



Douglas Partners

Geotechnics • Environment • Groundwater

Integrated Practical Solutions

**REPORT
ON
PRELIMINARY CONTAMINATION ASSESSMENT ON
STOCKPILED MATERIAL
AND GENERAL LAND QUALITY**

**LIGHT HORSE BUSINESS CENTRE (LHBC)
QUARRY ROAD
EASTERN CREEK**

Prepared for
DIAL A PRODUCT PTY LTD

Project 43756A
April 2006



Douglas Partners
Geotechnics • Environment • Groundwater

**REPORT
ON
PRELIMINARY CONTAMINATION ASSESSMENT ON
STOCKPILED MATERIAL
AND GENERAL LAND QUALITY**

**LIGHT HORSE BUSINESS CENTRE (LHBC)
QUARRY ROAD
EASTERN CREEK**

***Prepared for
DIAL A PRODUCT PTY LTD***

***Project 43756A
April 2006***

Douglas Partners Pty Ltd
ABN 75 053 980 117

96 Hermitage Road
West Ryde NSW 2114
Australia

PO Box 472
West Ryde NSW 1685

Phone (02) 9809 0666

Fax (02) 9809 4095

sydney@douglaspartners.com.au



EXECUTIVE SUMMARY

This report details the methodology and results of a Preliminary Contamination Assessment of Stockpiled Material conducted by Douglas Partners Pty Ltd (DP) at Quarry Road, Eastern Creek, New South Wales.

The subject site, Site A, is a 15 ha sub-section of a larger site owned by Dial A Product Pty Ltd (Site B), which includes Hanson Quarry (formerly Pioneer Quarry). Site A is overlain with an overburden stockpile material from the quarry. It is understood that this material is to be removed from the site and the area subdivided into allotments for commercial/ industrial land-use.

A review of available site history and previous environmental reports undertaken by others indicates that Site A and the surrounding area was used for agricultural purposes prior to the development of the quarry in the 1950's. By 1970 an extensive quarry pit had been excavated to the east of the site and office buildings, plants and stockpiled material were located to the south of the quarry. A significant volume of overburden, presumably from the quarry, had been placed on the northern portion of Site A. By 1986 the stockpile had been extended to the southern portion of Site A.

An excavator was used to excavate twenty one test pits at the site. Test pits at Locations 1 to 16 and 21 were in stockpiled material and those at Locations 17-20 were in natural in-situ material along the western portion of the subject site. The stockpiled material sourced as Virgin Excavated Natural Material (VENM) from the quarry area typically comprised grey-black ripped sandstone and mudstone filling, cobble and boulder inclusions and brown gravely clay filling with sandstone cobble inclusions. The in-situ natural material comprised brown silty top soil underlain by silty clay with some ironstone gravel.

The analytical results indicate that the heavy metal and PAH concentrations of the overburden stockpile material are within Australian background ranges. It is noted that one sample (15/0.8-1.0) recorded a concentration of nickel (100 mg/kg) above the NSW DEC provisional phototoxicity-based investigation levels (60 mg/kg), but within the DEC Health based investigation levels for residential use (600 mg/kg). The observed nickel concentration is consistent with those in materials collected from the adjacent quarry in a previous investigation undertaken by ADI (1998). In addition, it is noted that nickel is a

common element in basic igneous rocks with local dolerites understood to have levels >360 mg/kg, with chromium, >550 mg/kg, and copper >100 mg/kg.

The analytical results were found to be below the adopted threshold criteria for both the stockpile and the in-situ materials. On this basis, the stockpiled material can be considered to be VENM and is considered suitable for off-site re-use as fill. However, the assessment of the stockpile was limited to the top 2.8 m of the stockpile and accordingly if material different to that described in the test pit logs, or if material showing signs of contamination (identified by odours, stains, or anthropogenic inclusions) is encountered additional testing shall be required. Notwithstanding, it is recommended that additional samples are collected and analysed on a regular basis (and prior to removal) as the stockpile is progressively excavated for any off site re-use.

The preliminary analysis of in-situ material indicates that the site is suitable for commercial/ industrial use. However, following the removal of the stockpiled material it is recommended that additional field work and laboratory analysis and reporting are undertaken to a level commensurate with the site area intended for redevelopment and according to relevant published guidelines.

TABLE OF CONTENTS

	Page
1. INTRODUCTION	1
2. SCOPE OF WORKS	2
3. SITE DESCRIPTION	3
3.1 Site Location	3
3.2 Site Description	4
3.3 Proposed Development	4
4. REGIONAL GEOLOGY AND HYDROGEOLOGY	5
5. SITE HISTORY	6
5.1 Title Deeds	6
5.2 Aerial Photographs	6
5.3 Regulatory Notices Search	8
5.4 Blacktown City Council Section 149(2) Certificate	9
6. REVIEW OF PREVIOUS INVESTIGATIONS	9
6.1 Stage 1 Environmental Assessment of Pioneer Concrete (NSW) Wallgrove Quarry, December 1994 by Australian Defence Industries Services (ADI Services).....	10
6.2 <i>Stage 2 Environmental Assessment of Areas 1 and 3 Wallgrove Quarry</i> , March 1995, by Australian Defence Industries Services (ADI Services).....	11
6.3 Stage 3 Environmental Assessment of Pioneer Concrete (NSW) Wallgrove Quarry, April 1998 by Australian Defence Industries Services (ADI Services).....	12
6.4 Phase 1 Investigation for Lot 2 (DP262213), Archbold Road, Eastern Creek, NSW, October 2004 by CH2M Hill Australia Pty Ltd (CH2MHILL)	13
6.5 Lot 2 Deposit Plan (DP)262213 Archbold Road, Eastern Creek, NSW – Review of Previous Environmental Reports, December 2004, Environmental Resources Management Australia (ERM).	14
7. POTENTIAL CONTAMINANTS.....	14
8. ASSESSMENT CRITERIA.....	15
8.1 Site Assessment Criteria	15
9. FIELD INVESTIGATION	17
9.1 Sample Location Rationale.....	17
9.2 Sampling Methodology	17
9.3 Analytical Rationale	18

TABLE OF CONTENTS

	Page
10. RESULTS OF INVESTIGATION	19
10.1 Field Observations.....	19
10.2 Total Photoionisable Compounds (TOPIC) Results	21
10.3 Laboratory Analysis	21
10.3.1 Results of Laboratory Analysis	21
10.4 QA/QC Procedures and Results.....	25
11. DISCUSSION	25
11.1 Review of Available Site History Information	25
11.2 Overburden Stockpile Assessment	27
11.3 Preliminary Assessment of In-situ material	27
12. CONCLUSIONS	28
13. LIMITATIONS OF THIS REPORT	28
APPENDIX A: Notes Relating to this Report, Site Plan and Photographs	
APPENDIX B: DNR Groundwater Bore Search	
APPENDIX C: Title Deed Search Records	
APPENDIX D: Aerial Photographs	
APPENDIX E: Section 149 Planning Certificate	
APPENDIX F: ADI 1994 – Site Plan Areas 1-3	
APPENDIX G: Test Bore Report Sheets	
APPENDIX H: Laboratory Results	
APPENDIX I: Quality Assurance/Quality Control Procedures and Results	

CFK:jlb
Project 43756A
7 April 2006

**REPORT ON
PRELIMINARY CONTAMINATION ASSESSMENT OF STOCKPILED MATERIAL
AND GENERAL LAND QUALITY
QUARRY ROAD, EASTERN CREEK**

1. INTRODUCTION

This report details the methodology and results of a Preliminary Contamination Assessment of Stockpiled Material conducted by Douglas Partners Pty Ltd (DP) at Archbold Road, Eastern Creek, New South Wales. The investigation was commissioned by Mr Ian Malouf of Dial A Product Pty Ltd.

The subject site, Site A, is a 15 ha sub-section of a larger site owned by Dial A Product Pty Ltd (Site B), which includes Hanson Quarry (formerly Pioneer Quarry). Site A is overlain with an overburden stockpile material from the quarry. It is understood that this material is to be removed from the site and the area subdivided into allotments for commercial/industrial land-use.

The scope of the current assessment was to:

- Conduct a site history review; and
- Sample and analyse the in-situ sub-soils and the stockpile at a total of 21 locations. A detailed scope of works is provided in Section 2.

The objective of the Preliminary Assessment was to provide advice on the quality of the stockpiled material for re-use on or off the site and the suitability of the site for commercial use.

The current investigation has been carried out concurrently with a geotechnical investigation. The geotechnical findings are reported separately in a *Report on Geotechnical Investigation*, March 2006 by DP (Project 43756).

2. SCOPE OF WORKS

The scope of the current assessment comprised the following: -

- Undertake a site history search including a review of historical aerial photograph records, historical title deeds, Council records (s149(2)) certificate and a search of the NSW Department of Environment and Conservation (DEC) register for Notices issued under the Contaminated Land Management Act;
- Review available environmental information with reference to local soils and geology. Obtain and review Department of Natural Resources (DNR) groundwater bore records for the surrounding area (1 km);
- Review previous environmental investigations undertaken on the site;
- Excavate twenty one shallow test pits, using an excavator to a depth of 2.0 -3.0 m. Collect soil/filling samples at nominal depths of 0.3 - 0.5 m, 0.8 - 1.0 m and 1.8 - 2.0 m, or at signs of contamination. An additional 10% duplicates were collected for quality assurance and quality control (QA/ QC) requirements;
- Screen all samples collected with a photoionisation detector (PID) to detect the presence of volatile organic compounds;
- Conduct laboratory analysis on 26 selected samples (including 10% QA/ QC) at a NATA accredited analytical laboratory for a combination of the following potential contaminants:
 - Heavy metals (As, Cd, Cr, Cu, Pb, Hg, Ni, Zn);
 - Petroleum hydrocarbons (TPH) and mono - aromatic hydrocarbons (BTEX);
 - Polycyclic Aromatic Hydrocarbons (PAH);
 - Polychlorinated Biphenyls (PCB);
 - Organochlorine Pesticides (OCP);
 - Organophosphate Pesticides (OPP); and

- Phenols.
- Store remaining soil samples not analysed for a period of one month pending the need for further analysis;
- Completion of a Preliminary Contamination Assessment Report, providing general comments on:
 - the level of contamination in the insitu subsoils and stockpile,
 - the likely suitability of the site for commercial use; and
 - the quality of the stockpiled material for re-use on or off the site.

The scope of the site assessment activities and consulting services undertaken by DP were limited to those detailed in the proposal dated 20 January 2006 and by the accompanying conditions of engagement.

3. SITE DESCRIPTION

3.1 Site Location

The property is located on Archbold Road, Eastern Creek. It is approximately 15 ha in area and is located in the local government area of Blacktown. The site forms a portion of Lot 2 DP 262213 within the Parish of Melville, County of Cumberland.

The surrounding area is largely agricultural, with some industrial site use. The M4 Motorway is located to the north of the site and the former Australia's Wonderland site is located to the east. A site location map and site plan is provided as Appendix A.

3.2 Site Description

The site is a roughly rectangular shaped land parcel located in the south-west corner of the larger Dial A Product Pty Ltd site. The site fronts Archbold Road to the west and a quarry pit is located to the east. A stand of remnant bushland is located to the north of the site.

The majority of the site is overlain by a large stockpile estimated to comprise in excess of 1 million m³ of material originally sourced from the quarry. The overburden stockpile is 30 m in height and is vegetated with grasses. It is understood that the material from the quarry was excavated as Virgin Excavated Natural Material (VENM) and transported directly to the overburden stockpile for storage. On this basis, the material is described as VENM sourced material.

The remaining portion of the site, fronting Archbold Road, is vegetated with grasses and scattered trees. An unsealed road provides access around the stockpile and on top of stockpile. An old explosives bunker with a bituminous concrete slab is located on the eastern portion of the stockpile. It is understood that this area was used to store fertilisers for the explosives required as part of the adjacent quarry operation.

A site plan is provided as Drawing 1 (Appendix A). Selected photographs of the site are attached in Appendix A.

3.3 Proposed Development

It is understood that the overburden stockpile is to be excavated and exported off-site to the nearby Austral bricks site, and the area subdivided into allotments for commercial / industrial land-use. Details are not known at this stage.

4. REGIONAL GEOLOGY AND HYDROGEOLOGY

Reference to the Sydney 1:100 000 Geological Series Sheet indicates the site is underlain by Bringelly Shale from the Wianamatta Group. Bringelly Shale generally comprises shale, carbonaceous claystone, claystone, laminate, fine to medium grain lithic sandstone and rare coal. The adjacent quarry is found in an intrusive (igneous) plug of dolerite and breccia rocks which may have caused localised metamorphism of the shale rocks.

Groundwater was not encountered during the current investigation. Given the close proximity to the adjacent quarry which is understood to extend approximately 180 m below the surrounding ground level, it is considered that groundwater beneath the site would be at significant depth and flow eastward into the quarry. It is likely that groundwater levels would have been significantly lowered due to quarrying activities.

A NSW Department of Natural Resources (DNR, formerly Department of Land and Water Conservation) groundwater bore search was conducted for the site on 21 February 2006 (Table 1). The DNR bore search results are provided in Appendix B. Nine bores have been constructed within a radius of 4 km from the site for a variety of authorised purposes and proposed uses included aquaculture, irrigation, monitoring and waste disposal. The final depth of the bores varied from 6.0 to 217.9 m below ground level. Information regarding groundwater occurrence was available for only three of the bores in which the standing water level was measured between 2.10 to 33.5 m below ground level.

Table 1 – Summary of Groundwater Bores

Groundwater Bore	Standing Water Level (bgl) (m)	Depth of Bore (m)	Water Quality	Purpose Of Bore	
				Authorized	Intended
GW018361	33.50	217.9	-	Aquaculture/ Waste disposal	Waste Disposal
GW028414	3.90	6.00	-	Irrigation	Irrigation
GW028415	2.10	7.60	Brackish	Irrigation	Irrigation
GW101082	-	40.30	-	Monitoring bore	Test bore
GW101085	-	99.30	-	Monitoring bore	Test bore
GW101086	-	69.70	-	Monitoring bore	Test bore
GW102674	-	69.70	Brackish (4,400 mg/ L salinity)	Monitoring bore	Test bore
GW103953	-	9.90	-	Monitoring bore	Monitoring bore
GW103954	-	9.90	-	Monitoring bore	Monitoring bore

5. SITE HISTORY

5.1 Title Deeds

A 100-year historical land title deed search of the site was conducted at the Lands Title Office (LTO). Determination of the ownership or occupancy of the property, including company names, can assist in the identification of previous land uses and therefore establish potentially contaminating activities.

A summary of the records with the owner/occupier details and the possible site uses is presented in Table 2. The full title deed records and the Deposit Plan for the site are included in Appendix C.

Table 2 – Summary of Title Deed Search

Date	Owner/ Occupier	Occupation	Possible Site Use	Identifier
As to that part marked 1 on the attached cadastre				
06.12.1909	Thomas Baker	Tanner	Agricultural	Book 895 No. 803
03.05.1955	Burfield Pty Limited (Now Ray Fitzpatrick Pty Limited)		Quarry	2/ 262213
As to those parts marked 2 & 3 on the attached cadastre				
09.03.1917	Elizabeth Sarah Baker	Married Woman	Agricultural	Book 1102 No. 994
29.08.1946	William Thomas Gillett Baker	Grazier	Agricultural	Book 1995 No. 998
03.05.1955	Burfield Pty Limited (Now Ray Fitzpatrick Pty Limited)		Quarry	2/ 262213
Search continued as to the whole of the subject land				
12.09.2005	# ACN 114 843 453 Pty Limited		Quarry	2/ 262213

#

Current Registered Proprietor

5.2 Aerial Photographs

Aerial photographs from 1947, 1951, 1970, 1986, and 2002 were obtained from the NSW Department of Lands Office. The aerial photographs are presented in Appendix D. These aerial photos were studied to determine the likely past uses of the site, particularly those of a potentially contaminating nature. The findings are summarised below.

1947 Aerial Photograph: The subject site, Site A, and the majority of the surrounding area was open grassland, indicating agricultural land use. To the north of the subject site, land had been cleared of native vegetation and sub-divided into paddocks that had been tilled. A

small stand of remnant woodland was located adjacent to the northern portion of Site A. A small creek is located to the south of the site orientated from south-east to the north-west toward Ropes Creek in the west. Local infrastructure included present day Archbold Road to the west of the site and The Great Western Highway to the north. A number of small residential farm buildings are also present in the surrounding area.

1970 Aerial Photograph: The adjacent site to the east had commenced open-cut quarry operations by this time. A large pit had been excavated and infrastructure including office buildings, plant and extensive stockpiles were located to the south of the quarry area (current location of an asphalt plant). The northern half of subject site, Site A, had been overlain with a large stockpile of material excavated from the quarry. A drainage pathway is visible from the stockpiled material flowing in a westerly direction from the site. Two small shed style buildings were present to the south of the stockpile. A bund-like wall, constructed of soil and rock, surrounded the sheds; it is considered that these sheds may have been used for storage of explosives. The surrounding area remained agricultural at this time.

1986 Aerial Photograph: The quarry located to the east of the site had been extended laterally and vertically from the 1970 aerial photograph. The present day asphalt plant is present to the south of the quarry. The footprint of the overburden stockpile material located on Site A had also been expanded to the southern portion of the site. Four sheds were present on the stockpile with bund-like walls of soil and rock surrounding the perimeter, possibly used for the storage of explosives for quarry operations. Two larger sheds had been developed to the north-east of the stockpile. The small pocket of remnant woodland located to the north of the subject site remained unchanged at this time. The M4 Motorway had been constructed by this time, running in an east west direction to the north of the site. To the north of the M4 a residential area had been developed, whilst to the north-west earthworks had been undertaken for the development of a commercial/ industrial area.

2002 Aerial Photograph: The subject site appeared to relatively unchanged at this time. The four sheds noted in 1986 aerial photograph had been removed from the stockpile. The surrounding area remained relatively unchanged. The area to the north-west of the site had been developed as a commercial/ industrial area.

5.3 Regulatory Notices Search

Public Register – *Protection of the Environment Operations Act, 1997*

Hanson Construction Material is currently licensed by the DEC to undertake Concrete Batching and hard-rock gravel quarrying at the site (licence number 5073). The licence details monitoring requirements and acceptable limits for discharges to land and water. It is noted that a pollution reduction program has been undertaken to reduce the Total Suspended Solids and pH of water that is discharged from the site.

The DEC has registered four notices and one non-conformance for the site summarised below:

- Non-conformance on 12/10/2001. Related to two blasts that exceeded over-pressure levels;
- Notice of Licence Variation (1025278), 27/06/2003. Variation of licence to include concrete batching plant;
- Notice of Licence Variation (1028667), 12/11/03. References to the EPA changed to DEC;
- Notice of Licence Variation (103853) 18/06/2004. The licensee requested that the monitoring requirements for the 'final dam' be changed from weekly to monthly. This change was accepted by the DEC;
- Notice of Licence Variation (1041638) 26/11/2004. The licensee requested an extension of the monitoring period to obtain information regarding wet weather overflow data, part of a pollution reduction programme. The licensee was required to further monitor water in the dam.

Pioneer Road Services, located to the south-west of Site A, is licensed by the DEC (licence number 494) to undertake bitumen pre-mix or hot mix production and crushing, grinding or separating works at the asphalt plant. No notices or non-compliances have been issued under this licence.

Public Register – Contaminated Land Management Act, 1997

No Notices or Orders to investigate or remediate have been issued for the site under the *Contaminated Land Management Act, 1997*.

5.4 Blacktown City Council Section 149(2) Certificate

The Section 149 Planning Certificate for the site issued by Blacktown City Council was reviewed as part of this assessment and is provided in Appendix E. There are no notices issued on the site under the Contaminated Land Management Act, 1997.

6. REVIEW OF PREVIOUS INVESTIGATIONS

A number of environmental investigations have been undertaken on Lot 2 in DP 262213. Initially a series of three studies were conducted by ADI Services for Environmental Management Australia Pty Ltd on behalf of Ray Fitzpatrick Pty Ltd. For convenience, ADI Services divided the entire site (Lot 2 DP262213) into three areas; viz. Area 1 (northern portion - woodland / forested region), Area 2 (Central portion stockpile and western portion of the quarry) and Area 3 (southern portion – open grassland) (Appendix F). The subject site, Site A, is located within Area 2. The following environmental reports have been prepared by ADI:

- *Stage 1 Environmental Assessment of Pioneer Concrete (NSW) Wallgrove Quarry*, December 1994 by Australian Defence Industries Services (ADI Services);
- *Stage 2 Environmental Assessment of Areas 1 and 3 Wallgrove Quarry*, March 1994, by Australian Defence Industries Services (ADI Services); and
- *Stage 3 Environmental Assessment of Pioneer Concrete (NSW) Wallgrove Quarry*, April 1998 by Australian Defence Industries Services (ADI Services).

In addition, other consultants prepared a Phase 1 (desktop) Investigation and a Review of Previous Environmental Reports on Lot 2 DP 262213 which were completed in 2004, and are listed below.

- *Phase 1 Investigation for Lot 2 (DP262213), Archbold Road, Eastern Creek, NSW, October 2004 by CH2M Hill Australia Pty Ltd (CH2MHILL); and*
- *Lot 2 Deposit Plan (DP) 262213 Archbold Road, Eastern Creek, NSW – Review of Previous Environmental Reports, December 2004, Environmental Resources Management Australia (ERM).*

It is noted that the assessments focused on the whole of Lot 2 DP 262213, whilst this report is concerned with a 15 ha portion of the Lot located in the central west of the site fronting Archbold Road. A summary of the previous investigations is presented in the following sections.

6.1 Stage 1 Environmental Assessment of Pioneer Concrete (NSW) Wallgrove Quarry, December 1994 by Australian Defence Industries Services (ADI Services).

The report focused on Areas 1 and 3 located to the north and south of the subject site (Site A). A review of the report revealed:

- That the property had been used as grazing land, as a quarry for road base material and a portion of the site has been used as an asphalt plant;
- A number of potentially contaminated areas were identified, including areas affected by runoff from the quarry overburden stockpile (located on Site A) and the asphalt stockpiles and fines discharged from the dewatering basin into drainage lines, creeks and the local groundwater;
- Settled fines from the dewatering basin were typically disposed to landfill, however, it is noted that this material may have been disposed on the overburden stockpile at times; and

- The potential contaminants identified were heavy metals, oils, bitumen, lime, flocculants, cleaning agents, fuels, petroleum hydrocarbons, and PAHs.

A sampling regime was recommended by ADI to assess whether the identified receptors within Area 1 and 3 had been contaminated by Pioneer operations in Area 2.

6.2 Stage 2 Environmental Assessment of Areas 1 and 3 Wallgrove Quarry, March 1995, by Australian Defence Industries Services (ADI Services).

The Stage 2 assessment comprised the sampling regime recommended by ADI in the Stage 1 assessment. The sampling regime included the collection and laboratory analysis of soil/sediment from dams, drainage lines and creeks that were identified in the Stage 1 assessment as potential receptors of contaminated material due to quarry and asphalt plant operations. A number of 'background' sediment samples were also collected. In addition groundwater monitoring wells were installed to assess groundwater contamination.

The findings of the Stage 2 Investigation include:

- Sediment samples collected from the drainage lines (sourced from the northern end of the stockpile and down-gradient of the asphalt plant), the southern dam (located to the south of Site A), and the Eastern dam (located down-gradient of equipment storage area) were found to contain chromium, nickel, barium and manganese concentrations above the adopted guideline threshold (ANZECC *Australian and New Zealand Guidelines for the Assessment and Management of Contaminated Sites*, 1992);
- TPH, BTEX and PAH were not detected in the sediment/soil samples analysed, with the exception of three locations down-gradient of the asphalt plant; and
- Surface water and groundwater was found to be within the adopted guideline values (ANZECC *Australian Water Quality Guidelines for Fresh and Marine Waters*, 1992), with the exception of manganese exceedances attributed to natural high levels of manganese in the surrounding area.

6.3 Stage 3 Environmental Assessment of Pioneer Concrete (NSW) Wallgrove Quarry, April 1998 by Australian Defence Industries Services (ADI Services).

The Stage 3 Environmental Assessment was conducted on Area 2. The assessment involved soil sampling, sediment sampling, surface water sampling (Bob's dam) of the quarry area, including the Pioneer Road Services Site and the overburden stockpile material. Groundwater sampling from wells located at the surrounding southern section of the site (Area 3) (installed as part of the Stage 2 investigation) was also undertaken.

A review of the Stage 3 ADI Services report revealed:

- Areas with the Pioneer Road Services section of the site were found to be significantly affected with TPH, ethyl-benzene and zinc. The contaminated areas were in close vicinity of the workshop area, the bitumen laboratory, the tank farm and the kerosene wash down area. TPH concentrations were detected at hotspot concentrations;
- Samples collected from the overburden stockpile (Site A) were found to contain concentrations of heavy metals consistent with 'background samples' collected from Area 3, which was assessed to be unaffected by quarrying activities, with the exception of nickel. Nickel concentrations were elevated in comparison with the 'background samples', but consistent with two natural breccia samples collected from the adjacent quarry. In addition no waste material was noted in the stockpile and no TPH or PAH was detected in the samples;
- Surface water samples were detected to contain concentrations of Cu, Pb, Zn, Cd, Cr and Ni exceeding the ANZECC (1992) guidelines for the protection of aquatic ecosystems; and
- Groundwater monitoring wells installed in Area 3 as part of the Stage 2 investigation were re-sampled. The groundwater quality was found to have improved since the 1995 monitoring, and the results were within the adopted guideline, with the exception of one exceedance of Zn (75 µg/L). However, it is noted that current guidelines (ANZECC 2000) allow for the calculation of hardness-adjusted trigger values. Accordingly, it is likely considered that the groundwater sourced from shale would be 'hard' and that the hardness-adjusted trigger value would be above the recorded concentration of zinc.

During the field work no signs of waste material were noted in the overburden stockpiled material. The samples were compared with 'background' samples collected from Area 3, located to the south of Site A, which has remained unaffected by quarrying activities. With the exception of nickel concentrations, the overburden samples were found to be consistent with contaminant concentrations found in the 'background' samples. However, it is noted that the elevated nickel concentrations in the overburden stockpile samples were found to be consistent with the nickel concentration of two breccia samples collected from the adjacent quarry. These nickel concentrations are likely to be characteristic of the natural materials in question.

6.4 Phase 1 Investigation for Lot 2 (DP262213), Archbold Road, Eastern Creek, NSW, October 2004 by CH2M Hill Australia Pty Ltd (CH2MHILL)

A 'desktop' Phase 1 Contamination Assessment was conducted on Lot 2 in DP 262213 by CH2MHILL for Clayton Utz Solicitors in October 2004. The main findings of the CH2MHILL report were:

- The site history indicated the southern half of the site appeared to have been unaffected by industrial activity and was occasionally used for grazing, however the central portion of the site (Area 2) may have been subject to contamination from quarrying activities, such as oil spills and machinery operation;
- An asphalt production plant has been in operation in the south-east portion of the site since the early 1960's. The site walk-over assessment indicated that contamination associated with bituminous material (PAHs, phenols, semi-volatile aromatic compounds) would be confined within a small area of the site;
- Given that much of the site is open-grassland used for grazing, illegal dumping might have taken place on the site (including the overburden stockpile); and
- Asbestos based materials may be present in parts of the plant building infrastructure and in waste dumps on site (site surrounding south-east of the site) where the plant was dismantled.

The report concluded that the majority of the Lot 2 DP 262213 poses a low potential for residual contamination to be present, with the exception of the asphalt plant. However,

CH2MHILL recommended soil and/or groundwater sampling if the site usage changed, including redevelopment or sale. In addition it is noted that the ADI reports listed above were not made available to CH2MHILL, and subsequently the results of the previous assessments were not included in CH2MHILL's assessment.

6.5 Lot 2 Deposit Plan (DP)262213 Archbold Road, Eastern Creek, NSW – Review of Previous Environmental Reports, December 2004, Environmental Resources Management Australia (ERM).

This brief letter report was prepared by ERM for Valad Property Group Pty Ltd, to provide a summary of potential environmental risks for land sale purposes. The report did not include a site assessment and was limited to a 'desktop' review of three reports completed by ADI in 1995 and 1998 and the CH2MHILL 2004 report.

The report concluded the following:

- Contaminated areas were associated with discrete locations within the Pioneer Road Services section of the site;
- That elevated heavy metal concentrations in the soil can be attributed to high regional background concentrations, and from sediment runoff associated with the quarry. In addition, the heavy metal concentrations were typically within relevant site assessment guidelines (NEPM 1999 see section 8.1 of this report Guideline 1);
- Groundwater sampling, limited to five locations did not indicate significant contamination and that an elevated zinc concentration can be attributed to elevated regional background ranges.

7. POTENTIAL CONTAMINANTS

Based on the available site information, the potential for contamination associated with Site A is assessed to be low. The potential contaminants identified during the site history review and site inspection are:

- *Previous agricultural activities.* Impacts may be related to the use of fertiliser, and pesticides. Aerial photographs show that the site was cleared and vacant and graziers owned the site between 1909 to 1955 period. It is possible that the land was once cultivated. The associated contaminants may include pesticides, including organochlorine pesticides, and heavy metals (arsenic, chromium, zinc and mercury) from fertilisers eg. super-phosphates. It is envisaged, however, that these contaminants, if present, would most likely be confined only to the near surface horizon;
- *Dumping of contaminated waste on the overburden stockpile:* A range of potentially contaminated material may have been deposited on the stockpile including, building rubble, asbestos contaminated waste, waste from the asphalt plant located on the adjacent site, fines from the quarry tailings dam, and machinery waste, including waste oil and fuel. The associated contaminants of concern include heavy metals, TPH, BTEX, PAHs, solvents and asbestos.

8. ASSESSMENT CRITERIA

8.1 Site Assessment Criteria

The Environmental Soil Quality Guideline 'Background Ranges', as given in the Schedule B(1) NEPC Guideline on the *Investigation Levels for Soil and Groundwater* (1999), have been referenced to assess whether the concentration of analytes in the VENM sourced material compares with typical Australian background ranges (Guideline 1, Table 3) and is therefore consistent with VENM material.

The lower of the Health-based [soil] investigation levels (column 1) for residential sites with accessible soils, and the provisional phytotoxicity-based investigation levels for sandy loams (column 5), as specified in NSW Department of Environment and Conservation (DEC) (formerly the Environmental Protection Agency) *Guidelines for the NSW Site Auditors Scheme* (1998). The most sensitive land-use category has been selected as comparative criteria for the VENM sourced material to determine whether contamination has occurred (Guideline 2, Table 3). The NSW DEC *Guidelines for Assessing Service Station Sites* (1994) have been referenced for total petroleum hydrocarbon guidelines.

In addition the soil contaminant Threshold Concentrations for Commercial and Industrial Sites are based of the NSW EPA *Contaminated Sites Guidelines for the NSW Site Auditor Scheme* (1998) column 4, Health - based Investigation Levels for Commercial and Industrial sites and have been included for reference (Guideline 3, Table 3) as it is understood that the site is intended for future industrial land-use.

These Site Assessment Criteria are given in Table 3.

Table 3 – Site Assessment Criteria

	Australian Background Ranges	HIL Lower guideline value (HIL) and (PPIL)	HIL Commercial / Industrial
Substance	Guideline 1	Guideline 2	Guideline 3
As	1-50	20	500
Cd	1	3	100
Cr*	5-1000	400	60%
Cu	2-100	100	5000
Pb	2-200	300	1500
Hg	0.03	1	75
Ni	5-500	60	3000
Zn	10-300	200	35000
C ₆ - C ₉	-	65 ¹	65 ¹
C ₁₀ – C ₃₆	-	1000 ¹	1000 ¹
Benzene	0.05-1.0	1 ¹	1 ¹
Ethyl Benzene	-	3.1 ¹	3.1 ¹
Toluene	-	1.4 ¹	1.4 ¹
Xylene	-	14 ¹	14 ¹
PAH (Total)	0.95-5.0 ²	20	20
Benzo(a)pyrene	-	1	5
DDT	-	200	1000
Heptachlor	-	10	50
Aldrin + Dieldrin	-	10	50
Chlordane	-	50	250
Phenol	-	70	42500
PCBs	-	10	20

Notes:

- Guideline 1 Schedule B(1) NEPC Guideline on the *Investigation Levels for Soil and Groundwater* (1999), Background ranges.
- Guideline 2 NSW EPA *Contaminated Sites Guidelines for the NSW Site Auditor Scheme* (1998) column 1 and 5, Health - based Investigation Levels for Residential with gardens and provisional phytotoxicity based investigation levels for sandy loams. The lowest value has been selected as the threshold concentration.
- Guideline 3 NSW EPA *Contaminated Sites Guidelines for the NSW Site Auditor Scheme* (1998) column 4, Health - based Investigation Levels for Commercial and Industrial sites
1. NSW EPA *Contaminated Sites Guidelines for Assessing Service Station Sites* (1994).
 2. ANZECC *Guidelines for the Assessment and Management of Contaminated Sites* (1992).

Guideline 3 levels have been provided for reference only as the appropriate criteria for commercial/ industrial sites. The objective of this preliminary assessment of stockpiled and in-situ material has been to assess the characteristics against the lowest guideline threshold criteria, (i.e. Guideline 2), which would allow for any type of land-use from a contamination perspective.

9. FIELD INVESTIGATION

9.1 Sample Location Rationale

The sampling location and selection rationale were designed according to the known site information and to achieve representative coverage of the site area. A total of twenty one sampling locations were chosen for the current assessment. Seventeen of the sample locations were located on the overburden stockpiled material. The remaining four locations were located on the western portion of the site in natural in-situ material, in order to obtain preliminary information on the sub - surface conditions at the site.

The stockpile sampling locations (Locations 1 - 16 and 21) and the soil sampling locations (Locations 17 - 20) are provided in Drawing 1 of Appendix A.

9.2 Sampling Methodology

The field investigation comprised sampling from twenty one test pits. Environmental sampling was performed according to standard operating procedures outlined in the DP *Field Procedures Manual*. All sampling data were recorded on DP chain of custody sheets (Appendix G), and the general sampling and sample management procedures comprised:

- The use of disposable sampling equipment to reduce the potential for cross-contamination to occur between samples;
- Transferring samples into laboratory - prepared glass jars, capping immediately and ensuring headspace within the sample jar is minimised;

- Collection of 10% replicate samples for QA/ QC purposes;
- Labelling of sample containers with individual and unique identification, including project number, sample location and sample depth (where applicable); and
- Placement of the sample jars into a cooled, insulated and sealed container for transport to the laboratory.

A sub - sample was collected in a sealed zip - lock bag for each of the environmental samples collected. These samples were screened with a photoionisation detector (PID) to screen for the presence of volatile organic compounds in the soil. The PID was calibrated with isobutylene gas at 94.5 ppm.

9.3 Analytical Rationale

The selection of soil samples chosen for laboratory analysis was based on field observation, odour and PID response. The analytical regime for the soil samples selected for analysis is shown in Table 4. A total of 26 selected samples (including 3 replicate samples for QA/QC) were analysed for various combinations of the contaminants of concern (refer to Table 3). Envirolab Services Pty Ltd, a laboratory accredited by the National Association of Testing Authorities (NATA), was engaged to conduct the sample analysis.

Table 4 - Analytical Scheme

Sample ID	Heavy Metals	TPH	BTEX	PAH	PCB	OCP	OPP	Total Phenol
Stockpiled material								
1/ 0.3 – 0.5	✓	✓	✓	✓	-	-	-	-
3/ 1.8 - 2.0	✓	✓	✓	✓	-	-	-	-
BD1 140206	✓	-	-	-	-	-	-	-
4/ 0.8 - 1.0	✓	✓	✓	✓	-	-	-	-
5/ 0.3 - 0.5	✓	✓	✓	✓	✓	✓	✓	✓
6/ 1.8 - 2.0	✓	✓	✓	✓	-	-	-	-
7/ 0.3 - 0.5	✓	✓	✓	✓	✓	✓	✓	✓
8/ 1.8 - 2.0	✓	✓	✓	✓	✓	-	-	-
BD2 140206	✓	-	-	-	-	-	-	-
9/ 0.8 - 1.0	✓	✓	✓	✓	-	-	-	-
10/ 0.3 - 0.5	✓	✓	✓	✓	✓	✓	✓	✓
10/ 1.8 - 2.0	✓	✓	✓	✓	-	-	-	-
11/ 0.8 - 1.0	✓	✓	✓	✓	-	-	-	-
12/ 0.3 - 0.5	✓	✓	✓	✓	-	-	-	-
13/ 0.8 - 1.0	✓	✓	✓	✓	✓	✓	✓	✓
14/ 0.3 - 0.5	✓	✓	✓	✓	-	-	-	-
15/ 0.8 - 1.0	✓	✓	✓	✓	✓	✓	✓	✓
16/ 0.8 - 1.0	✓	✓	✓	✓	-	-	-	-
BD6 140206	✓	-	-	-	-	-	-	-
21/ 0 - 0.3	✓	✓	✓	✓	✓	✓	✓	✓
21/ 0.8 – 1.0	✓	✓	✓	✓	✓	✓	✓	✓
In-situ material								
17/ 0.3 - 0.5	✓	✓	✓	✓	✓	✓	✓	✓
17/ 0.8 - 1.0	✓	✓	✓	✓	-	-	-	-
18/ 0.3 - 0.5	✓	✓	✓	✓	✓	✓	✓	✓
19/ 0.8 - 1.0	✓	✓	✓	✓	-	-	-	-
20/ 0.3 - 0.5	✓	✓	✓	✓	✓	✓	✓	✓

BD1 140206 Denotes blind duplicate of sample 3/ 1.8 – 2.0
 BD2 140206 Denotes blind duplicate of sample 8/ 1.8 - 2.0
 BD6 140206 Denotes blind duplicate of sample 16/ 0.8 - 1.

10. RESULTS OF INVESTIGATION

10.1 Field Observations

A 23 tonne excavator (provided by the client, Dial A Product Pty Ltd) was used to excavate twenty one test pits over the site. The test pit excavation was undertaken under the direction of an environmental scientist who set out the test pit locations and logged the overburden soils. Test pits at Locations 1 to 16 and 21 were in stockpile material and those at Locations 17-20 were in natural in-situ material along the western portion of the subject site. A detailed description of the sampling can be found in Section 8.2, Sampling Methodology.

Overburden Stockpile (Locations 1 – 16, 21)

The field work at the above locations encountered stockpiled VENM sourced material from the adjacent quarry. The stockpiled material comprised:

- Grey-black ripped sandstone and mudstone filling, cobble and boulder inclusions; and
- Brown gravely clay filling with sandstone cobble inclusions.

In-situ Natural Material (Locations 17 – 20)

The field work at the above locations typically encountered the following conditions:

Top soil: The top soil contained a mixture of brown silt with rootlets to 200 mm depth.

Natural Material: The natural material is a mixture of light grey mottled red brown silty clay and brown silty sandy clay, with some ironstone gravel.

Details of the conditions encountered at each test location are given in Appendix G, together with notes defining classification methods and descriptive terms. A summary of the materials encountered in the overburden stockpile and in-situ natural material is presented in Table 5 below.

Table 5 - Summary of Material Encountered

Location	Depth	Material Description
1- 16 and 21	-	- Grey-black ripped sandstone and mudstone filling, cobble and boulder inclusions; and - Brown gravely clay filling with sandstone cobble inclusions.
17-20	0 – 0.2	Top soil – brown silt with rootlets
	0.2 – 0.6	Silty clay - yellow brown mottled silty clay, with trace fine gravel
	0.6 - 2.2	Silty clay – red brown mottled silty clay, some ironstone gravel
	>1.5 – 2.4	Siltstone – extremely weathered, light grey siltstone. Shale – extremely weathered, grey shale and siltstone.

10.2 Total Photoionisable Compounds (TOPIC) Results

PID results are indicated on the bore logs and test pit logs for the in - situ material and indicated on the record of samples for the stockpile material and are presented in Appendix G. The photoionisation detector (PID) indicated that all PID readings were below 6 ppm, indicating the absence of volatile compounds in the soil samples.

10.3 Laboratory Analysis

10.3.1 Results of Laboratory Analysis

The results of laboratory analysis for the stockpiled material (Appendix H) are presented in the following tables:

Table 6 – Results of Laboratory Analysis of Stockpile Material for Heavy Metals

Table 7 – Results of Laboratory Analysis of Stockpile Material for TPH and BTEX;

Table 8 – Results of Laboratory Analysis of Stockpile Material for OCP and OPP; and

Table 9 – Results of Laboratory Analysis of Stockpile Material for PCB, PAH and total Phenolics.

**Table 6 – Results of Laboratory Analysis of
Stockpile Material for Heavy Metals**

Sample ID	As (mg/ kg)	Cd (mg/ kg)	Cr (mg/ kg)	Cu (mg/ kg)	Pb (mg/ kg)	Hg (mg/ kg)	Ni (mg/ kg)	Zn (mg/ kg)
Overburden Stockpile								
1/ 0.3 – 1.0	5.4	<1	12	43	16	<0.1	32	81
3/ 1.8 -2.0	8	<1	35	42	20	<0.1	38	74
BD1 140206	5.9	<1	31	38	17	<0.1	35	72
4/ 0.8 – 1.0	8.3	<1	24	42	17	<0.1	32	71
5/ 0.3 – 0.5	6.5	<1	12	48	17	<0.1	21	75
6/ 1.8 – 2.0	6.5	<1	21	48	21	<0.1	30	68
7/ 0.3 – 0.5	7.8	<1	18	47	18	<0.1	26	68
8/ 1.8 – 2.0	4.9	<1	28	37	16	<0.1	43	66
BD2 140206	6.7	<1	27	34	14	<0.1	43	66
9/ 0.8 – 1.0	6.1	<1	31	45	17	<0.1	36	78
10/ 0.3 – 0.5	5.9	<1	11	48	17	<0.1	24	77
10/ 1.8 – 2.0	7.9	<1	19	24	18	<0.1	13	50
11/ 0.8 – 1.0	<4	<1	11	50	19	<0.1	25	90
12/ 0.3 – 0.5	4.2	<1	13	38	19	<0.1	25	73
13/ 0.8 – 1.0	6.4	<1	33	42	17	<0.1	37	68
14/ 0.3 – 0.5	7.7	<1	28	33	15	<0.1	31	69
15/ 0.8 – 1.0	<4	<1	150	38	10	<0.1	100	65
16/ 0.8 – 1.0	7.8	<1	24	40	15	<0.1	30	63
BD6 140206	7.7	<1	28	43	17	<0.1	34	68
21/ 0 - 0.3	5.9	<1	22	42	18	<0.1	32	62
21/ 0.8 – 1.0	5.5	<1	17	44	17	<0.1	24	79
In-situ Natural Material								
17/ 0.3 - 1.0	7.3	<1	21	26	26	<0.10	13	46
17/ 0.8 -1.0	9.1	<1	18	44	33	<0.10	12	56
18/ 0.3 – 0.5	6.9	<1	21	28	19	<0.10	10	31
19/ 0.8 – 1.0	13	<1	9.1	37	11	<0.10	6	33
20/ 0.3 – 0.5	15	<1	17	39	24	<0.10	22	88
Guideline 1	1 – 50	1	5 – 1000	2 – 100	2 – 200	0.03	5 – 500	10 - 300
Guideline 2	20	3	400	100	300	1	60	200

Notes:

Guideline 1 and 2 - Refer to Table 3 of the report

BD1 140206 Denotes blind duplicate of sample 3/ 1.8 – 2.0

BD2 140206 Denotes blind duplicate of sample 8/ 1.8 - 2.0

BD6 140206 Denotes blind duplicate of sample 16/ 0.8 - 1.0

Bold Exceeds Guideline 2.

Table 7 – Results of Laboratory Analysis of Stockpile Material for TPH & BTEX

Sample ID	Total Petroleum Hydrocarbons (TPH)				Monocyclic Aromatic Hydrocarbons (BTEX)			
	C ₆ - C ₉ (mg/ kg)	C ₁₀ - C ₁₄ (mg/ kg)	C ₁₅ - C ₂₈ (mg/ kg)	C ₂₉ - C ₃₆ (mg/ kg)	Benzene (mg/ kg)	Toluene (mg/ kg)	Ethyl benzene (mg/ kg)	Xylene (mg/ kg)
Overburden Stockpile								
1/ 0.3 – 1.0	<25	<50	<100	<100	<1.0	<1.0	<1.0	<1.0
3/ 1.8 -2.0	<25	<50	<100	<100	<1.0	<1.0	<1.0	<1.0
4/ 0.8 – 1.0	<25	<50	<100	<100	<1.0	<1.0	<1.0	<1.0
5/ 0.3 – 0.5	<25	<50	<100	<100	<1.0	<1.0	<1.0	<1.0
6/ 1.8 – 2.0	<25	<50	<100	<100	<1.0	<1.0	<1.0	<1.0
7/ 0.3 – 0.5	<25	<50	<100	<100	<1.0	<1.0	<1.0	<1.0
8/ 1.8 – 2.0	<25	<50	<100	<100	<1.0	<1.0	<1.0	<1.0
9/ 0.8 – 1.0	<25	<50	<100	<100	<1.0	<1.0	<1.0	<1.0
10/ 0.3 – 0.5	<25	<50	<100	<100	<1.0	<1.0	<1.0	<1.0
10/ 1.8 – 2.0	<25	<50	<100	<100	<1.0	<1.0	<1.0	<1.0
11/ 0.8 – 1.0	<25	<50	<100	<100	<1.0	<1.0	<1.0	<1.0
12/ 0.3 – 0.5	<25	<50	<100	<100	<1.0	<1.0	<1.0	<1.0
13/ 0.8 – 1.0	<25	<50	<100	<100	<1.0	<1.0	<1.0	<1.0
14/ 0.3 – 0.5	<25	<50	<100	<100	<1.0	<1.0	<1.0	<1.0
15/ 0.8 – 1.0	<25	<50	<100	<100	<1.0	<1.0	<1.0	<1.0
16/ 0.8 – 1.0	<25	<50	<100	<100	<1.0	<1.0	<1.0	<1.0
21/ 0 - 0.3	<25	<50	<100	<100	<1.0	<1.0	<1.0	<1.0
21/ 0.8 – 1.0	<25	<50	<100	<100	<1.0	<1.0	<1.0	<1.0
In-situ Natural Material								
17/ 0.3 - 1.0	<25	<50	<100	<100	<1.0	<1.0	<1.0	<1.0
17/ 0.8 -1.0	<25	<50	<100	<100	<1.0	<1.0	<1.0	<1.0
18/ 0.3 – 0.5	<25	<50	<100	<100	<1.0	<1.0	<1.0	<1.0
19/ 0.8 – 1.0	<25	<50	<100	<100	<1.0	<1.0	<1.0	<1.0
20/ 0.3 – 0.5	<25	<50	<100	<100	<1.0	<1.0	<1.0	<1.0
Guideline 1	NA	NA			0.05– 1.0	NA	NA	NA
Guideline 2	65	1000			1	1.4	3.1	1.4

Notes:

Guideline 1 and 2 - Refer to Table 3 of the report

Bold

Exceeds Guideline 2.

NA

Not Applicable

Table 8 – Results of Laboratory Analysis of Stockpile Material for OCP and OPP

Sample ID	Organochlorine Pesticides (OCP)					OPP (mg/ kg)
	Aldrin (mg/ kg)	Dieldrin (mg/ kg)	Chlordane (mg/ kg)	DDD+DDE+ DDT (mg/ kg)	Heptachlor (mg/ kg)	
Overburden Stockpile						
5/ 0.3 – 0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
7/ 0.3 – 0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
8/ 1.8 – 2.0	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
10/ 0.3 – 0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
13/ 0.8 – 1.0	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
15/ 0.8 – 1.0	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
21/ 0 - 0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
21/ 0.8 – 1.0	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
In-situ Natural Material						
17/ 0.3 - 1.0	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
18/ 0.3 – 0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
20/ 0.3 – 0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Guideline 1	NA		NA	NA	NA	NA
Guideline 2	10		50	200	10	NA

Notes:

Guideline 1 and 2 - Refer to Table 3 of the report

Bold

Exceeds Guideline 2.

NA

Not Applicable

Table 9 – Results of Laboratory Analysis of Stockpile Material for PCB, PAH and total Phenolics

Sample ID	Total PCB	Benzo(a) pyrene	PAH	Total Phenolics
	(mg/ kg)	(mg/ kg)	(mg/ kg)	(mg/ kg)
Overburden Stockpile				
5/ 0.3 – 0.5	<0.1	<0.050	<0.1	<5.0
7/ 0.3 – 0.5	<0.1	<0.050	<0.1	<5.0
8/ 1.8 – 2.0	<0.1	<0.050	<0.1	<5.0
10/ 0.3 – 0.5	<0.1	<0.050	<0.1	<5.0
13/ 0.8 – 1.0	<0.1	<0.050	<0.1	<5.0
15/ 0.8 – 1.0	<0.1	<0.050	<0.1	<5.0
21/ 0 - 0.3	<0.1	<0.050	<0.1	<5.0
21/ 0.8 – 1.0	<0.1	<0.050	<0.1	<5.0
In-situ Natural Material				
17/ 0.3 - 1.0	<0.1	<0.050	<0.10	<5.0
18/ 0.3 – 0.5	<0.1	<0.050	<0.10	<5.0
20/ 0.3 – 0.5	<0.1	<0.050	<0.10	<5.0
Guideline 1	NA	NA	0.95-5.0	NA
Guideline 2	10	1	20	70

Notes:

Guideline 2 - Refer to Table 3 of the report

Bold

Exceeds Guideline 2.

NA

Not Applicable

10.4 QA/QC Procedures and Results

Quality assurance/quality control procedures comprised an integral part of this Preliminary Assessment, and included both field and laboratory QA/QC procedures (see Appendix I).

11. DISCUSSION

11.1 Review of Available Site History Information

The 1947 aerial photograph shows that the subject site and surrounding area was largely open grassland, with the exception of the area to the north east which was divided into paddocks that had been tilled. The results of the title deeds search illustrate that the site was used for agricultural purposes, probably grazing, up until 1955.

Lot 2 DP 262213 was purchased by Burfield Pty Limited (later known as Ray Fitzpatrick Pty Limited) in 1955. The subject site, Site A, is a portion of Lot 2 DP 262213, located in the central, western portion of the Lot. A quarry commenced operation on the eastern half of Lot 2 DP 262213 and the adjacent property to the east, Lot 1 DP 400697, in the 1950's.

By 1970 an extensive quarry pit had been excavated to the east of the site and office buildings, plants and stockpiled material were located to the south of the quarry. A significant volume of overburden, presumably from the quarry, had been placed on the northern portion of Site A. In the 1986 aerial photograph the quarry had been extended both laterally and vertically. In addition, the stockpiled material on Site A had extended to the southern portion of Site A.

The site appeared relatively unchanged in the 2002 aerial photograph with the exception of the removal of small sheds which are believed to have stored explosives for quarrying activities. It is understood that the quarry has been operational since the 1950's and it is considered that overburden was placed on the stockpile since the commencement of quarrying activities.

The potential contaminants associated with the site are:

- Fertilisers and pesticides associated with agricultural activities; and
- Heavy metals, TPH, BTEX, PAHs, solvents and asbestos, associated with the dumping of material on the overburden stockpile.

A number of environmental assessments have been undertaken on the surrounding quarry area by other consultants, assessing the potential of quarry activities to impact the surrounding area. A sampling and analytical regime was undertaken by others which comprised the collection of soil and surface water samples from drainage lines, reservoirs and soil samples from locations surrounding the quarry site. The results indicated that sediment samples along drainage lines and reservoirs contained heavy metal concentrations above the adopted guideline threshold. It is noted that Quarry operators Hanson Operations, have undertaken a pollution reduction programme with the DEC that monitored the waters discharging from the site and no 'Notices' have been issued regarding this matter.

Following the above mention investigation, additional fieldwork was undertaken at discrete locations on the quarry site, including the asphalt plant, Pioneer Road Services section, the overburden stockpile (Site A) and the quarry pit. The results indicated that significant contamination occurred at discrete locations, including the workshop area, the tank farm and the kerosene wash down area. These contaminated areas are not located within Site A, the area being assessed in this current investigation.

No signs of waste material were noted on the overburden stockpiled material during ADI's 1998 investigation. The samples were compared with 'background' samples collected from Area 3, located to the south of Site A, which has remained unaffected by quarrying activities. With the exception of nickel concentrations, the overburden samples were found to be consistent with contaminant concentrations found in the 'background' samples from Area 3. However, it is noted that the elevated nickel concentrations in the overburden stockpile samples were found to be consistent with the nickel concentration of two natural breccia samples collected from the adjacent quarry.

11.2 Overburden Stockpile Assessment

The analytical results indicate that the heavy metal and PAH concentrations of the overburden stockpile material, that was sourced as VENM from the quarry area are within Australian background ranges.

It is noted that one sample (15/0.8-1.0) recorded a concentration of nickel (100 mg/kg) above the NSW DEC provisional phototoxicity-based investigation levels (60 mg/kg). However, it is noted that the nickel concentration is within the DEC Health based investigation levels for residential use (600 mg/kg).

The elevated nickel concentration is consistent with the nickel concentration of material collected from the adjacent quarry in the Stage 2 investigation by ADI (1998). On this basis, the nickel concentration 100 mg/kg in sample 15/0.8-1.0 is considered to be representative of background concentrations of natural material sourced from the adjacent quarry. Nickel is a common element in basic igneous rocks with local dolerites understood to have levels >360 mg/kg, with chromium >550 mg/kg, and copper >100 mg/kg.

The selected samples analysed for TPH, BTEX, PCB, PAH, OCP, OPP and phenol were found to be below laboratory quantification limits, indicating that the VENM-sourced material, located within the top 2.8 m of the stockpile, has not been contaminated during handling or whilst stored on the stockpile.

No signs of anthropogenic inclusions were noted at the time of field work and on this basis, asbestos was not analysed.

11.3 Preliminary Assessment of In-situ material

The concentration of selected samples analysed for heavy metals were found to be within the Site Assessment Criteria for residential sites with accessible soil. On this basis, the subsurface soils analysed are not considered to be contaminated.

The soil samples submitted for laboratory analysis reported TPH, PAH, BTEX, OCP, OPP, PCB and Phenols concentrations below the practical quantification limit. Hence the concentrations for all of these compounds were within the Site Assessment Criteria for residential sites with accessible soils.

12. CONCLUSIONS

The analytical results were found to be below the adopted threshold criteria for both the stockpile and the in-situ material. On this basis, the stockpiled material, which was sourced as VENM from the quarry is considered suitable for off-site re-use as VENM fill. However, it is noted that the assessment of the stockpile was limited to the top 2.8 m of the stockpile. If material different to that described in the test pit logs, or if material showing signs of contamination (identified by odours, stains, or anthropogenic inclusions) is encountered additional testing shall be required. Irrespective it is recommended that additional samples are collected and analysed on a regular basis (and prior to removal) as the stockpile is progressively excavated for any off site use.

The preliminary analysis of in-situ material indicates that the site is suitable for commercial/ industrial use. However, following the removal of the stockpiled material it is recommended that additional field work and laboratory analysis and reporting are undertaken to a level commensurate with the site area intended for redevelopment and according to relevant published guidelines.

13. LIMITATIONS OF THIS REPORT

The scope of the site assessment activities and consulting services undertaken by DP were limited to those detailed in the proposal dated 20 January 2006 and by the accompanying conditions of engagement.

DP's assessment is necessarily based upon the result of a limited site investigation and the restricted programme of surface and subsurface sampling, screening and chemical testing which was set out in the proposal. DP cannot provide unqualified warranties with regards to contamination nor does DP assume any liability for site conditions not observed or accessible during the time of the investigations.

Despite all reasonable care and diligence, the ground conditions encountered and concentrations of contaminants measured may not be representative of conditions between the locations sampled and investigated. In addition, site characteristics may change over time due to activities such as spillages of contaminating substances. These changes may occur subsequent to DP's investigations and assessment.

This report, its associated documentation and the information herein have been prepared solely for the use of Dial A Product Pty Ltd. Any reliance assumed by third parties on this report shall be at such parties' own risk.

DOUGLAS PARTNERS PTY LTD

Reviewed by

Catherine Karpel
Environmental Scientist**Lindsay Rockett**
Senior Associate**J M Nash**
Principal

APPENDIX A
Notes Relating to This Report
Site Drawing and Photographs



NOTES RELATING TO THIS REPORT

Introduction

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

Geotechnical reports are based on information gained from limited subsurface test boring and sampling, supplemented by knowledge of local geology and experience. For this reason, they must be regarded as interpretive rather than factual documents, limited to some extent by the scope of information on which they rely.

Description and Classification Methods

The methods of description and classification of soils and rocks used in this report are based on Australian Standard 1726, Geotechnical Site Investigations Code. In general, descriptions cover the following properties - strength or density, colour, structure, soil or rock type and inclusions.

Soil types are described according to the predominating particle size, qualified by the grading of other particles present (eg. sandy clay) on the following bases:

Soil Classification	Particle Size
Clay	less than 0.002 mm
Silt	0.002 to 0.06 mm
Sand	0.06 to 2.00 mm
Gravel	2.00 to 60.00 mm

Cohesive soils are classified on the basis of strength either by laboratory testing or engineering examination. The strength terms are defined as follows.

Classification	Undrained Shear Strength kPa
Very soft	less than 12
Soft	12—25
Firm	25—50
Stiff	50—100
Very stiff	100—200
Hard	Greater than 200

Non-cohesive soils are classified on the basis of relative density, generally from the results of standard penetration tests (SPT) or Dutch cone penetrometer tests (CPT) as below:

Relative Density	SPT "N" Value (blows/300 mm)	CPT Cone Value (q_c — MPa)
Very loose	less than 5	less than 2
Loose	5—10	2—5
Medium dense	10—30	5—15
Dense	30—50	15—25
Very dense	greater than 50	greater than 25

Rock types are classified by their geological names. Where relevant, further information regarding rock classification is given on the following sheet.

Sampling

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

Disturbed samples taken during drilling provide information on colour, type, inclusions and, depending upon the degree of disturbance, some information on strength and structure.

Undisturbed samples are taken by pushing a thin-walled sample tube into the soil and withdrawing with a sample of the soil 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 are given in the report.

Drilling Methods.

The following is a brief summary of drilling methods currently adopted by the Company and some comments on their use and application.

Test Pits — these are excavated with a backhoe or a tracked excavator, allowing close examination of the in-situ soils if it is safe to descent into the pit. The depth of penetration is limited to about 3 m for a backhoe and up to 6 m for an excavator. A potential disadvantage is the disturbance caused by the excavation.

Large Diameter Auger (eg. Pengo) — the hole is advanced by a rotating plate or short spiral auger, generally 300 mm or larger in diameter. The cuttings are returned to the surface at intervals (generally of not more than 0.5 m) and are disturbed but usually unchanged in moisture content. Identification of soil strata is generally much more reliable than with continuous spiral flight augers, and is usually supplemented by occasional undisturbed tube sampling.

Continuous Sample Drilling — the hole is advanced by pushing a 100 mm diameter socket into the ground and withdrawing it at intervals to extrude the sample. This is the most reliable method of drilling in soils, since moisture content is unchanged and soil structure, strength, etc. is only marginally affected.

Continuous Spiral Flight Augers — the hole is advanced using 90—115 mm diameter continuous spiral flight augers which are withdrawn at intervals to allow sampling or in-situ testing. This is a relatively economical means of drilling in clays and in sands above the water

table. Samples are returned to the surface, or may be collected after withdrawal of the auger flights, but they are very disturbed and may be contaminated. Information from the drilling (as distinct from specific sampling by SPTs or undisturbed samples) is of relatively lower reliability, due to remoulding, contamination or softening of samples by ground water.

Non-core Rotary Drilling — the hole is 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.

Rotary Mud Drilling — similar to rotary drilling, but using drilling mud as a circulating fluid. The mud tends to mask the cuttings and reliable identification is again only possible from separate intact sampling (eg. from SPT).

Continuous Core Drilling — a continuous core sample is obtained using a diamond-tipped core barrel, usually 50 mm internal diameter. Provided full core recovery is achieved (which is not always possible in very weak rocks and granular soils), this technique provides a very reliable (but relatively expensive) method of investigation.

Standard Penetration Tests

Standard penetration tests (abbreviated as SPT) are used mainly in non-cohesive soils, but occasionally also in cohesive soils as a means of determining 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 6.3.1.

The test is carried out in a borehole by driving a 50 mm diameter split sample tube under the impact of a 63 kg hammer with a free fall of 760 mm. It is normal for the tube to be driven in three successive 150 mm increments and the 'N' value is taken as the number of blows for the last 300 mm. In dense sands, very hard clays or weak rock, the full 450 mm 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 150 mm of say 4, 6 and 7

as 4, 6, 7
 N = 13

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

as 15, 30/40 mm.

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

Occasionally, the test method is used to obtain samples in 50 mm diameter thin walled sample tubes in clays. In such circumstances, the test results are shown on the borelogs in brackets.

Cone Penetrometer Testing and Interpretation

Cone penetrometer testing (sometimes referred to as Dutch cone — abbreviated as CPT) described in this report has been carried out using an electrical friction cone penetrometer. The test is described in Australian Standard 1289, Test 6.4.1.

In the tests, a 35 mm diameter rod with a cone-tipped end 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 friction resistance on a separate 130 mm long sleeve, immediately behind the cone. Transducers in the tip of the assembly are connected by electrical 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 20 mm per second) the information is plotted on a computer screen and at the end of the test is stored on the computer for later plotting of the results.

The information provided on the plotted results comprises: —

- 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 in percent.

There are two scales available for measurement of cone resistance. The lower scale (0–5 MPa) is used in very soft soils where increased sensitivity is required and is shown in the graphs as a dotted line. The main scale (0–50 MPa) is less sensitive and is shown as a full line.

The ratios of the sleeve friction to cone resistance will vary with the type of soil encountered, with higher relative friction in clays than in sands. Friction ratios of 1%–2% are commonly encountered in sands and very soft clays rising to 4%–10% in stiff clays.

In sands, the relationship between cone resistance and SPT value is commonly in the range:—

$$q_c \text{ (MPa)} = (0.4 \text{ to } 0.6) N \text{ (blows per 300 mm)}$$

In clays, the relationship between undrained shear strength and cone resistance is commonly in the range:—

$$q_c = (12 \text{ to } 18) c_u$$

Interpretation of CPT values can also be made to allow estimation of modulus or compressibility values to allow calculation of foundation settlements.

Inferred stratification as shown on the attached reports is assessed from the cone and friction traces and from experience and information from nearby boreholes, etc. This information is presented for general guidance, but must be regarded as being to some extent interpretive. The test method provides a continuous profile of engineering properties, and where precise information on soil classification is required, direct drilling and sampling may be preferable.

Hand Penetrometers

Hand penetrometer tests are carried out by driving a rod into the ground with a falling weight hammer and measuring the blows for successive 150 mm increments of penetration. Normally, there is a depth limitation of 1.2 m but this may be extended in certain conditions by the use of extension rods.

Two relatively similar tests are used.

- Perth sand penetrometer — a 16 mm diameter flat-ended rod is driven with a 9 kg hammer, dropping 600 mm (AS 1289, Test 6.3.3). This test was developed for testing the density of sands (originating in Perth) and is mainly used in granular soils and filling.
- Cone penetrometer (sometimes known as the Scala Penetrometer) — a 16 mm rod with a 20 mm diameter cone end is driven with a 9 kg hammer dropping 510 mm (AS 1289, Test 6.3.2). The test was developed initially for pavement subgrade investigations, and published correlations of the test results with California bearing ratio have been published by various Road Authorities.

Laboratory Testing

Laboratory testing is 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.

Bore Logs

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

Interpretation of the information and its application to design and construction should therefore take into account the spacing of boreholes, the frequency of sampling and the possibility of other than 'straight line' variations between the boreholes.

Ground Water

Where ground water levels are measured in boreholes, there are several potential problems;

- In low permeability soils, ground water although present, 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. They may not be

the same at the time of construction as are indicated in the report.

- The use of water or mud as a drilling fluid will mask any ground water inflow. Water has to be blown out of the hole and drilling mud must first be washed out of the hole if water observations are to be made.

More reliable measurements can be made by installing standpipes which are read at intervals over several days, or 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 a perched water table.

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 condition, 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 depend partly on bore spacing and sampling frequency
- changes in policy or interpretation of policy by statutory authorities
- the actions of contractors responding to commercial pressures.

If these occur, the Company will be pleased to assist with investigation or advice to resolve the matter.

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 than at some later stage, well after the event.

Reproduction of Information for Contractual Purposes

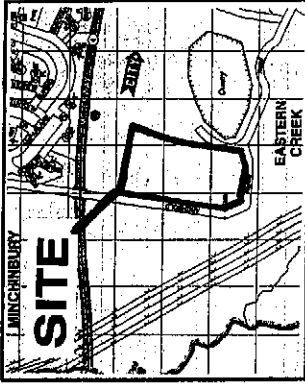
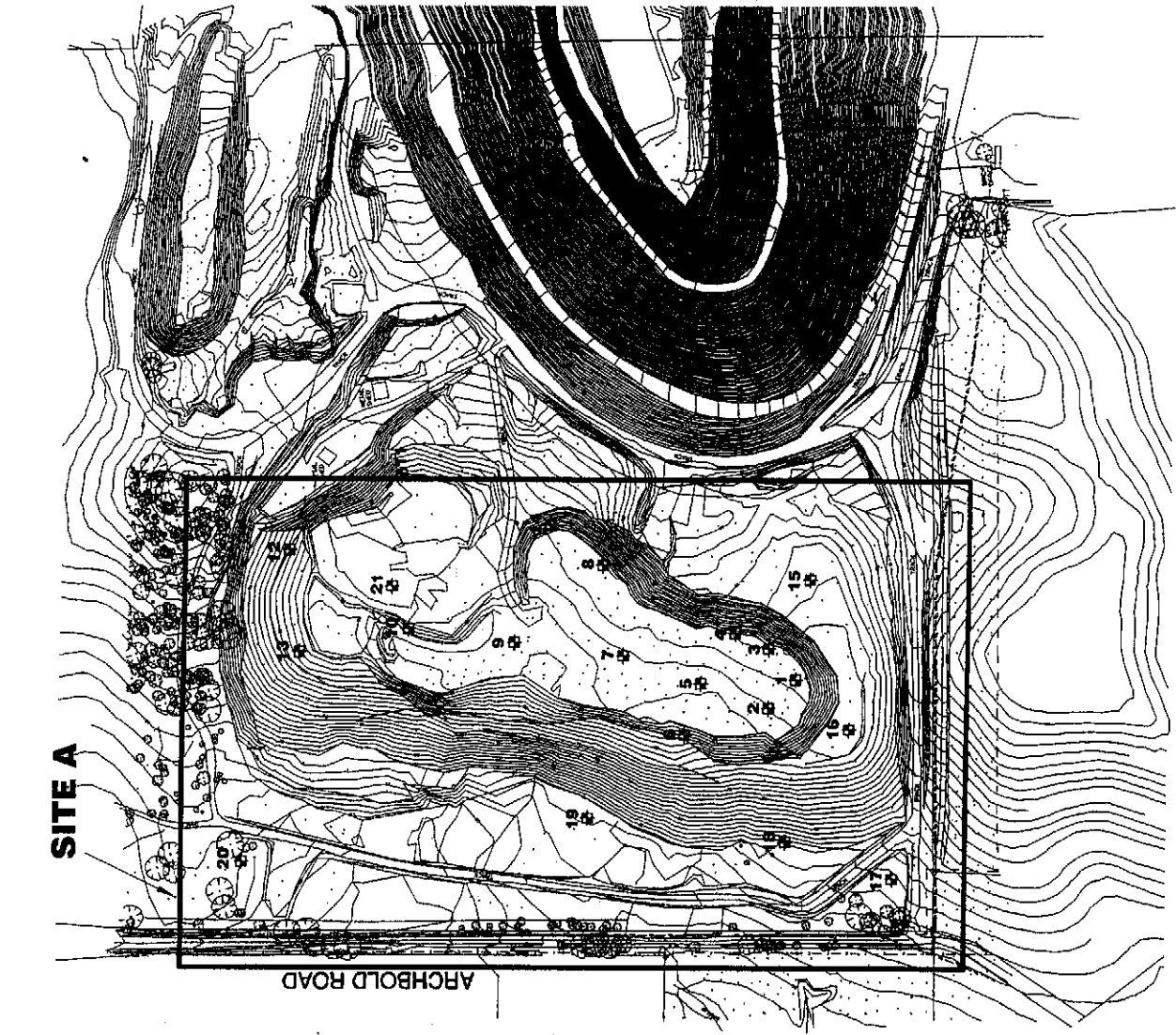
Attention is drawn to the document "Guidelines for the Provision of Geotechnical Information in Tender Documents", published by the Institution of Engineers, Australia. Where information obtained from this investigation is provided for tendering purposes, it is recommended that all information, including 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.

Site Inspection

The Company will always be pleased to provide engineering inspection services for geotechnical aspects of work to which this report is related. This could range from a site visit to confirm that conditions exposed are as expected, to full time engineering presence on site.

Copyright © 1998 Douglas Partners Pty Ltd



LOCALITY PLAN

LEGEND
◆ TEST BORE LOCATION

DP **Douglas Partners**
Geotechnics, Environment, Groundwater

Sydney, Newcastle, Brisbane,
Melbourne, Perth, Wyoong,
Carnegie, Townsville,
Cairns, Rockhampton, Darwin

TITLE:
**Location of Test Pits
Light Horse Business Centre (LHBC)
Quarry Road
EASTERN CREEK**

CLIENT: S&A Product Pty Ltd	PROJECT No: 43756	OFFICE: SYDNEY
DRAWN BY: PSCH	SCALE: N.T.S.	DATE: 14.1.2008
APPROVED BY: <i>CFK</i>		DRAWING No: 1



Photo 1 - Bunker



Photo 2 - Bunker 2



Photo 3 - Northern portion of stockpile large bunker



Photo 4 - Test Pit 6 Location



Photo 5 - Location of Test Pit 8

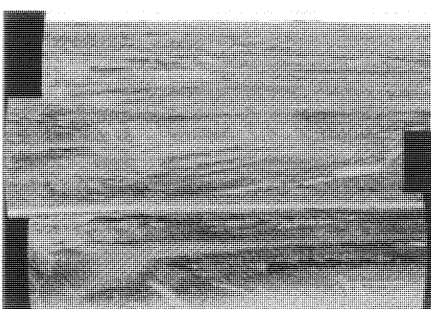


Photo 6 - Quarry face Panoramic - top to bottom

Project Name:	Prelim. Stockpile & Prelimin. Contamination Assess'mt	Project	March	Plate
Project Address:	Archbold Road	43756A	2006	1
Project Suburb/Location:	Eastern Creek			

Date/Time :21-Feb-2006 08:10 AM
 User :STANNER
 Report :RMGW001D.QRP
 Executable :S:\G5\PROD32\Ground.exe
 Exe Date :18-Apr-2005
 System :Groundwater
 Database :Edbp



DEPARTMENT OF NATURAL RESOURCES Work Summary

GW018361

Converted From HYDSYS

License :10BL010545

Work Type :Bore open thru rock
 Work Status :Unknown
 Construct. Method :Cable Tool
 Owner Type :Private

Commenced Date : Final Depth : 217.90 m
 Completion Date :01-Jan-1961 Drilled Depth : 217.90 m

Contractor Name :
 Driller :

Property : - N/A
 GWMA :603 - SYDNEY BASIN
 GW Zone : -

Standing Water Level :
 Salinity : (Unknown)
 Yield :

Site Details

Site Chosen By

County
 Form A :CUMBERLAND
 Licensed :CUMBERLAND

Parish
 ROOTY HILL
 ROOTY HILL

Portion/Lot DP
 161
 PT 21

Region :10 - SYDNEY SOUTH COAST
 River Basin :212 - HAWKESBURY RIVER
 Area / District :

CMA Map :9030-2N
 Grid Zone :56/1

PROSPECT
 Scale :1:25,000

Elevation :
 Elevation Source :Unknown

Northing :6259575
 Easting :300510

Latitude (S) :33° 47' 6"
 Longitude (E) :150° 50' 43"

GS Map :0056D4 AMG Zone :56

Coordinate Source :GD.,ACC.MAP

Construction

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

R	P	Component	Type	From (m)	To (m)	OD (mm)	ID (mm)	Interval	Details
1	1	Casing	Threaded Steel	0.00	12.10	203			Suspended in Clamps

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
(No Water Bearing Zone Details Found)									

Drillers Log

From (m)	To (m)	Thickness(m)	Drillers Description	Geological	Comments
0.00	14.02	14.02	Topsoil Clay	Topsoil	
14.02	16.45	2.43	Basalt	Basalt	
16.45	45.72	29.27	Shale Grey	Shale	
45.72	60.96	15.24	Shale Light Grey	Shale	
60.96	61.56	0.60	Shale Grey	Shale	
61.56	64.00	2.44	Basalt	Basalt	
64.00	72.54	8.54	Shale Black	Shale	
72.54	92.04	19.50	Shale Grey	Shale	
92.04	99.06	7.02	Sandstone	Sandstone	
99.06	137.16	38.10	Shale Grey	Shale	
137.16	150.87	13.71	Shale Grey	Shale	
150.87	194.46	43.59	Sandstone White	Sandstone	
194.46	195.68	1.22	Shale Grey	Shale	
195.68	217.62	21.94	Sandstone White	Sandstone	
217.62	217.93	0.31	Shale Grey	Shale	

Pumping Tests - Summaries

Pumping Test Type	Date	Duration (hr)	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Intake Depth (m)	Test Method	To Measure Water Level	To Measure Discharge	Tested By
Single-Rate Pumping Test	01-Jan-1961	5.00	33.50		0.38		Boiler			

Pumping Tests - Readings

Pumping Test Type	Date	Time (mins)	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Intake Depth (m)	Test Method	To Measure Water Level	To Measure Discharge	Tested By
(No Pumping Test Reading Details Found)										

Chemical Treatment

Treatment	Method	Duration	Success
(No Chemical Treatment Details Found)			

Warning To Clients: This raw data has been supplied to the Department of Land and Water Conservation (DLWC) by drillers, licensees and other sources. The DLWC does not verify the accuracy of this data. The data is presented for use by you at your own risk. You should consider verifying this data before relying on it. Professional hydrogeological advice should be sought in interpreting and using this data.

DEPARTMENT OF NATURAL RESOURCES
Work Summary

GW018361

Converted From HYDSYS

Development

Method

Time Taken

Other Development Method

(No Development Details Found)

Remarks

*** End of GW018361 ***

DEPARTMENT OF NATURAL RESOURCES

Work Summary

GW028414

Converted From HYDSYS

License : 10BL020250		Authorised Purpose(s) IRRIGATION	Intended Purpose(s) IRRIGATION
Work Type : Well			
Work Status : Supply Obtained			
Construct. Method : Rotary			
Owner Type : Private			
Commenced Date :	Final Depth :	6.00 m	
Completion Date : 01-Mar-1966	Drilled Depth :	6.10 m	
Contractor Name :			
Driller :			
Property : - N/A		Standing Water Level :	
GWMA : 603 - SYDNEY BASIN		Salinity :	(Unknown)
GW Zone : -		Yield :	

Site Details

Site Chosen By	County Form A : CUMBERLAND Licensed : CUMBERLAND	Parish MELVILLE MELVILLE	Portion/Lot DP 14 3 752041
Region : 10 - SYDNEY SOUTH COAST		CMA Map : 9030-2N	PROSPECT
River Basin : 212 - HAWKESBURY RIVER		Grid Zone : 56/1	Scale : 1:25,000
Area / District :			
Elevation :		Northing : 6259470	Latitude (S) : 33° 47' 8"
Elevation Source : (Unknown)		Easting : 298550	Longitude (E) : 150° 49' 27"
GS Map : 0056D4	AMG Zone : 56	Coordinate Source : GD., ACC.MAP	

Construction

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

H	P	Component	Type	From (m)	To (m)	OD (mm)	ID (mm)	Interval	Details
1	1	Casing	Concrete Cylinder	0.00	0.00	1219			(Unknown)

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
5.90	5.90	0.00	Fractured	3.90					(Unknown)

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	3.66	3.66	Clay		
3.66	6.10	2.44	Shale Soft Broken	Shale	
6.10	6.11	0.01	Shale Gray Hard	Shale	

Pumping Tests - Summaries

Pumping Test Type	Date	Duration (hr)	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Intake Depth (m)	Test Method	To Measure Water Level	To Measure Discharge	Tested By
Single-Rate Pumping Test	01-Mar-1966		3.90				(Unknown)			

Pumping Tests - Readings

Pumping Test Type	Date	Time (mins)	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Intake Depth (m)	Test Method	To Measure Water Level	To Measure Discharge	Tested By
(No Pumping Test Reading Details Found)										

Chemical Treatment

Treatment	Method	Duration	Success
(No Chemical Treatment Details Found)			

Development

Method	Time Taken	Other Development Method
(No Development Details Found)		

Remarks

*** End of GW028414 ***

DEPARTMENT OF NATURAL RESOURCES

Work Summary

GW028415

Converted From HYDSYS

License :10BL020249		Authorised Purpose(s) IRRIGATION	Intended Purpose(s) IRRIGATION
Work Type :Well			
Work Status :Supply Obtained			
Construct. Method :(Unknown)			
Owner Type :Private			
Commenced Date :	Final Depth :	0.00	
Completion Date :01-Mar-1966	Drilled Depth :	7.60 m	
Contractor Name :			
Driller :			
Property : - N/A		Standing Water Level :	
GWMA :603 - SYDNEY BASIN		Salinity :	Brackish
GW Zone : -		Yield :	

Site Details

Site Chosen By	County Form A :CUMBERLAND Licensed :CUMBERLAND	Parish ROOTY HILL ROOTY HILL	Portion/Lot DP 106 18 752052
Region :10 - SYDNEY SOUTH COAST		CMA Map :9030-2N	PROSPECT
River Basin :212 - HAWKESBURY RIVER		Grid Zone :56/1	Scale :1:25,000
Area / District :			
Elevation :		Northing :6260200	Latitude (S) :33° 46' 44"
Elevation Source :(Unknown)		Eastings :296985	Longitude (E) :150° 48' 27"
GS Map :0056D4	AMG Zone :56	Coordinate Source :GD.,ACC.MAP	

Construction

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

H	P	Component	Type	From (m)	To (m)	OD (mm)	ID (mm)	Interval	Details
1		Backfill	Backfill	0.00	7.60	1066			
1	1	Casing	Concrete Cylinder	-0.90	-0.90	1066			(Unknown)

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
3.00	4.80	1.80	Unconsolidated						(Unknown)
7.40	7.40	0.00	Fractured						(Unknown)

Drillers Log

From (m)	To (m)	Thickness(m)	Drillers Description	Geological Material	Comments
0.00	0.61	0.61	Loam Sandy	Clay	
0.61	3.05	2.44	Clay	Gravel	
3.05	4.88	1.83	Gravel Clayey Sandy	Shale	
4.88	7.62	2.74	Shale Soft Broken Water Supply	Shale	
7.62	7.64	0.02	Shale Gray Hard	Shale	

Pumping Tests - Summaries

Pumping Test Type	Date	Duration (hr)	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Intake Depth (m)	Test Method	To Measure Water Level	To Measure Discharge	Tested By
Single-Rate Pumping Test	01-Mar-1966		2.10				(Unknown)			

Pumping Tests - Readings

Pumping Test Type	Date	Time (mins)	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Intake Depth (m)	Test Method	To Measure Water Level	To Measure Discharge	Tested By
(No Pumping Test Reading Details Found)										

Chemical Treatment

Treatment	Method	Duration	Success
(No Chemical Treatment Details Found)			

Development

Method	Time Taken	Other Development Method
(No Development Details Found)		

Remarks

*** End of GW028415 ***

DEPARTMENT OF NATURAL RESOURCES

Work Summary

GW101082

License :10BL157654		Authorised Purpose(s) MONITORING BORE	Intended Purpose(s) TEST BORE
Work Type :Bore			
Work Status :(Unknown)			
Construct. Method :Percussion			
Owner Type :			
Commenced Date :	Final Depth :	40.30 m	
Completion Date :27-May-1996	Drilled Depth :		
Contractor Name :INTERTECH DRILLING			
Driller :			
Property : - N/A	Standing Water Level :	12.43 m	
GWMA : -	Salinity :		
GW Zone : -	Yield :		

Site Details

Site Chosen By	County	Parish	Portion/Lot DP
	Form A :		
	Licensed :CUMBERLAND	MELVILLE	93 838541
Region :10 - SYDNEY SOUTH COAST		CMA Map :	
River Basin :		Grid Zone :	Scale :
Area / District :			
Elevation :	Northing :6255728	Latitude (S) :33° 49' 8"	
Elevation Source :	Easting :296006.995	Longitude (E) :150° 47' 47"	
GS Map :	AMG Zone :56	Coordinate Source :	

Construction

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

H	P	Component	Type	From (m)	To (m)	OD (mm)	ID (mm)	Interval	Details
1		Hole	Hole	0.00	40.30	158			Other
1	1	Casing	P.V.C.	-1.02	40.30	50			C: 0-28mm
1	1	Opening	Screen	30.40	39.30	.4			(Unknown); PVC Class 18
1		Annulus	(Unknown)	0.00	0.00				(Unknown); GS: 2mm

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
(No Water Bearing Zone Details Found)									

Drillers Log

From (m)	To (m)	Thickness(m)	Drillers Description	Geological Material	Comments
(No Drillers Log Details Found)					

Pumping Tests - Summaries

Pumping Test Type	Date	Duration (hr)	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Intake Depth (m)	Test Method	To Measure Water Level	To Measure Discharge	Tested By
(No Pumping Test Summary Details Found)										

Pumping Tests - Readings

Pumping Test Type	Date	Time (mins)	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Intake Depth (m)	Test Method	To Measure Water Level	To Measure Discharge	Tested By
(No Pumping Test Reading Details Found)										

Chemical Treatment

Treatment	Method	Duration	Success
(No Chemical Treatment Details Found)			

Development

Method	Time Taken	Other Development Method
(No Development Details Found)		

Remarks

Bore is called BH14-R.

*** End of GW101082 ***

Warning To Clients: This raw data has been supplied to the Department of Land and Water Conservation (DLWC) by drillers, licensees and other sources. The DLWC does not verify the accuracy of this data. The data is presented for use by you at your own risk. You should consider verifying this data before relying on it. Professional hydrogeological advice should be sought in interpreting and using this data.

DEPARTMENT OF NATURAL RESOURCES

Work Summary

GW101085

License :10BL157654

Work Type :Bore
Work Status :(Unknown)
Construct. Method :Percussion
Owaer Type :

Authorised Purpose(s)
MONITORING BORE

Intended Purpose(s)
TEST BORE

Commenced Date : Final Depth : 99.30 m
Completion Date :30-May-1996 Drilled Depth :

Contractor Name :INTERTECH DRILLING
Driller :

Property : - N/A
GWMA : -
GW Zone : -

Standing Water Level :
Salinity :
Yield :

Site Details

Site Chosen By County Parish Portion/Lot DP
Form A :
Licensed :CUMBERLAND MELVILLE 93 838541
Region :10 - SYDNEY SOUTH COAST
River Basin :
Area / District :
Elevation :
Elevation Source :
GS Map : AMG Zone :56 Coordinate Source :
CMA Map :
Grid Zone : Scale :
Northing :6255599 Latitude (S) :33° 49' 12"
Easting :295752.456 Longitude (E) :150° 47' 37"

Construction

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

H	P	Component	Type	From (m)	To (m)	OD (mm)	ID (mm)	Interval	Details
1		Hole	Hole	0.00	99.30	158			Other
1	1	Casing	P.V.C.	-0.77	99.30	50			
1	1	Opening	Screen	79.50	97.30	.4			(Unknown); PVC
1		Annulus	(Unknown)	77.00	97.30				(Unknown); GS: 2mm

Water Bearing Zones

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

(No Water Bearing Zone Details Found)

Drillers Log

From (m) To (m) Thickness(m) Drillers Description

Geological
Material

Comments

(No Drillers Log Details Found)

Pumping Tests - Summaries

Pumping Test Type Date Duration (hr) S.W.L. (m) D.D.L. (m) Yield (L/s) Intake Depth (m) Test Method To Measure Water Level To Measure Discharge Tested By

(No Pumping Test Summary Details Found)

Pumping Tests - Readings

Pumping Test Type Date Time (mins) S.W.L. (m) D.D.L. (m) Yield (L/s) Intake Depth (m) Test Method To Measure Water Level To Measure Discharge Tested By

(No Pumping Test Reading Details Found)

Chemical Treatment

Treatment Method Duration

Success

(No Chemical Treatment Details Found)

Development

Method Time Taken

Other Development Method

(No Development Details Found)

Remarks

Form A Remarks:
Bore called BH-16B

*** End of GW101085 ***

Warning To Clients: This raw data has been supplied to the Department of Land and Water Conservation (DLWC) by drillers, licensees and other sources. The DLWC does not verify the accuracy of this data. The data is presented for use by you at your own risk. You should consider verifying this data before relying on it. Professional hydrogeological advice should be sought in interpreting and using this data.

DEPARTMENT OF NATURAL RESOURCES

Work Summary

GW101086

License :10BL157654

Work Type :Bore
Work Status :Unknown
Construct. Method :Percussion
Owner Type :

Authorised Purpose(s)
MONITORING BORE

Intended Purpose(s)
TEST BORE

Commenced Date : Final Depth : 69.70 m
Completion Date :29-May-1996 Drilled Depth :

Contractor Name :INTERTECH DRILLING
Driller :

Property : - N/A
GWMA : -
GW Zone : -

Standing Water Level :
Salinity :
Yield :

Site Details

Site Chosen By County Parish Portion/Lot DP
Form A :
Licensed :CUMBERLAND MELVILLE 93 838541
Region :10 - SYDNEY SOUTH COAST
River Basin :
Area / District :
Elevation :
Elevation Source :
GS Map : AMG Zone :56
CMA Map :
Grid Zone :
Scale :
Northing :6255568
Easting :295753.12
Latitude (S) :33° 49' 13"
Longitude (E) :150° 47' 37"
Coordinate Source :

Construction

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

SI	P	Component	Type	From (m)	To (m)	OD (mm)	ID (mm)	Interval	Details
1		Hole	Hole	0.00	69.70	158			Other
1	1	Casing	P.V.C.	-0.79	69.70	50			
1	1	Opening	Screen	49.90	67.70	50			(Unknown); PVC; A: .4mm
1		Annulus	(Unknown)	47.00	67.70				(Unknown); GS: 2mm

Water Bearing Zones

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

(No Water Bearing Zone Details Found)

Drillers Log

From (m) To (m) Thickness(m) Drillers Description

Geological
Material

Comments

(No Drillers Log Details Found)

Pumping Tests - Summaries

Pumping Test Type Date Duration (hr) S.W.L. (m) D.D.L. (m) Yield (L/s) Intake Depth (m) Test Method To Measure Water Level To Measure Discharge Tested By

(No Pumping Test Summary Details Found)

Pumping Tests - Readings

Pumping Test Type Date Time (mins) S.W.L. (m) D.D.L. (m) Yield (L/s) Intake Depth (m) Test Method To Measure Water Level To Measure Discharge Tested By

(No Pumping Test Reading Details Found)

Chemical Treatment

Treatment Method Duration Success

(No Chemical Treatment Details Found)

Development

Method Time Taken Other Development Method

(No Development Details Found)

Remarks

Form A Remarks:
Bore called BH-16A.

*** End of GW101086 ***

Warning To Clients: This raw data has been supplied to the Department of Land and Water Conservation (DLWC) by drillers, licensees and other sources. The DLWC does not verify the accuracy of this data. The data is presented for use by you at your own risk. You should consider verifying this data before relying on it. Professional hydrogeological advice should be sought in interpreting and using this data.

DEPARTMENT OF NATURAL RESOURCES

Work Summary

GW102674

License :10BL152917

Work Type :Bore
Work Status :(Unknown)
Construct. Method :Rotary
Owner Type :

Authorised Purpose(s)
MONITORING BORE

Intended Purpose(s)
MONITORING BORE

Commenced Date : Final Depth : 69.70 m
Completion Date :25-Aug-1993 Drilled Depth : 71.90 m

Contractor Name :ENGINEERING EXPLORATION
Driller : Williams, Roy

Property : - N/A
GWMA : -
GW Zone : -

Standing Water Level :
Salinity : 4,400.00 mg/L
Yield :

Site Details

Site Chosen By County Parish Portion/Lot DP
Form A :
Licensed :CUMBERLAND MELVILLE 91 838541
Region :10 - SYDNEY SOUTH COAST
River Basin :
Area / District :
Elevation :
Elevation Source :
GS Map : AMG Zone :56
Coordinate Source :GIS - Geographic Information System
CMA Map :
Grid Zone :
Scale :
Northing :6255589
Easting :295263.794
Latitude (S) :33° 49' 12"
Longitude (E) :150° 47' 18"

Construction

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

H	P	Component	Type	From (m)	To (m)	OD (mm)	ID (mm)	Interval	Details
1		Hole	Hole	0.00	36.00	100			(Unknown)
1		Hole	Hole	36.00	39.00	96			Cable Tool
1		Hole	Hole	39.00	71.90	100			(Unknown)
1		Casing	P.V.C.	0.00	21.00	50			C: 0-15m
1		Casing	(Unknown)	24.00	29.90				
1		Casing	(Unknown)	41.70	47.60				
1		Casing	(Unknown)	50.50	56.40				
1		Casing	(Unknown)	59.40	65.30				
1		Casing	(Unknown)	68.20	69.70				
1		Opening	Screen	21.00	23.90	50			PVC; A: 4mm; Screwed
1		Opening	Screen	29.90	32.80				A: 4mm; Screwed
1		Opening	Screen	38.70	41.70				A: 4mm; Screwed
1		Opening	Screen	47.60	50.50				A: 4mm; Screwed
1		Opening	Screen	56.40	59.40				A: 4mm; Screwed
1		Opening	Screen	65.30	68.20				A: 4mm; Screwed
1		Annulus	(Unknown)	15.00	69.70				Graded

Water Bearing Zones

From (m) To (m) Thickness (m) WBZ Type S.W.L. (m) D.D.L. (m) Yield (L/s) Hole Depth (m) Duration (hr) Salinity (mg/L)
(No Water Bearing Zone Details Found)

Drillers Log

From (m)	To (m)	Thickness(m)	Drillers Description	Geological Material	Comments
0.00	2.00	2.00	SHALE/GREY/BROWN	Siltstone	
2.00	9.00	7.00	SILTSTONE/SHALE	Shale	
9.00	12.00	3.00	SHALE/SILTSTONE	Siltstone	
12.00	25.00	13.00	SILTSTONE/SANDSTONE/SHALE	Sandstone	
25.00	32.00	7.00	SANDSTONE/SILTSTONE/SHALE	Siltstone	
32.00	37.40	5.40	SILTSTONE, SHALE	Shale	
37.40	40.00	2.60	SHALE, CARBONACEOUS	Siltstone	
40.00	48.00	8.00	SILTSTONE/SHALE	Shale	
48.00	53.00	5.00	SHALE/SILTSTONE/SANDSTONE	Shale	
53.00	56.00	3.00	SHALE	Sandstone	
56.00	60.00	4.00	SANDSTONE/SILTSTONE	Shale	
60.00	71.90	11.90	SHALE/SILTSTONE	Shale	

Pumping Tests - Summaries

Pumping Test Type Date Duration (hr) S.W.L. (m) D.D.L. (m) Yield (L/s) Intake Depth (m) Test Method To Measure Water Level To Measure Discharge Tested By
(No Pumping Test Summary Details Found)

Pumping Tests - Readings

Pumping Test Type Date Time (mins) S.W.L. (m) D.D.L. (m) Yield (L/s) Intake Depth (m) Test Method To Measure Water Level To Measure Discharge Tested By
(No Pumping Test Reading Details Found)

Warning To Clients: This raw data has been supplied to the Department of Land and Water Conservation (DLWC) by drillers, licensees and other sources. The DLWC does not verify the accuracy of this data. The data is presented for use by you at your own risk. You should consider verifying this data before relying on it. Professional hydrogeological advice should be sought in interpreting and using this data.

DEPARTMENT OF NATURAL RESOURCES
Work Summary

GW102674

Chemical Treatment

Treatment	Method	Duration	Success
<i>(No Chemical Treatment Details Found)</i>			

Development

Method	Time Taken	Other Development Method
<i>(No Development Details Found)</i>		

Remarks

*** End of GW102674 ***

DEPARTMENT OF NATURAL RESOURCES

Work Summary

GW103953

License :10BL156670

Work Type :Bore
Work Status :Unknown
Construct. Method :Auger
Owner Type :

Authorised Purpose(s)
MONITORING BORE

Intended Purpose(s)
MONITORING BORE

Commenced Date : Final Depth : 9.90 m
Completion Date :21-Jan-1993 Drilled Depth : 10.50 m

Contractor Name :ENGINEERING EXPLORATION P/L
Driller : Amaval, R

Property : - N/A
GWMA : -
GW Zone : -

Standing Water Level :
Salinity :
Yield :

Site Details

Site Chosen By
Other

County
Form A :CUMBERLAND
Licensed :CUMBERLAND

Parish
MELVILLE
MELVILLE

Portion/Lot DP
LOT80 DP106143
LOT80 DP106143

Region :10 - SYDNEY SOUTH COAST
River Basin :
Area / District :

CMA Map :
Grid Zone :

Scale :

Elevation :
Elevation Source :

Northing :
Easting :

Latitude (S) :
Longitude (E) :

GS Map :

AMG Zone :

Coordinate Source :

Construction

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

H	P	Component	Type	From (m)	To (m)	OD (mm)	ID (mm)	Interval	Details
1		Hole	Hole	0.00	10.05	100			Auger
1	1	Casing	P.V.C.	-0.30	9.90				C: -1-.3m
1	1	Opening	Screen	6.90	9.90	50			PVC

Water Bearing Zones

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

(No Water Bearing Zone Details Found)

Drillers Log

From (m)	To (m)	Thickness(m)	Drillers Description	Geological	Comments
0.00	1.50	1.50	CLAYEY SILT	Stratified Sand	
1.50	5.00	3.50	SILTY CLAY TO CLAYEY SILT	Silty Clay	
5.00	10.50	5.50	SHALE, GREY	Shale	

Pumping Tests - Summaries

Pumping Test Type	Date	Duration (hr)	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Intake Depth (m)	Test Method	To Measure Water Level	To Measure Discharge	Tested By
-------------------	------	---------------	------------	------------	-------------	------------------	-------------	------------------------	----------------------	-----------

(No Pumping Test Summary Details Found)

Pumping Tests - Readings

Pumping Test Type	Date	Time (mins)	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Intake Depth (m)	Test Method	To Measure Water Level	To Measure Discharge	Tested By
-------------------	------	-------------	------------	------------	-------------	------------------	-------------	------------------------	----------------------	-----------

(No Pumping Test Reading Details Found)

Chemical Treatment

Treatment	Method	Duration	Success
-----------	--------	----------	---------

(No Chemical Treatment Details Found)

Development

Method	Time Taken	Other Development Method
--------	------------	--------------------------

Remarks

*** End of GW103953 ***

DEPARTMENT OF NATURAL RESOURCES

Work Summary

GW103954

License :10BL156670

Work Type :Bore
Work Status :Unknown
Construct. Method :Auger
Owner Type :

Authorised Purpose(s)
MONITORING BORE

Intended Purpose(s)
MONITORING BORE

Commenced Date : Final Depth : 9.90 m
Completion Date :29-Oct-1993 Drilled Depth : 9.00 m

Contractor Name :ENGINEERING EXPLORATION P/L
Driller : Amaval, R

Property : - N/A
GWMA : -
GW Zone : -

Standing Water Level :
Salinity :
Yield :

Site Details

Site Chosen By
Other

County
Form A :CUMBERLAND
Licensed :CUMBERLAND

Parish
MELVILLE
MELVILLE

Portion/Lot DP
LOT80 DP106143
LOT80 DP106143

Region :10 - SYDNEY SOUTH COAST
River Basin :
Area / District :

CMA Map :
Grid Zone :

Scale :

Elevation :
Elevation Source :

Northing :
Easting :

Latitude (S) :
Longitude (E) :

GS Map :

AMG Zone :

Coordinate Source :

Construction

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

H	P	Component	Type	From (m)	To (m)	OD (mm)	ID (mm)	Interval	Details
1		Hole	Hole	0.00	9.00	100			Auger
1	1	Casing	P.V.C.	-0.30	9.00	50			C:-1.3m
1	1	Opening	Screen	6.00	9.00	50			PVC

Water Bearing Zones

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

(No Water Bearing Zone Details Found)

Drillers Log

From (m)	To (m)	Thickness(m)	Drillers Description
0.00	1.50	1.50	CLAYEY SILT
1.50	4.50	3.00	SILTY CLAY TO CLAYEY SILT
4.50	9.00	4.50	SHALE

Geological
Material
Silty Clay
Shale

Comments

Pumping Tests - Summaries

Pumping Test Type	Date	Duration (hr)	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Intake Depth (m)	Test Method	To Measure Water Level	To Measure Discharge	Tested By
-------------------	------	---------------	------------	------------	-------------	------------------	-------------	------------------------	----------------------	-----------

(No Pumping Test Summary Details Found)

Pumping Tests - Readings

Pumping Test Type	Date	Time (mins)	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Intake Depth (m)	Test Method	To Measure Water Level	To Measure Discharge	Tested By
-------------------	------	-------------	------------	------------	-------------	------------------	-------------	------------------------	----------------------	-----------

(No Pumping Test Reading Details Found)

Chemical Treatment

Treatment	Method	Duration	Success
-----------	--------	----------	---------

(No Chemical Treatment Details Found)

Development

Method	Time Taken	Other Development Method
--------	------------	--------------------------

Other

Remarks

*** End of GW103954 ***

*** End of Report ***

Warning To Clients: This raw data has been supplied to the Department of Land and Water Conservation (DLWC) by drillers, licensees and other sources. The DLWC does not verify the accuracy of this data. The data is presented for use by you at your own risk. You should consider verifying this data before relying on it. Professional hydrogeological advice should be sought in interpreting and using this data.

APPENDIX C
Title Deed Search Records

ACN: 093 398 611
ABN: 61 093 412 474

Peter S. Hopley Pty Limited
Legal Searchers

1 Boronia Avenue
Mount Annan, NSW, 2567
Mobile: 0412 199 304
Fax 9233 4590 (Attn Box 29)

SUMMARY AS TO OWNERS.

Property: Archbold Road, Eastern Creek

Description: - Lot 2 D.P. 262213

As to that part marked 1 on the attached cadastre

06.12.1909	Thomas Baker (Tanner)	Book 895 No. 803
03.05.1955	Burfield Pty Limited (Now Ray Fitzpatrick Pty Limited)	2/262213

For search continued as to this part, See Page 2

As to those parts marked 2 & 3 on the attached cadastre

09.03.1917	Elizabeth Sarah Baker (Married Woman)	Book 1102 No. 994
29.08.1946	William Thomas Gillett Baker (Grazier)	Book 1995 No. 998
03.05.1955	Burfield Pty Limited (Now Ray Fitzpatrick Pty Limited)	2/262213

For search continued as to this part, See Page 2

ACN: 093 398 611
ABN: 61 093 412 474

Peter S. Hopley Pty Limited
Legal Searchers

1 Boronia Avenue
Mount Annan , NSW , 2567
Mobile: 0412 199 304
Fax 9233 4590 (Attn Box 29)

Search continued as to the whole of the subject land

12.09.2005 # ACN 114 843 453 Pty Limited

2/262213

Current Registered Proprietor

Cadastral Records Enquiry Report

Box : 29

Requested Parcel : Lot 2 DP 262213

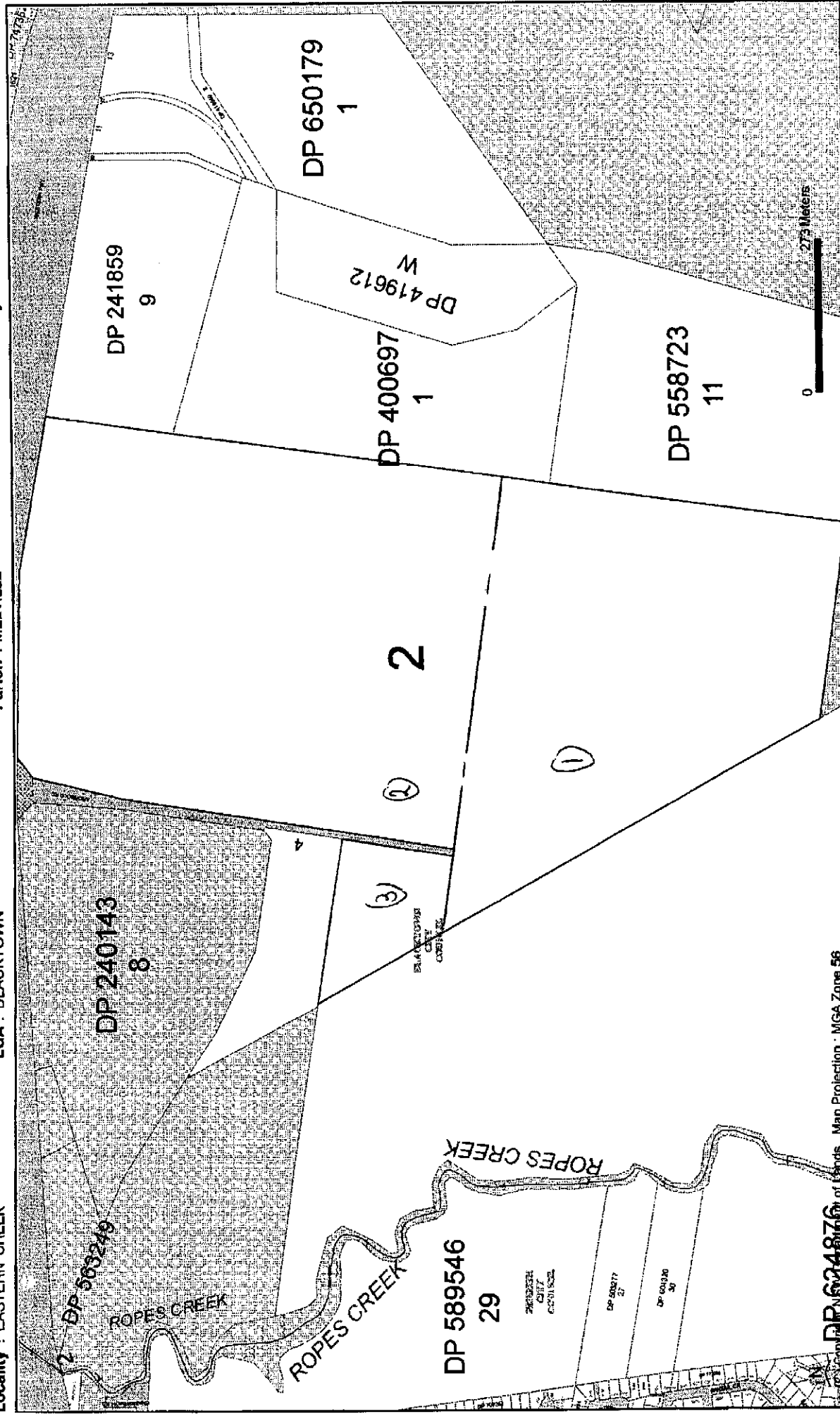
Identified Parcel : Lot 2 DP 262213

Locality : EASTERN CREEK

LGA : BLACKTOWN

Parish : MELVILLE

County : CUMBERLAND



B29/Req: B113518 /Doc: CT 13544-125
/Prt: 17-Feb-2006

NEW SOUTH WALES

Appln. No. 52818

13544 Fol. 125

EDITION ISSUED

6 2 1979

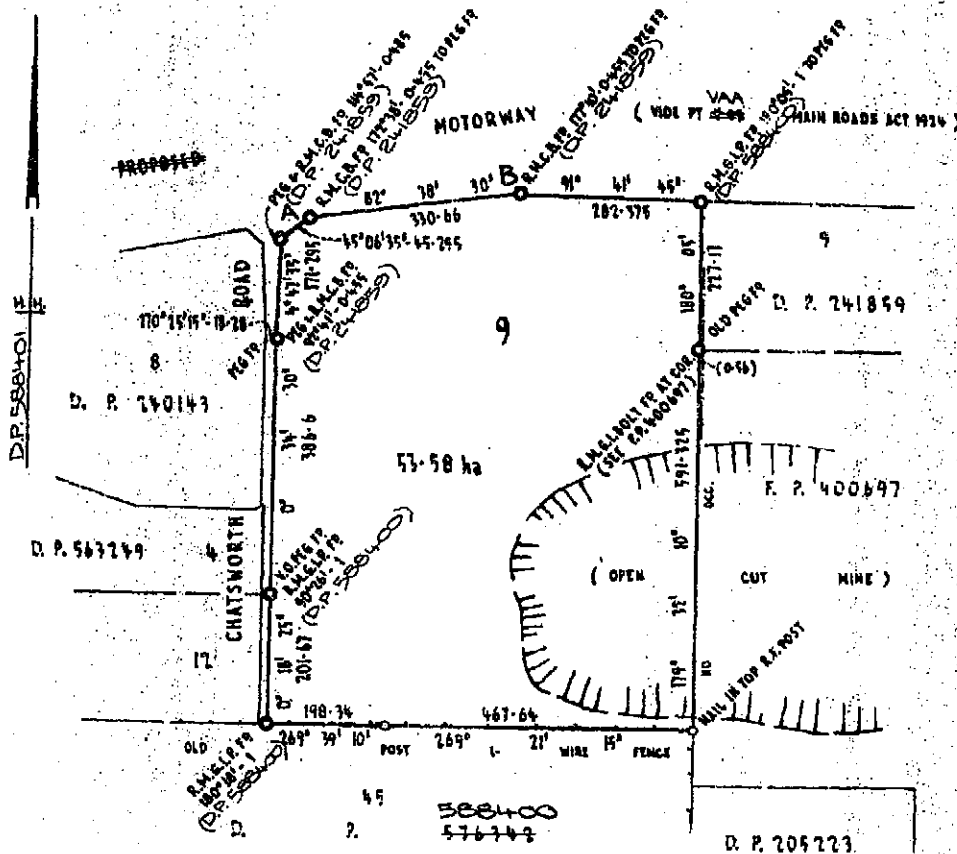


I certify that the person described in the First Schedule is the registered proprietor of the undermentioned estate in the land within described subject nevertheless to such exceptions encumbrances and interests as are shown in the Second Schedule.

Registrar General.

**PLAN SHOWING LOCATION OF LAND**

LENGTHS ARE IN METRES

CANCELLED**ESTATE AND LAND REFERRED TO**

Estate in Fee Simple in Lot 9 in Deposited Plan 588401 at Ropes Creek in the Municipality of Blacktown Parish of Melville and County of Cumberland being part of Portion 14 granted to William Cox (Junior) on 17-8-1819.

FIRST SCHEDULE

RAY FITZPATRICK PTY. LIMITED.

SECOND SCHEDULE

1. Reservations and conditions, if any, contained in the Crown Grant above referred to.
2. Book 2603 No. 79 Lease to Ray Fitzpatrick Quarries Pty. Limited. Date of expiry 14-2-1979.

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR GENERAL ARE CANCELLED.

PERSONS ARE CAUTIONED AGAINST ALTERING OR ADDING TO THIS CERTIFICATE OR ANY NOTIFICATION HEREON

WARNING: THIS DOCUMENT MUST NOT BE REMOVED FROM THE LAND TITLES OFFICE

B29/Req: B113350 /Doc: CT 13548-070 **E**
/Prt: 17-Feb-2006

NEW SOUTH WALES

Appln. No. 52819

Vol. **13548** Fol. **70**

EDITION ISSUED

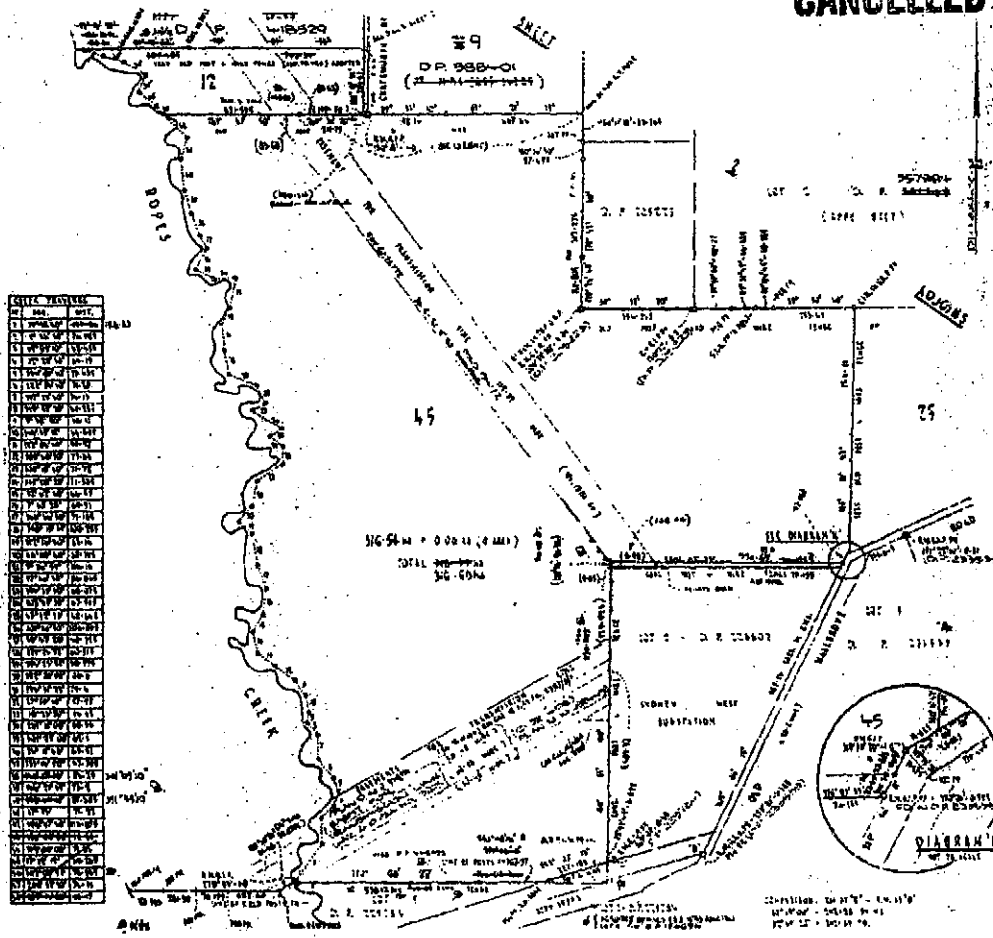
9 2 1970



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

Registrar General.**PLAN SHOWING LOCATION OF LAND**

LENGTHS ARE IN METRES

CANCELLED**ESTATE AND LAND REFERRED TO**

Estate in Fee Simple in Lot 45 in Deposited Plan 588400 at Ropes Creek in the Municipality of Blacktown Parish of Melville and County of Cumberland being part of Portion 45 granted to John Thomas Campbell on 17-8-1819.

FIRST SCHEDULE**RAY FITZPATRICK PTY. LIMITED.****SECOND SCHEDULE**

1. Reservations and conditions, if any, contained in the Crown Grant above referred to.
2. Book 2603 No. 79 Lease to Ray Fitzpatrick Quarries Pty. Limited. Date of expiry 14-2-1979.
3. Notification in Government Gazette 30-6-1961 folio 1941. Easement for transmission line affecting the part of the land above described shown so burdened in Deposited Plan 588400.
4. Notification in Government Gazette 16-8-1963 folio 2389. Easement for transmission line affecting the part of the land above described shown so burdened in Deposited Plan 588400.
5. Notification in Government Gazette 16-10-1964 folio 3205. Easement for transmission line affecting the part of the land above described shown so burdened in Deposited Plan 588400.

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR GENERAL ARE CANCELLED.

WARNING: THIS DOCUMENT MUST NOT BE REMOVED FROM THE LAND TITLES OFFICE.

PERSONS ARE CAUTIONED AGAINST ALTERING OR ADDING TO THIS CERTIFICATE OR ANY NOTIFICATION HEREON

FIRST SCHEDULE (continued)

REGISTERED PROPRIETOR

Signature of _____

DATE

REMARKS

Guidelines

REGISTERED PROPRIETOR

1

13548 FOL: 20

١٥٦

[illegible]

SECOND SCHEDULE (continued)

PARTICULARS

INSTRUMENT NUMBER

NÄLLE

Interests created pursuant to Section 108 Cooperative Act, 1919,
by the registration of Deed Plan 762213

New Certificates of Title have been issued on 08-4-1986
for lots in Deposited Plan No 060713
lots of A 5 Vol 19206 Fol 000125 - presently.

(Page 2 of 2 pages)

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR GENERAL ARE CANCELLED

B29/Req: B113349 /Doc: CT 13507-223
/Prt: 17-Feb-2006

NEW SOUTH WALES

Appln. No. 53178

ol. 13507 Fol. 223

EDITION ISSUED

6 12 1977

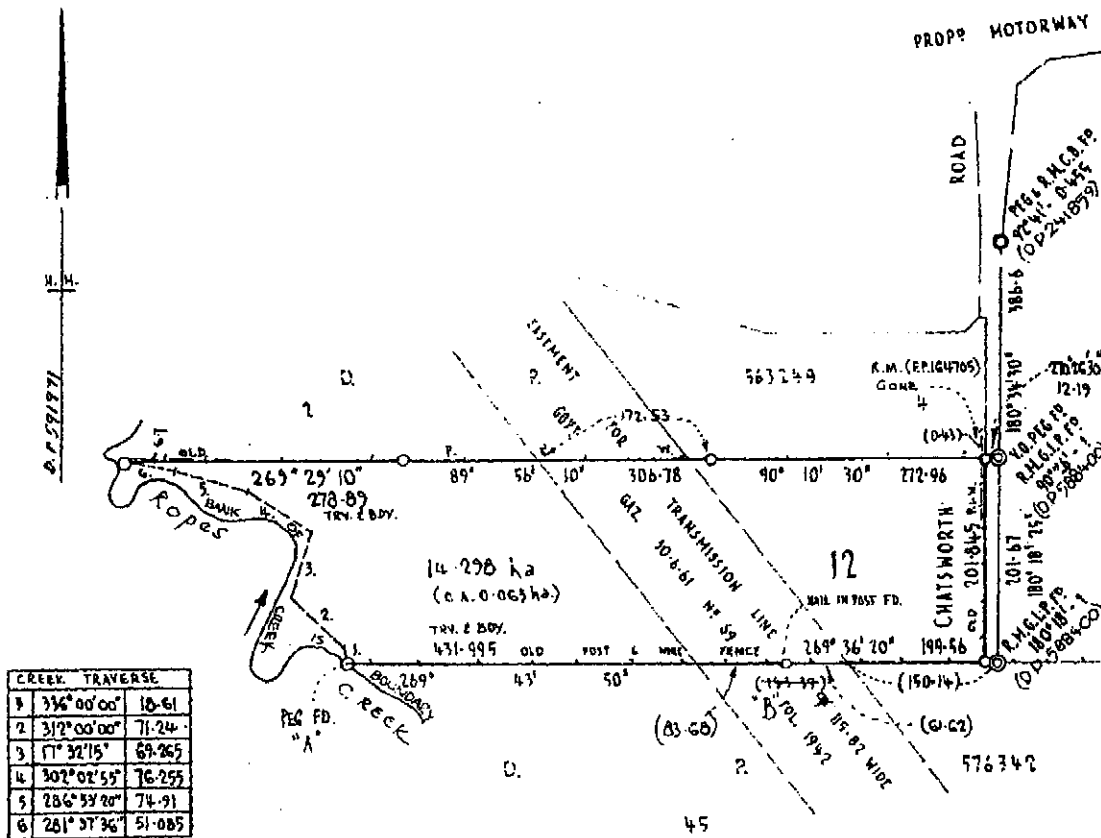


I certify that the person described in the First Schedule is the registered proprietor of the undermentioned estate in the land within described subject nevertheless to such exceptions encumbrances and interests as are shown in the Second Schedule.

Registrar General.

**PLAN SHOWING LOCATION OF LAND**

LENGTHS ARE IN METRES

**ESTATE AND LAND REFERRED TO**

Estate in Fee Simple in Lot 12 in Deposited Plan 591971 at Ropes Creek in the Municipality of Blacktown Parish of Melville and County of Cumberland being part of Portion 14 granted to William Cox (Junior) on 17-8-1819.

FIRST SCHEDULE

RAY FITZPATRICK PTY. LIMITED.

SECOND SCHEDULE

1. Reservations and conditions, if any, contained in the Crown Grant above referred to.
2. Book 2603 No. 79 Lease to Ray Fitzpatrick Quarries Pty. Ltd. Expiry dated 14-2-1979.
3. Notification in Government Gazette 30-6-1961 Folio 1942. Easement for Transmission Line affecting the part of the land above described shown so burdened in Deposited Plan 591971.

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR GENERAL ARE CANCELLED.

WARNING: THIS DOCUMENT MUST NOT BE REMOVED FROM THE LAND FILES OFFICE.

PERSONS ARE CAUTIONED AGAINST ALTERING OR ADDING TO THIS CERTIFICATE OR ANY NOTIFICATION HEREON

FIRST SCHEDULE (continued)

REGISTERED PROPRIETOR

**Signature of
Registrar General**

DATE _____

INSTRUMENT	NUMBER
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10
11	11
12	12
13	13
14	14
15	15
16	16
17	17
18	18
19	19
20	20
21	21
22	22
23	23
24	24
25	25
26	26
27	27
28	28
29	29
30	30
31	31
32	32
33	33
34	34
35	35
36	36
37	37
38	38
39	39
40	40
41	41
42	42
43	43
44	44
45	45
46	46
47	47
48	48
49	49
50	50
51	51
52	52
53	53
54	54
55	55
56	56
57	57
58	58
59	59
60	60
61	61
62	62
63	63
64	64
65	65
66	66
67	67
68	68
69	69
70	70
71	71
72	72
73	73
74	74
75	75
76	76
77	77
78	78
79	79
80	80
81	81
82	82
83	83
84	84
85	85
86	86
87	87
88	88
89	89
90	90
91	91
92	92
93	93
94	94
95	95
96	96
97	97
98	98
99	99
100	100

NATURE

.....

REGISTERED PROPRIETOR

Age Group	Percentage of Respondents
18-29	85%
30-49	80%
50-69	75%
70+	70%

NEW ORLEANS, LA. 70119
NO DEALING TO BE CONSIDERED WITHOUT ADVISORY TO
HUNTER JOSEPH FRANK

DP 262213

SECOND SCHEDULE (continued)

PARTICULARS

DATE _____

INVESTMENT NUMBER	NUMBER
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10
11	11
12	12
13	13
14	14
15	15
16	16
17	17
18	18
19	19
20	20
21	21
22	22
23	23
24	24
25	25
26	26
27	27
28	28
29	29
30	30
31	31
32	32
33	33
34	34
35	35
36	36
37	37
38	38
39	39
40	40
41	41
42	42
43	43
44	44
45	45
46	46
47	47
48	48
49	49
50	50
51	51
52	52
53	53
54	54
55	55
56	56
57	57
58	58
59	59
60	60
61	61
62	62
63	63
64	64
65	65
66	66
67	67
68	68
69	69
70	70
71	71
72	72
73	73
74	74
75	75
76	76
77	77
78	78
79	79
80	80
81	81
82	82
83	83
84	84
85	85
86	86
87	87
88	88
89	89
90	90
91	91
92	92
93	93
94	94
95	95
96	96
97	97
98	98
99	99
100	100

NATURE

Interests created pursuant to Section 88B Conveyancing Act, 1919,
by the registration of Deceased Plan 262213

90471 On the possibility of [unclear] [unclear]

New Certificate of Title have issued on 02-4-1982

Discontinued 11/1/13 06/20/13

24 1400 2144 1100

[illegible]

10

224

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR GENERAL ARE CANCELLED

B29

/Req: B113346 /Doc: CT 14726-222
/Prt: 17-Feb-2006

NEW SOUTH WALES

Appln. Nos. 52818 & 52819

Prior Titles Vol.13544 Fol.125
Vol.13548 Fol. 70
Vol.13507 Fol.223

726 Fol. 222

EDITION ISSUED

23 4 1992



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

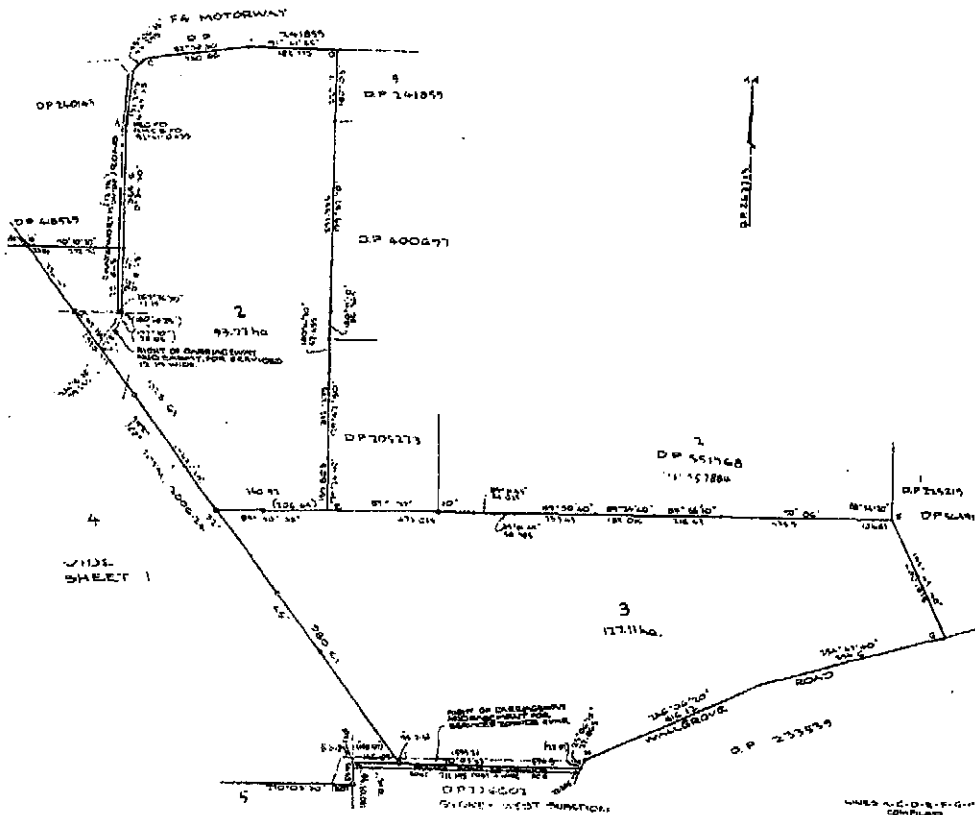
CANCELLED

[Signature]
Registrar General.
SEE AUTO FOLIO



PLAN SHOWING LOCATION OF LAND

LENGTHS ARE IN METRES



ESTATE AND LAND REFERRED TO

Estate in Fee Simple in Lot 2 in Deposited Plan 262213 at Ropes Creek in the City of Blacktown Parish of Melville and County of Cumberland being part of Portion 14 granted to William Cox (Junior) on 17-8-1819 and part of Portion 45 granted to John Thomas Campbell on 17-8-1819.

FIRST SCHEDULE

RAY FITZPATRICK PTY. LIMITED.

SECOND SCHEDULE

- GAY 1. Reservations and conditions, if any, contained in the Crown Grants above referred to.
RG(SB) 2. DP262213 Right of carriageway affecting the part of the land above described shown so burdened in the plan hereon.
EG(SB) 3. DP262213 Easement for services affecting the part of the land above described shown so burdened in the plan hereon.

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR GENERAL ARE CANCELLED

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR GENERAL ARE CANCELLED

LegalStream Australia Pty Ltd

ABN: 80 002 801 498
Level 10, 135 King Street, SYDNEY NSW 2000, AUSTRALIA * DX654, SYDNEY
Tel: (02) 9231 0122 Fax: (02) 9233 6411 www.legalstream.com.au

An Approved
LPI NSW
Information Broker

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - HISTORICAL SEARCH

SEARCH DATE

21/2/2006 6:21PM

FOLIO: 2/262213

First Title(s): SEE PRIOR TITLE(S)
Prior Title(s): VOL 14726 FOL 222

Recorded	Number	Type of Instrument	C.T. Issue
5/6/1987		TITLE AUTOMATION PROJECT	LOT RECORDED FOLIO NOT CREATED
6/8/1987		CONVERTED TO COMPUTER FOLIO	FOLIO CREATED CT NOT ISSUED
21/5/1996		AMENDMENT: LOCAL GOVT AREA	
23/12/1996	2716424	VARIATION OF LEASE	EDITION 1
19/6/1998	5067558	DEPARTMENTAL DEALING	
9/11/2004	AB78884	REQUEST	EDITION 2
23/12/2004	AB183817	CAVEAT	
16/3/2005	AB222195	MORTGAGE	EDITION 3
12/9/2005	AB760521	WITHDRAWAL OF CAVEAT	
12/9/2005	AB760522	DISCHARGE OF MORTGAGE	
12/9/2005	AB760523	TRANSFER	
12/9/2005	AB760524	MORTGAGE	
12/9/2005	AB760525	MORTGAGE	EDITION 4

*** END OF SEARCH ***

archbold road

PRINTED ON 21/2/2006

LegalStream Australia Pty Ltd

ABN: 80 002 801 498
Level 10, 135 King Street, SYDNEY NSW 2000, AUSTRALIA * DX654, SYDNEY
Tel: (02) 9231 0122 Fax: (02) 9233 6411 www.legalstream.com.au

An Approved
LPI NSW
Information Broker

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - TITLE SEARCH

FOLIO: 2/262213

SEARCH DATE	TIME	EDITION NO	DATE
21/2/2006	6:21 PM	4	12/9/2005

LAND

LOT 2 IN DEPOSITED PLAN 262213
AT ROPES CREEK
LOCAL GOVERNMENT AREA: BLACKTOWN
PARISH OF MELVILLE COUNTY OF CUMBERLAND
TITLE DIAGRAM: DP262213

FIRST SCHEDULE

ACN 114 843 453 PTY LIMITED (T AB760523)

SECOND SCHEDULE (5 NOTIFICATIONS)

1. RESERVATIONS AND CONDITIONS IN THE CROWN GRANT(S)
2. DP262213 RIGHT OF CARRIAGEWAY AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM
3. DP262213 EASEMENT FOR SERVICES AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM
4. AB760524 MORTGAGE TO VALAD FUNDS MANAGEMENT LIMITED
5. AB760525 MORTGAGE TO VALAD COMMERCIAL MANAGEMENT LIMITED

NOTATIONS

UNREGISTERED DEALINGS: L AC54545 L AC54546 L AC54547
L AC54548 L AC54549.

*** END OF SEARCH ***

archbold road

PRINTED ON 21/2/2006

LEGALSTREAM AUSTRALIA hereby 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.

*ANY ENTRIES PRECEDED BY AN ASTERIX DO NOT APPEAR ON THE CURRENT EDITION OF THE CERTIFICATE OF TITLE
WARNING: THE INFORMATION APPEARING UNDER NOTATIONS HAS NOT BEEN FORMALLY RECORDED IN THE REGISTER

APPENDIX D
Aerial Photographs



Photo 1 - 1947 Aerial

Project Name	Preliminary Contamination Assessment of Stockpiled Quarry Overburden and General Land Quality	Project	March	Plate
Project Address	Archbold Road	43756A	2006	1
Project Suburb/Location	Eastern Creek			



Photo 2 - 1970 Aerial

Project Name	Preliminary Contamination Assessment of Stockpiled Quarry Overburden and General Land Quality	Project	March	Plate
Project Address	Archbold Road	43756A	2006	2
Project Suburb/Location	Eastern Creek			



Photo 3 - 1986 Aerial

Project Name	Preliminary Contamination Assessment of Stockpiled Quarry Overburden and General Land Quality	Project	March	Plate
Project Address	Archbold Road	43756A	2006	3
Project Suburb/Location	Eastern Creek			



Photo 4 - 2002 Aerial Photograph

Project Name	Preliminary Contamination Assessment of Stockpiled Quarry Overburden and General Land Quality	Project	March	Plate
Project Address	Archbold Road	43756A	2006	4
Project Suburb/Location	Eastern Creek			

APPENDIX E
Section 149 Planning Certificate

PLANNING CERTIFICATE UNDER SECTION 149

ENVIRONMENTAL PLANNING AND ASSESSMENT ACT, 1979

Certificate No.: 06-1004
Date: 27 FEB 2006
Page: 1 of 7
Enquiries: Ms Lucic
Applicants Ref:

Applicant CATHERINE KARPIEL
PO BOX 472
WEST RYDE NSW 1685

Property LOT 2 DP 262213
ARCHBOLD ROAD,

Suburb EASTERN CREEK



NOTE: The land the subject of this Certificate is known to be located in the suburb of Eastern Creek. For all correspondence and property transactions this suburb name is to be used.

PART A PRESCRIBED INFORMATION PROVIDED PURSUANT TO SECTION 149(2) OF THE EPA ACT 1979

NOTE: The following information is provided pursuant to Section 149(2) of the Environmental Planning & Assessment (EPA) Act 1979 as prescribed by Schedule 4 of the EPA Regulation 2000 and is applicable as of the date of this certificate.

1. RELEVANT STATE ENVIRONMENTAL PLANNING POLICIES (INCLUDING DRAFT POLICIES), REGIONAL ENVIRONMENTAL PLANS (INCLUDING DRAFT PLANS), LOCAL ENVIRONMENTAL PLANS (INCLUDING DRAFT PLANS) AND DEVELOPMENT CONTROL PLANS

1.1 Local Environmental Planning Instruments

As at the date of this certificate the abovementioned land is not affected by Blacktown Local Environmental Plan 1988.

1.2 Development Control Plans

As at the date of this certificate the abovementioned land is not affected by Blacktown Development Control Plan 1992.

1.3 Relevant State Environmental Planning Policies (including Draft Policies) or Regional Environmental Plans (including Draft Plans)

Council Chambers • 62 Flushcombe Road • Blacktown NSW 2148

Telephone: (02) 9839 6000 • Facsimile: (02) 9831 1961 • DX 8117 Blacktown

<http://www.blacktown.nsw.gov.au> • email: council@blacktown.nsw.gov.au

All correspondence to: The General Manager • PO Box 63 • Blacktown NSW 2148

State Environmental Planning Policy - 1 - Development Standards and Draft State Environmental Planning Policy (Application of Development Standards) 2004

State Environmental Planning Policy (SEPP) No. 1 gives Councils the power to vary standards and approve development in some situations. Currently the Department of Planning is reviewing the SEPP and a draft SEPP called draft State Environmental Planning Policy (Application of Development Standards) 2004 was exhibited from 10 May to 18 June 2004. One change proposed would make developers and Councils more accountable. When applicants use SEPP 1, they must provide sufficient evidence that proposed development meets the objectives of the local plan. Local communities will be more certain about the quality of development in their area. Another change would affect rural areas. Farmland will be protected and unintended development will be prevented in rural, environment protection and water catchment areas.

State Environmental Planning Policy - 4 - Development Without Consent and Miscellaneous and Complying Development

This Policy allows relatively simple or minor changes of land or building use and certain types of development without the need for formal Development Applications. The types of development covered in the Policy are outlined in the Policy.

State Environmental Planning Policy - 6 - Number of Storeys in a Building

This Policy sets out a method for determining the number of storeys in a building, to prevent possible confusion arising from the interpretation of various environmental planning instruments.

State Environmental Planning Policy - 11 - Traffic Generating Developments

State Environmental Planning Policy No. 11 rationalises consultation required in relation to traffic-generating developments. The Policy establishes the Roads and Traffic Authority as the sole traffic management authority to be consulted, and ensures it is given the opportunity to make a representation on a Development Application before the local Council decides whether to approve a proposal. The Policy is being reviewed to remove requirements for unnecessary consultations.

State Environmental Planning Policy - 19 - Bushland in Urban Areas

This Policy protects and preserves bushland within certain urban areas, as part of the natural heritage or for recreational, educational and scientific purposes. The Policy is designed to protect bushland in public open space zones and reservations, and to ensure that bush preservation is given a high priority when local environmental plans for urban development are prepared.

State Environmental Planning Policy - 32 - Urban Consolidation (Redevelopment of Land)

This Policy states the Government's intention to ensure that urban consolidation objectives are met in all urban areas throughout the State. The Policy focuses on the redevelopment of urban land that is no longer required for the purpose it is currently zoned or used and encourages local councils to pursue their own urban consolidation strategies to help implement the aims and objectives of the policy. Councils will continue to be responsible for the majority of rezonings. The Policy sets out guidelines for the Minister to follow when considering whether to initiate a regional environmental plan (REP) to make particular sites available for consolidated urban redevelopment. Where a site is rezoned by an REP, the Minister will be the consent authority.

State Environmental Planning Policy - 33 - Hazardous and Offensive Development

This policy provides new definitions for 'hazardous industry', 'hazardous storage establishment', 'offensive industry' and 'offensive storage establishment'. The definitions apply to all planning instruments, existing and future. The new definitions enable decisions to approve or refuse a development to be based on the merit of proposal. The consent authority must carefully consider the specifics of the case, the location and the way in which the proposed activity is to be carried out. The Policy also requires specified matters to be considered for proposals that are 'potentially hazardous' or 'potentially offensive' as defined in the policy. For example, any application to carry out a potentially hazardous or potentially offensive development is to be advertised for public comment, and applications to carry out potentially hazardous development must be supported by a preliminary hazard analysis (PHA). The Policy does not change the role of Councils as consent authorities, land zoning, or the designated development provisions of the Environmental Planning and Assessment Act 1979.

State Environmental Planning Policy - 34 - Major Employment Generating Industrial Development

This Policy promotes and coordinates the orderly and economic use and development of land, and the economic welfare of State, by facilitating certain types of major employment-generating industrial development of State significance; and the carrying out of labour-intensive rural industrial development of State significance.

State Environmental Planning Policy - 37 - Continued Mines and Extractive Industries

This Policy provides for the continued operation of mines and extractive industries that lawfully commenced without development consent before planning controls came into force and which cannot operate in future without obtaining consent. The Policy sets a 3 month registration period and a 2 year moratorium during which operations may continue without development consent, provided certain limitations and restrictions are complied with, and establishes environmental impact assessment provisions which are to be followed when seeking approval to operate after the end of the moratorium period.

State Environmental Planning Policy - 55 - Remediation of Land

The Policy introduces state-wide planning controls for the remediation of contaminated land. The policy states that land must not be developed if it is unsuitable for a proposed use because it is contaminated. If the land is unsuitable, remediation must take place before the land is developed. The Policy makes remediation permissible across the State, defines when consent is required, requires all remediation to comply with standards, ensures land is investigated if contamination is suspected, and requires Councils to be notified of all remediation proposals. To assist Councils and developers, the Department, in conjunction with the Environment Protection Authority, has prepared Managing Land Contamination: Planning Guidelines.

State Environmental Planning Policy - 59 - Central Western Sydney Economic and Employment Area

This Policy rezones land in the central-west of Sydney for employment and residential purposes and regional open space. The Policy provides a framework for detailed planning and development on a precinct-by-precinct basis. It promotes employment, providing for major warehousing and industrial, high-tech and research facilities that have good access to road freight networks, including the M4 motorway and the Western Sydney orbital.

State Environmental Planning Policy - 64 - Advertising and Signage

State Environmental Planning Policy No. 64 - Advertising and Signage (SEPP 64) aims to improve the amenity of urban and natural settings by managing the impact of outdoor advertising. The Policy responds to growing concerns from the community, the advertising industry and local government that existing controls and guidelines were not effective. SEPP 64 offers the comprehensive provisions and consistent approach needed. SEPP 64 Advertising and Signage: Explanatory Information should be read in conjunction with the policy.

State Environmental Planning Policy - 66 - Integration of Land Use and Transport (Draft)

This draft Policy aims to ensure that urban structure, building forms, land use locations, development designs, subdivision and street layouts help achieve the following planning objectives:

- (a) improving accessibility to housing, employment and services by walking, cycling, and public transport,
- (b) improving the choice of transport and reducing dependence solely on cars for travel purposes,
- (c) moderating growth in the demand for travel and the distances travelled, especially by car,
- (d) supporting the efficient and viable operation of public transport services,
- (e) providing for the efficient movement of freight.

Sydney Regional Environmental Plan No. 9 - Extractive Industry Sydney Region

This plan aims to protect the viability of extractive resources in the Sydney Metropolitan Area by ensuring consideration is given to the impact of encroaching development.

2. ZONING AND LAND USE UNDER RELEVANT ENVIRONMENTAL PLANNING INSTRUMENTS

- (a) The abovementioned land is subject to the provisions of State Environmental Planning Policy No. 59 - Central Western Sydney Economic and Employment Area and is zoned:

Employment Lands

- (b) The land does not include or comprise a critical habitat. Critical habitat refers to habitat that is critical to the survival of endangered species, populations or ecological communities. Areas of critical habitat are declared under Part 3 of the Threatened Species Conservation Act 1995 and Part 7A of the Fisheries Management Act 1994.
- (c) The land is not within a conservation area.
- (d) This land does not contain an item of environmental heritage under the protection of Blacktown Local Environmental Plan 1988.

3. DECLARED STATE SIGNIFICANT DEVELOPMENT

The land to which this certificate applies has not been the subject of any application to carry out development on the land which was, at the time the application for the certificate was lodged, the subject of a notice by the Minister under section 76A(7)(b) of the Act declaring the development to be State Significant development.

4. COASTAL PROTECTION

The land is not affected by the operation of Section 38 or 39 of the Coastal Protection Act, 1979.

5. MINE SUBSIDENCE

The land has not been proclaimed to be a mine subsidence district within the meaning of Section 15 of the Mine Subsidence Compensation Act, 1961.

6. ROAD WIDENING AND ROAD REALIGNMENT

Blacktown Local Environmental Plan 1988 and Blacktown Development Control Plan 1992 nominate preferred road patterns throughout the City.

The land is not affected by road widening/road realignment under Division 2 of Part 3 of the Roads Act 1993 and/or Blacktown Local Environmental Plan 1988.

7. COUNCIL AND OTHER PUBLIC AUTHORITY POLICIES ON HAZARD RISK RESTRICTIONS

Council has not adopted, by resolution, any policies to restrict the development of the land by reason of the likelihood of landslip, bushfire, tidal inundation, subsidence or acid sulphate soils. Although the Council has not adopted a specific policy to restrict development on bush fire prone land, it is bound by bush fire legislation and the "Planning for Bushfire Protection Guidelines", produced by the NSW Rural Fire Service and the then PlanningNSW, which may restrict development. In this regard, refer to point 11 below.

Council has adopted by resolution a policy on contaminated land which may restrict the development of this land. This policy is implemented when zoning or land use changes are proposed on lands which have previously been used for certain purposes or have the potential to be affected by such purposes undertaken on nearby lands. Council's records may not be sufficient to determine all previous uses to which this land may have been put or determine all activities which may have taken place on this land. Consideration of Council's adopted policy and the application of provisions under the relevant State legislation and guidelines is warranted.

The land the subject of this Certificate has not been identified, based on flood inundation maps prepared by Council, as subject to flooding during a flood with a 1% or 1 in 100 chance of occurring in a given year. Therefore, the land the subject of this Certificate is not affected by Council's Floodplain Management Policy.

8. LAND RESERVED FOR ACQUISITION

Clauses 17, 17A and 18 of Blacktown Local Environmental Plan 1988 provide for the acquisition of certain land zoned 5(a), 5(b), 5(c), 6(a) or 6(c) by a public authority.

9. SECTION 94 CONTRIBUTIONS PLANS

Council currently levies Section 94 Contributions for facilities and services. The further development of the subject land may incur such contribution.

10. MATTERS ARISING UNDER THE CONTAMINATED LAND MANAGEMENT ACT 1997

- (a) The land to which the certificate relates is not within land declared to be an **investigation area** or **remediation site** under Part 3 of that Act.
- (b) The land to which the certificate relates is not subject to an **investigation order** or a **remediation order** within the meaning of that Act.
- (c) The land to which the certificate relates is not the subject of a voluntary investigation proposal (or voluntary remediation proposal) the subject of the Environment Protection Authority's agreement under section 19 or 26 of that Act.
- (d) The land to which the certificate relates is not the subject of a **site audit statement** within the meaning of Part 4 of that Act.

11. BUSHFIRE PRONE LAND

The Rural Fires and Environmental Assessment Legislation Amendment Act 2002, which came into force on 1 August 2002, introduces development provisions for bush fire prone land which is shown on Bush Fire Prone Land Maps. Under the provisions of the Rural Fires and Environmental Assessment Legislation Amendment Act 2002, "bush fire prone land" is land that has been designated by the Commissioner of the NSW Rural Fire Service as being bush fire prone, as well as those bush fire prone areas within 100m of a high or medium bush fire hazard (Category 1 Type Vegetation) or within 30m of a low bush fire hazard (Category 2 Type Vegetation) and which are recorded so on a Bush Fire Prone Land Map. The land the subject of this certificate has been identified on Council's Bush Fire Prone Land Map as being

clear of any bush fire prone land

On land that is bush fire prone, certain development may require further consideration under section 79BA or section 91 of the Environmental Planning and Assessment Act 1979 and under section 100B of the Rural Fires Act 1997 with respect to bush fire matters.

General Manager

Per: _____

End of Certificate

APPENDIX F
ADI 1994 – Site Plan Areas 1-3



NOTE : ALL SAMPLING LOCATIONS WERE GIVEN THE PREFIX "WQ" BY ADI.

FIGURE 2

SCALE N/A		ADI Limited MAJOR PROJECTS GROUP Level 6, Westfield Towers 100 William Street East Sydney NSW 2011 PH (02) 9916 4900 FAX (02) 9358 5768	CLIENT PIONEER CONCRETE SERVICES P/L	TITLE AERIAL PHOTO SHOWING ALL SOIL/SEDIMENT AND SURFACE WATER SAMPLING LOCATIONS	DWG No. 204.0.2
DATE 7/5/98					JOB No. EO0055
FILE 204-2.CDR					REV. No.

APPENDIX G
Test Bore Report Sheets

GRAPHIC SYMBOLS FOR SOIL & ROCK

SOIL

	BITUMINOUS CONCRETE
	CONCRETE
	TOPSOIL
	FILLING
	PEAT
	CLAY
	SILTY CLAY
	SANDY CLAY
	GRAVELLY CLAY
	SHALY CLAY
	SILT
	CLAYEY SILT
	SANDY SILT
	SAND
	CLAYEY SAND
	SILTY SAND
	GRAVEL
	SANDY GRAVEL
	CLAYEY GRAVEL
	COBBLES/BOULDERS
	TALUS

SEDIMENTARY ROCK

	BOULDER CONGLOMERATE
	CONGLOMERATE
	CONGLOMERATIC SANDSTONE
	SANDSTONE FINE GRAINED
	SANDSTONE COARSE GRAINED
	SILTSTONE
	LAMINITE
	MUDSTONE, CLAYSTONE, SHALE
	COAL
	LIMESTONE

METAMORPHIC ROCK

	SLATE, PHYLITTE, SCHIST
	GNEISS
	QUARTZITE

IGNEOUS ROCK

	GRANITE
	DOLERITE, BASALT
	TUFF
	PORPHYRY



TEST PIT LOG

CLIENT: Dial A Product Pty Ltd
PROJECT: Light Horse Business Centre
LOCATION: Quarry & Archbold Roads, Eastern Creek

SURFACE LEVEL: 89.1 AHD
EASTING:
NORTHING:
DIP/AZIMUTH: 90°/--

PIT No: TP1
PROJECT No: 43756
DATE: 14 Feb 06
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
89		FILLING - poorly compacted, grey-black ripped sandstone and mudstone filling, dry, with cobble and boulder inclusions to 500mm in size		D	0.0		PID<3ppm					
					0.3							
				D	0.8		PID<2ppm					
					1.0							
1												
89												
	1.2	FILLING - poorly to moderately compacted, brown gravelly clay filling, dry to moist, trace sand, sandstone cobble inclusions										
				D	1.8		PID<3ppm					
2	2.0	Pit discontinued at 2.0m			2.0							
87												
3												
86												
4												
85												

RIG: 20T Excavator

LOGGED: Blinman

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Test pit levels determined by survey

- ☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	PID	Photo ionisation detector
S	Bulk sample	S	Standard penetration test
U	Tube sample (x mm dia.)	PL	Point load strength (50) MPa
W	Water sample	V	Shear Vane (kPa)
C	Core drilling	D	Water seep
			Water level

CHECKED	
Initials:	AB
Date:	23/3/06



Douglas Partners
Geotechnics · Environment · Groundwater

TEST PIT LOG

CLIENT: Dial A Product Pty Ltd
PROJECT: Light Horse Business Centre
LOCATION: Quarry & Archbold Roads, Eastern Creek

SURFACE LEVEL: 87.5 AHD
EASTING:
NORTHING:
DIP/AZIMUTH: 90°/-

PIT No: TP2
PROJECT No: 43756
DATE: 14 Feb 08
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
87		FILLING - poorly to moderately compacted, grey black ripped sandstone and mudstone filling, dry to moist, with cobble and boulder inclusions to 800mm in size		D	0.0		PID<3ppm					
					0.3							
				B	0.5							
					0.8		PID<3ppm					
1				D	1.0			1				
1.2		FILLING - moderately compacted, yellow brown and red brown silty clay filling, moist to wet, medium plasticity fines, trace sand		B	1.4							
					1.8		PID<3ppm					
				D	2.0			2				
2.3		Pit discontinued at 2.3m										
2.5												
3								3				
3.4												
4								4				
3.3												

RIG: 20T Excavator

LOGGED: Blinman

WATER OBSERVATIONS: No free groundwater observed

☐ Sand Penetrometer AS1289.6.3.3

REMARKS: Test pit levels determined by survey

☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	PID	Photo ionisation detector
B	Bulk sample	S	Standard penetration test
U	Tube sample (x mm dia.)	PL	Point load strength (50) MPa
W	Water sample	V	Shear Vane (kPa)
C	Core drilling	D	Water seep
		E	Water level

CHECKED
Initials: <i>RB</i>
Date: <i>23/3/06</i>



Douglas Partners
Geotechnics • Environment • Groundwater

TEST PIT LOG

CLIENT: Dial A Product Pty Ltd
PROJECT: Light Horse Business Centre
LOCATION: Quarry & Archbold Roads, Eastern Creek

SURFACE LEVEL: 89.2 AHD
EASTING:
NORTHING:
DIP/AZIMUTH: 90°/-

PIT No: TP3
PROJECT No: 43758
DATE: 14 Feb 06
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
88		FILLING - poorly compacted, grey black ripped sandstone and mudstone filling, dry, cobble and boulders inclusions to 1m in size										
				D	0.3		PID<2ppm					
					0.5							
				D	0.8		PID<3ppm					
1					1.0							
88								1				
	1.4	FILLING - poorly to moderately compacted, brown gravelly clay filling, moist, medium plasticity fines, trace sand, cobble and boulder inclusions to 40mm in size		B	1.6							
					1.8		PID<3ppm					
				D*								
2	2.0	Pit discontinued at 2.0m			2.0			2				
87												
3								3				
85												
4								4				
85												

RIG: 20T Excavator

LOGGED: Blinman

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Test pit levels determined by survey

- ☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	PID	Photo ionisation detector
B	Bulk sample	S	Standard penetration test
U	Tube sample (x mm dia.)	PL	Point load strength (50) MPa
W	Water sample	V	Shear Vane (kPa)
C	Core drilling	D	Water seep
		W	Water level

CHECKED	
Initials:	RB
Date:	23/3/06



Douglas Partners
Geotechnics • Environment • Groundwater

TEST PIT LOG

CLIENT: Dial A Product Pty Ltd
PROJECT: Light Horse Business Centre
LOCATION: Quarry & Archbold Roads, Eastern Creek

SURFACE LEVEL: 89.4 AHD
EASTING:
NORTHING:
DIP/AZIMUTH: 90°/--

PIT No: TP4
PROJECT No: 43756
DATE: 14 Feb 06
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
89.0	1.0	FILLING - poorly compacted, ripped sandstone and mudstone filling, dry, cobble and boulder inclusions to 1m in size, generally less than 0.6m in size		D	0.3		PID<3ppm					
					0.5							
				D	0.8		PID<3ppm					
					1.0							
88.0	1.2	FILLING - poorly to moderately compacted, yellow brown gravelly clay filling, dry to moist, cobble and boulder inclusions to 300mm in size FILLING - poorly compacted, grey black ripped sandstone and mudstone filling, dry, cobbles and boulders to 1.2m but generally less than 0.6m in size										
				D	1.8		PID<3ppm					
					2.0							
87.0	2.3	Pit discontinued at 2.3m										
86.0	3.0											
85.0	4.0											

RIG: 20T Excavator

LOGGED: Blinman

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Test pit levels determined by survey

- ☐ Sand Penetrometer AS1289.8.3.3
☐ Cone Penetrometer AS1289.8.3.2

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	PID	Photo ionisation detector
B	Bulk sample	S	Standard penetration test
U	Tube sample (x mm dia.)	PL	Point load strength Is(50) MPa
W	Water sample	V	Shear Vane (kPa)
C	Core drilling	D	Water seep
		f	Water level

CHECKED
Initials: <i>RB</i>
Date: <i>28/3/06</i>



Douglas Partners
Geotechnics • Environment • Groundwater

TEST PIT LOG

CLIENT: Dial A Product Pty Ltd
PROJECT: Light Horse Business Centre
LOCATION: Quarry & Archbold Roads, Eastern Creek

SURFACE LEVEL: 86.9 AHD
EASTING:
NORTHING:
DIP/AZIMUTH: 90°/--

PIT No: TP5
PROJECT No: 43756
DATE: 14 Feb 06
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
85.5 1		FILLING - poorly compacted, grey black ripped sandstone and mudstone filling, dry to moist, cobble and boulder inclusions to 0.8m but generally less than 0.5m in size			0.3		PID<3ppm					
				D	0.5							
					0.8		PID<3ppm					
				D	1.0							
85.0 2	2.0	FILLING - poorly to moderately compacted, orange brown gravelly clay filling, moist, medium plasticity fines, cobble and boulder inclusions to 0.3m in size										
				D	2.4		PID<3ppm					
84.5 3	2.6	Pit discontinued at 2.6m			2.6							
84.0 4												

RIG: 20T Excavator

LOGGED: Blinman

WATER OBSERVATIONS: No free groundwater observed

☐ Sand Penetrometer AS1289.6.3.3

REMARKS: Test pit levels determined by survey

☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	PID	Photo ionisation detector
B	Bulk sample	S	Standard penetration test
U	Tube sample (x mm dia)	PL	Point load strength (s(50) MPa)
W	Water sample	V	Shear Vane (kPa)
C	Core drilling	D	Water seep
		ƒ	Water level

CHECKED	
Initials:	<i>LB</i>
Date:	28/3/06



Douglas Partners
Geotechnics • Environment • Groundwater

TEST PIT LOG

CLIENT: Dial A Product Pty Ltd
PROJECT: Light Horse Business Centre
LOCATION: Quarry & Archbold Roads, Eastern Creek

SURFACE LEVEL: 80.6 AHD
EASTING:
NORTHING:
DIP/AZIMUTH: 90°/-

PIT No: TP6
PROJECT No: 43756
DATE: 14 Feb 06
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
80.0	1.0	FILLING - poorly to moderately compacted, brown gravelly clay filling, dry to moist, sandstone cobble and boulder inclusions		D	0.3		PID<4ppm					
					0.5							
				D	0.8		PID<5ppm					
					1.0							
79.0	1.2	FILLING - poorly compacted, grey rippled mudstone filling, dry, sandstone cobble and boulder inclusions to generally 0.3m in size			1.8		PID<5ppm					
				D	2.0							
78.0	2.4	Pit discontinued at 2.4m										
77.0	3.0											
76.0	4.0											

RIG: 20T Excavator

LOGGED: Blinman

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Test pit levels determined by survey

- ☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	PID	Photo ionisation detector
B	Bulk sample	S	Standard penetration test
U	Tube sample (x mm dia.)	PL	Point load strength (50) MPa
W	Water sample	V	Shear Vane (kPa)
C	Core drilling	D	Water seep
		W	Water level

CHECKED	
Initials:	RB
Date:	23/3/06



Douglas Partners
Geotechnics • Environment • Groundwater

TEST PIT LOG

CLIENT: Dial A Product Pty Ltd
PROJECT: Light Horse Business Centre
LOCATION: Quarry & Archbold Roads, Eastern Creek

SURFACE LEVEL: 87.7 AHD
EASTING:
NORTHING:
DIP/AZIMUTH: 90°/--

PIT No: TP7
PROJECT No: 43756
DATE: 14 Feb 06
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
87.5 1		FILLING - poorly compacted, gray black ripped sandstone and mudstone filling, dry, cobble and boulder inclusions to 0.8m but generally less than 0.6m in size. Voids evident in test pit sides			0.3		PID<4ppm					
	D			0.5								
	D			0.8		PID<4ppm						
	D			1.0								
86.5 2	2.0	FILLING - poorly to moderately compacted, brown gravelly clay filling, dry, medium plasticity, sandstone cobbles to 0.2m in size			1.8		PID<4ppm					
	D			2.0								
85.5 3	2.3	Pit discontinued at 2.3m										
84.5 4												
83.5 5												

RIG: 20T Excavator

LOGGED: Blinman

WATER OBSERVATIONS: No free groundwater observed

☐ Sand Penetrometer AS1289.6.3.3

REMARKS: Test pit levels determined by survey

☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	PID	Photo ionisation detector
B	Bulk sample	S	Standard penetration test
U	Tube sample (x mm dia.)	PL	Point load strength Is(50) MPa
W	Water sample	V	Shear Vane (kPa)
C	Core drilling	D	Water seep
		f	Water level

CHECKED
Initials: <i>LB</i>
Date: <i>23/8/06</i>



Douglas Partners
Geotechnics • Environment • Groundwater

TEST PIT LOG

CLIENT: Dial A Product Pty Ltd
PROJECT: Light Horse Business Centre
LOCATION: Quarry & Archbold Roads, Eastern Creek

SURFACE LEVEL: 89.6 AHD
EASTING:
NORTHING:
DIP/AZIMUTH: 90°/--

PIT No: TP8
PROJECT No: 43756
DATE: 14 Feb 06
SHEET 1 OF 1

[illegible]

RIG: 20T Excavator

LOGGED: Blinman

WATER OBSERVATIONS: No free groundwater observed

☐ Sand Penetrometer AS1289.6.3.3

REMARKS: Test pit levels determined by survey

☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	PID	Photo ionisation detector
B	Bulk sample	S	Standard penetration test
U	Tube sample (x mm dia.)	PL	Point load strength (50) MPa
W	Water sample	V	Shear Vane (kPa)
C	Core drilling	▷	Water seep
		↑	Water level

CHECKED:
Initials: *[Signature]*
Date: 23/3/06



Douglas Partners
Geotechnics • Environment • Groundwater

TEST PIT LOG

CLIENT: Dial A Product Pty Ltd
PROJECT: Light Horse Business Centre
LOCATION: Quarry & Archbold Roads, Eastern Creek

SURFACE LEVEL: 86.3 AHD
EASTING:
NORTHING:
DIP/AZIMUTH: 90°/---

PIT No: TP9
PROJECT No: 43756
DATE: 14 Feb 06
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
86		FILLING - poorly compacted, grey black ripped sandstone and mudstone filling, dry, cobble and boulder inclusions to 0.8m but generally less than 0.5m in size. Some clay bands present		D	0.3		PID<4ppm					
					0.4							
				D	0.8		PID<3ppm					
1					1.0							
85				D	1.6		PID<4ppm					
					1.8							
2	2.0	Pit discontinued at 2.0m										
84												
3												
83												
4												
82												

RIG: 20T Excavator

LOGGED: Blinman

WATER OBSERVATIONS: No free groundwater observed

☐ Sand Penetrometer AS1289.6.3.3

REMARKS: Test pit levels determined by survey

☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND			
A Auger sample	pp Pocket penetrometer (kPa)		
D Disturbed sample	PID Photo ionisation detector		
B Bulk sample	S Standard penetration test		
U Tube sample (x mm dia.)	PL Point load strength is(50) MPa		
W Water sample	V Shear Vane (kPa)		
C Core drilling	D Water seep	W Water level	

CHECKED	
Initials:	<i>LE</i>
Date:	23/3/06



Douglas Partners
Geotechnics • Environment • Groundwater

APPENDIX I
Quality Assurance/Quality Control Procedures and Results

QA/ QC PROCEDURES AND RESULTS

The field QC procedures for sampling as prescribed in Douglas Partners *Field Procedures Manual* were followed at all times during the validation assessment. Field sampling comprised replicate sampling, at a rate of approximately one replicate sample for every ten original samples.

Relative Percentage Difference

The field QC comprised the collection of at least 10% replicate samples during the course of sampling. In total, sixty eight soil samples were obtained from the subject site, four of which were replicate samples. A total of five soil samples were selected for laboratory analysis and no duplicate soil samples were collected. However, twenty one stockpile samples were selected for laboratory analysis, of which three were replicate samples. The replicate samples were analysed for heavy metals and the comparative results of analysis are included in Table 11. Relative Percentage Differences (RPD) were calculated as an assessment of the result consistency.

A measure of the consistency of results is derived by the calculation of relative percentage differences (RPD's) for replicate samples. Generally, an RPD of $\pm 30\%$ is considered acceptable by the EPA, however, certain exceptions apply. The RPD's, which were calculated using the heavy metal concentrations, are tabulated below.

Table 11 – Comparative Results of Replicate Sample Analysis for Heavy Metals

Sample ID	Arsenic	Cadmium	Chromium [^]	Copper	Lead	Mercury	Nickel	Zinc
3/ 1.8 -2.0	8	<1	35	42	20	<0.1	38	74
BD1 140206	5.9	<1	31	38	17	<0.1	35	72
RPD %	30.2	-	12.1	10.0	16.2	-	8.2	2.7
8/ 1.8 – 2.0	4.9	<1	28	37	16	<0.1	43	66
BD2 140206	6.7	<1	27	34	14	<0.1	43	66
RPD %	31.0		3.6	8.5	13.3		0.0	0.0
16/ 0.8 – 1.0	7.8	<1	24	40	15	<0.1	30	63
BD6 140206	7.7	<1	28	43	17	<0.1	34	68
RPD %	1.3		15.4	7.2	12.5		12.5	7.6

All the RPD results for heavy metals fall within the typical acceptable range ($\pm 30\%$), with the exception arsenic from samples 3/ 1.8 - 2.0 and 8/ 1.8 – 2.0. The calculated RPD exceeding the acceptability range is not, however, considered to be of significant concern due to the generally low levels of arsenic detected (relative to the adopted guideline levels), the low actual differences in concentration and the generally heterogenous nature of the material. It is therefore considered that the results indicate an acceptable consistency between the samples and their replicates and indicates that suitable field sampling methodology was adopted and laboratory precision was achieved.

Laboratory QA/ QC Procedures

The analytical laboratory is accredited by the National Association of Testing Authorities (NATA) and is required to conduct in - house QA/ QC procedures. These are normally incorporated into every analytical run and include the following: -

Reagent Blank

A reagent blank sample is prepared and analysed at the beginning of every analytical run, following calibration of the analytical apparatus. The laboratory results for reagent blanks for soil analysis indicated that concentrations of all analytes were below respective laboratory practical quantitation (detection) limits. These results are included in the laboratory report in Appendix H.

Spike Recovery

Spike recovery tests were conducted by adding a known amount of a particular analyte or analytes prior to analysis, and then treating the spiked sample in exactly the same manner as all other samples. The recovery results indicate the proportion of the known concentration of the target analytes which were detected during analysis. Spike recovery results are included in the laboratory report in Appendix H. The spike recovery results all fell within the acceptable range thus the results are considered to be acceptable.