb Bag														

Remarks (comments/detection limits required):

Relinquished By:	Date: 18/3/09 Time: 2pm	Received By: Simon. S	Relinquished By:	Date: Time:		Received By:

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
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CERTIFICATE OF ANALYSIS 27443-A

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

Attention: Todd Hore

Sample log in details:

Your Reference:	**E22758K, Wahroonga**
No. of samples:	Additional Testing on 17 Soils
Date samples received:	18/03/09
Date completed instructions received:	30/03/09

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:	6/04/09
Date of Preliminary Report:	Not issued
Issue Date:	3/04/09

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

Results Approved By:

David Springer
Business Development & Quality Manager

Metals in TCLP USEPA1311						
Our Reference:	UNITS	27443-A-2	27443-A-4	27443-A-6	27443-A-10	27443-A-12
Your Reference	----------	BH2	BH3	BH4	BH5	BH6
Depth	----------	0.2-0.4	0.1-0.2	0.1-0.2	0.9-1.0	0.5-0.7
Date Sampled		17/03/09	16/03/09	16/03/09	13/03/09	12/03/09
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	31/03/2009	31/03/2009	31/03/2009	31/03/2009	31/03/2009
Date analysed	-	2/04/2009	2/04/2009	2/04/2009	2/04/2009	2/04/2009
pH of soil for fluid# determ.	pH units	8.40	8.20	7.80	7.50	7.40
pH of soil for fluid # determ. (acid)	pH units	1.70	1.60	1.50	1.60	1.70
Extraction fluid used	-	1	1	1	1	1
pH of final Leachate	pH units	5.00	5.10	5.20	5.00	5.00
Arsenic in TCLP	mg/L	<0.050	[NA]	[NA]	[NA]	<0.050
Chromium in TCLP	mg/L	[NA]	<0.010	<0.010	<0.010	<0.010
Lead in TCLP	mg/L	[NA]	<0.030	<0.030	<0.030	<0.030
Nickel in TCLP	mg/L	[NA]	<0.020	<0.020	<0.020	<0.020

Metals in TCLP USEPA1311						
Our Reference:	UNITS	27443-A-15	27443-A-17	27443-A-22	27443-A-26	27443-A-33
Your Reference	----------	BH7	BH8	BH10	BH11	BH14
Depth	----------	0.4-0.7	0.05-0.3	0.2-0.5	0.2-0.3	0.4-0.5
Date Sampled		12/03/09	12/03/09	12/03/09	12/03/09	17/03/09
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	31/03/2009	31/03/2009	31/03/2009	31/03/2009	31/03/2009
Date analysed	-	2/04/2009	2/04/2009	2/04/2009	2/04/2009	2/04/2009
pH of soil for fluid# determ.	pH units	7.20	9.70	8.10	7.80	8.60
pH of soil for fluid # determ. (acid)	pH units	1.70	1.60	1.50	1.60	1.50
Extraction fluid used	-	1	1	1	1	1
pH of final Leachate	pH units	5.00	6.50	5.00	5.10	5.40
Arsenic in TCLP	mg/L	<0.050	[NA]	[NA]	[NA]	[NA]
Chromium in TCLP	mg/L	<0.010	<0.010	<0.010	<0.010	<0.010
Lead in TCLP	mg/L	<0.030	[NA]	0.040	<0.030	<0.030
Nickel in TCLP	mg/L	<0.020	0.020	<0.020	<0.020	0.070

Metals in TCLP USEPA1311						
Our Reference:	UNITS	27443-A-35	27443-A-41	27443-A-42	27443-A-44	27443-A-46
Your Reference	----------	BH14	BH16	BH17	BH18	BH19
Depth	----------	2.5-2.8	0.3-0.5	0.1-0.2	0.1-0.3	0.0-0.1
Date Sampled		17/03/09	17/03/09	17/03/09	12/03/09	12/03/09
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	31/03/2009	31/03/2009	31/03/2009	31/03/2009	31/03/2009
Date analysed	-	2/04/2009	2/04/2009	2/04/2009	2/04/2009	2/04/2009
pH of soil for fluid# determ.	pH units	7.80	8.20	8.10	7.80	7.30
pH of soil for fluid # determ. (acid)	pH units	1.50	1.60	1.50	1.60	1.50
Extraction fluid used	-	1	1	1	1	1
pH of final Leachate	pH units	5.00	5.00	5.00	5.00	5.00
Chromium in TCLP	mg/L	<0.010	[NA]	<0.010	<0.010	<0.010
Lead in TCLP	mg/L	0.060	[NA]	<0.030	<0.030	0.050
Nickel in TCLP	mg/L	<0.020	<0.020	[NA]	<0.020	<0.020

Metals in TCLP USEPA1311			
Our Reference:	UNITS	27443-A-48	27443-A-50
Your Reference	----------	BH20	BH21
Depth	----------	0.02-0.2	0.2-0.4
Date Sampled		12/03/09	12/03/09
Type of sample		Soil	Soil
Date extracted	-	31/03/2009	31/03/2009
Date analysed	-	2/04/2009	2/04/2009
pH of soil for fluid# determ.	pH units	8.20	9.80
pH of soil for fluid # determ. (acid)	pH units	1.60	1.60
Extraction fluid used	-	1	1
pH of final Leachate	pH units	5.10	5.10
Chromium in TCLP	mg/L	<0.010	[NA]
Lead in TCLP	mg/L	<0.030	<0.030
Nickel in TCLP	mg/L	[NA]	<0.020

PAHs in TCLP (USEPA 1311)					
Our Reference:	UNITS	27443-A-15	27443-A-22	27443-A-33	27443-A-35
Your Reference	----------	BH7	BH10	BH14	BH14
Depth	----------	0.4-0.7	0.2-0.5	0.4-0.5	2.5-2.8
Date Sampled		12/03/09	12/03/09	17/03/09	17/03/09
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	1/04/2009	1/04/2009	1/04/2009	1/04/2009
Date analysed	-	1/04/2009	1/04/2009	1/04/2009	1/04/2009
Naphthalene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001
Acenaphthylene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001
Acenaphthene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001
Fluorene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001
Phenanthrene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001
Anthracene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001
Fluoranthene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001
Pyrene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001
Benzo(a)anthracene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001
Chrysene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001
Benzo(b+k)fluoranthene in TCLP	mg/L	<0.002	<0.002	<0.002	<0.002
Benzo(a)pyrene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001
Indeno(1,2,3-c,d)pyrene - TCLP	mg/L	<0.001	<0.001	<0.001	<0.001
Dibenzo(a,h)anthracene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001
Benzo(g,h,i)perylene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001
Surrogate p-Terphenyl-d14	%	119	106	96	106

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+.
Metals.20 ICP-AES	Determination of various metals by ICP-AES.
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 Metals in TCLP USEPA1311	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			31/03/09	27443-A-6	31/03/2009 II 31/03/2009	LCS-W1	31/03/0
Date analysed	-			02/04/09	27443-A-6	2/04/2009 II 2/04/2009	LCS-W1	02/04/0
Arsenic in TCLP	mg/L	0.05	Metals.20 ICP-AES	<0.050	[NT]	[NT]	LCS-W1	111%
Chromium in TCLP	mg/L	0.01	Metals.20 ICP-AES	<0.010	27443-A-6	<0.010 II <0.010	LCS-W1	103%
Lead in TCLP	mg/L	0.03	Metals.20 ICP-AES	<0.030	27443-A-6	<0.030 II <0.030	LCS-W1	104%
Nickel in TCLP	mg/L	0.02	Metals.20 ICP-AES	<0.020	27443-A-6	<0.020 II <0.020	LCS-W1	106%

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	-			1/04/2009	[NT]	[NT]	LCS-W1	1/04/20
Date analysed	-			1/04/2009	[NT]	[NT]	LCS-W1	1/04/20
Naphthalene in TCLP	mg/L	0.001	GC.12 subset	<0.001	[NT]	[NT]	LCS-W1	92%
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	101%
Phenanthrene in TCLP	mg/L	0.001	GC.12 subset	<0.001	[NT]	[NT]	LCS-W1	100%
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	96%
Pyrene in TCLP	mg/L	0.001	GC.12 subset	<0.001	[NT]	[NT]	LCS-W1	100%
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	108%
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	102%
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]

QUALITY CONTROL PAHs in TCLP (USEPA 1311)	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Benzo(g,h,i)perylene in TCLP	mg/L	0.001	GC.12 subset	<0.001	[NT]	[NT]	[NR]	[NR]
Surrogate p-Terphenyl-d14	%		GC.12	95	[NT]	[NT]	LCS-W1	112%

QUALITY CONTROL Metals in TCLP USEPA1311	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	[NT]	[NT]	LCS-W2	31/03/09
Date analysed	-	[NT]	[NT]	LCS-W2	02/04/09
Arsenic in TCLP	mg/L	[NT]	[NT]	LCS-W2	109%
Chromium in TCLP	mg/L	[NT]	[NT]	LCS-W2	103%
Lead in TCLP	mg/L	[NT]	[NT]	LCS-W2	103%
Nickel in TCLP	mg/L	[NT]	[NT]	LCS-W2	104%

QUALITY CONTROL Metals in TCLP USEPA1311	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	[NT]	[NT]	27443-A-41	31/03/09
Date analysed	-	[NT]	[NT]	27443-A-41	02/04/09
Arsenic in TCLP	mg/L	[NT]	[NT]	27443-A-41	107%
Chromium in TCLP	mg/L	[NT]	[NT]	27443-A-41	101%
Lead in TCLP	mg/L	[NT]	[NT]	27443-A-41	102%
Nickel in TCLP	mg/L	[NT]	[NT]	27443-A-41	103%

Report Comments:

Asbestos was analysed by Approved Identifier: Not applicable for this job
INS: Insufficient sample for this test NT: Not tested PQL: Practical Quantitation Limit <: Less than >: Greater t
RPD: Relative Percent Difference NA: Test not required LCS: Laboratory Control Sample NR: Not requeste

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 batches of 20. The duplicate sample RPD and matrix spike recoveries for the sample batch were within 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. Surrogates: 60-140% is acceptable for general organics and 10-140% for SVOC and speciated phenols.

SAMPLE AND CHAIN OF CUSTODY FORM

TO:	EIS Job Number: E22758K	FROM:
Envirolab Services Pty Ltd 12 Ashley Street Chatswood NSW 2067 Phone: (02) 99106200 Fax: (02) 99106201 Attention: Aileen	Date Results Required: standard t'aroun Sheet 1 / 1	Environmental Investigation Services Rear 115 Wicks Road Macquarie Park NSW 2113 Phone: (02) 9888 5000 Fax: (02) 9888 5004 Contact: Todd Hore

Project: Proposed Hospital Upgrade	Tests Required	Sample Preservation:
Location: Wagroonga		In esky on ice
Sampler: BP		

Date Sampled	Lab Ref:	Borehole/ Sample Number	Depth (m)	Sample Container	PID	Sample Description	TCLP Prep	Arsenic	Cadmium	Chromium	Lead	Nickel	PAHs	VOC	sVOC	sPOCAS		
17/03/2009		BH1	0.2-0.4	Glass jar + Ash Bag	0	Fill												
17/03/2009	3	BH2	0.2-0.4	Glass jar + Ash Bag	0	Fill	X	X		X								
16/03/2009	4	BH3	0.1-0.2	Glass jar + Ash Bag	0	Fill	X			X	X	X						
16/03/2009	5	BH4	0.1-0.3	Glass jar + Ash Bag	0	Fill	X			X	X	X						
13/03/2009	10	BH5	0.9-1.0	Glass jar + Ash Bag	0	Fill	X			X	X	X						
12/03/2009	12	BH6	0.5-0.6	Glass jar + Ash Bag	0	Fill	X	X		X	X	X						
12/03/2009	15	BH7	0.4-0.7	Glass jar + Ash Bag	0	Fill	X	X		X	X	X	X					
12/03/2009	17	BH8	0.05-0.2	Glass jar + Ash Bag	0	Fill	X	X		X	X	X						
12/03/2009	19	BH9	0.8-1.0	Glass jar + Ash Bag	0	Fill												
12/03/2009	23	BH10	0.2-0.4	Glass jar + Ash Bag	0	Fill	X			X	X	X						
12/03/2009	26	BH11	0.2-0.3	Glass jar + Ash Bag	0	Fill	X			X	X	X						
17/03/2009	32	BH13	0.4-0.6	Glass jar + Ash Bag	0	Fill	X			X	X	X						
17/03/2009	35	BH14	2.5-2.8	Glass jar + Ash Bag	0	Fill	X			X	X	X	X					
17/03/2009	36	BH14	4.6-4.8	Glass jar + Ash Bag	0	Natural												
17/03/2009	41	BH16	0.3-0.5	Glass jar + Ash Bag	0	Natural	X					X						
17/03/2009	43	BH17	0.1-0.2	Glass jar + Ash Bag	0	Fill	X			X	X	X						
12/03/2009	44	BH18	0.1-0.3	Glass jar + Ash Bag	0	Fill	X			X	X	X						
12/03/2009	45	BH18	0.4-0.6	Glass jar + Ash Bag	0	Natural												
12/03/2009	46	BH19	0.0-0.1	Glass jar + Ash Bag	0	Fill	X			X	X	X						
12/03/2009	48	BH20	0.2-0.4	Glass jar + Ash Bag	0	Fill	X			X	X	X						
12/03/2009	50	BH21	0.2-0.4	Glass jar + Ash Bag	0	Fill	X				X	X						
				Glass jar + Ash Bag														
				Glass jar + Ash Bag														
				Glass jar + Ash Bag														

Remarks (comments/detection limits required):

Relinquished By:	Date: 16/3/09 Time: 3.30pm	Received By:	Relinquished By:	Date: Time:		Received By:

Envirolab Ref: 27443 A

Due: 6/4/09

std TIA.

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 27715

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

Attention: Todd Hore

Sample log in details:

Your Reference:	**E22758K, Wahroonga**
No. of samples:	3 Waters
Date samples received:	27/03/09
Date completed instructions received:	27/03/09

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:	3/04/09
Date of Preliminary Report:	Not issued
Issue Date:	31/03/09

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

Results Approved By:

David Springer
Business Development & Quality Manager

vTPH & BTEX in Water Our Reference: Your Reference Date Sampled Type of sample	UNITS ---------- ----------	27715-1 MW3 27/03/2009 Water	27715-2 MW17 27/03/2009 Water	27715-3 Dup A 27/03/2009 Water
Date extracted	-	28/03/2009	28/03/2009	28/03/2009
Date analysed	-	28/03/2009	28/03/2009	28/03/2009
TPH C6 - C9	µg/L	<10	<10	<10
Benzene	µg/L	<1.0	<1.0	<1.0
Toluene	µg/L	<1.0	<1.0	<1.0
Ethylbenzene	µg/L	<1.0	<1.0	<1.0
m+p-xylene	µg/L	<2.0	<2.0	<2.0
o-xylene	µg/L	<1.0	<1.0	<1.0
Surrogate Dibromofluoromethane	%	98	93	94
Surrogate toluene-d8	%	104	104	103
Surrogate 4-BFB	%	99	98	102

sTPH in Water (C10-C36) Our Reference: Your Reference Date Sampled Type of sample	UNITS ---------- ----------	27715-1 MW3 27/03/2009 Water	27715-2 MW17 27/03/2009 Water	27715-3 Dup A 27/03/2009 Water
Date extracted	-	30/03/2009	30/03/2009	30/03/2009
Date analysed	-	31/03/2009	31/03/2009	31/03/2009
TPH C_{10} - C_{14}	µg/L	<50	<50	<50
TPH C_{15} - C_{28}	µg/L	<100	<100	<100
TPH C_{29} - C_{36}	µg/L	<100	<100	<100
Surrogate o-Terphenyl	%	97	97	104

HM in water - dissolved Our Reference: Your Reference Date Sampled Type of sample	UNITS ---------- ----------	27715-1 MW3 27/03/2009 Water	27715-2 MW17 27/03/2009 Water	27715-3 Dup A 27/03/2009 Water
Date prepared	-	31/03/2009	31/03/2009	31/03/2009
Date analysed	-	31/03/2009	31/03/2009	31/03/2009
Arsenic-Dissolved	µg/L	3.3	9.2	9.2
Cadmium-Dissolved	µg/L	<0.10	0.20	0.20
Chromium-Dissolved	µg/L	<1.0	<1.0	<1.0
Copper-Dissolved	µg/L	<1.0	<1.0	<1.0
Lead-Dissolved	µg/L	<1.0	50	55
Mercury-Dissolved	µg/L	<0.50	<0.50	<0.50
Nickel-Dissolved	µg/L	6.5	50	50
Zinc-Dissolved	µg/L	21	110	90

Miscellaneous Inorganics			
Our Reference:	UNITS	27715-1	27715-2
Your Reference	----------	MW3	MW17
Date Sampled	----------	27/03/2009	27/03/2009
Type of sample		Water	Water
Date prepared	-	27/03/2009	27/03/2009
Date analysed	-	27/03/2009	27/03/2009
pH	pH Units	6.5	6.2
Electrical Conductivity	µS/cm	340	610

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.
Metals.22 ICP-MS	Determination of various metals by ICP-MS.
Metals.21 CV-AAS	Determination of Mercury by Cold Vapour AAS.
LAB.1	pH - Measured using pH meter and electrode in accordance with APHA 20th ED, 4500-H+.
LAB.2	Conductivity and Salinity - measured using a conductivity cell and dedicated meter, in accordance with APHA2510 20th ED and Rayment & Higginson.

QUALITY CONTROL vTPH & BTEX in Water	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			28/03/2009	[NT]	[NT]	LCS-W1	28/03/20
Date analysed	-			28/03/2009	[NT]	[NT]	LCS-W1	28/03/20
TPH C6 - C9	µg/L	10	GC.16	<10	[NT]	[NT]	LCS-W1	90%
Benzene	µg/L	1	GC.16	<1.0	[NT]	[NT]	LCS-W1	88%
Toluene	µg/L	1	GC.16	<1.0	[NT]	[NT]	LCS-W1	95%
Ethylbenzene	µg/L	1	GC.16	<1.0	[NT]	[NT]	LCS-W1	88%
m+p-xylene	µg/L	2	GC.16	<2.0	[NT]	[NT]	LCS-W1	89%
o-xylene	µg/L	1	GC.16	<1.0	[NT]	[NT]	LCS-W1	90%
Surrogate Dibromofluoromethane	%		GC.16	94	[NT]	[NT]	LCS-W1	99%
Surrogate toluene-d8	%		GC.16	106	[NT]	[NT]	LCS-W1	107%
Surrogate 4-BFB	%		GC.16	99	[NT]	[NT]	LCS-W1	94%

QUALITY CONTROL sTPH in Water (C10-C36)	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			30/03/2009	[NT]	[NT]	LCS-W1	30/03/20
Date analysed	-			31/03/09	[NT]	[NT]	LCS-W1	31/03/0
TPH C10 - C14	µg/L	50	GC.3	<50	[NT]	[NT]	LCS-W1	129%
TPH C15 - C28	µg/L	100	GC.3	<100	[NT]	[NT]	LCS-W1	131%
TPH C29 - C36	µg/L	100	GC.3	<100	[NT]	[NT]	LCS-W1	119%
Surrogate o-Terphenyl	%		GC.3	103	[NT]	[NT]	LCS-W1	107%

QUALITY CONTROL HM in water - dissolved	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date prepared	-			31/03/2009	[NT]	[NT]	LCS-W1	31/03/20
Date analysed	-			31/03/2009	[NT]	[NT]	LCS-W1	31/03/20
Arsenic-Dissolved	µg/L	1	Metals.22 ICP-MS	<1.0	[NT]	[NT]	LCS-W1	110%
Cadmium-Dissolved	µg/L	0.1	Metals.22 ICP-MS	<0.10	[NT]	[NT]	LCS-W1	112%
Chromium-Dissolved	µg/L	1	Metals.22 ICP-MS	<1.0	[NT]	[NT]	LCS-W1	106%
Copper-Dissolved	µg/L	1	Metals.22 ICP-MS	<1.0	[NT]	[NT]	LCS-W1	107%
Lead-Dissolved	µg/L	1	Metals.22 ICP-MS	<1.0	[NT]	[NT]	LCS-W1	116%
Mercury-Dissolved	µg/L	0.5	Metals.21 CV-AAS	<0.50	[NT]	[NT]	LCS-W1	97%
Nickel-Dissolved	µg/L	1	Metals.22 ICP-MS	<1.0	[NT]	[NT]	LCS-W1	107%

QUALITY CONTROL HM in water - dissolved	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Zinc-Dissolved	µg/L	1	Metals.22 ICP-MS	<1.0	[NT]	[NT]	LCS-W1	104%

QUALITY CONTROL Miscellaneous Inorganics	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date prepared	-			27/03/09	[NT]	[NT]	LCS-1	27/03/0
Date analysed	-			27/03/09	[NT]	[NT]	LCS-1	27/03/0
pH	pH Units		LAB.1	[NT]	[NT]	[NT]	LCS-1	100%
Electrical Conductivity	µS/cm	1	LAB.2	<1.0	[NT]	[NT]	LCS-1	102%

Report Comments:

Asbestos was analysed by Approved Identifier: Not applicable for this job
INS: Insufficient sample for this test NT: Not tested PQL: Practical Quantitation Limit <: Less than >: Greater t
RPD: Relative Percent Difference NA: Test not required LCS: Laboratory Control Sample NR: Not requeste

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 batches of 20. The duplicate sample RPD and matrix spike recoveries for the sample batch were within 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. Surrogates: 60-140% is acceptable for general organics and 10-140% for SVOC and speciated phenols.

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: Todd Hore

Sample log in details:

Your reference:	**E22758K, Wahroonga**
Envirolab Reference:	**27715**
Date received:	27/03/09
Date results expected to be reported:	**3/04/09**

Samples received in appropriate condition for analysis:	YES
No. of samples provided	3 Waters
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

TO:
Envirolab Services Pty Ltd
12 Ashley St, Chatswood 2067

Phone: (02) 9910 6200
Fax: (02) 9910 6201

Attention: Aileen

Date Results Required: Standard

SAMPLE AND CHAIN OF CUSTODY FORM

EIS Job Number: E 22758K

Sheet 1 / 1

FROM:
Environmental Investigation Services

Rear 115 Wicks Road
Macquarie Park NSW 2113

Phone: (02) 9888 5000
Fax: (02) 9888 5004

Contact: Todd Hore

Project: Proposed Upgrade
Location: Wahroonga
Sampler: BP

Date Sampled	Time Sampled	Location	Sample/ Borehole Number	Sample Container	PID (ppm/ Odour)	Sample Description	Heavy metals	TPH/BTEX	VOCs	pH / EC						Comments/Detection Limits Required
							Tests Required									Sample Preservation: In esky on ice
27.3.09	1		MW3	2 x 1 L Amber Bottle 2* BTEX Vials HDPE Plastic Bottle		Water	X	X		X						
	2		MW17	"			X	X		X						
	3		DUP A	"			X	X								

Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: 9910 6200

Job No: 27715
Date received: 27/3/09
Time received: 2
Received by: SS
Temp: Cool/Ambient
Cooling: Ice/Ice pack
Security: Intact/Broken/None

Relinquished By:	Date: 27/3/09 Time: 11:00am	Received By: Simon Song
Relinquished By:	Date: Time:	Received By:

Remarks:

All analysis PQLs to ANZECC (2000) Detection Limits Please

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 27715-A

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

Attention: Todd Hore

Sample log in details:

Your Reference:	**E22758K, Wahroonga**
No. of samples:	Additional Testing on 2 Waters
Date samples received:	27/03/09
Date completed instructions received:	01/04/09

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:	8/04/09
Date of Preliminary Report:	Not issued
Issue Date:	3/04/09

NATA accreditation number 2901. This document shall not be reproduced except in full.
This document is issued in accordance with NATA's accreditation requirements.
Accredited for compliance with ISO/IEC 17025.
Tests not covered by NATA are denoted with *.

Results Approved By:

Jacinta Hurst
Operations Manager

Miscellaneous Inorganics Our Reference: Your Reference Date Sampled Type of sample	UNITS ---------- ----------	27715-A-1 MW3 27/03/2009 Water	27715-A-2 MW17 27/03/2009 Water
Date prepared	-	2/04/2009	2/04/2009
Date analysed	-	2/04/2009	2/04/2009
Calcium - Dissolved	mg/L	25	6.7
Magnesium - Dissolved	mg/L	6.6	15
Hardness by calculation	mgCaCO3 /L	89	77

Method ID	Methodology Summary
Metals.20 ICP-AES	Determination of various metals by ICP-AES.

QUALITY CONTROL Miscellaneous Inorganics	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date prepared	-			02/04/09	[NT]	[NT]	LCS-W1	02/04/(
Date analysed	-			02/04/09	[NT]	[NT]	LCS-W1	02/04/(
Calcium - Dissolved	mg/L	0.03	Metals.20 ICP-AES	<0.030	[NT]	[NT]	LCS-W1	112%
Magnesium - Dissolved	mg/L	0.03	Metals.20 ICP-AES	<0.030	[NT]	[NT]	LCS-W1	111%
Hardness by calculation	mgCaCO3/L	1	Metals.20 ICP-AES	<1	[NT]	[NT]	[NR]	[NR]

Report Comments:

Asbestos was analysed by Approved Identifier: Not applicable for this job
INS: Insufficient sample for this test NT: Not tested PQL: Practical Quantitation Limit <: Less than >: Greater t
RPD: Relative Percent Difference NA: Test not required LCS: Laboratory Control Sample NR: Not requeste

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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.

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Matrix Spikes and LCS: Generally 70-130% for inorganics/metals; 60-140% for organics and 10-140% for SVOC and speciated phenols is acceptable. Surrogates: 60-140% is acceptable for general organics and 10-140% for SVOC and speciated phenols.

Aileen Hic

From: Todd Hore [thore@jkgroup.net.au]
Sent: Wednesday, 1 April 2009 10:44 AM
To: Aileen Hie
Subject: 27715

EIS

ENVIRONMENTAL INVESTIGATION SERVICES

A division of Jeffery & Katauskas Pty Ltd
ABN 17 003 550 801

-1 -2

Aileen,
Could you please schedule hardness analysis on the two water samples (MW3 and MW17) already in your custody for the EIS project E22758K (Envirolab ref: 27715).

Regards,
For and on behalf of
ENVIRONMENTAL INVESTIGATION SERVICES

Todd Hore
Senior Environmental Engineer

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

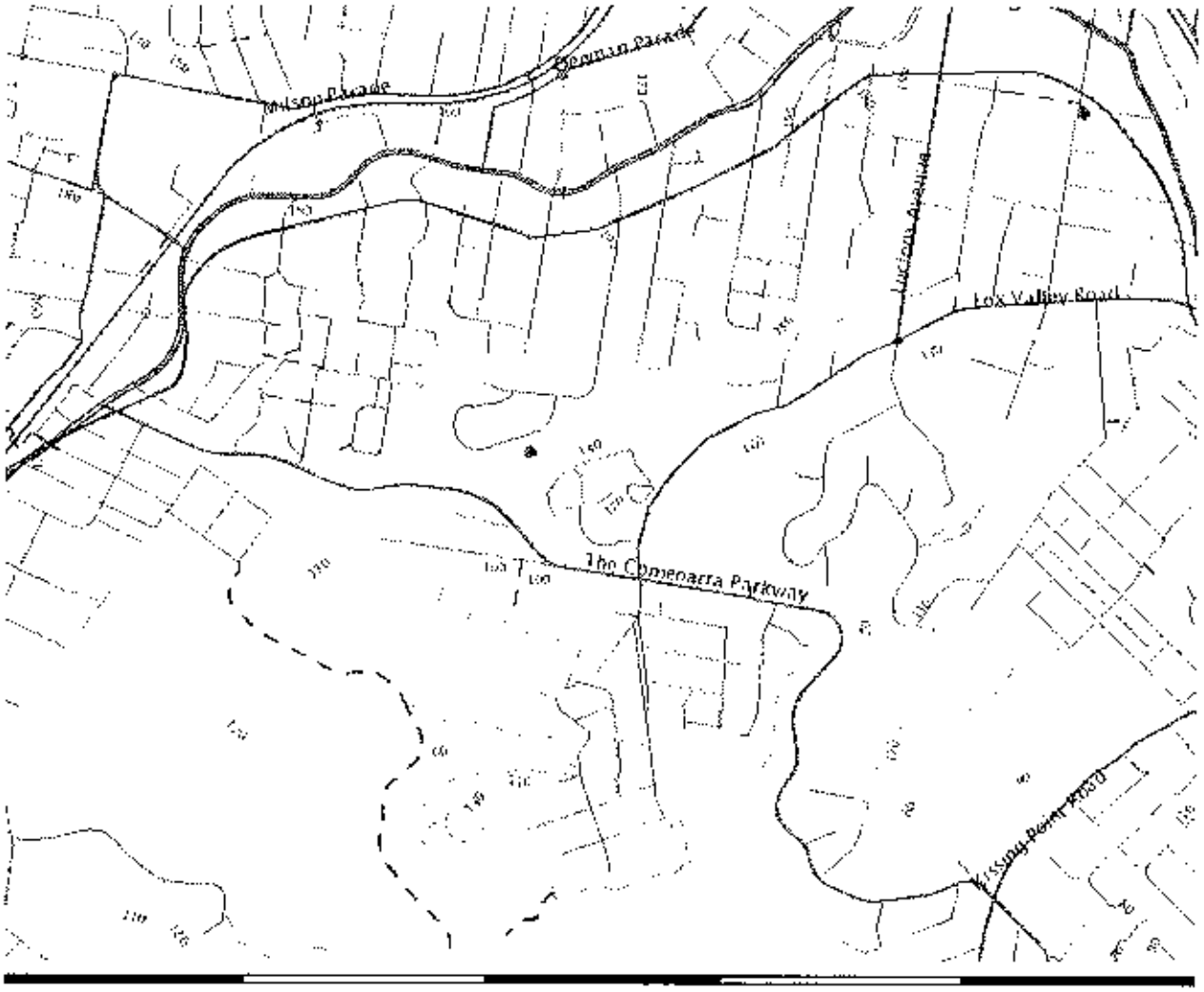
Envirolab Ref: 27715A
Due: 8/4/09
Std TIA.

APPENDIX C

E22758K Wahroonga

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

Monday, March 16, 2009



0 3 Km

Legend

Symbol	Layer	Custodian
	Groundwater Bores	
	Catchment Management Authority boundaries	
	Major rivers	
	Primary/arterial road Motorway/freeway Railway Runway Contour Background	Topographic base map

Groundwater Works Summary

For information on the meaning of fields please see Glossary
Document Generated on Monday, March 16, 2009

Print Report

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

Work Requested -- GW107929

Works Details (top)

GROUNDWATER NUMBER	GW107929
LIC-NUM	10BL165856
AUTHORISED-PURPOSES	RECREATION (GROUNDWATER)
INTENDED-PURPOSES	RECREATION (GROUNDWATER)
WORK-TYPE	Bore
WORK-STATUS	
CONSTRUCTION-METHOD	Rotary
OWNER-TYPE	
COMMENCE-DATE	
COMPLETION-DATE	2005-03-18
FINAL-DEPTH (metres)	180.00
DRILLED-DEPTH (metres)	180.00
CONTRACTOR-NAME	
DRILLER-NAME	
PROPERTY	AUSTRALASIAN CONFERENCE ASSOC.
GWMA	-
GW-ZONE	-
STANDING-WATER-LEVEL	58.00
SALINITY	1800.00
YIELD	0.10

Site Details (top)

REGION	10 - SYDNEY SOUTH COAST
RIVER-BASIN	
AREA-DISTRICT	
CMA-MAP	
GRID-ZONE	
SCALE	
ELEVATION	
ELEVATION-SOURCE	
NORTHING	6265935.00
EASTING	323621.00
LATITUDE	33 43' 55"
LONGITUDE	151 5' 46"
GS-MAP	

AMG-ZONE	56
COORD-SOURCE	
REMARK	

Form-A (top)

COUNTY	CUMBERLAND
PARISH	GORDON
PORTION-LOT-DP	62 1017514

Licensed (top)

COUNTY	CUMBERLAND
PARISH	GORDON
PORTION-LOT-DP	62 1017514

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	2.50	206			Down Hole Hammer
1		Hole	Hole	2.50	180.00	162			Down Hole Hammer
1	1	Casing	Steel	-0.50	5.50	162	152.4		C: -.1-5.5m; Driven into Hole
1	1	Casing	PVC Class 9	-0.50	23.50	140			Screwed and Glued; Suspended in Clamps

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
73.00	74.50	1.50				0.15	78.00	0.25	1188.00
117.00	117.20	0.20		58.00		0.25	120.00	0.25	1715.00
133.00	135.00	2.00				0.25	150.00	0.25	1677.00
153.00	156.50	3.50				0.10	180.00	0.25	1800.00

Drillers Log (top)

FROM	TO	THICKNESS	DESC	GEO-MATERIAL	COMMENT
0.00	16.00	16.00	SANDSTONE L./B		
16.00	17.00	1.00	SANDSTONE,FRACTURED, SOFT		

17.00	35.00	18.00	SANDSTONE GREY
35.00	35.50	0.50	SHALE
35.50	73.00	37.50	SANDSTONE GREY
73.00	74.50	1.50	SANDSTONE FINE QUARTZ
74.50	83.00	8.50	SANDSTONE GREY
83.00	88.00	5.00	SANDSTONE D/G
88.00	92.00	4.00	SANDSTONE GREY
92.00	92.50	0.50	SANDSTONE F/Q
92.50	117.00	24.50	SANDSTONE D/G
117.00	117.20	0.20	SANDSTONE FRACTURED
117.20	124.00	6.80	SANDSTONE GREY
124.00	124.50	0.50	SANDSTONE F/Q
124.50	133.00	8.50	SANDSTONE GREY
133.00	135.00	2.00	SANDSTONE / QUARTZ
135.00	153.00	18.00	SANDSTONE GREY
153.00	156.50	3.50	SANDSTOHNE FINE QUARTZ
156.50	180.00	23.50	SANDSTONE GREY

EPA

Print Close page

Licence summary

Your search for: **LGA** - KU-RING-GAI

Summary of Licence No: 6546

Licence holder: **SYDNEY ADVENTIST HOSPITAL LIMITED**
Trading as : SYDNEY ADVENTIST HOSPITAL

Premises: SYDNEY ADVENTIST HOSPITAL
185 FOX VALLEY ROAD WAHROONGA 2076
LGA: Ku-ring-gai **Catchment:** Hawkesbury

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 14 Feb 05

Applications

Number	Application type	Current status	Date received
140899	Licence Transfer	Approved	06 Nov 01

Notices

Number	Issue Date	Notice type
1047037	27 Apr 05	S 58 Licence Variation
1044478	15 Feb 05	S 58 Licence Variation

Annual Return Information

Start date	End date	Date received	Non-compliance	LBL data
01 Dec 06	30 Nov 07	29 Jan 08	No	n/a
01 Dec 05	30 Nov 06	22 Jan 07	No	n/a
01 Dec 04	30 Nov 05	24 Jan 06	No	n/a
01 Dec 03	30 Nov 04	23 Dec 04	No	n/a
01 Dec 02	30 Nov 03	12 Jan 04	No	n/a
01 Dec 01	30 Nov 02	17 Jan 03	No	n/a
01 Dec 00	30 Nov 01	29 Jan 02	No	n/a
01 Dec 99	30 Nov 00	15 Jan 01	No	n/a

1 April 2009

ADVANCE LEGAL SEARCH PTY LIMITED

(ACN 077 067 068)
ABN 49 077 067 068

P.O. Box 149
Yagoona NSW 2199

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

18 March 2009

ENVIRONMENTAL INVESTIGATION SERVICES
PO Box 976
NORTH RYDE BC NSW 1670

Attention: Todd Hore

RE: **Sydney Adventist Hospital**
Fox Valley Road,
Wahroonga

Current Search

Folio Identifier 621/1128314 (title attached)
DP 1128314 (plan attached)
Dated 16 March 2009
Registered Proprietor:
AUSTRALASIAN CONFERENCE ASSOCIATION LIMITED

Title Tree
Lot 621 DP 1128314

Folio Identifier 621/1128314

Folio Identifier 62/1017514

Folio Identifier 53/880017

Folio Identifier 14/834969

Certificate of Title Volume 8447 Fol 83

Certificate of Title Volume 6572 Fol 212

Certificate of Title Volume 5964 Fol 61

See Notes (a), (b), (c) & (d)

(a)		**(b)**	**(c)**
CTVol 4506 Folio 44		CTVol 5011 Folio 245	CTVol 3067 Folio 88
CTVol 2827 Folio 182		CTVol 313 Folio 146	CTVol 2112 Folio 104
(ai)	**(aii)**	***	***
CT 97 – 141	CT 98 - 64		
****	****		

(d)

Certificate of Title Volume 4785 Folio 192

****

Summary of proprietor(s)
Lot 621 DP 1128314

Year	Proprietor
	(Lot 621 DP 1128314)
2008 – todate	Australasian Conference Association Limited
(2008 – todate)	*(various commercial leases see Folio Identifier 621/1128314)*
(2008 – todate)	*(various commercial leases see Historical Folio Identifier 621/1128314)*
	(Lot 62 DP 1017514)
2000 – 2008	Australasian Conference Association Limited
(2000 – 2008)	*(various commercial leases see Folio Identifier 62/1017514)*
(2000 – 2008)	*(various commercial leases see Historical Folio Identifier 62/1017514)*
	(Lot 53 DP 880017)
1998 – 2000	Australasian Conference Association Limited
(1998 – 2000)	*(various commercial leases see Historical Folio Identifier 53/880017)*
	(Lot 14 DP 834969)
1994 – 1998	Australasian Conference Association Limited
(1994 – 1998)	*(various commercial leases see Historical Folio Identifier 14/834969)*
	(Portion 30 and part Portions 28, 29 & 31 and 1 Acre 2 Roods 4 ½ Perches grant, Parish Gordon & South Colah – Area 158 Acres 0 Roods 25 Perches – CTVol 8447 Fol 83)
1963 – 1994	Australasian Conference Association Limited
	(Portion 30 and part Portions 28, 29 & 31 and 1 Acre 2 Roods 4 ½ Perches grant, Parish Gordon & South Colah – Area 159 Acres 1 Roods 37 ¼ Perches – CTVol 6572 Fol 212)
1952 – 1963	Australasian Conference Association Limited
(1955 – 1958)	*(lease to Walter George Fredericks, storekeeper & Margaret Lucy Fredericks, of part)*
	(Portion 30 and part Portions 28, 29 & 31 and 1 Acre 2 Roods 4 ½ Perches grant, Parish Gordon & South Colah – Area 159 Acres 1 Roods 37 ¼ Perches – CTVol 5964 Fol 61)
1949 – 1952	Australasian Conference Association Limited

See Notes (a), (b), (c) & (d)

Note (a)

	(Part Portions 29 & 30 Parish Gordon – Area 74 Acres 0 Roods 3 ¼ Perches – CTVol 4506 Fol 44)
1931 – 1949	Australasian Conference Association Limited
	(Part Portions 29 & 30 Parish Gordon – Area 75 Acres 1 Roods 18 Perches – CTVol 2827 Fol 182)
1918 – 1931	Australasian Conference Association Limited

See Notes (ai) & (aii)

Note (ai)

	(Part Portion 30 Parish Gordon – Area 9 Acres 0 Roods 33 Perches – CTVol 97 Fol 141)
1903 – 1918	The Sydney Sanitarium and Benevolent Association Limited
1901 – 1903	Frederick Lacey Sharp, business manager John Allen Burbery, business manager Daniel Kness, physician Eugene William Farnsworth, minister of gospel Merritt Gardiner Kellogg, architect
1890 – 1901	Joshua Reubon Johnson, minor

****

Note (aii)

	(Part Portions 29 & 30 Parish Gordon – Area 71 Acres 2 Roods 21 Perches – CTVol 98 Fol 64)
1903 – 1918	The Sydney Sanitarium and Benevolent Association Limited
1901 – 1903	Frederick Lacey Sharp, business manager John Allen Burbery, business manager Daniel Kness, physician Eugene William Farnsworth, minister of gospel Merritt Gardiner Kellogg, architect
1895 – 1901	Elizabeth Sharpe Evans, widow
1870 – 1895	Richard Battleff Evans, labourer

****

Note (b)

	(Part Portion 31 Parish Gordon – Area 54 Acres 2 Roods 31 ½ Perches – CTVol 5011 Fol 245)
1941 – 1949	Australasian Conference Association Limited
1939 – 1941	Perpetual Trustee Company (Limited)
	(Portion 31 Parish Gordon – Area 72 Acres – CTVol 313 Fol 146)
1935 – 1939	Perpetual Trustee Company (Limited)
1885 – 1935	Austin Torange, esquire
1877 – 1885	Alexander Bowman, grantee

****

Note (c)

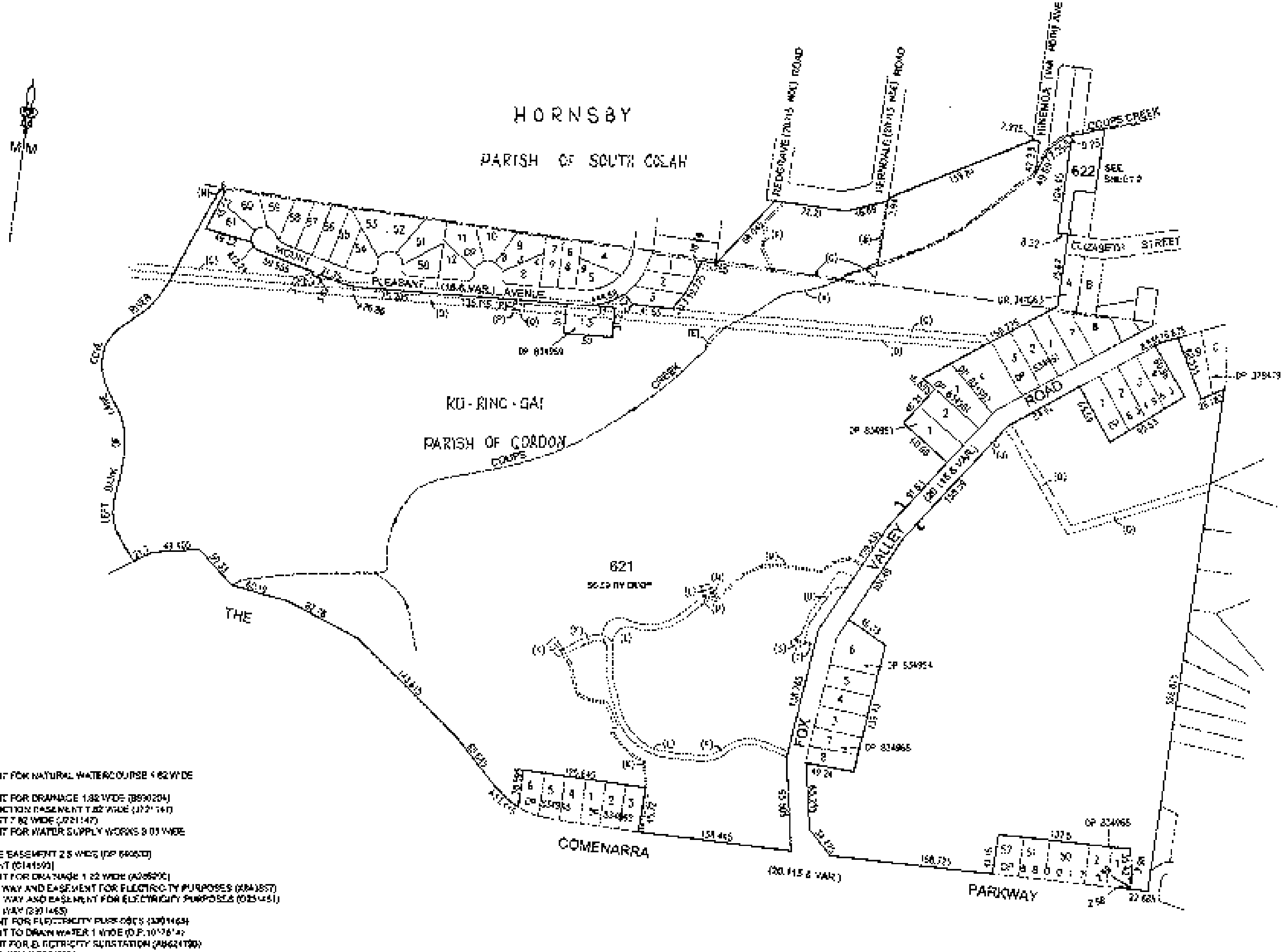
	(Part Portions 29 & 30 Parish Gordon – Area 16 Acres 3 Roods 18 Perches – CTVol 3067 Fol 88)
1920 – 1949	Australasian Conference Association Limited
	(Part Portions 29 & 30 Parish Gordon – Area 17 Acres 0 Roods 10 ½ Perches – CTVol 2112 Fol 104)
1910 – 1920	Alexander Gordon Waugh, orchardist

****

Note (d)

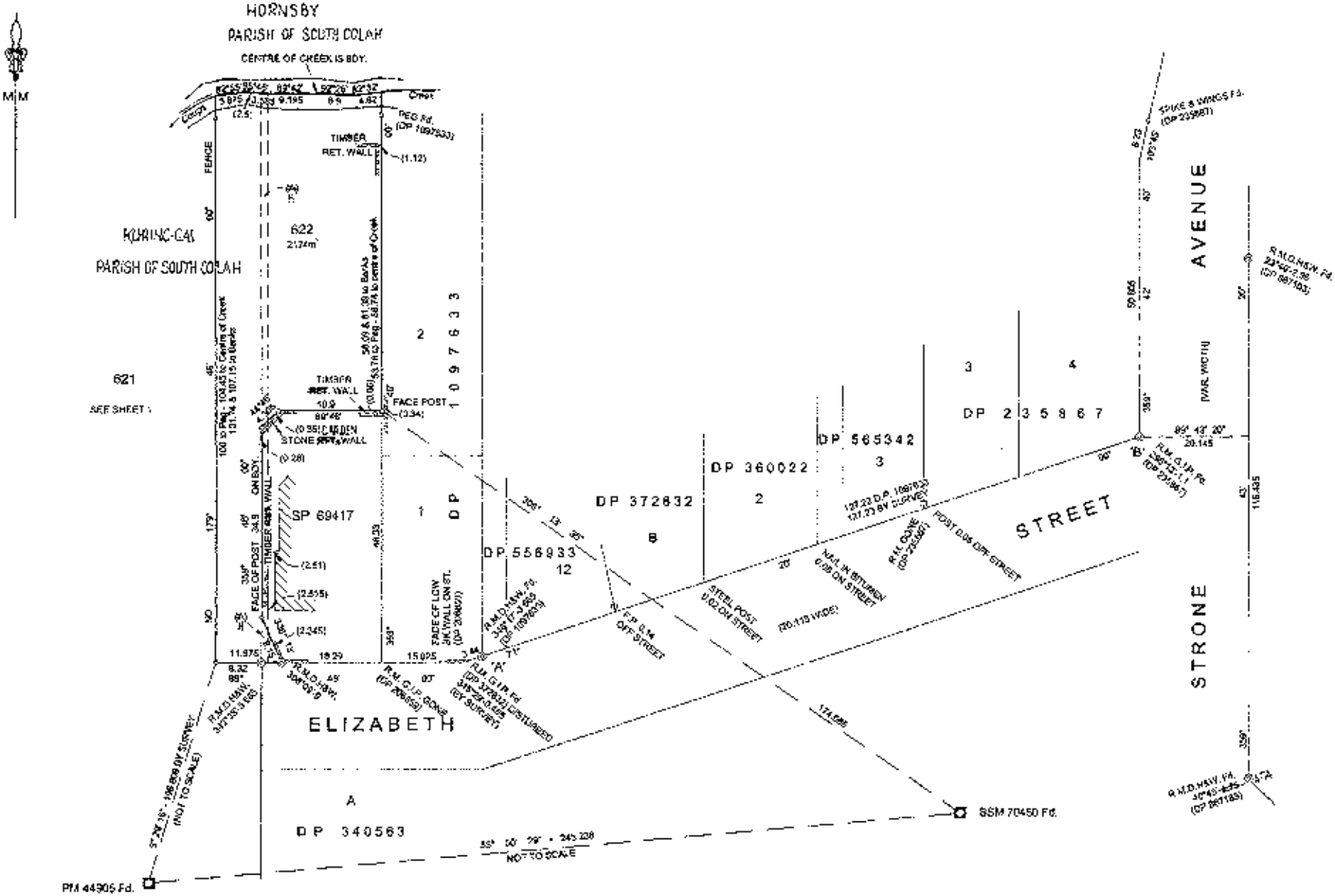
	(1 Acre 2 Rood 4 ½ Perches, Grant of Closed – CTVol 4785 Fol 192)
1936 – 1949	Australasian Conference Association Limited

****



(A) EASEMENT FOR NATURAL WATERCOURSE 1.62 WIDE (B890204)
(B) EASEMENT FOR DRAINAGE 1.82 WIDE (B890204)
(C) CONSTRUCTION EASEMENT 1.82 WIDE (J721147)
(D) EASEMENT 7.92 WIDE (J721147)
(E) EASEMENT FOR WATER SUPPLY WORKS 3.05 WIDE (K610355)
(F) DRAINAGE EASEMENT 2.5 WIDE (DP 590570)
(G) COVENANT (C141593)
(H) EASEMENT FOR DRAINAGE 1.22 WIDE (A205920)
(J) RIGHT OF WAY AND EASEMENT FOR ELECTRICITY PURPOSES (X841557)
(K) RIGHT OF WAY AND EASEMENT FOR ELECTRICITY PURPOSES (D251451)
(L) RIGHT OF WAY (230146S)
(M) EASEMENT FOR ELECTRICITY PURPOSES (230146S)
(N) EASEMENT TO DRAIN WATER 1 WIDE (D.P.1017514)
(P) EASEMENT FOR ELECTRICITY SUBSTATION (AB624190)
(Q) RIGHT OF WAY (AB624190)
(R) EASEMENT FOR ELECTRICITY PURPOSES (AB624190)
(S) EASEMENT FOR ELECTRICITY SUBSTATION 5.35 WIDE (AC484401)
(T) EASEMENT FOR ELECTRICITY PURPOSES 5.2 WIDE (AC484401)
(U) RIGHT OF WAY VARIABLE WIDTH (AC484401)

Surveyor: STELLA L. WALTER Date of Survey: 2nd October 2007 Surveyor's Ref. 4221 2007M7100(1714) Partial Survey	PLAN OF SUBDIVISION OF LOT 62 IN D.P.1017514 AND LOT 1 IN D.P.208959	LGA: KU-RING-GAI, HORNSBY Locality: WAHROONGA Subdivision No: 2007/59 Lengths are in metres. Reduction Ratio 1:3000	Registered 1.1.2008	DP1128314 P



Surveyor: STELLA L.WALTER Date of Survey: 2nd October 2007 Surveyor's Ref: 4221	PLAN OF SUBDIVISION OF LOT 62 IN D.P.1017514 AND LOT 1 IN D.P.206859	LGA: KU-RING-GAI, HORNSBY Locality: WAHROONGA Subdivision No: 2007/59 Lengths are in metres. Reduction Ratio 1:500	Registered P.M. 3.1.1008	DP1128314

DEPOSITED PLAN ADMINISTRATION SHEET

Sheet 1 of 2 Sheet(s)

* OFFICE USE ONLY

SIGNATURES, SEALS and STATEMENTS of intention to dedicate public roads, to create public reserves, drainage reserves, easements, restrictions on the use of land or positive covenants.

3/11/07

3/11/07

The Common Seal of AUSTRALASIAN CONFERENCE ASSOCIATION LIMITED was hereunto affixed pursuant to a resolution of the Board of management in the presence of:

Members of the Board of Management

Secretary

Use PLAN FORM 6A for additional certificates, signatures, seals and statements

Crown Lands NSW/Western Lands Office Approval

I.....in approving this plan certify
(Authorised Officer)
that all necessary approvals in regard to the allocation of the land shown herein have been given

Signature:.....
Date:.....
File Number:.....
Office:.....

Subdivision Certificate

I certify that the provisions of s.109J of the Environmental Planning and Assessment Act 1979 have been satisfied in relation to:

the proposed SUBDIVISION set out herein
(insert 'subdivision' or 'new road')

* Authorised Person/~~General Manager/Accredited Certifier~~

Consent Authority: KU-RING-GAI
Date of Endorsement: 7-11-07
Accreditation no:.....
Subdivision Certificate no: 2007/59
File no:.....

* Delete whichever is inapplicable.

DP1128314 S

Registered: 31.7.2008

Title System: Torrens

Purpose: Subdivision

PLAN OF SUBDIVISION OF LOT 62 IN D.P.1017514 AND LOT 1 IN D.P.206859

LGA: KU-RING-GAI, HORNSBY

Locality: WAHROONGA

Parish: GORDON, SOUTH COLAH

County: CUMBERLAND

Surveying Regulation, 2006

I, Stella Louise Walter
of Mepstead & Associates P.O.Box 208 Pennant Hills NSW
a surveyor registered under the *Surveying Act, 2002*, certify that the survey represented in this plan is accurate, has been made in accordance with the *Surveying Regulation, 2006* and was completed on: 5th October 2007
The survey relates to Lot 622 only. Lot 621 is compiled

.....
.....
(specify the land actually surveyed or specify any land shown in the plan that is not the subject of the survey)

Signature Stella Walter *Dated:* 12.10.07
Surveyor registered under the Surveying Act, 2002

Datum Line: A-B D.P.1097633.....
Type: Urban

Plans used in the preparation of survey/compilation

D.P.7348	D.P.1017514
D.P.206859	D.P.1097633
D.P.235867	S.P.69417
D.P.311336	
D.P.360022	
D.P.372832	
D.P.867183	

(If insufficient space use Plan Form 6A annexure sheet)

SURVEYOR'S REFERENCE:4221 2007MT(1214) Partial Survey

DEPOSITED PLAN ADMINISTRATION SHEET

PLAN OF

DP1128314

Registered: 31.7.2008

* OFFICE USE ONLY

Subdivision Certificate No:

Date of Endorsement:

I certify that the person(s) signing opposite, with whom I am personally acquainted or as to whose identity I am otherwise satisfied, signed this instrument in my presence.

Signature of Witness:

Name of Witness: BRANDON LEIGH QUIN
Address of Witness: Level 23, 66 Eagle Street
BRISBANE QLD 4000

Certified correct for the purposes of the Real Property Act 1900 by the Mortgagee.

Signature of Attorney:

Attorney's Name: DAVID GEORGE ROBERTS
Partner of Cooper Grace Ward Lawyers
Signed for and on behalf of FirstMac Finance Pty Ltd
ACN 123 871 698
Power of Attorney - Book 4512
- No. 136

SURVEYOR'S REFERENCE:

TH

20 MAR 2009

ADVANCE LEGAL SEARCH PTY LIMITED

(ACN 077 067 068)
ABN 49 077 067 068

P.O. Box 149
Yagoona NSW 2199

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

18 March 2009

ENVIRONMENTAL INVESTIGATION SERVICES
PO Box 976
NORTH RYDE BC NSW 1670

Attention: Todd Hore

RE: **Sydney Adventist Hospital**
Fox Valley Road,
Wahroonga

Current Search

Folio Identifier 621/1128314 (title attached)
DP 1128314 (plan attached)
Dated 16 March 2009
Registered Proprietor:
AUSTRALASIAN CONFERENCE ASSOCIATION LIMITED

Title Tree
Lot 621 DP 1128314

Folio Identifier 621/1128314

Folio Identifier 62/1017514

Folio Identifier 53/880017

Folio Identifier 14/834969

Certificate of Title Volume 8447 Fol 83

Certificate of Title Volume 6572 Fol 212

Certificate of Title Volume 5964 Fol 61

See Notes (a), (b), (c) & (d)

(a)		**(b)**	**(c)**
CTVol 4506 Folio 44		CTVol 5011 Folio 245	CTVol 3067 Folio 88
CTVol 2827 Folio 182		CTVol 313 Folio 146	CTVol 2112 Folio 104
(ai)	**(aii)**	***	***
CT 97 – 141	CT 98 - 64		
****	****		

(d)

Certificate of Title Volume 4785 Folio 192

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Summary of proprietor(s)
Lot 621 DP 1128314

Year	Proprietor
	(Lot 621 DP 1128314)
2008 – todate	Australasian Conference Association Limited
(2008 – todate)	*(various commercial leases see Folio Identifier 621/1128314)*
(2008 – todate)	*(various commercial leases see Historical Folio Identifier 621/1128314)*
	(Lot 62 DP 1017514)
2000 – 2008	Australasian Conference Association Limited
(2000 – 2008)	*(various commercial leases see Folio Identifier 62/1017514)*
(2000 – 2008)	*(various commercial leases see Historical Folio Identifier 62/1017514)*
	(Lot 53 DP 880017)
1998 – 2000	Australasian Conference Association Limited
(1998 – 2000)	*(various commercial leases see Historical Folio Identifier 53/880017)*
	(Lot 14 DP 834969)
1994 – 1998	Australasian Conference Association Limited
(1994 – 1998)	*(various commercial leases see Historical Folio Identifier 14/834969)*
	(Portion 30 and part Portions 28, 29 & 31 and 1 Acre 2 Roods 4 ½ Perches grant, Parish Gordon & South Colah – Area 158 Acres 0 Roods 25 Perches – CTVol 8447 Fol 83)
1963 – 1994	Australasian Conference Association Limited
	(Portion 30 and part Portions 28, 29 & 31 and 1 Acre 2 Roods 4 ½ Perches grant, Parish Gordon & South Colah – Area 159 Acres 1 Roods 37 ¼ Perches – CTVol 6572 Fol 212)
1952 – 1963	Australasian Conference Association Limited
(1955 – 1958)	*(lease to Walter George Fredericks, storekeeper & Margaret Lucy Fredericks, of part)*
	(Portion 30 and part Portions 28, 29 & 31 and 1 Acre 2 Roods 4 ½ Perches grant, Parish Gordon & South Colah – Area 159 Acres 1 Roods 37 ½ Perches – CTVol 5964 Fol 61)
1949 – 1952	Australasian Conference Association Limited

See Notes (a), (b), (c) & (d)

Note (a)

	(Part Portions 29 & 30 Parish Gordon – Area 74 Acres 0 Roods 3 ¾ Perches – CTVol 4506 Fol 44)
1931 – 1949	Australasian Conference Association Limited
	(Part Portions 29 & 30 Parish Gordon – Area 75 Acres 1 Roods 18 Perches – CTVol 2827 Fol 182)
1918 – 1931	Australasian Conference Association Limited

See Notes (ai) & (aii)

Note (ai)

	(Part Portion 30 Parish Gordon – Area 9 Acres 0 Roods 33 Perches – CTVol 97 Fol 141)
1903 – 1918	The Sydney Sanitarium and Benevolent Association Limited
1901 – 1903	Frederick Lacey Sharp, business manager John Allen Burbery, business manager Daniel Kness, physician Eugene William Farnsworth, minister of gospel Merritt Gardiner Kellogg, architect
1890 – 1901	Joshua Reubon Johnson, minor

****

Note (aii)

	(Part Portions 29 & 30 Parish Gordon – Area 71 Acres 2 Roods 21 Perches – CTVol 98 Fol 64)
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1895 – 1901	Elizabeth Sharpe Evans, widow
1870 – 1895	Richard Battleff Evans, labourer

****

Note (b)

	(Part Portion 31 Parish Gordon – Area 54 Acres 2 Roods 31 ½ Perches – CTVol 5011 Fol 245)
1941 – 1949	Australasian Conference Association Limited
1939 – 1941	Perpetual Trustee Company (Limited)
	(Portion 31 Parish Gordon – Area 72 Acres – CTVol 313 Fol 146)
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1885 – 1935	Austin Torange, esquire
1877 – 1885	Alexander Bowman, grantee

****

Note (c)

	(Part Portions 29 & 30 Parish Gordon – Area 16 Acres 3 Roods 18 Perches – CTVol 3067 Fol 88)
1920 – 1949	Australasian Conference Association Limited
	(Part Portions 29 & 30 Parish Gordon – Area 17 Acres 0 Roods 10 ½ Perches – CTVol 2112 Fol 104)
1910 – 1920	Alexander Gordon Waugh, orchardist

****

Note (d)

	(1 Acre 2 Rood 4 ½ Perches, Grant of Closed – CTVol 4785 Fol 192)
1936 – 1949	Australasian Conference Association Limited

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Printed : Tuesday, 17 March 2009 12:38:52 PM by planroom3

Cadastral Records Viewer Print

Current Feature
Lot 621 DP1128314
Locality:
WAHROONGA,NORMANHURST
LGA: HORNSBY,KU-RING-GAI
Parish: GORDON,SOUTH COLAH

LEGEND

Parcels [Selected Features]

- Current Feature
- Other Selected Features
- **Notations (Manual)**

Notations (Auto)

- Auto Notation
- **Localities**
- **LGAs**
- **Rail Corridor**
- **Waterway Corridor**
- **Waterways**
- **Unidentified Parcels**

Parcels

- Standard Lot
- Standard Part Lot
- Strata
- Stratum
- **Road Corridor**
- **Roads**

Department of Lands

Information Provided Through
Advance Legal Search Pty Ltd
Ph 0297541590 *Fax* 0297541364

Title Search

LEAP Legal
An Approved LPI *NSW*
Information Broker

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - TITLE SEARCH

FOLIO: 621/1128314

SEARCH DATE	TIME	EDITION NO	DATE
16/3/2009	7:54 PM	1	31/7/2008

LAND

LOT 621 IN DEPOSITED PLAN 1128314
AT WAHROONGA
LOCAL GOVERNMENT AREA HORNSBY, KU-RING-GAI
PARISH OF GORDON COUNTY OF CUMBERLAND
PARISH OF SOUTH COLAH COUNTY OF CUMBERLAND
TITLE DIAGRAM DP1128314

FIRST SCHEDULE

AUSTRALASIAN CONFERENCE ASSOCIATION LIMITED

SECOND SCHEDULE (53 NOTIFICATIONS)

1 RESERVATIONS AND CONDITIONS IN THE CROWN GRANT(S)
2 C141593 COVENANT AFFECTING THE PART SHOWN SO BURDENED IN THE TITLE DIAGRAM.
3 B830204 EASEMENT FOR NATURAL WATERCOURSE 1.82 METRE(S) WIDE AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM
4 B830204 EASEMENT FOR DRAINAGE 1.82 METRE(S) WIDE AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM
5 J221147 EASEMENT 7.62 METRE(S) WIDE AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM
6 J221147 CONSTRUCTION EASEMENT 7.62 METRE(S) WIDE AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM
7 K610315 EASEMENT FOR WATER SUPPLY WORKS 3.05 METRE(S) WIDE AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM
8 DP640633 DRAINAGE EASEMENT 2.5 METRE(S) WIDE AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM
9 X843857 LEASE TO SYDNEY COUNTY COUNCIL OF SUBSTATION PREMISES NO 6435 TOGETHER WITH RIGHT OF WAY & EASEMENT FOR ELECTRICITY PURPOSES AS SHOWN IN PLAN WITH X843857. EXPIRES 31.12.2037
10 O251457 LEASE TO SYDNEY ELECTRICITY OF SUBSTATION PREMISES NO.7241 TOGETHER WITH RIGHT OF WAY & EASEMENT FOR ELECTRICITY PURPOSES AS SHOWN IN PLAN WITH O251457. EXPIRES 28.2.2045
11 3301465 LEASE TO ENERGY AUSTRALIA OF SUBSTATION PREMISES NO.7484 TOGETHER WITH RIGHT OF WAY & EASEMENT SHOWN IN PLAN WITH 3301465. EXPIRES 31.8.2046

END OF PAGE 1 - CONTINUED OVER

EIS - Wahroonga ALSP PRINTED ON 16/3/2009

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - TITLE SEARCH

FOLIO: 621/1128314 PAGE 2

SECOND SCHEDULE (53 NOTIFICATIONS) (CONTINUED)

12	5431960	LEASE TO OPTUS MOBILE PTY LIMITED OF THE PART SHOWN HATCHED IN PLAN WITH 5431960. COMMENCES 31/3/2004. EXPIRES: 30/3/2009.
13	5431961	LEASE TO OPTUS MOBILE PTY LIMITED OF THE PART SHOWN HATCHED IN PLAN WITH 5431961. COMMENCES 31/3/2009. EXPIRES: 30/3/2014.
14	DP1017514	EASEMENT TO DRAIN WATER 1 METRE(S) WIDE AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM
15	7015241	LEASE TO HUTCHISON 3G AUSTRALIA PTY LIMITED (SEE 8688491) OF THE AREA SHOWN HATCHED IN PLAN WITH 7015241. EXPIRES: 10/2/2005. OPTION OF RENEWAL: 5 YEARS WITH 2 FURTHER PERIODS OF 5 YEARS.
16	9789667	LEASE TO BRAMJO PTY LIMITED (SEE AC327610) OF SUITE 307, THE SAN CLINIC, 185 FOX VALLEY ROAD, WAHROONGA. EXPIRES: 30/6/2008. OPTION OF RENEWAL: 5 YEARS WITH A FURTHER PERIOD OF 5 YEARS.
17	9789668	LEASE TO CHILDS FAMILY KINDERGARTENS LIMITED (SEE AC399613) OF "THE POON CHILDCARE CENTRE", 185 FOX VALLEY ROAD, WAHROONGA. EXPIRES: 31/3/2008. OPTION OF RENEWAL: 5 YEARS.
18	9903470	LEASE TO STUART G KIRKHAM OF SUITE 508, THE SAN CLINIC, 185 FOX VALLEY ROAD, WAHROONGA. EXPIRES: 22/7/2008. OPTION OF RENEWAL: 5 YEARS.
19	9923248	LEASE TO GRAHAM DOUGLAS SELLARS OF SUITE 507, THE SAN CLINIC, 185 FOX VALLEY ROAD, WAHROONGA. EXPIRES: 9/7/2008. OPTION OF RENEWAL: 5 YEARS.
20	9923249	LEASE TO MAXIVEND PTY LTD OF SUITE 601A, THE SAN CLINIC, 185 FOX VALLEY ROAD, WAHROONGA. EXPIRES: 27/7/2008. OPTION OF RENEWAL: 5 YEARS.
21	9923250	LEASE TO JOHN JAMES BURKE & DAVID MCHARG OF SUITE 306, THE SAN CLINIC, 185 FOX VALLEY ROAD, WAHROONGA. EXPIRES: 15/7/2010. OPTION OF RENEWAL: TWO TERMS OF 7 YEARS EACH.
22	9923251	LEASE TO MELISSA DOOHAN OF SUITE 504, THE SAN CLINIC, 185 FOX VALLEY ROAD, WAHROONGA. EXPIRES: 9/7/2008. OPTION OF RENEWAL: 5 YEARS.
23	9923252	LEASE TO MADELEINE GIUTRONICH OF SUITE 601C, THE SAN CLINIC, 185 FOX VALLEY ROAD, WAHROONGA. EXPIRES: 27/7/2008. OPTION OF RENEWAL: 5 YEARS.
24	9923253	LEASE TO WESTERN SYDNEY ORTHOPAEDIC ASSOCIATES PTY LIMITED OF SUITE 601B, THE SAN CLINIC, 185 FOX VALLEY ROAD, WAHROONGA. EXPIRES: 27/7/2008. OPTION OF RENEWAL: 5 YEARS.
25	9966048	LEASE TO THOMAS P GAVAGHAN PTY & NICHIGO CARDIOLOGY PTY LTD OF SUITE 502, THE SAN CLINIC, 185 FOX VALLEY ROAD, WAHROONGA. EXPIRES: 9/7/2008. OPTION OF RENEWAL:

END OF PAGE 2 - CONTINUED OVER

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - TITLE SEARCH

FOLIO: 621/1128314 PAGE 3

SECOND SCHEDULE (53 NOTIFICATIONS) (CONTINUED)

5 YEARS.

26 9985692 LEASE TO EJR PTY LIMITED OF SUITE 511, THE SAN CLINIC, 185 FOX VALLEY ROAD, WAHROONGA. EXPIRES: 9/7/2008. OPTION OF RENEWAL: 5 YEARS.

27 9985693 LEASE TO THOMAS DEAN PTY LIMITED OF SUITE 506, THE SAN CLINIC, 185 FOX VALLEY ROAD, WAHROONGA. EXPIRES: 3/8/2008. OPTION OF RENEWAL: 5 YEARS.

28 9985694 LEASE TO HARVEY GEORGE WASHINGTON OF SUITE 603, THE SAN CLINIC, 185 FOX VALLEY ROAD, WAHROONGA. EXPIRES: 3/8/2008. OPTION OF RENEWAL: 5 YEARS.

29 AA7460 LEASE TO SCOTT BUTLER SIMPSON OF SUITE 510, THE SAN CLINIC, 185 FOX VALLEY ROAD, WAHROONGA. EXPIRES: 29/7/2008. OPTION OF RENEWAL: 5 YEARS.

30 AA7461 LEASE TO NODIBO PTY LTD OF SUITE 304, THE SAN CLINIC, 185 FOX VALLEY ROAD, WAHROONGA. EXPIRES: 26/8/2008. OPTION OF RENEWAL: 5 YEARS.

AE151089 TRANSFER OF LEASE AA7461 LESSEE NOW YEW TREE MANAGEMENT PTY LIMITED

31 AA31754 LEASE TO BONE RECONSTRUCTION PTY LIMITED OF SUITE 601D, THE SAN CLINIC, 185 FOX VALLEY ROAD, WAHROONGA. EXPIRES: 27/7/2008. OPTION OF RENEWAL: 5 YEARS.

32 AA87015 LEASE TO MATTHEW JOSEPH MCNAMARA OF SUITE 501, THE SAN CLINIC, 185 FOX VALLEY ROAD, WAHROONGA. EXPIRES: 15/7/2008. OPTION OF RENEWAL: 5 YEARS.

33 AA95145 LEASE TO DR ARTHUR RICHARDSON PTY LTD OF SUITE 503, THE SAN CLINIC, 185 FOX VALLEY RD, WAHROONGA. EXPIRES: 9/7/2008. OPTION OF RENEWAL: 5 YEARS.

34 AA95146 LEASE TO ROBERT JAMES HARDWICK OF SUITE 606, THE SAN CLINIC, 185 FOX VALLEY RD, WAHROONGA. EXPIRES: 24/7/2008. OPTION OF RENEWAL: 5 YEARS.

35 AA177677 LEASE TO CUNDLE MANAGEMENT SERVICES PTY LIMITED OF SUITE 505, THE SAN CLINIC, 185 FOX VALLEY RD, WAHROONGA. EXPIRES: 27/7/2008. OPTION OF RENEWAL: 5 YEARS.

36 AA302548 LEASE TO NORTHSIDE PHYSIO NO.2 PTY LIMITED OF SUITE 602, THE SAN CLINIC, 185 FOX VALLEY RD, WAHROONGA. EXPIRES: 19/10/2008. OPTION OF RENEWAL: 5 YRS.

37 AA462063 LEASE TO DR R. & S. L KIRSOP PTY LIMITED OF SUITE 605, THE SAN CLINIC, 185 FOX VALLEY RD, WAHROONGA. EXPIRES: 9/7/2008. OPTION OF RENEWAL: 5 YRS.

38 AA478792 LEASE TO GREGORY BRUCE BENNETT (SEE AB940557) OF SUITE 604, THE SAN CLINIC, 185 FOX VALLEY RD, WAHROONGA. EXPIRES: 3/8/2008. OPTION OF RENEWAL: 5 YEARS.

39 AB27704 LEASE TO G H PAUL PTY LTD OF SUITE 509, THE SAN CLINIC, 185 FOX VALLEY RD, WAHROONGA. EXPIRES:

END OF PAGE 3 - CONTINUED OVER

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - TITLE SEARCH

FOLIO: 621/1128314 PAGE 4

SECOND SCHEDULE (53 NOTIFICATIONS) (CONTINUED)

30/6/2008. OPTION OF RENEWAL: 5 YEARS.

40 AB624793 EASEMENT FOR ELECTRICITY SUBSTATION AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM

41 AB624793 RIGHT OF WAY AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM

42 AB624793 EASEMENT FOR ELECTRICITY PURPOSES AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM

43 AB766634 LEASE TO VODAFONE NETWORK PTY LIMITED OF PART OF THE ROOF SHOWN HATCHED IN PLAN WITH LEASE U990412 BUT EXCLUDING THE AREA SHOWN HATCHED IN PLAN WITH PARTIAL SURRENDER OF LEASE S532722. EXPIRES: 30/3/2009. OPTION OF RENEWAL: 5 YEARS.

44 AC352261 LEASE TO JDG WATSON PTY LTD OF SUITE 402 THE SAN CLINIC 185 FOX VALLEY ROAD WAHROONGA. EXPIRES: 31/12/2010. OPTION OF RENEWAL: 2 X 5 YEARS.

45 AC352262 LEASE TO HOAM PTY LTD OF SUITE 401 THE SAN CLINIC 185 FOX VALLEY ROAD WAHROONGA. EXPIRES: 31/12/2010. OPTION OF RENEWAL: 2 X 5 YEARS.

46 AC366463 LEASE TO SPECIALIST ONCOLOGY SERVICES PTY LTD OF SUITES 301 AND 302, "THE SAN CLINIC", 185 FOX VALLEY ROAD, WAHROONGA. EXPIRES: 31/10/2010. OPTION OF RENEWAL: 5 YEARS WITH A FURTHER PERIOD OF 5 YEARS.

47 AC366464 LEASE TO NORTHERN SURGICAL ONCOLOGY PTY LTD OF SUITE 404, "THE SAN CLINIC", 185 FOX VALLEY ROAD, WAHROONGA. EXPIRES: 31/10/2010. OPTION OF RENEWAL: 5 YEARS WITH A FURTHER PERIOD OF FIVE YEARS.

48 AC366465 LEASE TO SYDNEY UROLOGICAL ASSOCIATES PTY LTD OF SUITE 406, "THE SAN CLINIC", 185 FOX VALLEY ROAD, WAHROONGA. EXPIRES: 31/10/2010. OPTION OF RENEWAL: 5 YEARS WITH A FURTHER PERIOD OF 5 YEARS.

49 AC484401 EASEMENT FOR ELECTRICITY SUBSTATION PURPOSES 5.33 METRE(S) WIDE AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM

50 AC484401 EASEMENT FOR ELECTRICITY PURPOSES 2 METRE(S) WIDE AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM

51 AC484401 RIGHT OF WAY VARIABLE WIDTH AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM

52 AD900986 LEASE TO TELSTRA CORPORATION LIMITED OF THE PART SHOWN HATCHED IN PLAN WITH AD900986. EXPIRES: 30/6/2012. OPTION OF RENEWAL: 5 YEARS.

53 AD990739 LEASE TO SIMON TAYLOR OF SUITE 303 OF "THE SAN CLINIC", 185 FOX VALLEY ROAD, WAHROONGA. EXPIRES: 19/3/2011. OPTION OF RENEWAL: 5 YEARS WITH A FURTHER PERIOD OF 5 YEARS.

END OF PAGE 4 - CONTINUED OVER

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LAND AND PROPERTY INFORMATION NEW SOUTH WALES - TITLE SEARCH

FOLIO: 621/1128314 PAGE 5

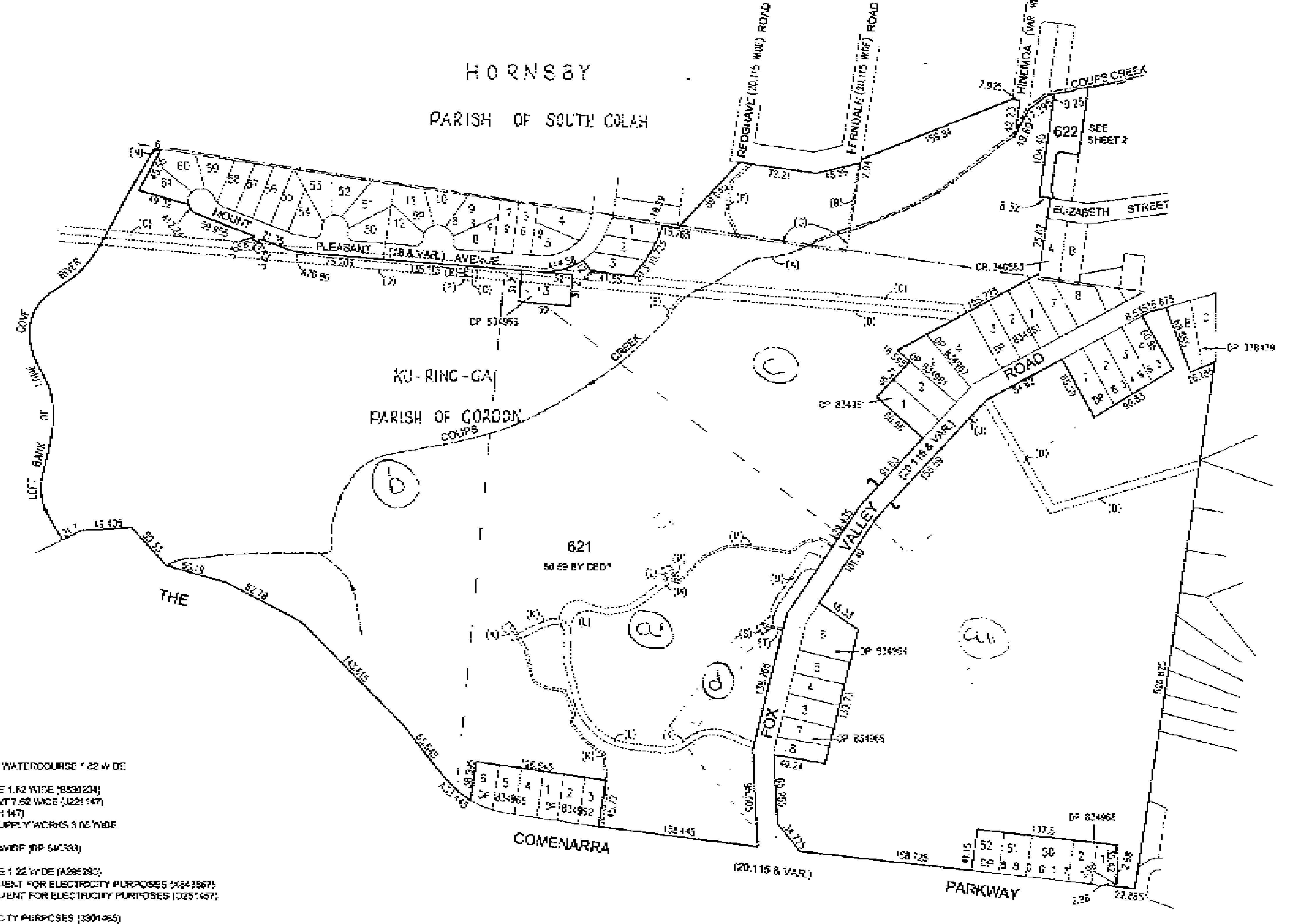
NOTATIONS

UNREGISTERED DEALINGS: NIL

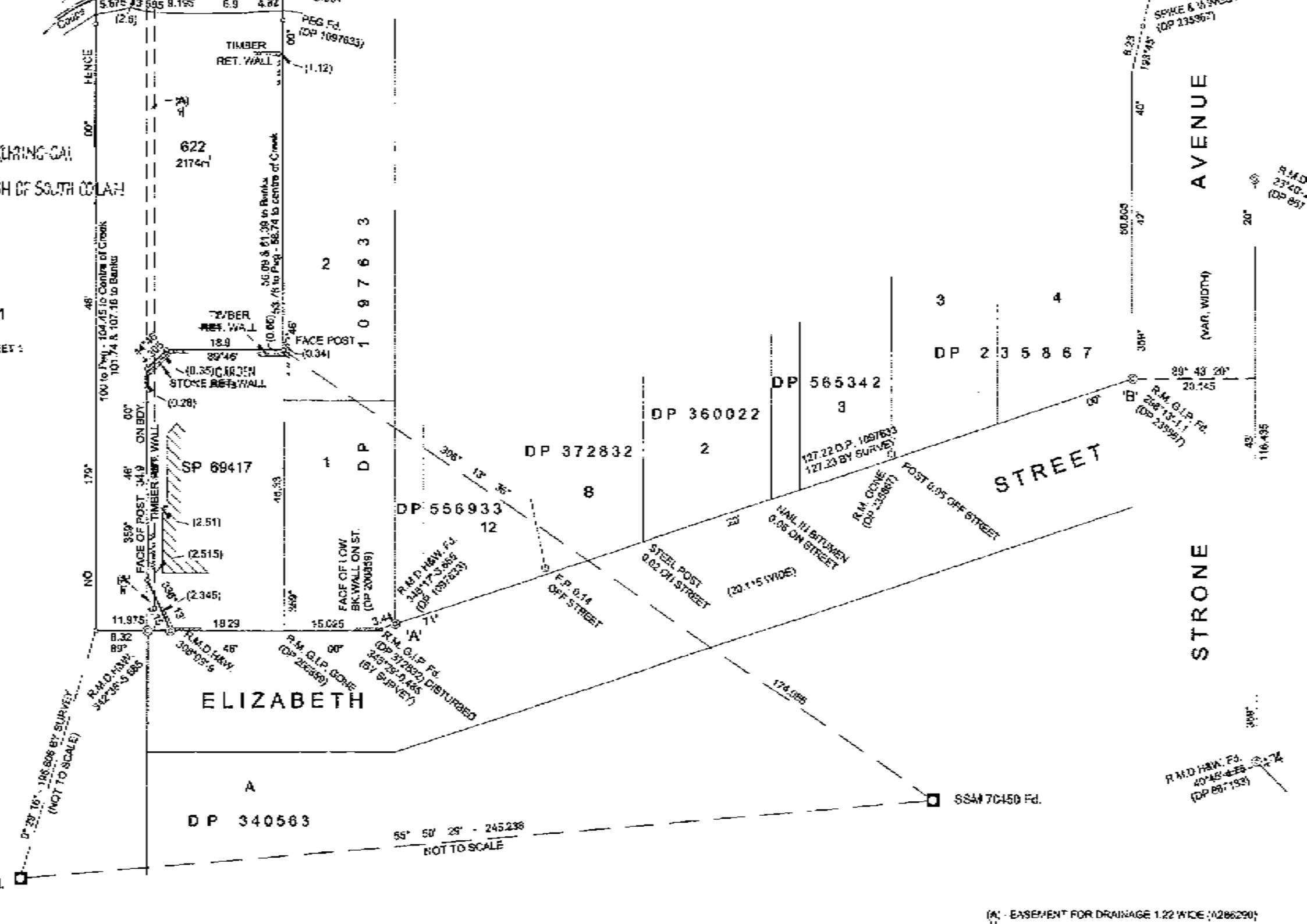
*** END OF SEARCH ***

EIS - Wahroonga ALSF PRINTED ON 16/3/2009

* ANY ENTRIES PRECEDED BY AN ASTERISK DO NOT APPEAR ON THE CURRENT EDITION OF TITLE. WARNING. THE INFORMATION APPEARING UNDER NOTATIONS HAS NOT BEEN FORMALLY RECORDED IN THE REGISTER. ADVANCE LEGAL SEARCH PTY LTD CERTIFIES THAT THE INFORMATION CONTAINED IN THIS DOCUMENT HAS BEEN PROVIDED ELECTRONICALLY BY THE REGISTRAR-GENERAL IN ACCORDANCE WITH SECTION 96B(2) OF THE REAL PROPERTY ACT, 1900


HORNSBY
PARISH OF SOUTH COLAH
KU-RING-GAI
PARISH OF GORDON
COUPS CREEK
621
58.59 BY DED*
622
SEE SHEET 2
HINEMOA (VAR. W
REDGRAVE (20.115 WIDE) ROAD
FERNDALE (20.115 WIDE) ROAD
ELIZABETH STREET
MOUNT PLEASANT (28 & VAR.) AVENUE
FOX VALLEY (20.115 & VAR.) ROAD
COMENARRA (20.115 & VAR.) PARKWAY
THE LEFT BANK OF LANE COVE RIVER
DP 834963
DP 834351
DP 834964
DP 834965
DP 834962
DP 834968
DP 376479
CR. 340583

WATERCOURSE 1.22 WIDE
E 1.52 WIDE (B530234)
NT 7.52 WIDE (J221147)
1147)
UPPLY WORKS 3.05 WIDE
WIDE (DP 540333)
E 1.22 WIDE (A296280)
MENT FOR ELECTRICITY PURPOSES (X843567)
MENT FOR ELECTRICITY PURPOSES (D251457)
CITY PURPOSES (3301465)



(A) - EASEMENT FOR DRAINAGE 1.22 WIDE (V286290)

Registered: 31.7.2008

Title System: Torrens

Purpose: Subdivision

PLAN OF SUBDIVISION OF LOT 62 IN D.P.1017514 AND LOT[IN D.P.206859

LGA: KU-RING-GAI , HORNSBY

Locality: WAHROONGA

Parish: GORDON, SOUTH COLAH

County: CUMBERLAND

Surveying Regulation, 2006

I, Stella Louise Walter
of Mepstead & Associates P.O.Box 208 Pennant Hills
a surveyor registered under the *Surveying Act, 2002*, certify
survey represented in this plan is accurate, has been made
accordance with the *Surveying Regulation, 2006* and was c
on: 5th October 2007
The survey relates to Lot 622 only. Lot 621 is compiled

.....

.....

(specify the land actually surveyed or specify any land show
plan that is not the subject of the survey)

Signature Stella Walter *Dated:* 12.1

Surveyor registered under the Surveying Act, 2002

Datum Line: A-B D.P.1097633
Type: Urban

Plans used in the preparation of survey/comp

D.P.7348	D.P.1017514
D.P.206859	D.P.1097633
D.P.235867	S.P.69417
D.P.311336	
D.P.360022	

Lands NSW/Western Lands Office Approval

.....in approving this plan certify
norised Officer)
ssary approvals in regard to the allocation of the land
n have been given

.....
.....
.....
.....

Subdivision Certificate

the provisions of s.109J of the Environmental Planning and
Act 1979 have been satisfied in relation to:

d..... SUBDIVISION ..... set out herein
(insert 'subdivision' or 'new road')

.....
norised Person/~~General Manager/Accredited Certifier~~

thority: KU-RING-GAI .....

Use PLAN FORM 6A
ional certificates, signatures, seals and statements

3/11/07

The Common Seal of
AN CONFERENCE ASSOCIATION LIMITED
affixed pursuant to a resolution of the Board
nt in the presence of:

KR Hewlett ..... Members of the Board of Management

..... Secretary

Registered: JJP 31.7.2008

Certificate No: Date of Endorsement:

at the person(s) signing opposite, with whom I
ally acquainted or as to whose identity I am
satisfied, signed this instrument in my presence.

of Witness:

.....

Witness: BRANDON LEIGH QUIN
Witness: Level 23, 66 Eagle Street
BRISBANE QLD 4000

Certified correct for the purposes
of the Real Property Act 1900 by
the Mortgagee.

Signature of Attorney:

.....

Attorney's Name: DAVID GEORGE ROBERT
Partner of Cooper Grace Ward Lawyers
Signed for and on behalf of FirstMac Finance
ACN 123 871 698
Power of Attorney - Book 4512
- No. 136

Information Provided Through
Advance Legal Search Pty Ltd
Ph. 0297541590 *Fax.* 0297541364

Historical Search

LEAP Legal
An Approved LPI *NSW*
Information Broker

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - HISTORICAL SEARCH

SEARCH DATE

16/3/2009 7:56PM

FOLIO: 621/1128314

First Title(s): VOL 313 FOL 146 OLD SYSTEM
Prior Title(s): 62/1017514

Recorded	Number	Type of Instrument	C.T. Issue
31/7/2008	DP1128314	DEPOSITED PLAN	FOLIO CREATED EDITION 1
15/8/2008	AE151089	TRANSFER OF LEASE	

*** END OF SEARCH ***

EIS - Wahroonga ALSP PRINTED ON 16/3/2009

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LAND AND PROPERTY INFORMATION NEW SOUTH WALES - HISTORICAL SEARCH

SEARCH DATE

16/3/2009 7:57PM

FOLIO: 62/1017514

First Title(s): VOL 313 FOL 146 VOL 4785 FOL 192
OLD SYSTEM
Prior Title(s): 53/880017

Recorded	Number	Type of Instrument	C.T. Issue
2/11/2000	DP1017514	DEPOSITED PLAN	FOLIO CREATED CT NOT ISSUED
9/1/2001	7015241	LEASE	
12/2/2001	7154495	LEASE	EDITION 1
29/3/2001	7398269	TRANSFER OF LEASE	
11/7/2002	8680107	LEASE	
11/7/2002	8688491	TRANSFER OF LEASE	EDITION 2
15/7/2003	9789667	LEASE	
15/7/2003	9789668	LEASE	EDITION 3
22/8/2003	9903470	LEASE	EDITION 4
29/8/2003	9923248	LEASE	
29/8/2003	9923249	LEASE	
29/8/2003	9923250	LEASE	
29/8/2003	9923251	LEASE	
29/8/2003	9923252	LEASE	
29/8/2003	9923253	LEASE	EDITION 5
12/9/2003	9966048	LEASE	EDITION 6
18/9/2003	9985692	LEASE	
18/9/2003	9985693	LEASE	
18/9/2003	9985694	LEASE	
25/9/2003	AA7022	DEPARTMENTAL DEALING	EDITION 7
25/9/2003	AA7460	LEASE	
25/9/2003	AA7461	LEASE	EDITION 8
2/10/2003	AA31754	LEASE	EDITION 9
22/10/2003	AA87015	LEASE	EDITION 10
27/10/2003	AA95145	LEASE	

END OF PAGE 1 - CONTINUED OVER

EIS - Wahroonga ALSP PRINTED ON 16/3/2009

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - HISTORICAL SEARCH

SEARCH DATE
16/3/2009 7:57PM

FOLIO: 62/1017514 PAGE 2

Recorded	Number	Type of Instrument	C.T. Issue
27/10/2003	AA95146	LEASE	EDITION 11
20/11/2003	AA177677	LEASE	EDITION 12
7/1/2004	AA302548	LEASE	EDITION 13
2/3/2004	AA462063	LEASE	EDITION 14
15/6/2004	AA478792	LEASE	EDITION 15
18/10/2004	AB27704	LEASE	EDITION 16
18/4/2005	DP1080220	DEPOSITED PLAN	
18/7/2005	AB624793	GRANT OF EASEMENT	EDITION 17
27/9/2005	AB766634	LEASE	EDITION 18
9/11/2005	AB856407	DETERMINATION OF LEASE	
9/11/2005	AB856408	LEASE	EDITION 19
25/11/2005	AB940557	TRANSFER OF LEASE	
2/12/2005	AB958505	LEASE	EDITION 20
24/5/2006	AC327610	TRANSFER OF LEASE	
1/6/2006	AC352261	LEASE	
1/6/2006	AC352262	LEASE	EDITION 21
23/6/2006	AC399613	TRANSFER OF LEASE	
21/7/2006	AC366463	LEASE	
21/7/2006	AC366464	LEASE	
21/7/2006	AC366465	LEASE	EDITION 22
14/8/2006	DP1101280	DEPOSITED PLAN	
20/9/2006	AC484401	GRANT OF EASEMENT	EDITION 23
20/9/2006	AC610039	DEPARTMENTAL DEALING	
19/2/2007	AC947037	DETERMINATION OF LEASE	EDITION 24

END OF PAGE 2 - CONTINUED OVER

EIS - Wahroonga ALSP PRINTED ON 16/3/2009

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - HISTORICAL SEARCH

SEARCH DATE
16/3/2009 7:57PM

FOLIO: 62/1017514 PAGE 3

Recorded	Number	Type of Instrument	C.T. Issue
21/5/2008	AD968359	DEPARTMENTAL DEALING	
21/5/2008	AD900966	LEASE	EDITION 25
2/6/2008	AD990739	LEASE	EDITION 26
31/7/2008	DP1128314	DEPOSITED PLAN	FOLIO CANCELLED

*** END OF SEARCH ***

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LAND AND PROPERTY INFORMATION NEW SOUTH WALES - HISTORICAL SEARCH

SEARCH DATE
16/3/2009 7:59PM

FOLIO: 53/880017

First Title(s): OLD SYSTEM VOL 313 FOL 146
VOL 4785 FOL 192
Prior Title(s): 14/834969

Recorded	Number	Type of Instrument	C.T. Issue
18/9/1998	DP880017	DEPOSITED PLAN	FOLIO CREATED EDITION 1
10/12/1998	5431958	LEASE	
10/12/1998	5431959	LEASE	
10/12/1998	5431960	LEASE	
10/12/1998	5431961	LEASE	EDITION 2
19/1/1999	5532722	DETERMINATION OF LEASE	EDITION 3
20/1/1999	5534827	DEPARTMENTAL DEALING	
20/1/1999	5534644	CHANGE OF NAME	EDITION 4
29/4/1999	5587384	CHANGE OF NAME	
18/11/1999	6250590	LEASE	EDITION 5
2/11/2000	DP1017514	DEPOSITED PLAN	FOLIO CANCELLED RESIDUE REMAINS
7/11/2000	7204401	DEPARTMENTAL DEALING	

*** END OF SEARCH ***

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LAND AND PROPERTY INFORMATION NEW SOUTH WALES - HISTORICAL SEARCH

SEARCH DATE
16/3/2009 8:00PM

FOLIO: 14/834969

First Title(s): OLD SYSTEM VOL 313 FOL 146
VOL 4785 FOL 192
Prior Title(s): VOL 8447 FOL 83

Recorded	Number	Type of Instrument	C.T. Issue
7/2/1994	DP834969	DEPOSITED PLAN	FOLIO CREATED EDITION 1
22/2/1995	U990412	LEASE	EDITION 2
25/5/1995	O251457	LEASE	EDITION 3
22/6/1995		AMENDMENT: LOCAL GOVT AREA	
22/6/1995		AMENDMENT: PARISH-COUNTY	
22/6/1995	O324983	DEPARTMENTAL DEALING	
16/8/1997	3301465	LEASE	EDITION 4
16/9/1998	DP880017	DEPOSITED PLAN	FOLIO CANCELLED
3/11/1998	5370510	DEPARTMENTAL DEALING	

*** END OF SEARCH ***

EIS - Wahroonga ALSP PRINTED ON 16/3/2009

203

Appn. Nos. 754, 12129, 14[illegible] and 37671 (as to parts)

Reference to Grant
Vol. 4705 Fol. 192
Reference to Last Certificates
Vol. 2574 Fol. 17
" 2650 " 21
" 3067 " 30
" 3966 " 73
" 4506 Fols. 44 to 47 inclusive
" 4949 Fol. 89
" 5011 " 245

New South Wales

[CERTIFICATE OF TITLE]

Order No. 1671372 [illegible]

Register Book,
Vol. 5964 Fol. 61

AUSTRALASIAN CONFERENCE ASSOCIATION LIMITED, by virtue of Crown Grant Volume 4705 Folio 192 and Certificates of Title Volume 2574 Folio 17, Volume 2650 Folio 21, Volume 3067 Folio 30, Volume 3966 Folio 73, Volume 4506 Folios 44 to 47 inclusive, Volume 4949 Folio 89 and Volume 5011 Folio 245 now surrendered for consolidation is now the proprietor of an Estate in Fee Simple, subject nevertheless to the reservations and conditions, if any contained in the Grants hereinafter referred to, and also subject to such encumbrances, liens, and interests as are notified hereon, in that piece of land situated partly in the Municipality of Ku-ring-gai and partly in the Shire of Hornsby Parishes of Gordon and South Colah and County of Cumberland, containing One hundred and fifty nine acres one rood thirty nine and one half perches or thereabouts as shown in the plan hereon and therein edged red and also shown as to part in plan annexed to Instrument of Transfer No. A917250 being lot 16 in Deposited Plan No.7214, lots 1 to 9 inclusive in Deposited Plan No.7893, lots 46 to 57 inclusive in Deposited Plan No.15946, lot 3 in plan annexed to Instrument of Transfer No. [illegible], lots A, B, and C in plan annexed to Order No. [illegible] and land adjoining. Which said piece of land was originally granted by the Crown Grants set forth in the following Schedule.

SCHEDULE REFERRED TO

Parish	No. of Portion	Name of Grantee	Date of Grant	Original Reference Vol. Fol.
Gordon	Pt. 49a. (Portion 29 of Pt.)	Thomas Bothwell	9th May 1857	- -
	49a. 2r. (Portion 30 of Pt.)	Thomas Bothwell	9th May 1857	- -
	Pt. 72a. (Portion 31 of Pt.)	Alexander Rowan	9th September 1877	311 146
	1a. 2r. 4½p. R1.	Australasian Conference Association Limited	31st August 1936	4705 192
South Colah	Pt. 280a. (Portion 26 of Pt.)	Samuel Henry Horne	7th April 1836	- -

Excepting out of the said piece of land the roads colored brown in the plan hereon the areas of which are not included in the above stated area of 159 acres 1 rood 39½ perches.

In witness whereof I have hereunto signed my name and affixed my Seal, this [illegible] day of May, 1940.

Signed in the presence of G. McKenna [signature]

J. Wells [signature]
Registrar General.

NOTIFICATIONS REFERRED TO

Amongst the reservations and conditions contained in the Grants above referred to are reservations in the Grant of 1 acre 2 roods 4½ perches Parish of Gordon of minerals and in the Grant of 280 acres (Portion 26 of Parish) Parish of South Colah of all mines of gold and of silver.

J. Wells [signature]
Registrar General.

No. B[illegible], Grant of Easement for Drainage to the Council of the Shire of Hornsby over the pieces of land each 6 feet wide colored blue in plan hereon and along the natural watercourse shown by blue line in plan hereon.

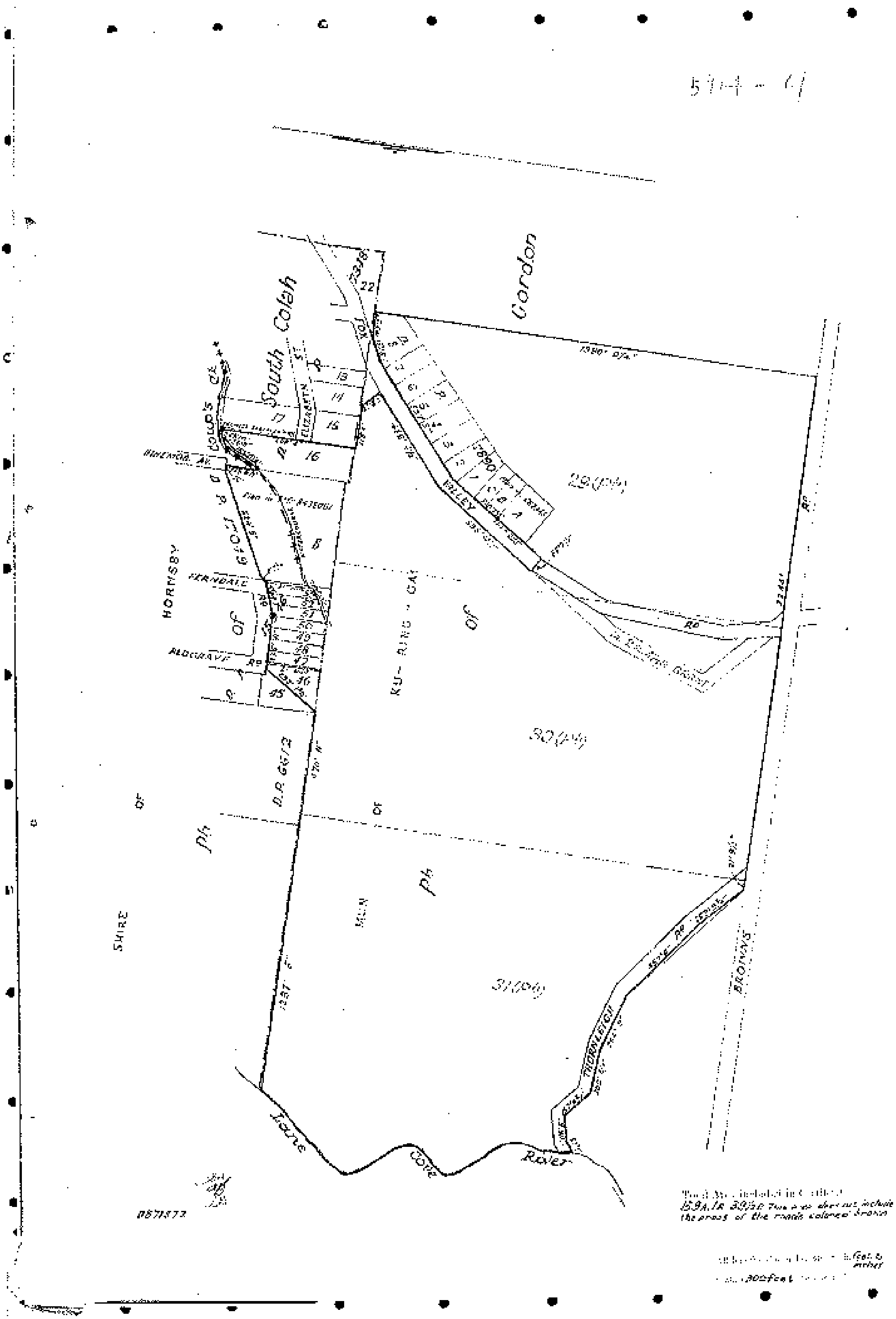
J. Wells [signature]
Registrar General.

Instrument of Transfer No. C[illegible] comprising lots 46 to 57 inclusive in Deposited Plan 15946 contains a covenant agreement and declaration in the following words—
"And the transferee for itself its successors and assigns covenants with the transferor its successors and assigns that any "main building erected on any one lot hereby transferred shall be "constructed of brick or stone or brick and stone with slate and/ "or tiled roof and shall cost and be of the value of not less "than Six hundred pounds (£600) and that not more than one main "building shall be erected upon any one lot hereby transferred "and that any such main building shall be erected not less than "twenty feet back from the alignment of the street to which the "said lots have a frontage.
"And it is hereby agreed and declared that:—
"(a) The land to which the benefit of the above covenants is "intended to be appurtenant is the whole of the land comprised in "Deposited plan No.15946 other than the land hereby transferred.
"(b) The land which is to be subject to the burden of the above "covenants is the land herein described.
"(c) The above covenants or any of them may be released varied "or modified with the consent of the said transferror its "successors or assigns."

J. Wells [signature]
Registrar General.

No. [illegible] Dated 22nd May 1940 [illegible] Australasian Conference Association Limited to Gertrude Mary [illegible] [illegible] [illegible]
[illegible] June 1940 [illegible]
J. Wells [signature]

[illegible] Vol. 6572 Fol. [illegible]
J. Wells [signature]


Gordon
South Colah
HORNSBY
FERNDALE
SHIRE
BROWNS
THORNLEIGH
29(Pt)
30(Pt)
31(Pt)
Lane Cove River

203

Appn. Nos. 750, 12129, 14429 and 17011 (as to part)

New South Wales.

PARTIALLY CANCELLED
CERTIFICATE OF TITLE.
Delivered pursuant to S.30 R.P.Act 1900

ORDER NO. F680401

Reference to Last Certificates.

Vol. 5964 Fol. 61

" 6167 " 171

Register Book
Vol. 6572 Fol. 212

CANCELLED

AUSTRALASIAN CONFERENCE ASSOCIATION LIMITED, transferee as to part under Instrument of Transfer No. F680400 and as to the other part by virtue of Certificate of Title Volume 5964 Folio 61 now surrendered is now the proprietor of an Estate in Fee Simple subject nevertheless to the reservations and conditions if any contained in the Grants hereinafter referred to and also subject to such encumbrances liens and interests as are notified hereon in That Piece of Land situated partly in the Municipality of Kuring-gai and partly in the Shire of Hornsby Parishes of Gordon and South Colah and County of Cumberland containing One hundred and fifty nine acres one rood thirty seven and one quarter perches or thereabouts as shown in the plan hereon and therein edged red and also shown as to part in plan annexed to Instrument of Transfer No. A517230 being Lot 16 in Deposited Plan No.7348, Lots 1 to 7 inclusive in Deposited Plan No.7850, Lots 46 to 53 inclusive in Deposited Plan No.15946, Lot 3 in plan annexed to Instrument of Transfer No. B438061, Lots A, B and C in plan annexed to Order No. C52543, Lots A, B and C in plan annexed to Order No. F680401 and land adjoining. Which said piece of land was originally granted by the Crown Grants set forth in the following Schedule.

SCHEDULE REFERRED TO

Parish	Number of Portion	Name of Grantee	Date of Grant	Original Reference Vol.	Fol.
Gordon	Pt. 69a. (Portion 29 of Ph.)	Thomas Rothwell	9th May 1857	-	-
	49a. 2r. (Portion 30 of Ph.)	Thomas Rothwell	9th May 1857	-	-
	Pt. 72a. (Portion 31 of Ph.)	Alexander Bowman	5th September 1877	313	146
	1a. 2r. 4¾p. Ct.	Australasian Conference Association Limited	31st August 1936	4785	192
South Colah	Pt. 320a. (Portion 28 of Ph.)	Samuel Henry Horne	7th April 1838	-	-

Excepting out of the said piece of land the roads colored brown in the plan hereon the areas of which are not included in the above stated area of 159 acres 1 rood 37¼ perches.

In witness whereof I have hereunto signed my name and affixed my Seal, this [illegible] day of October, 1952.

Signed in the presence of [signature] }

[signature]
Registrar General.

NOTIFICATION REFERRED TO.

Amongst the reservations and conditions contained in the Grants above referred to are reservations in the Grant of 1 acre 2 roods 4¾ perches (Parish of Gordon) of minerals and in the Grant of 320 acres (Portion 28 of Parish) (Parish of South Colah) of all mines of gold and of silver.

[signature]
Registrar General.

No. B420202 Grant of Easement for drainage to The Council of the Shire of Hornsby over the pieces of land each 6 feet wide colored blue in plan hereon and along the natural watercourse shown by a blue line in the plan hereon.

[signature]
Registrar General.

Covenant contained in Instrument of Transfer No. C141593 as regards Lots 46 to 53 inclusive in Deposited Plan No.15946.

[signature]
Registrar General.

F606513 TRANSFER AND GRANT dated 19th May 1953 from the said Australasian Conference Association Limited to The Council of the Municipality of Ku-ring-gai of an easement for drainage [illegible] affecting the part of the land [illegible] in the plan [illegible]
Produced 6th August 1953 and entered 16th September 1953
at [illegible] o'clock in the [illegible] noon.

[signature]
REGISTRAR GENERAL.

No. G376417 [illegible]
from the said Australasian Conference Association Limited [illegible]
[illegible]
Produced [illegible] and entered [illegible]
at [illegible] o'clock in the [illegible] noon.

[signature]
REGISTRAR GENERAL.

The Council of the Municipality of Ku-ring-gai
[illegible]
now the proprietor [illegible]
[illegible]
[illegible] G391462 [illegible] 19[illegible]
Entered [illegible] 19[illegible]

[signature]

No. C912275 SURRENDER dated [illegible]
of Lease No. C374969 Entered [illegible] 19 [illegible]

J. Wells
REGISTRAR GENERAL

No. C379 [illegible] [illegible] October 1957
to [illegible] and [illegible]
[illegible] joint tenants of [illegible]
[illegible]
subject to covenant
[illegible] 19 [illegible]
[illegible]
J. Wells
REGISTRAR GENERAL

No. H230659 TRANSFER dated 9th June 1959
to Mary [illegible]
[illegible] (C65401)
subject to Covenant
[illegible] 9th [illegible] 1959

[illegible]
REGISTRAR GENERAL

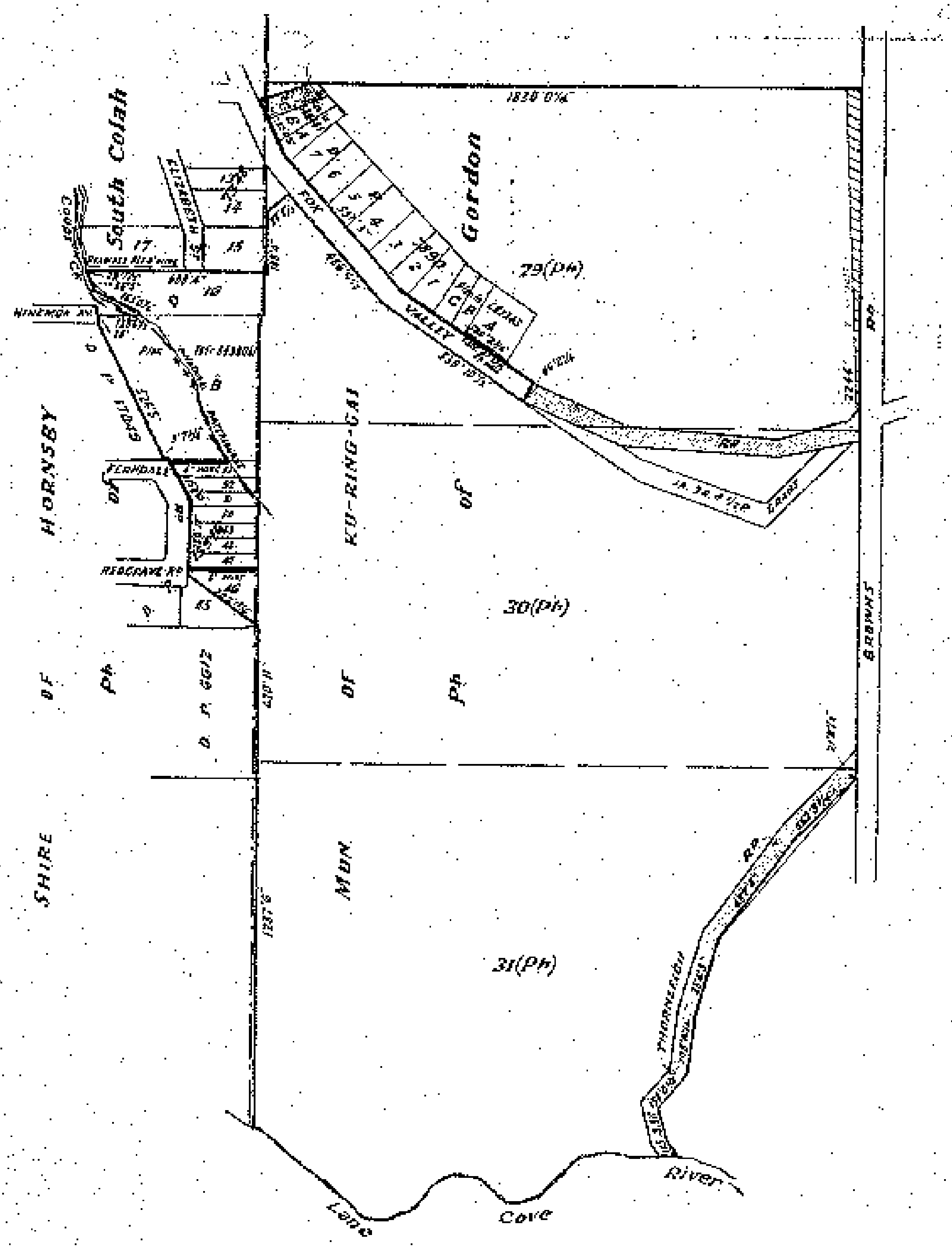
[illegible] part [illegible]
[illegible]
DEP [illegible] 206859 [illegible]
Vol. 172 [illegible] 9676 [illegible] 1892 [illegible]

[illegible]
REGISTRAR GENERAL

[illegible]
[illegible]
Vol. [illegible]
[illegible]

[illegible]

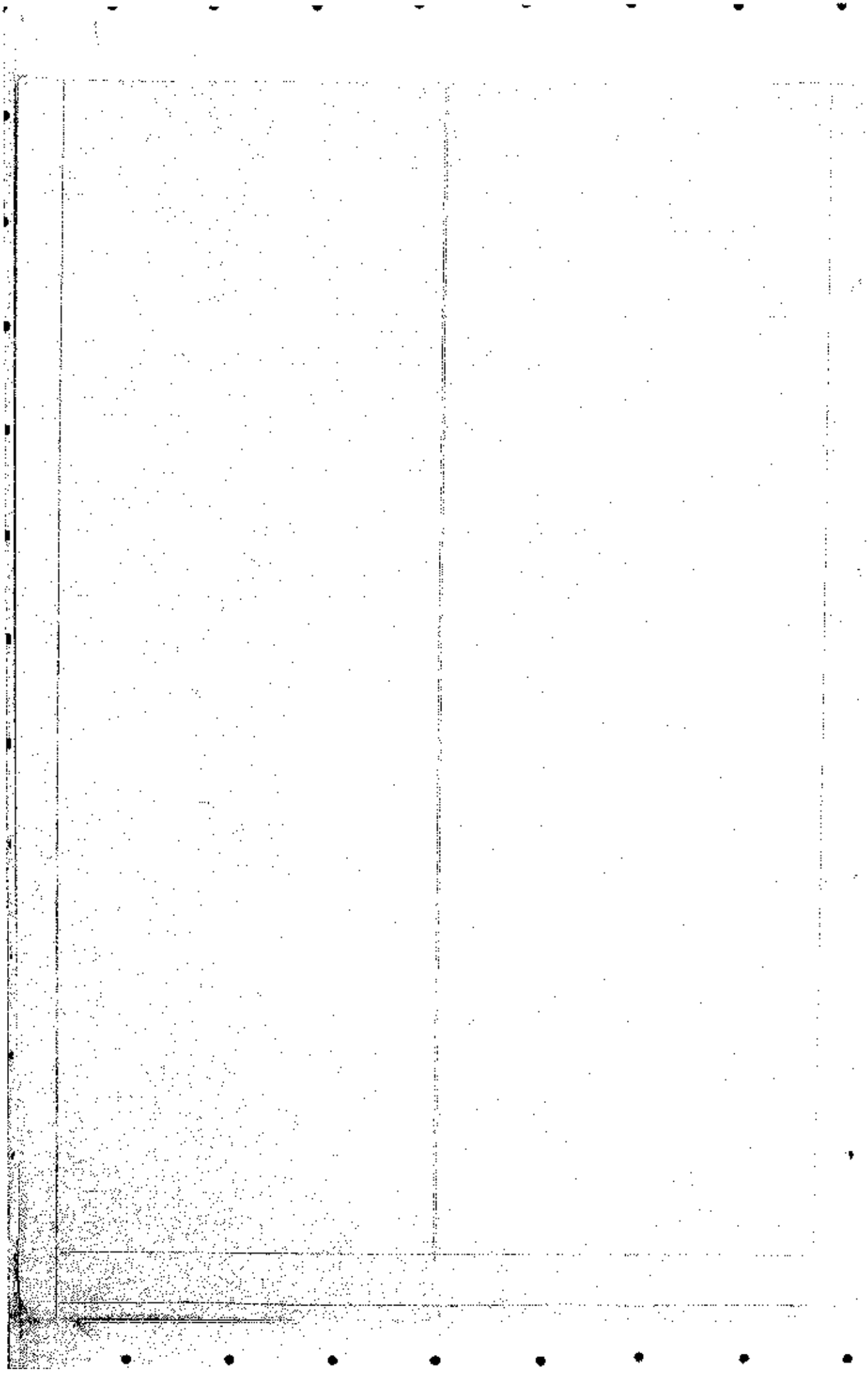
6572-212



Total Area included in Certificate
159A. 1R. 37 1/4 P.
Exclusive of roads coloured brown.

All lengths shown hereon are in feet

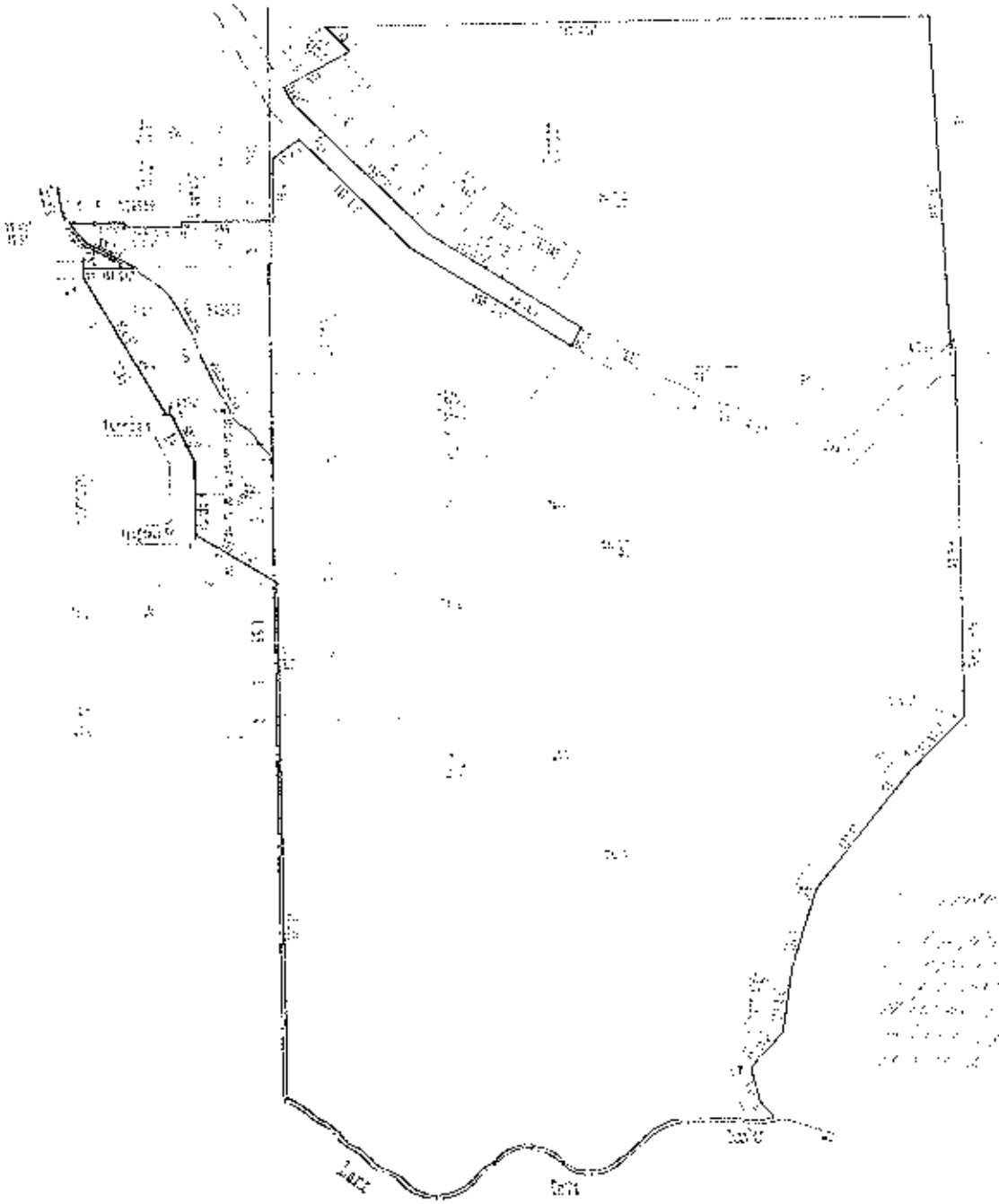
Scale - 400 feet to one inch



New South Wales

CANCELLED
REGISTER BOOK
VOL. 8447 FOL. 83

Persons are cautioned against altering or adding to this Certificate or any notification thereon



DP/SP Registered

This folio is cancelled as to whole/part upon creation of computer folios for lots in the abovementioned plan.

DP/SP Registered

This folio is cancelled as to whole/part upon creation of computer folios for lots in the abovementioned plan.

DP/SP Registered

This folio is cancelled as to whole/part upon creation of computer folios for lots in the abovementioned plan.

DP/SP Registered

This folio is cancelled as to whole/part upon creation of computer folios for lots in the abovementioned plan.

DP/SP Registered

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DP/SP Registered

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DP/SP Registered

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DP/SP Registered

This folio is cancelled as to whole/part upon creation of computer folios for lots in the abovementioned plan.

DP/SP Registered

This folio is cancelled as to whole/part upon creation of computer folios for lots in the abovementioned plan.

DP/SP Registered

This folio is cancelled as to whole/part upon creation of computer folios for lots in the abovementioned plan.

The residue of land in this folio comprises

Total Area included in Certificate

Scale

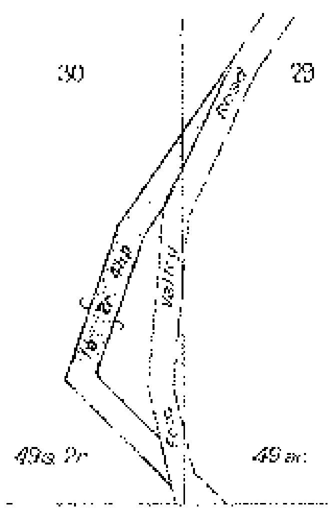
State of New South Wales

4785 192

Grant of Land

To all to whom

Whereas



Scale 4 Chains to an inch

[illegible]

Witness [illegible]

[illegible]

4785 - 192

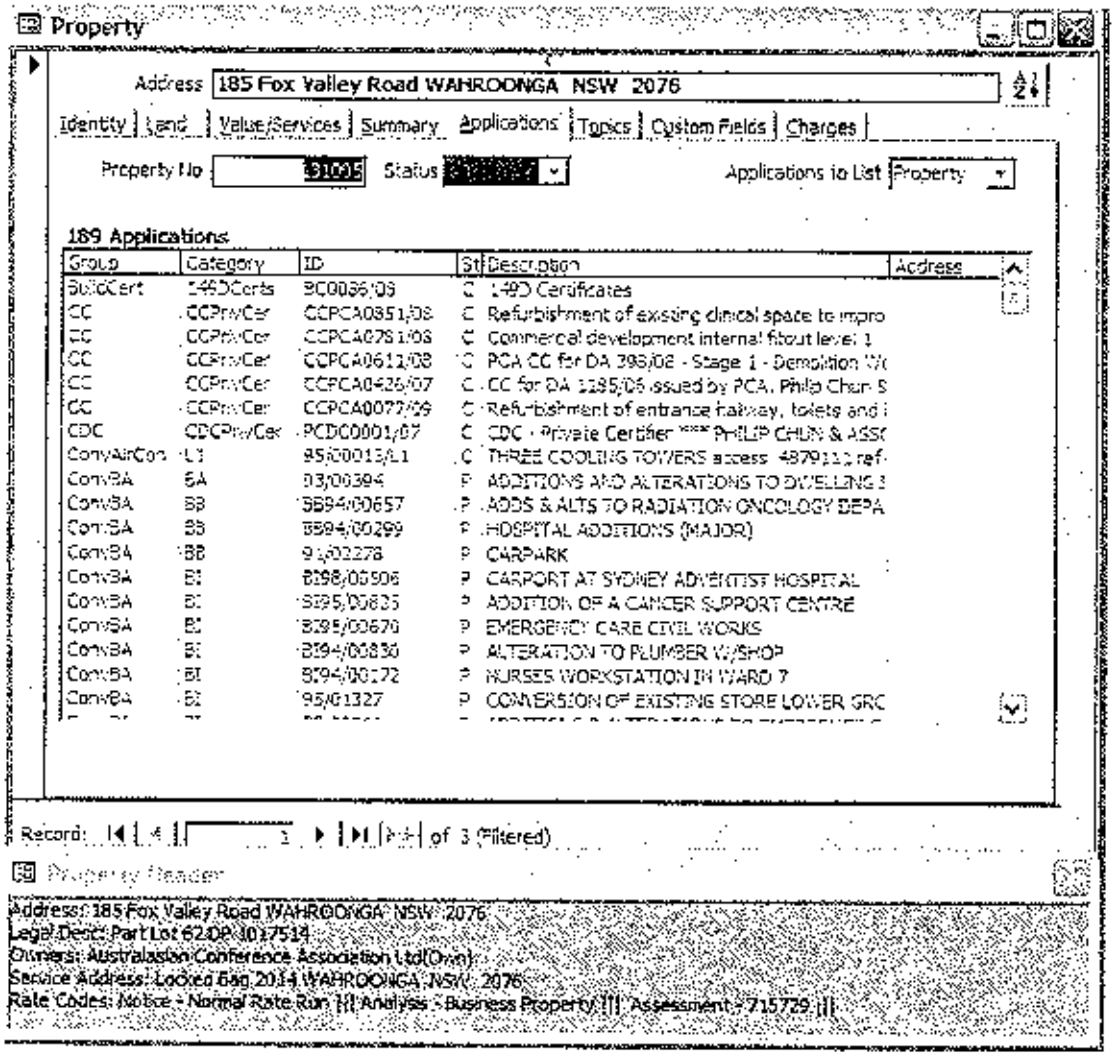
No C 561743. MORTGAGE dated 7th July 1931 from the AUSTRALASIAN CONFERENCE ASSOCIATION LIMITED to BANK OF NEW SOUTH WALES. Produced 29th July 1937 and entered 11th August 1937 at 12 o'clock noon.

Registrar General

No D 717092 DISCHARGE of within mortgage No. C 561743 dated 28th July 1947 Produced 29th August 1947 and entered 10th March 1948 at 12 o'clock noon.

Registrar General

185 Fox Valley Road Wahroonga



185 Fox Valley Road Wahroonga

Group	Category	ID	St	Description	Address
ConvBA	BI	95/01327	P	CONVERSION OF EXISTING STORE LOWER GRC	
ConvBA	BI	95/00911	P	ADDITIONS & ALTERATIONS TO EMERGENCY C	
ConvBA	BI	93/01734	P	EARLY STAGE APPLICATION	
ConvBA	BI	93/01183	P	PROPOSED STORE ROOM FIFTH FLOOR	
ConvBA	BI	93/00556	P	ALTERATIONS TO HOSPITAL DAY SURGERY CEI	
ConvBA	BI	92/00765	P	ADDITIONS AND ALTERATIONS TO THEATRE 8	
ConvBA	BL	BL96/00695	P	ADDITIONS TO EXISTING OFFICE, STORES ARE	
ConvBA	BL	BL95/00729	P	REFURBISHMENT OF EXISTING ENTRANCE TO I	
ConvBA	BL	BL95/00599	P	CENTRE FOR HEALTH MANAGEMENT	
ConvBA	BL	96/01308	P	ADDITIONAL CARPARKING	
ConvBA	BL	93/01393	P	INTERNAL ALTERATIONS	
ConvBA	BL	93/00025	P	PROPOSED MAMMOGRAPHY SCREENING UNIT	
ConvBA	BL	93/00238	P	PROPOSED INTERNAL ADDITIONS AND ALTERA	
ConvBA	BL	92/00965	P	ALTERATIONS MEDICAL AND DENTAL CENTRE	
ConvBA	CL	CL97/00902	P	ADDITIONAL CARPARKING FOR SYDNEY ADVEN	
ConvBA	CL	CL96/00778	P	INTERNAL ALTERATIONS & NEW DISABLED RAI	
ConvBA	CL	CL95/00435	P	ADDITION OF CHEMICAL TANK COMPOUND FOI	
ConvBA	CL	96/01374	P	INSTITUTIONAL ADDITIONS AND ALTERATIONS	

Group	Category	ID	St	Description	Address
ConvBA	CL	96/01374	P	INSTITUTIONAL ADDITIONS AND ALTERATIONS	
ConvBA	CN	CN98/00235	P	OFFICE FITOUT AND ADDITIONS	
ConvBA	CN	CN97/00284	P	INTERNAL FITOUT OF EXISTING BUILDING TO P	
ConvBA	CN	CN97/00197	P	INTERNAL ALTERATIONS TO ENDOSCOPY UNIT	
ConvBA	CN	98/01030	P	ROADWAY FOR LAUNDRY SERVICE	
ConvBA	CN	97/01641A	P	JACARANDA LODGE - STAGE 2 AMENDMENT	
ConvBA	CN	97/01641	P	JACARANDA LODGE - STAGE 2	
ConvBA	CU	CU98/00071	P	SIGN APPLICATION	
ConvBA	CU	CU96/00717	P	PROPOSED ENTRY CANOPY TO FOUNDATION C	
ConvBA	CU	CU96/00173	P	INTERNAL ALTERATION TO PURCHASING OFFI	
ConvBA	CU	98/00900	P	INTERNAL ALTERATIONS	
ConvBA	CU	96/01852	P	INTERNAL ALTERATIONS AT LEVEL SIX	
ConvBA	CU	95/01019	P	RELOCATION OF MEDICAL RECORDS DEPARTM	
ConvCC	C1	06/01006/C1	C	CC FOR DA 1099/06	
ConvCC	C1	03/01244/C1	C	C/CERT FOR DA/526/03 AS PER ARRANGEMENT	
ConvCC	C1	01/01167/C1	C	CHILD CARE CENTRE & CARPARK	
ConvCC	C2	06/00407/C2	P	PCA CC for DA933/05 - INTERNAL ADDS & ALTS	
ConvCC	C2	06/00015/C2	P	PCA CC FOR DA 1225/05 GREENFIELD ACCRED	

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Group	Category	ID	St	Description	Address
ConvCC	C2	05/00011/C2	P	PCA CC FOR DA 1225/05 GREENFIELD ACCRED	
ConvCC	C2	05/00334/C2	P	CC FOR DA 1338/04	
ConvCC	C2	04/00044/C2	P	C/CERT FOR FOURTH & FINAL STAGE	
ConvCC	C2	03/00788/C2	P	PCA CC FOR DA 452/03	
ConvCC	C2	03/00704/C2	P	PCA FOR DA 481/01 & 164/02	
ConvCC	C2	03/00441/C2	P	PCA CC FOR DA 1059/02	
ConvCC	C2	03/00419/C2	P	PCA CONS CERT FOR DA1357/02	
ConvCC	C2	02/01495/C2	P	PCA BCA LOGIC PTY LTD CC FOR DA 926/02	
ConvCC	C2	02/01104/C2	P	PCO FOR DA 381/01	
ConvCC	C2	02/00974/C2	P	cc by pca	
ConvCC	C2	02/00756/C2	P	PCO FOR DA 481/01 STAGE 3	
ConvCC	C2	02/00611/C2	P	PCO FOR DA 646/01	
ConvCC	C2	02/00527/C2	P	PCO FOR DA 481/01	
ConvCC	C2	02/00525/C2	P	PCO FOR DA 402/01	
ConvCC	C2	02/00226/C2	P	PCO FOR DA 481/01	
ConvCC	C2	01/01487/C2	P	PCA FOR DA 402/01	
ConvCC	C2	01/01467/C2	P	cc by pc	
ConvCC	C2	01/01232/C2	P	PRIVATE PCO FOR DA 482/01	

Group	Category	ID	St	Description	Address
ConvCC	C2	01/01232/C2	P	PRIVATE PCO FOR DA 482/01	
ConvCC	C2	01/00866/C2	P	PCO FOR DA 381/01	
ConvCC	C2	01/00686/C2	P	PCO FOR DA 646/01	
ConvCC	FO	99/00893/FO	P	ALTERATIONS TO EXISTING OFFICE FITOUT OI	
ConvCC	FO	99/00071/FO	P	FITOUT OF EXISTING SPACE ON LEVEL 3 FOR M	
ConvCC	FP	99/01039/FP	P	ALTERATION TO LEVEL 4 - MAIN BUILDING - FC	
ConvCC	FP	98/04750/FP	P	REMODELING OF PURCHASING DEPOT IN LAUN	
ConvCC	FP	98/04367/FP	P	LAUNDRY, MEZZANINE TO OFFICE SPACE.	
ConvCC	FP	98/04278/FP	P	INTERNAL ALTERATIONS	
ConvCC	FP	00/01095/FP	P	ALTERATIONS TO CARPARK	
ConvCC	FP	00/00940/FP	P	RELOCATE ULTRASOUND FACILITY	
ConvCC	FP	00/00939/FP	P	ALTERATIONS TO KITCHEN	
ConvCC	FP	00/00597/FP	P	PRE-FABRICATED STAFF BUILDING	
ConvCC	FP	00/00596/FP	P	REFURBISH NUCLEAR MEDICINE DEPARTMENT	
ConvCC	FP	00/00334/FP	P	REFURBISH AN EXISTING BRICK STORAGE SPA	
ConvCC	FP	00/00332/FP	P	REFURBISH A EXISTING SPACE ON LEVEL 3 OF	
ConvCDC	CX	45/06/CX	P	Anniversary Celebrations Food Stalls etc	
ConvCDC	CZ	30/05/CZ	C	cdc by pca	

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Group	Category	ID	St	Description	Address
ConvCDC	CZ	60/05/CZ/	C	cdc by pca	
ConvCDC	CZ	79/05/CZ/	C	internal office fitout	
ConvCDC	CZ	78/05/CZ/	P	cdc by pca	
ConvCDC	CZ	76/03/CZ/	P	NEW SUITES LEVELS 3,5 & 6 OF NEW MEDICAL	
ConvCDC	CZ	75/03/CZ/	P	NEW SUITES, LEVELS 5 & 6 - NEW MEDICAL CE	
ConvCDC	CZ	74/03/CZ/	P	PCA COMPLYING DEVELOPMENT - NEW SUITES	
ConvCDC	CZ	66/05/CZ/	P	PCA CDC FOR INTERNAL COMMERCIAL ALTS (S	
ConvCDC	CZ	59/06/CZ/	P	COMPLYING DEVELOPMENT FROM PCA INTERN	
ConvCDC	CZ	55/04/CZ/	C	internal fitout of medical suites.	
ConvCDC	CZ	53/03/CZ/	P	INTERNAL FITOUT OF MEDICAL SUITES - LEVEL	
ConvCDC	CZ	15/06/CZ/	C	INTERNAL OFFICE FITOUT TO MEDICAL SUITE	
ConvDA	DB	1225/05/DB	P	NEW VERGOLA	
ConvDA	DK	1099/06/DK	C	MINOR INTERNAL ALTERATIONS CHILD CARE C	
ConvDA	DO	993/99/DO	P	ALTERATIONS TO EXISTING OFFICE FITOUT ON	
ConvDA	DO	77/99/DO	P	FITOUT OF EXISTING SPACE ON LEVEL 3 FOR V	
ConvDA	DO	630/00/DO	P	REFURBISH NUCLEAR MEDICINE DEPARTMENT	
ConvDA	DO	452/03/DO	P	FITOUT EXISTING SPACE FOR NEW COFFEE SH	
ConvDA	DP	933/05/DP	P	INTERNAL ALTERATIONS TO TOWER LEVEL 6 AI	

Group	Category	ID	St	Description	Address
ConvDA	DP	933/05/DP	P	INTERNAL ALTERATIONS TO TOWER LEVEL 6 AI	
ConvDA	DP	738/03/DP	P	ADDITIONS AND ALTERATIONS TO HOSPITAL	
ConvDA	DP	702/01/DPA	P	CHILDCARE CENTRE AND CARPARK - AMENDED	
ConvDA	DP	703/01/DP	P	CHILDCARE CENTRE AND CARPARK	
ConvDA	DP	682/00/DP	P	PRE-FABRICATED STAFF BUILDING	
ConvDA	DP	646/01/DP	P	REFURBISH WARDS	
ConvDA	DP	570/02/DP	P	DEMOLISH SHEDS & FUEL AREA ESTABLISh BUI	
ConvDA	DP	543/98/DP	P	NEW MULTI LEVEL CAR PARK STRUCTURE AND	
ConvDA	DP	528/03/DP	P	ERECT A FREESTANDING SIGN & A WALL MOUN	
ConvDA	DP	482/01/DPA	P	CARPARKING - AMEND DRIVEWAY	
ConvDA	DP	482/01/DP	P	CARPARKING	
ConvDA	DP	481/01/DPA	P	MEDICAL CENTRE - AMENDED PLANS	
ConvDA	DP	481/01/DP	P	DEMOLITION THEN BUILD NEW MEDICAL CENTF	
ConvDA	DP	404/98/DP	P	LAUNDRY,MEZZANINE TO OFFICE SPACE	
ConvDA	DP	402/01/DP	P	REFURBISH WARD LEVELS 7-12	
ConvDA	DP	386/00/DP	P	REFURBISH AN EXISTING BRICK STORAGE SPA(	
ConvDA	DP	384/00/DP	P	REFURBISH A EXISTING SPACE ON LEVEL 3 OF	
ConvDA	DP	351/01/DP	P	COMMUNITY CENTRE	

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Group	Category	ID	St	Description	Address
ConvDA	DP	381/91/DP	P	COMMUNITY CENTRE	
ConvDA	DP	311/99/DP	P	INTERNAL ALTERATIONS	
ConvDA	DP	164/02/DP	P	MEDICAL CENTRE	
ConvDA	DP	1407/00/DP	P	ADDITIONS AND ALTERATIONS TO HOSPITAL L	
ConvDA	DP	1357/92/DP	P	ADDITIONAL PEDESTRIAN LEVEL TO LINK FOOT	
ConvDA	DP	1338/04/DP	P	ADDITIONS AND ALTERATIONS - SUBSTATION	
ConvDA	DP	1257/05/DP	P	UPGRADE OF LAUNDRY STORES AND MORGUE	
ConvDA	DP	1215/00/DP	P	ALTERATIONS TO CARPARK	
ConvDA	DP	1185/06/DP	C	ADDITIONS & ALTERATIONS TO EXISTING DEVE	
ConvDA	DP	1163/99/DP	P	ALTERATION TO LEVEL 4 - MAIN BUILDING - FO	
ConvDA	DP	1059/02/DP	P	TENANT FITOUT IN SPECIALIST MEDICAL CENT	
ConvDA	DP	1056/00/DP	P	RELOCATE ULTRASOUND FACILITY	
ConvDA	DP	1055/00/DP	P	ALTERATIONS TO KITCHEN	
ConvDA	DT	926/02/DT	P	ADDITIONS AND ALTERATIONS TO APPROVED	
ConvDA	TA	4477/95	P	ADDITION OF CHEMICAL TANK COMPOUND FO	
ConvDA	TP	805/98/TP	P	REMODELING OF PURCHASING DEPOT IN LAUN	
ConvDA	TP	5863/98	P	ROADWAY FOR LAUNDRY SERVICE	
ConvDA	TP	5850/98	P	INTERNAL ALTERATIONS	

Group	Category	ID	St	Description	Address
ConvDA	TP	5850/98	P	INTERNAL ALTERATIONS	
ConvDA	TP	5800/98	P	ADDITIONS TO EXISTING OFFICE, STORES ARE	
ConvDA	TP	5696/98	P	OFFICE FITOUT AND ADDITIONS	
ConvDA	TP	5548/97A	P	JACARANDA LODGE - STAGE 2 AMENDMENT	
ConvDA	TP	5548/97	P	JACARANDA LODGE - STAGE 2	
ConvDA	TP	5396/97	P	ADDITIONAL CARPARKING FOR SYDNEY ADVEN	
ConvDA	TP	5272/97	P	INTERNAL FITOUT OF EXISTING BUILDING TO P	
ConvDA	TP	5240/97	P	INTERNAL ALTERATIONS TO ENDOSCOPY UNIT	
ConvDA	TP	5213/96	P	INTERNAL ALTERATIONS AT LEVEL 5DX	
ConvDA	TP	5109/96	P	INSTITUTIONAL ADDITIONS AND ALTERATIONS	
ConvDA	TP	4954/96	P	INTERNAL ALTERATIONS & NEW DISABLED RAM	
ConvDA	TP	4933/96	P	PROPOSED ENTRY CANOPY TO FOUNDATION C	
ConvDA	TP	4812/96	P	INTERNAL ALTERATION TO PURCHASING OFFI	
ConvDA	TP	4607/95	P	RELOCATION OF MEDICAL RECORDS DEPARTM	
ConvDA	TP	4346/94	P	NEW EMERGENCY UNIT & RELOCATE HEALTH M	
ConvDA	TP	4240/94	P	CONSTRUCTION OF A CANCER SUPPORT CENT	
ConvDA	TP	3938/94	P	INCORPORATE SCHOOL OF NURSING, LECTURI	
ConvDA	TP	3860/93	P	ADDS TO ONCOLOGY UNIT & NEW CARPARK (C	

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185 Fox Valley Road Wahroonga

Group	Category	ID	St	Description	Address
ConvDA	TP	3861/93	P	ADDS TO ONCOLOGY UNIT & NEW CARPARK (C	
ConvDA	TP	3736/93	P	NEW HOSPITAL WING (MS) (C)	
ConvDA	TP	3549/93	P	CHANGE OF USE FROM LDY IRONING ROOM TO	
ConvDA	TP	2943/91	P	Alts & adds to create a new op-theatre, 2 meet	
ConvDA	TP	2789/91	P	Additions to Sydney Adventist Hosp - Lower, gr	
ConvDA	TP	2788/91	P	Alterations to Sydney Advent Hosp - Lower grot	
ConvDA	TP	2318/90	P	New building to house laundry fac ties Comena	
ConvDA	WZ	5644/93	P	SIGN APPLICATION	
ConvDA	WZ	4103/94	P	ALTS TO 'PLUMBERS WORKSHOP' TO CREATE A	
ConvDA	WZ	4055/94	P	ON-SITE DISPOSAL OF EXCAVATED MATERIAL !	
ConvEssSer	ES	8/91/ES	C	JACARANDA LODGE STAGE 1 UNITS 25-28 & LC	
ConvEssSer	ES	7/95/ES	C	ONCOLOGY UNIT 94/657	
ConvEssSer	ES	4/97/ES	C	PAEDIATRICS WARD LEVEL 6	
ConvEssSer	ES	12/94/ES	C	CLASS 9A BA 91/2143 PHYSIOTHERAPY	
ConvEssSer	ES	111/94/ES	C	CLASS 9b BA 93/556 DAY CARE CENTRE	
ConvEssSer	ES	11/94/ES	C	BA 92/766 THEATRE & EXTENSIONS	
ConvOrders	ON	ON96/00063	C	FOOD ACT 1989	
ConvOrders	ON	03/00105	P	NOXIOUS WEEDS ACT 1993 REMOVE WEEDS	

Group	Category	ID	St	Description	Address
ConvOrders	ON	02/00415	C	ORDER UNDER SECTION 121B ENVIRONMENTAL	
ConvOrders	ON	02/00414	C	ORDER UNDER SECTION 121B ENVIRONMENTAL	
ConvOrders	ON	02/00413	C	ORDER UNDER SECTION 121B ENVIRONMENTAL	
ConvOrders	ON	02/00412	C	ORDER UNDER SECTION 121B ENVIRONMENTAL	
ConvOrders	ON	02/00411	C	ORDER UNDER SECTION 121B ENVIRONMENTAL	
ConvOrders	ON	02/00410	C	ORDER UNDER SECTION 121B ENVIRONMENTAL	
ConvOther	WW	54/97	C	TELECOMMUNICATIONS FACILITY FOR OPTUS	
ConvOther	WW	50/96	C	TELSTRA TELECOMMUNICATIONS FACILITY - C	
ConvOther	WW	48/96	C	VODAPHONE UPGRADING OF EXISTING TELECC	
ConvSec96	TT	306/95/TT	C	ONCOLOGY UNIT - MODIFICATION OF CONDITI	
DA	Commercial	DA1099/06	P	ALTERATIONS TO EXISTING CHILD CARE CENTI	
DA	Commercial	DA0083/03	P	Commercial development internal fitout level 1	
DA	CommFacil	DA1135/06	P	ALTERATIONS & ADDITIONS TO EXISTING HOS	
DA	CommFacil	DA1103/08	P	Refurbishment of entrance hallway, toilets and	
DA	CommFacil	DA0395/08	P	Refurbishment of existing clinical space to impro	
PlanCert	s1492	PC0210/05	P	Section 149 (2) Certificate	
PlanCert	s14925	PC2355/05	P	Section 149 (2) & (5) Certificate	
RatCert	603Cert	Rat2046/08	P	Certificate under 603 of LG Act (1993)	

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9 APR 2009

Our Ref: D09/037657
Your Ref: Todd Hore

7 April 2009

Attention: Todd Hore
Environmental Investigation Services
PO Box 976
North Ryde NSW 1670

Dear Todd

RE SITE: 185 Fox Valley Road, Wahroonga NSW 2076

I refer to your site search request received on 1st April 2009 requesting information on a Licence to Keep Dangerous Goods on the above site.

Enclosed are copies of the documents that WorkCover NSW holds on Dangerous Goods Licence **35/014066** relating to the storage of dangerous goods at the above-mentioned premises, as listed on the Stored Chemical Information Database (SCID).

If you have any further queries, please contact WorkCover's Dangerous Goods Licensing staff on (02) 4321 5500.

Yours sincerely

Sue Waugh
A/C Senior Licensing Officer
Dangerous Goods Team

Notification of Dangerous Goods on Premises Form

FDG01

Depot No	Type of storage location or process	Class	Maximum Storage Capacity (L, kg)
DG1	Above Ground Tank	2	12500L

UN Number	Proper Shipping Name	Class	PG (I,II,III)	Product or Common Name	HazChem Code	Typical Qty	Unit eg L, kg
1073	Oxygen Refrigerated Liquid	2.2		Liquid Oxygen	2PE	12500	L

Cryogenic Liquid MD = 10,000L PG = 10000L

Depot No	Type of storage location or process	Class	Maximum Storage Capacity (L, kg)
DG2	Cylinder Store	2	108 kg

UN Number	Proper Shipping Name	Class	PG (I,II,III)	Product or Common Name	HazChem Code	Typical Qty	Unit eg L, kg
1075	Petroleum Gases Liquefied	2.1		LPG	2WE	70	kg

Depot No	Type of storage location or process	Class	Maximum Storage Capacity (L, kg)
DG3	Cylinder Store	2.2	3000L

UN Number	Proper Shipping Name	Class	PG (I,II,III)	Product or Common Name	HazChem Code	Typical Qty	Unit eg L, kg
1977	Nitrogen, Refrigerated Liquid	2.2		Liquid Nitrogen	2RE	2000	L

Depot No	Type of storage location or process	Class	Maximum Storage Capacity (L, kg)
DG4	Cylinder Store	2.2	500L

UN Number	Proper Shipping Name	Class	PG (I,II,III)	Product or Common Name	HazChem Code	Typical Qty	Unit eg L, kg
1977	Nitrogen, Refrigerated Liquid	2.2		Liquid Nitrogen	2RE	200	L

Depot No	Type of storage location or process	Class	Maximum Storage Capacity (L, kg)
DG5	Roofed Store	8	240

UN Number	Proper Shipping Name	Class	PG (I,II,III)	Product or Common Name	HazChem Code	Typical Qty	Unit eg L, kg
1791	Sodium Hypochlorite	8	II	Hypochlorite Solution	2X	180	L
1789	Hydrochloric Acid	8	II	Hydrochloric Acid	2R	30	L

Depot No	Type of storage location or process	Class	Maximum Storage Capacity (L, kg)
DG6	Above Ground Tank	C1	20000L

UN Number	Proper Shipping Name	Class	PG (I,II,III)	Product or Common Name	HazChem Code	Typical Qty	Unit eg L, kg
1202	Diesel Fuel	C1		Diesel Fuel		20000	L

Depot No	Type of storage location or process	Class	Maximum Storage Capacity (L, kg)
DG7	Above Ground Tank	C1	15000L

UN Number	Proper Shipping Name	Class	PG (I,II,III)	Product or Common Name	HazChem Code	Typical Qty	Unit eg L, kg
1202	Diesel Fuel	C1		Diesel Fuel		15000	L

Depot No	Type of storage location or process	Class	Maximum Storage Capacity (L, kg)
DG8	Roofed Store	8	100L

UN Number	Proper Shipping Name	Class	PG (I,II,III)	Product or Common Name	HazChem Code	Typical Qty	Unit eg L, kg
1791	Sodium Hypochlorite	8	II	Hypochlorite Solution	2X	70	L

Depot No	Type of storage location or process	Class	Maximum Storage Capacity (L, kg)
DG9	Above Ground Tank	2	180L

UN Number	Proper Shipping Name	Class	PG (I,II,III)	Product or Common Name	HazChem Code	Typical Qty	Unit eg L, kg
1013	Carbon Dioxide	2.2		Carbon Dioxide	2RE	180	L

Depot No	Type of storage location or process	Class	Maximum Storage Capacity (L, kg)
DG10	Above Ground Tank	2	2500L

UN Number	Proper Shipping Name	Class	PG (I,II,III)	Product or Common Name	HazChem Code	Typical Qty	Unit eg L, kg
1073	Oxygen Refrigerated Liquid	2.2		Liquid Oxygen	2PE	2500	L

Depot No	Type of storage location or process	Class	Maximum Storage Capacity (L, kg)
DG11	Roofed Store	3	500L

UN Number	Proper Shipping Name	Class	PG (I,II,III)	Product or Common Name	HazChem Code	Typical Qty	Unit eg L, kg
1170	Ethanol	3	II	Ethyl Alcohol	2(Y)E	300	L

Depot No	Type of storage location or process	Class	Maximum Storage Capacity (L, kg)
DG12	Cylinder Store	2	120kg

UN Number	Proper Shipping Name	Class	PG (I,II,III)	Product or Common Name	HazChem Code	Typical Qty	Unit eg L, kg
1075	Petroleum Gas Liquefied	2.1		LPG	2WE	70	Kg

Depot No	Type of storage location or process	Class	Maximum Storage Capacity (L, kg)
DG13	Cylinder Store	2	47 L

UN Number	Proper Shipping Name	Class	PG (I,II,III)	Product or Common Name	HazChem Code	Typical Qty	Unit eg L, kg
1046	Helium Compressed	2.2		Helium	2(T)	47	L

Depot No	Type of storage location or process	Class	Maximum Storage Capacity (L, kg)
DG14	Cylinder Store	2	2600 L

UN Number	Proper Shipping Name	Class	PG (I,II,III)	Product or Common Name	HazChem Code	Typical Qty	Unit eg L, kg
1046	Helium Compressed	2.2		Helium	2T	6	L
1070	Nitrous Oxide	2.2		Nitrous Oxide	2P	850	L
1066	Nitrogen	2.2		Nitrogen	2T	95	L
1013	Carbon Dioxide	2.2		Carbon Dioxide	2RE	336	L
1002	Air	2.2		Medical Air	2(T)	769	L
1072	Oxygen Compressed	2.2		Oxygen	2(S)	478	L

Depot No	Type of storage location or process	Class	Maximum Storage Capacity (L, kg)
DG15	Underground Tank	C1	12000L

UN Number	Proper Shipping Name	Class	PG (I,II,III)	Product or Common Name	HazChem Code	Typical Qty	Unit eg L, kg
1202	Diesel Fuel	C1		Diesel Fuel		12000	L

Depot No	Type of storage location or process	Class	Maximum Storage Capacity (L, kg)
DG16	Decommissioned		

UN Number	Proper Shipping Name	Class	PG (I,II,III)	Product or Common Name	HazChem Code	Typical Qty	Unit eg L, kg

Depot No	Type of storage location or process	Class	Maximum Storage Capacity (L, kg)
DG17	Cylinder Store	2	81 L

UN Number	Proper Shipping Name	Class	PG (I,II,III)	Product or Common Name	HazChem Code	Typical Qty	Unit eg L, kg
1072	Compressed Oxygen	2.2		Oxygen	2(S)	19	L
1013	Carbon Dioxide	2.2		Carbon Dioxide	2RE	24	L
1001	Acetylene Dissolved	2.1		Acetylene	2(S)E	19	L
1006	Argon Compressed	2.2		Argon	2(T)	19	L

Depot No	Type of storage location or process	Class	Maximum Storage Capacity (L, kg)
DG18	Fenced Compound	2	108kg

UN Number	Proper Shipping Name	Class	PG (I,II,III)	Product or Common Name	HazChem Code	Typical Qty	Unit eg L, kg
1075	Petroleum Gas Liquefied	2.1		LPG	2WE	100	kg

Depot No	Type of storage location or process	Class	Maximum Storage Capacity (L, kg)
DG19	Cylinder(s) in Use	2.1	112 L

UN Number	Proper Shipping Name	Class	PG (I,II,III)	Product or Common Name	HazChem Code	Typical Qty	Unit eg L, kg
1006	Argon Compressed	2.2		Argon	2(T)	94	L
1001	Acetylene Dissolved	2.1		Acetylene	2(S)E	9	L
1072	Compressed Oxygen	2.2		Oxygen	2(S)	9	L

Depot No	Type of storage location or process	Class	Maximum Storage Capacity (L, kg)
DG20	Flammable Goods Cabinet	3	250L

UN Number	Proper Shipping Name	Class	PG (I,II,III)	Product or Common Name	HazChem Code	Typical Qty	Unit eg L, kg
1270	Petroleum Fuel	3	II	Unleaded Petrol		100	L

Depot No	Type of storage location or process	Class	Maximum Storage Capacity (L, kg)
DG21	Toxic Liquids Cabinet	6.1	120L

UN Number	Proper Shipping Name	Class	PG (I,II,III)	Product or Common Name	HazChem Code	Typical Qty	Unit eg L, kg
3017	Glyco-phosphate	6.1	III	Roundup		20	L
3017	Pesticide Organo-phosphorus	6.1	III	Rogor		10	L

3010	Copper Oxychloride	6.1	II	Copper Oxychloride		5	L
3017	Bromoxymil	6.1	III	Bindi Killer		5	L
3017	Pesticide Organo-phosphorus	6.1	III	ChloralPyrophos		5	L

Depot No	Type of storage location or process	Class	Maximum Storage Capacity (L, kg)
DG22	Above Ground Tank	C1	2500L

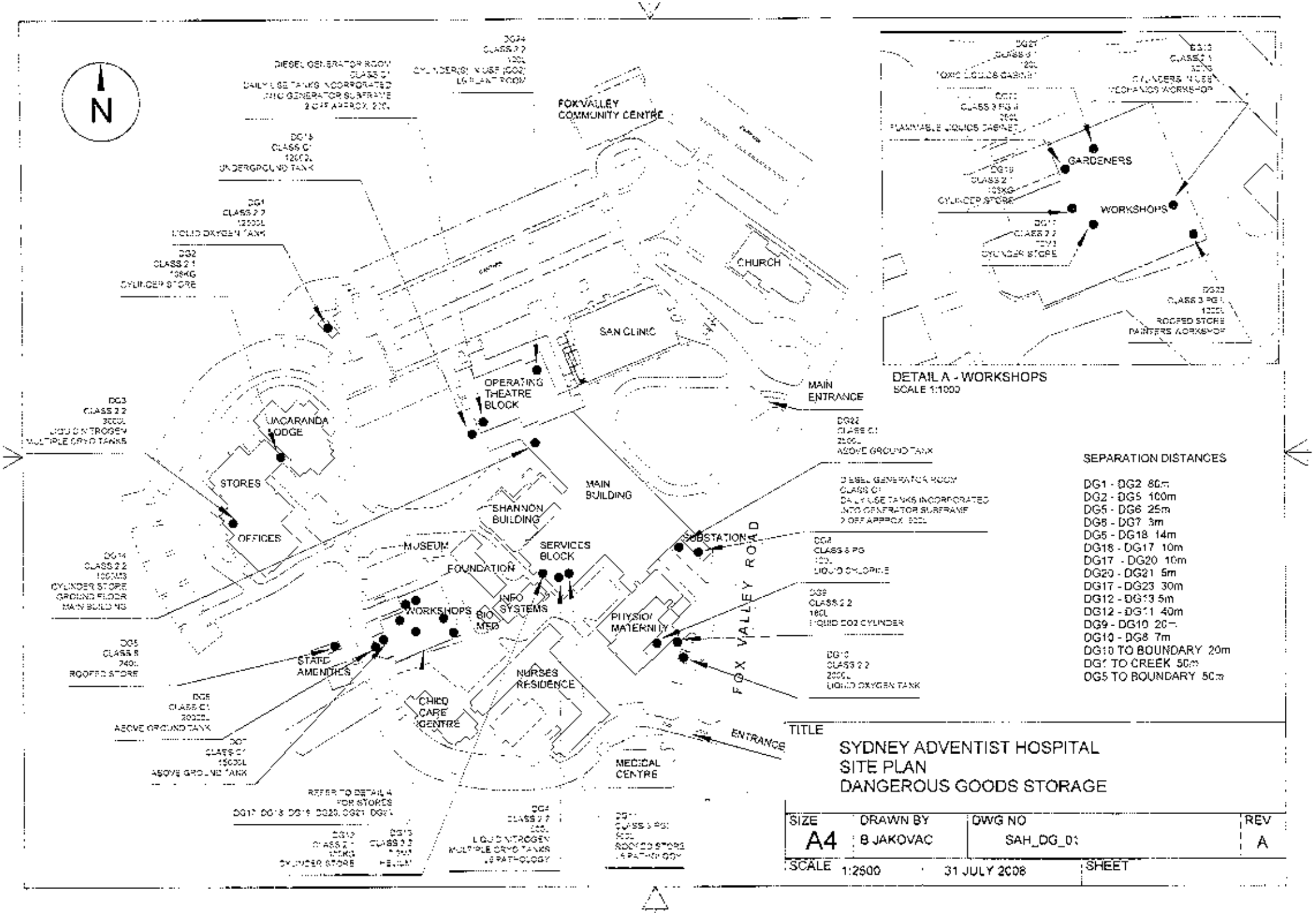
UN Number	Proper Shipping Name	Class	PG (I,II,III)	Product or Common Name	HazChem Code	Typical Qty	Unit eg L, kg
1202	Diesel Fuel	C1		Diesel Fuel		2500	L

Depot No	Type of storage location or process	Class	Maximum Storage Capacity (L, kg)
DG23	Roofed Store	3	1000L

UN Number	Proper Shipping Name	Class	PG (I,II,III)	Product or Common Name	HazChem Code	Typical Qty	Unit eg L, kg
1263	Paint Related Material	3	II	Paint, Thinners	3(Y)E	500	L
1170	Ethanol	3	II	Ethanol	2(Y)E	20	L
1299	Turpentine	3	III	Turpentine	3(Y)	205	L
1950	Aerosols	2.1		Aerosols		20	L

Depot No	Type of storage location or process	Class	Maximum Storage Capacity (L, kg)
DG24	Cylinder(s) in Use	2.1	100L

UN Number	Proper Shipping Name	Class	PG (I,II,III)	Product or Common Name	HazChem Code	Typical Qty	Unit eg L, kg
1006	Argon Compressed	2.2		Argon	2(T)	25m3	m^3
1001	Acetylene Dissolved	2.1		Acetylene	2(S)E	7.2	kg
1072	Compressed Oxygen	2.2		Oxygen	2(S)	1.6	m^3



DETAIL A - WORKSHOPS
SCALE 1:1000

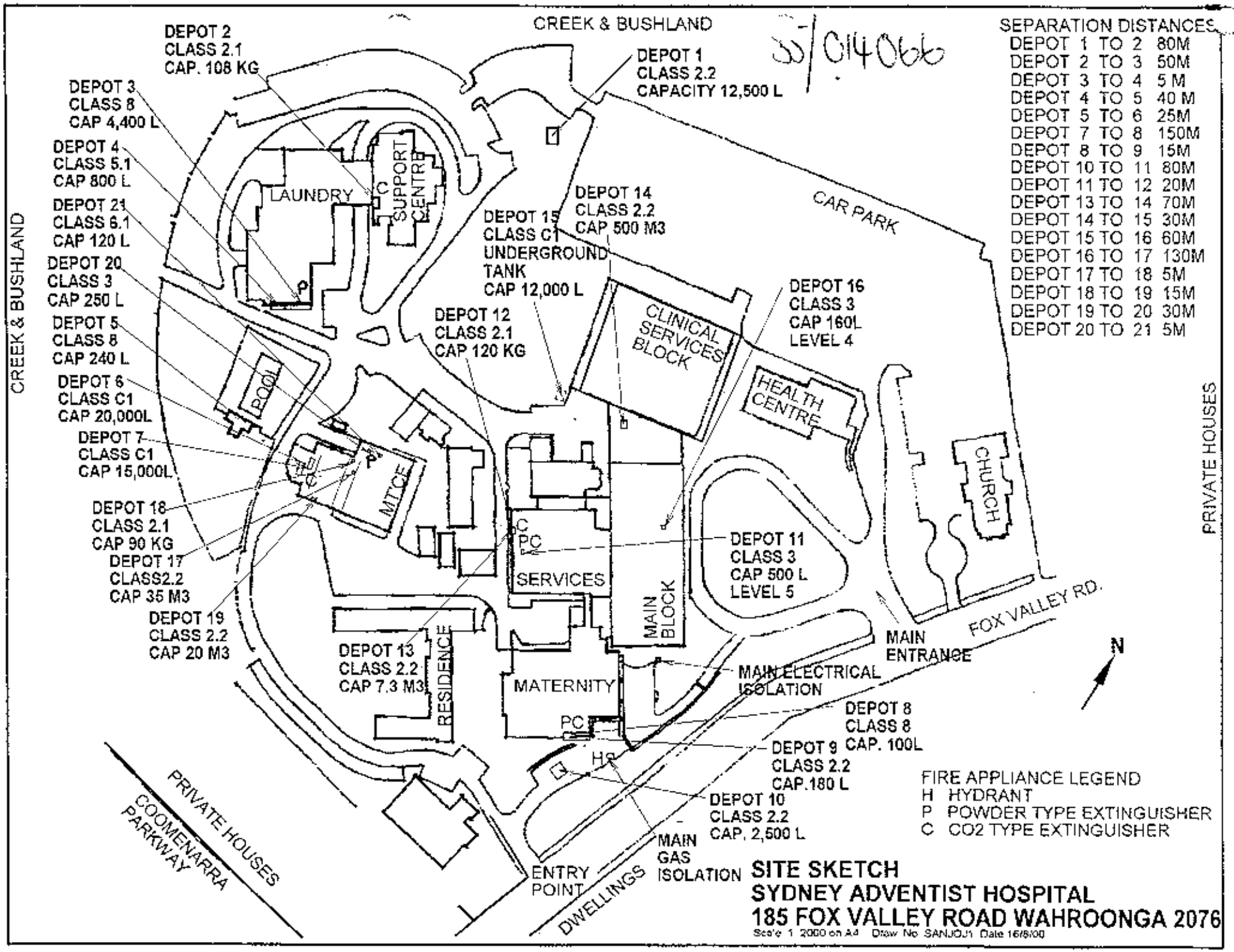
SEPARATION DISTANCES

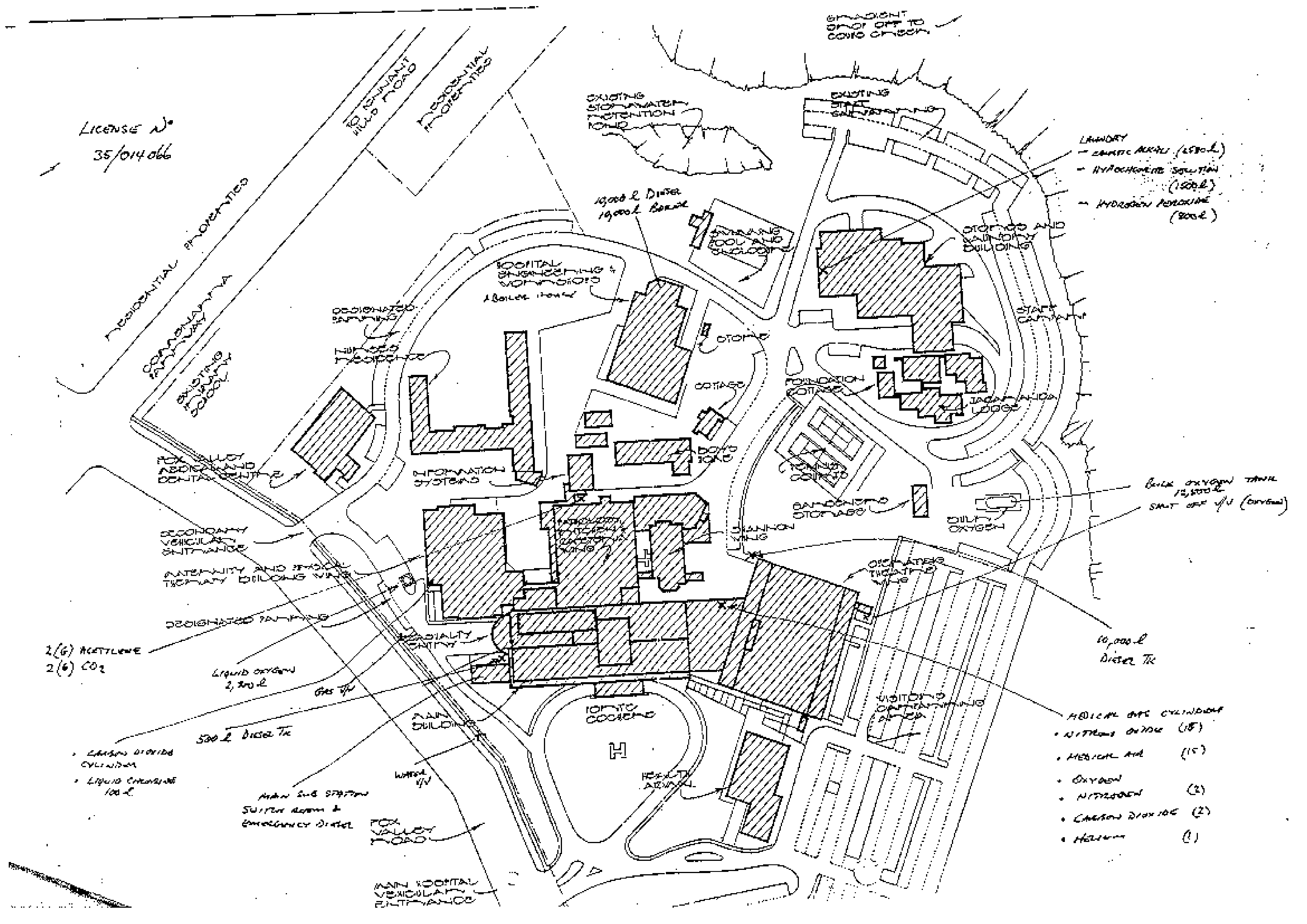
DG1 - DG2 80m
DG2 - DG5 100m
DG5 - DG6 25m
DG6 - DG7 3m
DG5 - DG18 14m
DG18 - DG17 10m
DG17 - DG20 10m
DG20 - DG21 5m
DG17 - DG23 30m
DG12 - DG13 5m
DG12 - DG11 40m
DG9 - DG10 20m
DG10 - DG8 7m
DG10 TO BOUNDARY 20m
DG1 TO CREEK 50m
DG5 TO BOUNDARY 50m

TITLE

SYDNEY ADVENTIST HOSPITAL
SITE PLAN
DANGEROUS GOODS STORAGE

SIZE	DRAWN BY	DWG NO	REV
A4	B JAKOVAC	SAH_DG_01	A
SCALE 1:2500	31 JULY 2008	SHEET	


CREEK & BUSHLAND
DEPOT 2
CLASS 2.1
CAP. 108 KG
DEPOT 1
CLASS 2.2
CAPACITY 12,500 L
SEPARATION DISTANCES
DEPOT 1 TO 2 80M
DEPOT 2 TO 3 50M
DEPOT 3 TO 4 5 M
DEPOT 4 TO 5 40 M
DEPOT 5 TO 6 25M
DEPOT 7 TO 8 150M
DEPOT 8 TO 9 15M
DEPOT 10 TO 11 80M
DEPOT 11 TO 12 20M
DEPOT 13 TO 14 70M
DEPOT 14 TO 15 30M
DEPOT 15 TO 16 60M
DEPOT 16 TO 17 130M
DEPOT 17 TO 18 5M
DEPOT 18 TO 19 15M
DEPOT 19 TO 20 30M
DEPOT 20 TO 21 5M
DEPOT 3
CLASS 8
CAP 4,400 L
DEPOT 4
CLASS 5.1
CAP 800 L
DEPOT 21
CLASS 6.1
CAP 120 L
DEPOT 20
CLASS 3
CAP 250 L
DEPOT 5
CLASS 8
CAP 240 L
DEPOT 6
CLASS C1
CAP 20,000L
DEPOT 7
CLASS C1
CAP 15,000L
DEPOT 18
CLASS 2.1
CAP 90 KG
DEPOT 17
CLASS2.2
CAP 35 M3
DEPOT 19
CLASS 2.2
CAP 20 M3
LAUNDRY
SUPPORT CENTRE
POOL
MTCE
DEPOT 15
CLASS C1
UNDERGROUND
TANK
CAP 12,000 L
DEPOT 14
CLASS 2.2
CAP 500 M3
DEPOT 12
CLASS 2.1
CAP 120 KG
CLINICAL SERVICES BLOCK
DEPOT 16
CLASS 3
CAP 160L
LEVEL 4
CAR PARK
HEALTH CENTRE
CHURCH
PRIVATE HOUSES
SERVICES
MAIN BLOCK
DEPOT 11
CLASS 3
CAP 500 L
LEVEL 5
FOX VALLEY RD.
MAIN ENTRANCE
N
DEPOT 13
CLASS 2.2
CAP 7.3 M3
RESIDENCE
MATERNITY
MAIN ELECTRICAL ISOLATION
DEPOT 8
CLASS 8
CAP. 100L
DEPOT 9
CLASS 2.2
CAP.180 L
DEPOT 10
CLASS 2.2
CAP. 2,500 L
MAIN GAS ISOLATION
ENTRY POINT
DWELLINGS
PRIVATE HOUSES
COOMENARRA PARKWAY
FIRE APPLIANCE LEGEND
H HYDRANT
P POWDER TYPE EXTINGUISHER
C CO2 TYPE EXTINGUISHER
SITE SKETCH
SYDNEY ADVENTIST HOSPITAL
185 FOX VALLEY ROAD WAHROONGA 2076
Scale 1 2000 on A4 Draw No SANJOJ1 Date 16/8/00



LICENSE No
35/014066
RESIDENTIAL PROPERTIES
EXISTING STORMWATER DETENTION POND
LAUNDRY
- Hypochlorite Solution (1500 L)
- Hydrogen Peroxide (300 L)
STORES AND LAUNDRY BUILDING
STAFF CARPARK
JACARANDA LODGE
FOUNDATION COTTAGE
COTTAGE
STORE
TENNIS COURTS
HOSPITAL ENGINEERING & WORKSHOPS
& Boiler House
INFORMATION SYSTEMS
DESIGNATED PARKING
SECONDARY VEHICULAR ENTRANCE
MATERNITY AND PHYSICAL THERAPY BUILDING WING
SHANNON WING
OPERATING THEATRE WING
Bulk oxygen tank
Shut off V/V (oxygen)
10,000 L Diesel Tk
VISITORS CARPARKING AREA
Medical gas cylinders
• Nitrous Oxide (15)
• Medical Air (15)
• Oxygen
• Nitrogen (2)
• Carbon Dioxide (2)
• Helium (1)
H
MAIN BUILDING
SPECIALTY ENTRY
2(G) Acetylene
2(G) CO2
Gas V/V
500 L Diesel Tk
• Carbon Dioxide cylinder
• Liquid Chlorine 100 L
Water V/V
Main Sub Station
Switch Room &
Emergency Diesel
FOX VALLEY ROAD
MAIN HOSPITAL VEHICULAR ENTRANCE

WorkCover New South Wales, 400 Kent Street, Sydney 2000 Telephone 9370 5000 ALL MAIL TO G.P.O. BOX 5364 SYDNEY 2001

Licence No: 35/014066

APPLICATION FOR RENEWAL

OF LICENCE TO KEEP DANGEROUS GOODS

WORKCOVER NEW SOUTH WALES

ISSUED UNDER AND SUBJECT TO THE PROVISIONS OF THE DANGEROUS GOODS ACT, 1975 AND REGULATION THEREUNDER

DECLARATION: Please renew licence number 35/014066 to 18/07/2000 . I confirm that all the licence details shown below are correct (amend if necessary).

R L Herbert ..... RONALD LESLIE HERBERT ..... 3/12/99 .....

(Signature) *(Please print name)* *(Date signed)*

for: AUSTRALASIAN CONFERENCE ASSOC LTD AS CORPORATE TRUSTEE FOR SYDNEY ADVENTIST HOSPITAL.

*THIS **SIGNED** DECLARATION SHOULD BE **RETURNED TO:***

WorkCover New South Wales
Dangerous Goods Licensing Section
GPO BOX 5364
SYDNEY 2001

Enquiries: ph (02) 9370 5187
fax (02) 9370 6105

Details of licence on 19 November 1999 ASSOCIATION LTD

Licence Number 35/014066 **Expiry Date** 18/07/1999

Licensee AUSTRALASIAN CONFERENCE ~~ASSOC~~ LTD AS CORPORATE TRUSTEE FOR
SYDNEY ADVENTIST HOSPITAL ~~ACN 000 000 010~~ ACN 000 003930

Postal Address: SYDNEY ADVENTIST HOSPITAL 185 FOX VALLEY RD WAHROONGA NSW 2076

Licensee Contact ~~SUSAN MATTHEWS~~/DOUG HITCHICK Ph. 9487 9070 Fax. 9489 7715

Premises Licensed to Keep Dangerous Goods
~~AUSTRALASIAN CONFERENCE ASSOC LTD~~ SYDNEY ADVENTIST HOSPITAL
185 FOX VALLEY RD WAHROONGA 2076

RECEIVED
20 DEC 1999
SCIENTIFIC SERVICES

Nature of Site HOSPITALS (EXCEPT PSYCHIATRIC HOSPITALS)

Major Supplier of Dangerous Goods NOT APPLICABLE

Emergency Contact for this Site SECURITY SERVICE (PAGE 033) Ph. 9487 9111

Site staffing 18 HRS 5 DAYS

Details of Depots

Depot No.	Depot Type	Goods Stored in Depot	Qty
H1	ROOFED STORE	Class 3	1000 L
	UN 1170 ETHANOL (ETHYL ALCOHOL)		800 L
LS1	ABOVE-GROUND TANK	Class 8	2580 L
	UN 1719 CAUSTIC ALKALI LIQUID, N.O.S.		2580 L
LS2	ABOVE-GROUND TANK	Class 8	1500 L
	UN 1791 HYPOCHLORITE SOLUTION		1500 L
LS3	ABOVE-GROUND TANK	Class 5.1	800 L
	UN 2014 HYDROGEN PEROXIDE, AQUEOUS SOLUTION		800 L

DATA
17 MAR 2000
ENTERED

Changed 27.3.00 TC

Form DG10

INCORPORATED IN NSW
ADVANCED POWER PRODUCTS (NSW) PTY LIMITED
33 Shepherd Street, Liverpool, NSW 2170
Telephone: (02) 600 6555 Facsimile: (02) 821 1936
ACN: 002 880 024

A/W
Australian Design Award 1988

April 4, 1995

Work Cover Authority,
Dangerous Goods Section,
Lot Bag 10,
Clarence Street Post Office,
SYDNEY NSW 2001

000633

RECEIVED
- 5 APR 1995
SCIENTIFIC SERVICES BRANCH

Attention : Mr. Phil Butt, Chief Inspector

Dear Sir,

RE: SYDNEY ADVENTIST HOSPITAL
185 FOX VALLEY ROAD, WAHROONGA.

We have been contracted to supply and install a Diesel Generator System at the above premises. Part of this system, is the installation of a 10,000 litre capacity inground bulk distillate fuel tank.

On behalf of the owners "Adventist Hospital" and the builder "Fletcher Constructions", we wish to submit an application for approval, to install an inground bulk fuel tank, as detailed on the enclosed drawing JE 346-09A.

The installation will comply with the requirements of AS 1940, as well as being provided with remote contents indication and cathodic protection of inground tank.

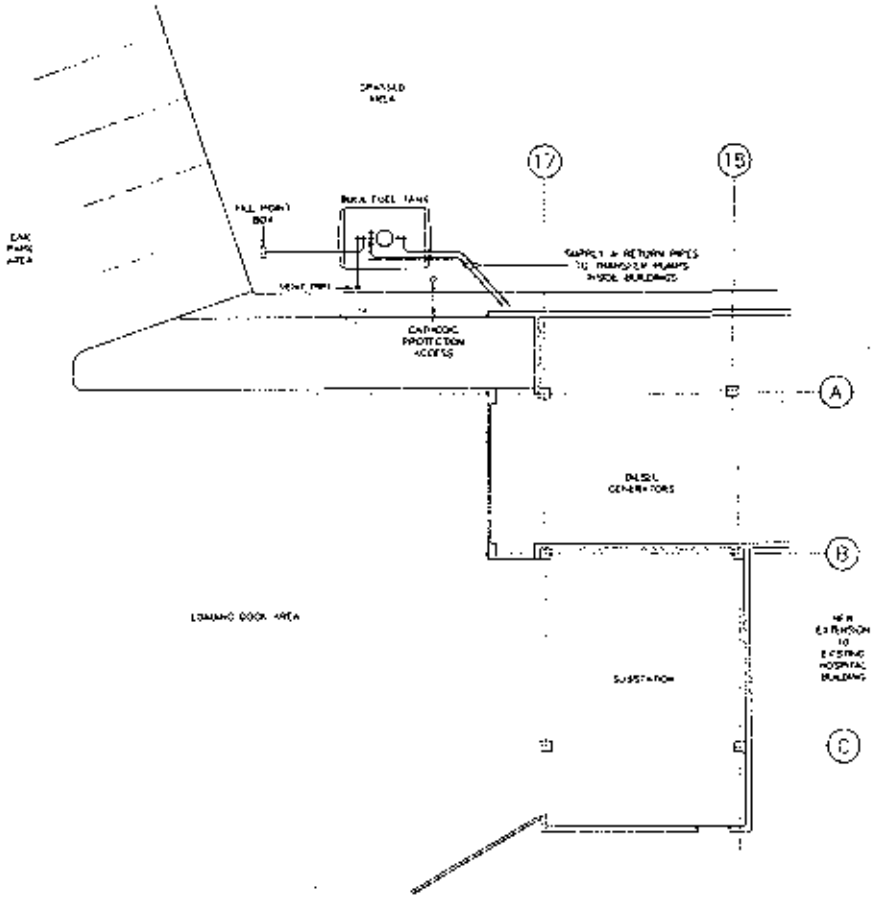
We trust the enclosed drawings contains sufficient information for your requirements. However, should you require any additional information, please advise the undersigned.

Thanking you for your assistance and advice,

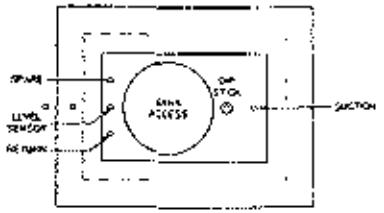
Yours faithfully,
ADVANCED POWER PRODUCTS (NSW) PTY.LTD.

A.J. WALKER
ASST. GENERAL MANAGER

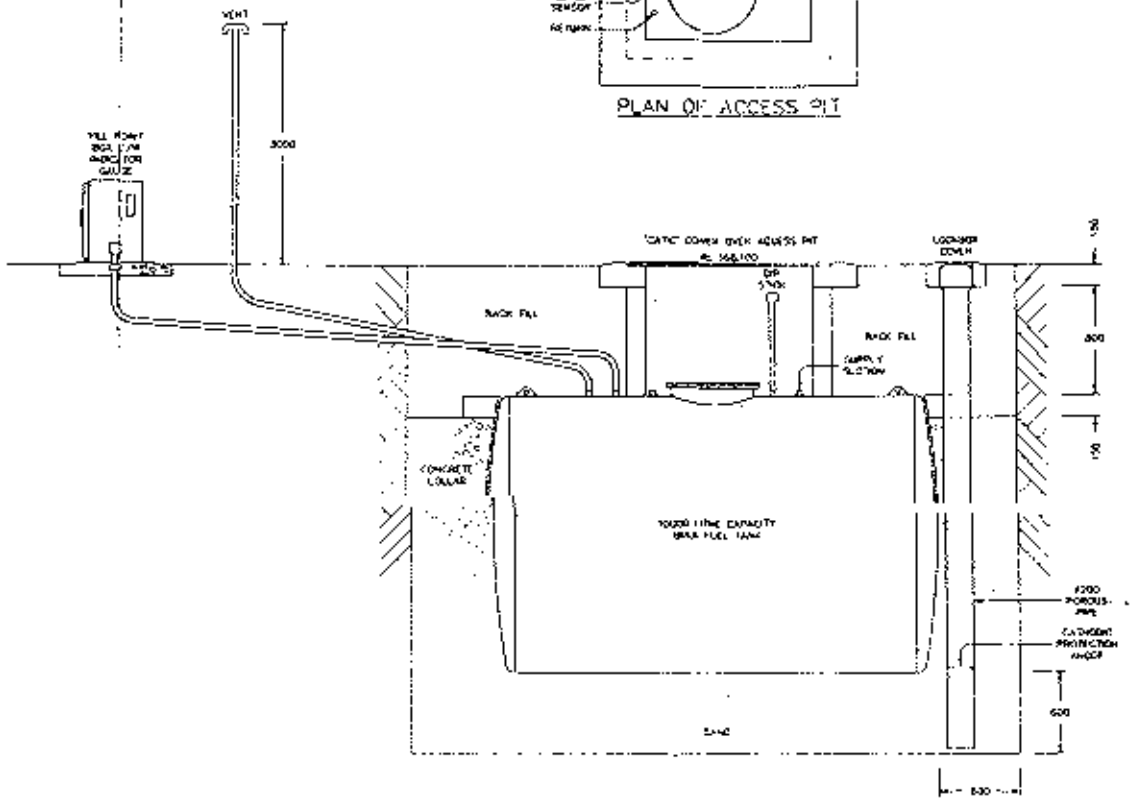
Please attach to 35/014066.
Thank you.
Amanda.



LOCATION DIAGRAM



PLAN OF ACCESS PIT



TYPICAL INSTALLATION DETAILS

APPROVED

WorkCover Authority

KENNEDY & TAYLOR PTY LTD

SYDNEY ADVENTIST HOSPITAL

ADVANCED POWER PRODUCTS PTY LTD

DIESEL GENERATOR

LICENCE No. 35014066.5

DANGEROUS GOODS ACT, 1975

DG 8207 0001 — — * 83

APPLICATION FOR LICENCE (or AMENDMENT or TRANSFER of LICENCE)
FOR THE KEEPING OF DANGEROUS GOODS

Application is hereby made for— *a licence (or amendment of the licence) *the transfer of the licence for the keeping of dangerous goods in or on the premises described below.

(*delete whichever is not required)

FEE: $10.00 per Depot for new licence.
$10.00 for amendment or transfer.

Name of Applicant in full (see over)	Australian Conference Association Limited.
Trading name or occupier's name (if any)	Sydney Adventist Hospital
Postal address	3366 10/09/83 Postcode
Address of the premises including street number (if any)	185 Fox Valley Road Wahroonga Postcode 2076
Nature of premises (see over)	Hospital
Telephone number of applicant	STD Code Number 4879111

Particulars of type of depots and maximum quantities of dangerous goods to be kept at any one time.

Depot number	Type of depot (see over)	Storage capacity	Dangerous goods: Product being stored	C & C Office use only
		Litre	D1)	004 060 7
1	Underground Tank	15000	Class 3.1 Petrol	2 020 24
2	✓	15000	✓ ✓ ✓	2 020 24
3	Aboveground Tank	2172 m^3	Class 2.2 Oxygen	1 040 23
4	Roofed Package Store	1000	Class 3.1, 3.2	6 020 13
5	([illegible])			
6				
7				
8				
9				
10				
11				
12				

Has site plan been approved? Yes ~~No~~ — If yes, no plans required. If no, please attach site plan.

Have premises previously been licensed? Yes ~~No~~ — If yes, state name of previous occupier. As above

Name of company supplying flammable liquid (if any) Mobil

Signature of applicant [signature] Date [illegible] 9.83

For external explosives magazine(s), please fill in side 2.

HOSPITAL SECRETARY - LICENSEE

FOR OFFICE USE ONLY **CERTIFICATE OF INSPECTION**

I, [handwritten name, illegible] being an Inspector under the Dangerous Goods Act, 1975, do hereby certify that the premises described above do comply with the requirements of the Dangerous Goods Act, 1975, and the Dangerous Goods Regulation with regard to their situation and construction for the keeping of dangerous goods of the nature and in the quantity specified.

[signature] [illegible date]

DANGEROUS GOODS ACT, 1975 No. 14 of 1975

APPLICATION FOR LICENCE (or AMENDMENT or TRANSFER of LICENCE) FOR THE KEEPING OF DANGEROUS GOODS

Application is hereby made for—*a licence (or amendment of the licence) *the transfer of the licence for the keeping of dangerous goods in or on the premises described below.

(*delete whichever is not required)

FEE: $10.00 per Depot

7490 17/07/80 03A

Name of Applicant in full (see over)	AUSTRALIAN CONFERENCE ASSOCIATION LIMITED., Surname ..... Given Names .....
Trading name or occupier's name (if any)	SYDNEY ADVENTIST HOSPITAL
Postal address	Postcode
Telephone number of applicant	STD Code Number
Address of the premises in or on which the depot or depots are situated (including street number, if any)	185 Fox Valley Road, WAHROONGA Postcode 2076
Nature of premises (see over)	Hospital

PLEASE ATTACH SITE PLAN

Particulars of type of depots and maximum quantities of dangerous goods to be kept at any one time.

Depot number	Type of depot (see over)	Storage capacity	Dangerous goods ND 003 060 0 Product being stored	C & C Office use only
1	Underground Tank	15000 ltre	Petrol .. Class 3.1	2 020 29
2	" "	15,000 "	" .. " "	2 020 29
3	Aboveground Tank	2172 m^3	Oxygen .. " 2.3	1 040 23
4				
5				
6				
7				
8				
9				
10				
11				
12				

Name of company supplying flammable liquid (if any) MOBIL

Have premises previously been licensed? YES

If known, state name of previous occupier as above Licence No. 14066-07

SYDNEY ADVENTIST HOSPITAL

Signature of applicant ..... Date 1 JUL 1980

For external explosives magazine(s), please fill in side 2.

FOR OFFICE USE ONLY

LICENCE No.

CERTIFICATE OF INSPECTION

I ..... being an Inspector under the Dangerous Goods Act,

Page 1

Register No. 1066

INFLAMMABLE LIQUID ACT, 1915 (AS AMENDED)

Application for Registration of Premises or Store Licence under Division B or for the transfer alteration or amendment of any such Registration or Licence, for the keeping of Inflammable Liquid and/or Dangerous Goods, in accordance with the provisions of the Inflammable Liquid Act, 1915 (as amended), for the ensuing year.

(MOBIL)

DIRECTIONS

1. Applications must be forwarded to the Chief Inspector of Inflammable Liquid, Explosives Department, Box R.216, Royal Exchange Sydney, N.S.W. 2000 and must be accompanied by the prescribed fee, as set out hereunder:

Registration of Premises (Fee $3.00 p.a.) – For quantities not exceeding 300 gallons of mineral oil and 100 gallons of mineral spirit, if kept together; or 800 gallons of mineral oil and 100 gallons of mineral spirit, if kept in separate depots; or 500 gallons of mineral spirit, if kept in an underground tank depot; or 800 gallons of mineral oil and 500 gallons of mineral spirit, if mineral spirit is kept in an underground tank depot.

In addition to, or in lieu of the above, similar quantities of Dangerous Goods of Classes 1 and 2 may be kept under the like conditions; reading Dangerous Goods of Class 1 for the words Mineral Spirit and Dangerous Goods of Class 2 for the words Mineral Oil.

Store License, Div. A (Fee, $6.50 p.a.) – For quantities in excess of those stated above, but not exceeding 4,000 gallons mineral oil and/or mineral spirit, and/or Dangerous Goods of Classes 1, 2 and 9.

Store License, Div. B (Fee, See Regulation 7) – For quantities exceeding 4,000 gallons of mineral spirit, and/or dangerous goods of Classes 1 and 2, and/or dangerous goods of Class 3.
For the keeping of Dangerous Goods of Classes 3 and/or 4. ($15.00 p.a.).

Fees for the keeping of inflammable liquid and dangerous goods in excess of the above stated quantities and also for Liquid Petroleum Gas storage are set out in Regulation 7.

Amendment A14066 to 15-7-72

1. Name of occupier including full christian names.	AUSTRALIAN CONFERENCE ASSOCIATION LIMITED
2. Trading Name (if any)	SYDNEY SANITARIUM HOSPITAL
3. Locality of the premises in which the depot or depots are situated	No. or Name 185 Street FOX VALLEY ROAD Town WAHROONGA
4. Postal address	as above Postcode 2076
5. Occupation	Hospital Proprietors
6. Nature of premises (dwelling, garage etc.)	Hospital

7. Particulars of construction of depots and maximum quantities of inflammable liquid and/or Dangerous Goods to be kept at any one time.

PLEASE ATTACH ~~PLAN OF PREMISES~~

Depot No.	Construction of depots*			Inflammable liquid		Dangerous goods					
	Walls	Roof	Floor	Mineral spirit gallons	Mineral oil gallons	Class 1 gallons	Class 2 gallons	Class 3 lb	Class 4 cu ft	Class 5A water gal	Class 9 gallons
1	Underground Tank			3000							
2	—	—		3000							
3								Bank		15 00	
4											
5											
6										0659	
7											
8											
9											
10											

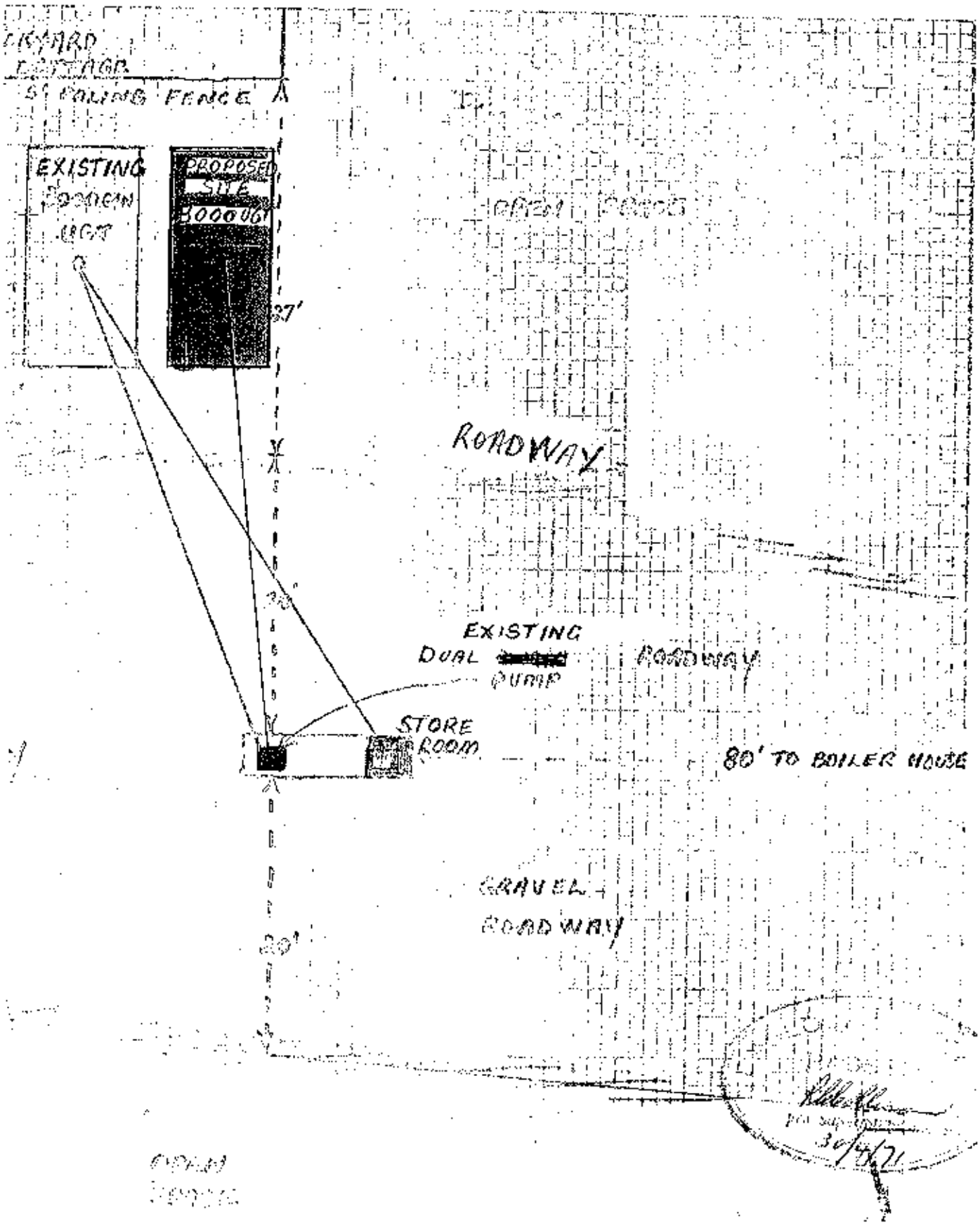
* If product is kept in tanks describe depots as underground or aboveground tanks.

Signature of applicant

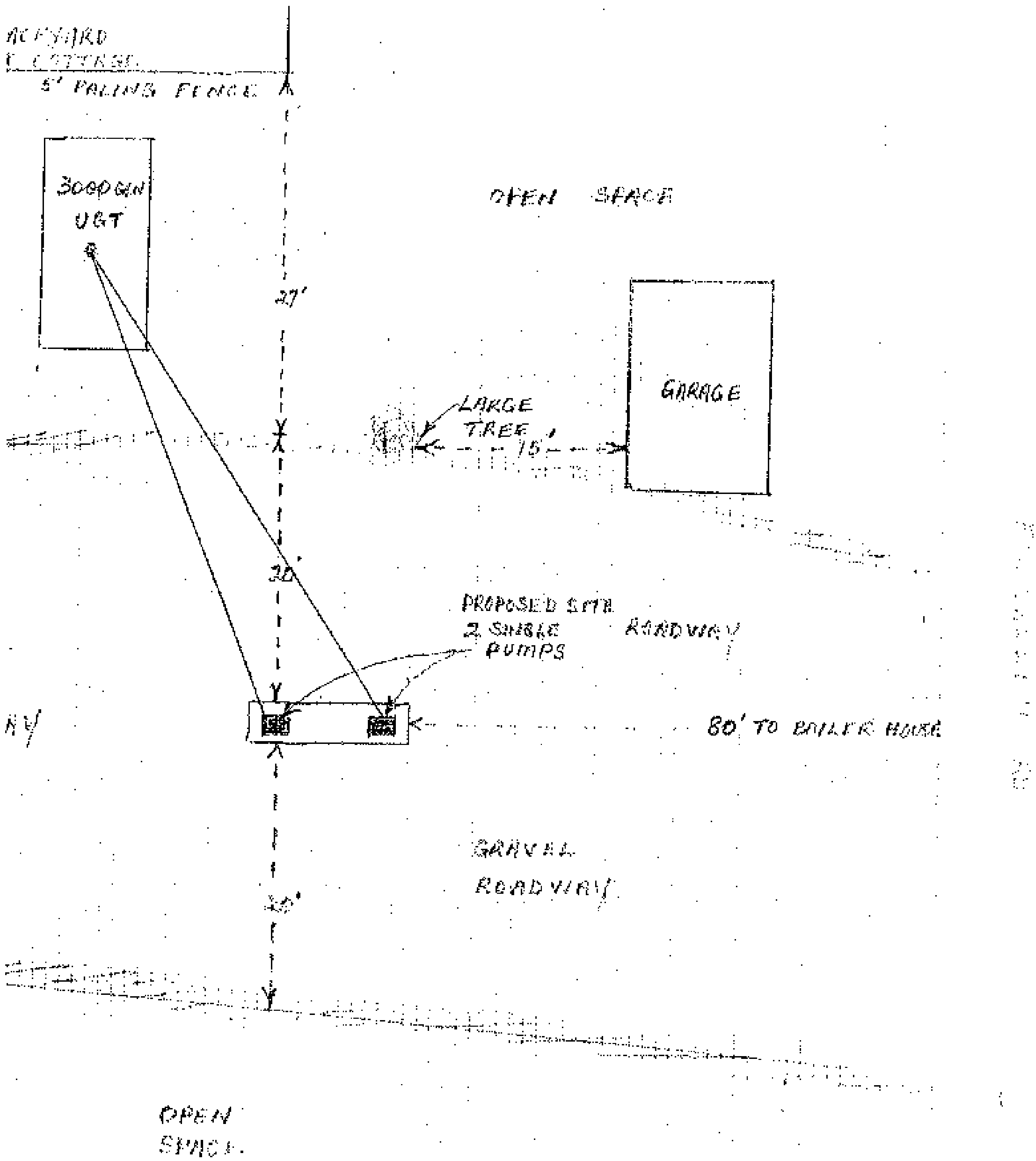
Date of application 4/7/71

CERTIFICATE OF INSPECTION

REAR OF SANITARIUM HOSPITAL WAHROONGA.



REAR OF [illegible] HOSPITAL [illegible]



Sc. 1/10 = 1 ft

APPENDIX D

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 Environmental Investigation Services. 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

(i) prepare a test pit/borehole log.

(ii) 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.

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

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

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

(vi) Label the jar with the EIS job number, sample location (eg. TP1), sampling interval and date. If more than one sample container is used, this should also be indicated (eg. 2 = Sample jar 1 of 2 jars).

(vii) 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 glass jars. PID headspace data is recorded on the borehole/test pit log and the chain of custody forms.

(viii) Record the lithology of the sample and sample depth on the borehole/test pit log in accordance with AS1726-1993.

(ix) 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.

(x) 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.

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

DECONTAMINATION PROCEDURES FOR SOIL SAMPLING EQUIPMENT

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

(ii) The following equipment and materials are required for the decontamination procedure:

- Phosphate free detergent (Extran 100)
- Tap water
- Two buckets
- Stiff brushes
- Plastic sheets

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

(iv) Fill both buckets with clean tap water and add phosphate free detergent to one bucket.

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

(vi) Rinse sampling equipment in the bucket containing tap water.

(vii) 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 details in AS2306.1 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 piezometers.

(i) After piezometer installation, at least four bore volumes should be pumped from the piezometers to remove any water introduced during the drilling process. Piezometers should then be left to recharge for at least five 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.

(ii) Take the groundwater level from the collar of the piezometer using an electronic dipmeter. The collar level should be taken during the site visit using a dumpy level and staff.

(iii) Purging and sampling of piezometers should generally be done on the same site visit. 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:

- New disposable polyethylene bailer and sufficient cord OR submersible pump.
- Micropore filtration system (for heavy metals samples).
- Filter paper (glass fibre and 0.45(m).
- Buckets with volume increments.
- Sample containers – at least 1 x Teflon bottle with 1ml nitric acid, 1 x 75mL glass vial and 2 x 1L amber glass bottles for each piezometer.
- pH/Cond/Eh/T meters.
- Glass jars for purged samples.
- Esky and ice.
- Latex gloves.
- Distilled water (for cleaning).
- Electronic dipmeter.
- Groundwater sampling forms and notebook.
- Aluminium foil and labels.

(iv) 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.

(v) 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.

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

(vii) Purge at least four bore volumes from the well. Take pH, conductivity, redox potential, and temperature measurements of the purged groundwater at regular intervals during purging. (Say, every 5-10 litres if abundant groundwater and every 1 litre if only limited groundwater is encountered). Groundwater condition measurements should be taken from a sample in a clean glass jar which has been taken directly from the sampling equipment (either pump or bailer). Electrodes should be placed in the sample after the electrodes have been rinsed with distilled water. Purged volumes and groundwater measurements should be recorded on the field sampling sheet. An assessment of the turbidity of the sample should also be made based on three categories: silty, opaque and clear.

(viii) Prepare all sample bottles. Label bottles with EIS job number, borehole number and date of collection.

(ix) Fill amber sample bottles and BTEX vial directly from pump or bailer. Ensure sampling equipment does not touch sample containers. Sample bottles and vials must be filled to the brim, so that a reverse meniscus is formed, seal with aluminium foil and then cap. Check that no air has entered the sample invert and check for bubbles.

(x) Fill vacuum filtration system and turn on filter pump.

(xi) Undertake pH/Cond/Eh/T of a sample taken in a clean glass jar used only for groundwater condition measurements. Turn the meters on and insert the electrodes into the sample. Record the measurements when the instruments have stabilized, then discard the sample. Clean the electrodes with distilled water between measurements.

(xii) When the sample filtering is complete (note: at least 50mL of filtered sample is required for heavy metal analysis), decant the filtered sample into a Teflon bottle containing nitric acid. Check label of sample bottle to ensure container has been treated with nitric acid and not sulfuric acid. Clean the filtration system with distilled water and replace the filters ready for the next sample.

(xiii) Photoionisation detector (PID) screening of volatile organic compounds (VOC) should be undertaken on groundwater samples using the sample headspace method during fieldwork. VOC data is obtained from partly filled glass jar samples following equilibration of the headspace gases. The PID headspace data should be included on the chain of custody forms and borehole logs.

(xiv) 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.

(xv) 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 PROCEDURE FOR GROUNDWATER SAMPLING EQUIPMENT

(i) All of the equipment associated with the groundwater sampling procedure should be decontaminated between every sampling location.

(ii) The following equipment and materials are required for the decontamination procedure:

- Phosphate free detergent (Extran 100).
- Tap water.
- Distilled water.
- Two buckets.
- Plastic sheets.

(iii) Fill one bucket with clean tap water and phosphate free detergent, and one bucket with distilled water.

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

(v) Flush pump with distilled water.

(vi) Change water and detergent solution after each sampling location.

(vii) Rinse sampling equipment in the bucket containing distilled water.

(viii) Place cleaned equipment on clean plastic sheets.

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 current US EPA SW-846 (1994) methods and those described in Environmental Sampling and Analysis, A Practical Guide, (H. Keith 1991).

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).

Accuracy

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.

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.

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;

$$\frac{(\text{spiked sample result} - \text{sample result})}{\text{concentration of spike added}} \times 100$$

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:

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

where D1 is the sample concentration and D2 is the duplicate sample concentration.

APPENDIX E

EIS

Groundwater Monitoring Well Development Report

Client:	Origin Properties	**Job No.:**	E22758K
Project:	Proposed Upgrade and Extensions	**Well No.:**	MW14
Location:	San Hospital, Fox Valley Road, Wahroonga	**Depth (m):**	

WELL FINISH DETAILS

X	**Gatic Cover**		**Standpipe**		**PVC Pipe**

WELL DEVELOPMENT DETAILS

Method:	Electric Pump	**SWL – Before: (m)**	2.94
Date:	28.02.09	**Time – Before:**	--
Undertaken By:	BP	**SWL – After: (m)**	5.53
Total Vol. Removed:	Approx 9L	**Time – After:**	--
PID Reading (ppm):			

Comments:

DEVELOPMENT MEASUREMENTS

Volume Removed (L)	Temp (°C)	pH	EC (mS/m)	DO (mg/L)	Eh (mV)
1	30.3	5.86	295.0		18.2
3	21.2	5.94	131.3		76.2
6	21.3	5.98	86.8.9		84.4
9	21.3	5.69	69%		110.3
effectively dry					

Comments:

Tested By:	
Date Tested:	
Checked By:	
Date:	

Remarks:

- All measurements are corrected to ground level
- All stated Volumes are in Litres
- SWL is an abbreviation for standing water level
- Steady state conditions - difference in the pH less than 0.2 units and difference in conductivity less than 10%
- Minimum 3 monitoring well volumes are purged

EIS

Groundwater Monitoring Well Development Report

Client:	Origin Properties	**Job No.:**	E22758K
Project:	Proposed Upgrade and Extensions	**Well No.:**	MW3
Location:	San Hospital, Fox Valley Road, Wahroonga	**Depth (m):**	

WELL FINISH DETAILS

X	**Gatic Cover**		**Standpipe**		**PVC Pipe**

WELL DEVELOPMENT DETAILS

Method:	Electric Pump	**SWL – Before: (m)**	4.47
Date:	23-02-09	**Time – Before:**	
Undertaken By:	[illegible]	**SWL – After: (m)**	[illegible]
Total Vol. Removed:	2 l	**Time – After:**	
PID Reading (ppm):			

Comments:

DEVELOPMENT MEASUREMENTS

Volume Removed (L)	Temp (°C)	pH	EC (mS/m)	DO (mg/L)	Eh (mV)
2	22.3	4.93	725.4		351.6
effectively dry					

Comments: [illegible]

Tested By: Date Tested: Checked By: Date:	**Remarks:** - All measurements are corrected to ground level - All stated Volumes are in Litres - SWL is an abbreviation for standing water level - Steady state conditions - difference in the pH less than 0.2 units and difference in conductivity less than 10% - Minimum 3 monitoring well volumes are purged

Cal pH 7 batch GC2068 exp Sep 09 pH 7.00 SLP 99.5%
4 batch GC1110 exp Jan 10 pH 4.01

Cal EC batch 11285 exp Jan 09, value 1476µs @ 21.2°c, expected [illegible]

Cal batch [illegible]

JOB NO: E227548K
LOCATION: SAN HOSPITAL, WAHROONGA

FIELD CALIBRATION CERTIFICATE

PID

Make: MiniRAE	Model: 2000	Unit:	Date of last factory calibration:
Date of calibration:		Name of Calibrator:	
Calibration gas: Iso-butylene		Calibration Gas Concentration:	100.0 ppm
Measured reading: ppm		Error in measured reading: ±	ppm

DISSOLVED OXYGEN

Make:	Model:
Date of calibration:	Name of Calibrator:
Theoretical value: 101% to 103%	
Measured value:	

pH METER

Make: Orion	Model: Four star	
Date of calibration: 23.03.09	Name of Calibrator: BP	
Buffer 1: Theoretical pH = 7.01± 0.01	Expiry date: Sep 09	Lot No: QC 2068
Buffer 2: Theoretical pH = 4.01± 0.01	Expiry date: Jan 10	Lot No: QC 1110
Measured reading of Buffer 1: 7.00		
Measured reading of Buffer 2: 4.01		
Slope: 99.5 %		

CONDUCTIVITY METER

Make: Orion		Model: 130a	
Date: 23.03.09	Name of Calibrator: BP		Temperature: 24.2 °C
Calibration solution: Intermediate Standard		Expiry date: Jun 09	Lot No: T1 1283
Theoretical conductivity at temperature (see solution container):			1376 µS/cm
Measured conductivity:			1476 µS/cm

REDOX METER

Make: Orion	Model: 250A	
Date of calibration: 23.03.09	Name of Calibrator: BP	
Calibration solution:	Expiry date:	Lot No:
Theoretical redox value: 240mV		
Measured redox reading: 241.7 mV		

JOB NO: E227548K
LOCATION: SAN HOSPITAL, WAHROONGA

FIELD CALIBRATION CERTIFICATE

PID

Make: MiniRAE	Model: 2000	Unit: 2	Date of last factory calibration:
Date of calibration: 18-03-09		Name of Calibrator: BP	
Calibration gas: Iso-butylene		Calibration Gas Concentration:	100.0 ppm
Measured reading: 100 ppm		Error in measured reading: ±	0 ppm

DISSOLVED OXYGEN

Make:	Model:
Date of calibration:	Name of Calibrator:
Theoretical value: 101% to 103%	
Measured value:	

pH METER

Make: Orion	Model: Four star	
Date of calibration:	Name of Calibrator:	
Buffer 1: Theoretical pH = 7.01± 0.01	Expiry date:	Lot No:
Buffer 2: Theoretical pH = 4.01± 0.01	Expiry date:	Lot No:
Measured reading of Buffer 1:		
Measured reading of Buffer 2:		
Slope:		

CONDUCTIVITY METER

Make: Orion		Model: 130a	
Date:	Name of Calibrator:		Temperature: °C
Calibration solution:		Expiry date:	Lot No:
Theoretical conductivity at temperature (see solution container):			µS/cm
Measured conductivity:			µS/cm

REDOX METER

Make: Orion	Model: 250A	
Date of calibration:	Name of Calibrator:	
Calibration solution:	Expiry date:	Lot No:
Theoretical redox value:	240mV	
Measured redox reading:	mV	

Groundwater Monitoring Well Sampling Report

Client:	Sydney Adventist Hospital	Job No.:	[illegible]
Project:	SAH Upgrade + extensions	Well No.:	MW3
Location:	Fox Valley Rd Wahroonga	Depth (m):	

WELL FINISH DETAILS

	Gatic Cover		Standpipe		PVC Pipe

WELL DEVELOPMENT DETAILS

Method:	[illegible]	SWL – Before: (m)	4.43m
Date:	[illegible]	Time – Before:	
Undertaken By:	[illegible]	SWL – After: (m)	
Total Vol. Removed:		Time – After:	
PID Reading (ppm):			

Comments:

DEVELOPMENT MEASUREMENTS

Volume Removed (L)	Temp (°C)	pH	EC (mS/m)	DO (mg/L)	Eh (mV)
Sample	[illegible]	[illegible]	[illegible]	NA	[illegible]

Comments: [illegible]

Tested By:	
Date Tested:	
Checked By:	
Date:	

Remarks:

- All measurements are corrected to ground level
- All stated Volumes are in Litres
- SWL is an abbreviation for standing water level
- Steady state conditions - difference in the pH less than 0.2 units and difference in conductivity less than 10%
- Minimum 3 monitoring well volumes are purged

EIS

Groundwater Monitoring Well Sampling Report

Client:	Sydney Adventist Hospital	**Job No.:**	E22758K
Project:	SAH Upgrade + Extensions	**Well No.:**	MW14
Location:	Fox Valley Rd, Wahroonga	**Depth (m):**	

WELL FINISH DETAILS

X	Gatic Cover		Standpipe		PVC Pipe

WELL DEVELOPMENT DETAILS

Method:	[illegible]	**SWL – Before: (m)**	3.280
Date:	[illegible]	**Time – Before:**	
Undertaken By:	[illegible]	**SWL – After: (m)**	
Total Vol. Removed:		**Time – After:**	
PID Reading (ppm):			

Comments:

DEVELOPMENT MEASUREMENTS

Volume Removed (L)	Temp (°C)	pH	EC (mS/m)	DO (mg/L)	Eh (mV)
Sample	21.2	[illegible]	[illegible]	[illegible]	[illegible]

Comments: DUP A taken

Tested By:	
Date Tested:	
Checked By:	
Date:	

Remarks:

- All measurements are corrected to ground level
- All stated Volumes are in Litres
- SWL is an abbreviation for standing water level
- Steady state conditions - difference in the pH less than 0.2 units and difference in conductivity less than 10%
- Minimum 3 monitoring well volumes are purged

JOB NO: E227548K
LOCATION: SAN HOSPITAL, WAHROONGA

FIELD CALIBRATION CERTIFICATE

PID

Make: MiniRAE	Model: 2000	Unit:	Date of last factory calibration:
Date of calibration:		Name of Calibrator:	
Calibration gas: Iso-butylene		Calibration Gas Concentration:	100.0 ppm
Measured reading:	ppm	Error in measured reading: ±	ppm

DISSOLVED OXYGEN

Make:	Model:
Date of calibration:	Name of Calibrator:
Theoretical value: 101% to 103%	
Measured value:	

pH METER

Make: Orion	Model: Four star	
Date of calibration: 21/3/08	Name of Calibrator: BV	
Buffer 1: Theoretical pH = 7.01± 0.01	Expiry date: Sep 08	Lot No: [illegible]
Buffer 2: Theoretical pH = 4.01± 0.01	Expiry date: Jan 10	Lot No: [illegible]
Measured reading of Buffer 1: 7.00		
Measured reading of Buffer 2: 4.01		
Slope: 100 %		

CONDUCTIVITY METER

Make: Orion		Model: 130a	
Date:	Name of Calibrator: BV		Temperature: 22.8 °C
Calibration solution:		Expiry date:	Lot No:
Theoretical conductivity at temperature (see solution container):			µS/cm
Measured conductivity:			1518 µS/cm

REDOX METER

Make: Orion	Model: 250A	
Date of calibration: 21/3/08	Name of Calibrator: BV	
Calibration solution: Redox	Expiry date: 2013	Lot No: [illegible]
Theoretical redox value:	240mV	
Measured redox reading:	240.4 mV	