Aargus
AUSTRALIA

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Environmental Services - Remediation - Geotechnical Engineering - Drilling

DETAILED ENVIRONMENTAL SITE ASSESSMENT

Allied Flour Mills site, Summer Hill, NSW

prepared for

EG Funds Management

June 2008

CONTROLLED DOCUMENT
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REFERENCES

- Australian and New Zealand Environment and Conservation Council (ANZECC) (1996) – *Drinking Water Guidelines*.
- Australian and New Zealand Environment and Conservation Council (ANZECC) (2000) – *Guidelines for Fresh and Marine Waters*.
- Department of Urban Affairs and Planning – EPA (1998) "*Managing Land Contamination – Planning Guidelines – SEPP 55 – Remediation of Land*"
- URS Australia Pty Ltd (April 2002) - "Environmental Audit of Goodman Fielder Flour Mill, 2 Smith Street, Summer Hill, NSW" (Report ref no. 23409\020_558\Final).
- Aargus Pty Ltd (July 2007 - "Hazardous Materials Assessment, 2 Smith Street, Summer Hill, NSW" (Report ref no. E1559).
- National Environmental Protection Council (NEPC) (1999) – *National Environmental Protection (Assessment of Site Contamination) Measure.*
- NSW DEC (2004), *Contaminated Sites: Draft Guidelines for the assessment and Management of Groundwater Contamination*
- NSW EPA (1994) – *Guidelines for Assessing Service Station Sites*.
- NSW EPA (1995) – *Sampling Design Guidelines*.
- NSW EPA (1997) – *Guidelines for Consultants Reporting on Contaminated Sites*.
- NSW EPA (2006) – *Guidelines for the NSW Site Auditor Scheme*.
- NSW EPA (1999) – *Guidelines on Significant Risk of Harm from contaminated land and the duty to report*.
- NSW DEC (2008) – *Waste Classification Guidelines Part 1: Classifying Wastes*.
- NSW EPA (2005) – *Guidelines for assessing former orchards and market gardens.*

ABBREVIATIONS

AIP	Australian Institute of Petroleum Ltd
ANZECC	Australian and New Zealand Environment and Conservation Council
AST	Aboveground Storage Tank
BGL	Below Ground Level
BTEX	Benzene, Toluene, Ethyl benzene and Xylene
COC	Chain of Custody
DA	Development Approval
DP	Deposited Plan
DEC	(NSW) Department of Environment and Conservation
DNR	(NSW) Department of Natural Resources
DQOs	Data Quality Objectives
EPA	(NSW) Environment Protection Authority
ESA	Environmental Site Assessment
HIL	Health-Based Soil Investigation Level
LGA	Local Government Area
NEHF	National Environmental Health Forum
NEPC	National Environmental Protection Council
NHMRC	National Health and Medical Research Council
OCP	Organochlorine Pesticides
OPP	Organophosphate Pesticides
PAH	Polycyclic Aromatic Hydrocarbon
PCB	Polychlorinated Biphenyl
PID	Photo Ionisation Detector
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance, Quality Control
RAC	Remediation Acceptance Criteria
RAP	Remediation Action Plan
RPD	Relative Percentage Difference
SAC	Site Assessment Criteria
SVC	Site Validation Criteria
TCLP	Toxicity Characteristics Leaching Procedure
TPH	Total Petroleum Hydrocarbons
UCL	Upper Confidence Limit
UST	Underground Storage Tank
VHC	Volatile Halogenated Compounds
VOC	Volatile Organic Compounds

TABLE OF CONTENTS

1.0 INTRODUCTION 11
2.0 OBJECTIVES 11
3.0 SCOPE OF WORKS 12
4.0 SITE INFORMATION 12
4.1 SITE IDENTIFICATION AND ZONING 12
4.2 SITE DESCRIPTION 12
4.3 LOCAL TOPOGRAPHY 15
4.4 GEOLOGY 15
4.5 HYDROGEOLOGY 15
4.6 SITE OPERATIONS 16
5.0 SITE HISTORY 17
5.1 AERIAL PHOTOGRAPHS 17
5.2 HISTORICAL LAND TITLES 19
5.3 EPA RECORDS 19
5.4 OTHER RECORDS 19
5.5 DANGEROUS GOODS STORAGE 20
5.6 RECORDS OF WORKCOVER NSW 21
5.7 CHEMICAL STORAGE 22
5.8 HISTORICAL SUMMARY 23
6.0 PREVIOUS INVESTIGATIONS 23
7.0 AREAS OF ENVIRONMENTAL CONCERN 24
8.0 REVIEW OF QUALITY OF DATA 27
9.0 SITE ASSESSMENT CRITERIA 30
9.1 SOIL 30
9.2 GROUNDWATER 31
9.2.1 POTENTIAL USES 31
9.2.2 UNLIKELY USES 33
9.3 ASSESSMENT OF SIGNIFICANT RISK OF HARM 33
9.4 EXPORT OF FILL MATERIAL 34
10.0 SOIL BORING AND SAMPLING STRATEGY 35
10.1 SOIL SAMPLING 35
10.2 SURFACE AND SUBSURFACE CONDITIONS 36
10.3 GROUNDWATER SAMPLING 37
10.4 LABORATORY ANALYSIS 38
11.0 QUALITY ASSURANCE / QUALITY CONTROL 41
11.1 DATA QUALITY OBJECTIVES 41
11.2 FIELD QAQC 42

11.2.1 Sampling procedures *42*
11.2.2 Intra-laboratory Duplicates *42*
11.2.3 Inter-laboratory Duplicates *48*
11.2.4 Rinsate *51*
11.3 LABORATORY QUALITY ASSURANCE QUALITY CONTROL 52
11.4 CONCLUSION FOR THE QA/QC 53
12.0 DISCUSSION 54
12.1 SOIL 54
12.1.1 METALS - FILL 54
12.1.2 METALS – NATURAL 64
12.1.3 TPH AND BTEX 66
12.1.4 POLYCYCLIC AROMATIC HYDROCARBONS (PAH) - FILL 68
12.1.5 POLYCYCLIC AROMATIC HYDROCARBONS (PAH) – NATURAL 76
12.1.6 OTHER ORGANICS 77
12.1.7 VOLATILE ORGANIC COMPUNDS (VOC'S) 79
12.2 GROUNDWATER 82
12.2.1 METALS 82
12.2.2 TPH AND BTEX 83
12.2.3 PAH 84
12.3 DISCUSSION 85
12.3.1 WATER 85
13.0 CONCLUSIONS AND RECOMMENDATIONS 86
14.0 LIMITATIONS 88

LIST OF TABLES

Table 1: Summary of potential areas and chemicals of concerns 25
Table 2: Summary of Monitoring Well Details 38
Table 3: Schedule of Laboratory Analysis 39
Table 4: Soil - Duplicate Sample Analyses 43
Table 5: Soil - Duplicate D1 – RPD's 44
Table 6: Soil - Duplicate D2 – RPD's 45
Table 7: Soil - Duplicate A – RPD's 46
Table 8: Groundwater - Duplicate GW1A – RPD's 47
Table 9: Soil - Split Sample Analyses 48
Table 10: Soil – Split SS1 – RPD's 49
Table 11: Soil – Split SS2 – RPD's 50
Table 12: Soil – Split BH6.10 – RPD's 51
Table 13: Rinsate Analysis 52
Table 14: Metals Test Results - Fill 55
Table 15: Metals Test Results - Fill 57
Table 16: Metals Test Results - Fill 59
Table 17: Metals Test Results - Fill 61
Table 18: Metals Test Results - Fill 63
Table 19: Metals Test Results - Natural 65
Table 20: TPH Test Results - Fill 67
Table 21: TPH Test Results - Natural 68
Table 22: PAH Test Results - Fill 69
Table 23: PAH Test Results - Fill 71
Table 24: PAH Test Results - Fill 73
Table 25: PAH Test Results - Fill 75
Table 26: PAH Test Results - Natural 76
Table 27: OCP, PCB, Phenols & Cyanides Test Results 78
Table 28: VOC Test Results 79

Table 29: VOC Test Results 80
Table 30: VOC Test Results 81
Table 31: Metals Test Results - Groundwater 82
Table 32: TPH Test Results - Groundwater.. 83
Table 33: PAH Test Results - Groundwater 84

APPENDICIES

APPENDIX A SITE PLANS

APPENDIX B IMPORTANT INFORMATION ABOUT YOUR ENVIRONMENTAL REPORT

APPENDIX C WORKCOVER RECORDS

APPENDIX D BOREHOLE & GROUNDWATER LOGS

APPENDIX E SITE PHOTOGRAPHS

APPENDIX F WELL DEVELOPMENT WORK SHEETS

APPENDIX G LABORATORY CERTIFICATES

APPENDIX H AARGUS FIELD PROTOCOLS

APPENDIX I RESUMES OF CLIENT TEAM

APPENDIX J REGULATORY CRITERIA

APPENDIX K PREVIOUS REPORTS

EXECUTIVE SUMMARY

Aargus Pty Ltd ("Aargus") was commissioned by EG Funds Management to undertake a Detailed Environmental Site Assessment (ESA) of the Allied Flour Mills site, located at the corner of Smith and Edward Streets, Summer Hill, NSW. This assessment was carried out in relation to future development. The site is currently operating as an active flour mill.

Soil sampling for this investigation was performed in May 2007 and March 2008. Soil samples were collected by Aargus from a combined total of thirty-three (33) locations at the site.

Statistical analysis of the laboratory results for the soil samples were generally lower than the most stringent regulatory guideline criteria adopted (PPBIL, HIL 'A' and EPA Service Station) with the exception of concentrations of arsenic, copper, lead, zinc, TPH (C_{10}-C_{36}), benzo(a)pyrene and Total PAH in a number of samples across the site.

Reference may be made to Figures 4 to 8 in Appendix A - Site Plans for sample locations with elevated concentrations above the relevant assessment criteria. The locations with elevated concentrations can be considered to be 'hotspots' and require some form of remediation and/or management.

Groundwater was encountered during drilling at the site, and concentrations of some heavy metals and TPH (C_{10}-C_{36}) were above the adopted assessment criteria. Based on the observations provided, elevated heavy metal concentrations can possibly be attributed to the regional groundwater quality, whilst the elevated concentration of TPH (C_{10}-C_{36}) can be attributed to the former UST located adjacent to this borehole. Based on the observations provided, the minor groundwater contamination is unlikely to be of any further concern in the future, however it is recommended that the groundwater is re-assessed after the remediation process has been completed and the source removed.

In Summary

Based on the results of this investigation it is considered that the risks to human health and the environment associated with soil and groundwater contamination at the site are low in the context of the future development. The site is therefore considered ***to be suitable*** for the future development, subject to the following:

- It is recommended that an appropriate remedial / management strategy is developed, culminating in preparation of a Remedial Action Plan (RAP) in accordance with DECC guidelines, once the proposed development has been finalised.

- Any soils requiring removal from the site, as part of the remediation process, should be classified in accordance with the "*Waste Classification Guidelines Part 1: Classifying Wastes, NSW DECC 2008"*.

- Groundwater within GW1 is re-assessed after the remediation process has been completed and the UST and associated potentially impacted soils removed.

Reference should be made to Section 13.0 of the report and Appendix B, which set out details of the limitations of the assessment.

1.0 INTRODUCTION

Aargus Pty Ltd ("Aargus") was commissioned by EG Funds Management to undertake a Detailed Environmental Site Assessment (ESA) of the Allied Flour Mills site, located at the corner of Smith and Edward Streets, Summer Hill, NSW.

The site is currently operating as an active flour mill. Within the site are a number of silos used for the storage of flour, buildings for office use, and warehouses and sheds for packing, storing & workshop activities.

This assessment was carried out in relation to future site development. It is understood that the precise nature and form of the proposed development of the site is not known at this stage; therefore the criteria adopted for this assessment was based upon all permissible land uses (Health Investigation Levels (HIL)) and EPA criteria (Service Stations and Site Auditor Scheme).

2.0 OBJECTIVES

The primary objective of this detailed ESA was to assess the contamination status of the site and its suitability, with regard to site contamination, for future development.

The other objectives of this ESA were to:

- Assess the likelihood and/or extent of significant soil contamination which may have resulted from past practices at (or surrounding) the site;
- Identify contamination which may be occurring at the site, and non-compliance with existing environmental regulations; and
- Recommend management strategies which may be required at the site, including additional investigations and/or remediation works.

The ESA includes the assessment of the following:

- Contaminant dispersion in air, surface water, groundwater, soil and dust;
- Potential effects of contaminants on human health, the environment and building structures; and

- The adequacy and completeness of the information available on the contamination status of the site.

3.0 SCOPE OF WORKS

In order to achieve the above objectives, the following scope of work was carried out:

- Review of the information available, including previous environmental investigations, historical data and past site practices, site surveys, records of ownership, aerial photographs, NSW WorkCover and anecdotal information available;
- A targeted soil drilling/sampling program, and the laboratory analysis of selected soil samples;
- Review of Quality Assurance/Quality Control (QA/QC) data and comparison with Data Quality Objectives;
- Interpretation of results and findings; and
- Development of conclusions and recommendations.

4.0 SITE INFORMATION

4.1 Site Identification and Zoning

The site is located at the corner of Smith and Edward Streets, Summer Hill, NSW (Figure 1 – Locality Map in Appendix A – Site Plans), in the Local Government Area of Ashfield and Marrickville, Parish of Petersham and County of Cumberland.

4.2 Site Description

The site is irregular in shape with an area of approximately 2.5 hectares. The area covered by buildings is estimated at approximately 6,000 m^2.

The site features (Figure 2) are shown in Appendix A – Site Plans.

The site features include:

- A three-story (two-storey plus basement) brick office building in the north-western corner of the site. This houses the offices and laboratory of the Milling & Baking Technical Centre.

- Demountable technical offices in the north-central part of the site.

- The brick flour mill building on the eastern side of the site including the mill offices, warehouse, packing area and laboratory areas.

- Wooden silos south of the flour mill building.

- The general store building to the south of the wooden silos, constructed of steel cladding on a steel frame.

- Four large concrete bulk wheat storage silos to the south of the general store building.

- Rail wagon unloading facilities on the south-eastern side of the site.

- Six concrete bulk wheat storage silos to the west of the wooden silos and near the centre of the site.

- Approximately 18 steel flour silos with a bulk flour outloading facility in the centre of the site.

- Three steel silos and a bulk outloading facility on the southern side of the steel flour silos.

- The Merchant Shed on the western side of the site with brick walls and an asbestos-cement roof.

- A workshop on the southern part of the site with steel cladding on a steel frame.

- Three storage buildings in the southern corner of the site constructed of asbestos-cement walls and roofs on steel frames.

- A brick amenities building with a steel roof between the Merchant Shed and the flour silos.

- Other minor buildings including the office & weighbridge, main sprinkler pump house, the hydrant pump house, gardener's shed and flammable liquids store.

- Other features include a cooling tower, the LPG store, grease pit, electrical substation, transformer yard, underground storage tanks (USTs), an interceptor pit and a former aboveground storage tank (AST).

- Oil staining adjacent to the western wall of the Amenities block.

- Chemical storage in 44 gallon drums at the rear of the site.

- Metal plating on the ground surface in the southern portion of the site.

- An open stormwater channel is present within the north-eastern portion of the site.

- The north-eastern part of the site is open and vacant, with several trees present.

- There are bitumen carparking areas on the south side of the Technical Centre and on the south side of the Merchant Store.

- The remainder of the site is concrete, grass and gravel covered.

Land use surrounding the site is a mixture of light industrial and residential, and is summarised as follows:

Northern boundary	Smith Street, followed by residential and light industrial businesses;
Eastern boundary	Railway, followed by light industrial properties;
Western boundary	Edward Street (north) and residential & light industrial (south), followed by residential; and
Southern boundary	Old Canterbury Road.

We expect that current local land uses would contribute minimally to potential areas of environmental concern with the major concerns arising from historical and present operations within the site.

4.3 Local topography

The general topography of the area slopes gently downwards towards the east. Surface water drainage follows the natural contours of the site into the stormwater channel and associated stormwater drains within the site.

Runoff from neighbouring sites is also expected to be intercepted by constructed stormwater drains and minimal concerns arise from surrounding land uses bearing waterborne contaminants onto the site via surface runoff.

4.4 Geology

The 1:100,000 scale Sydney Geological Map published in 1983 by the Geological Survey of NSW indicates that the site lies mainly on an area of Ashfield Shale of the Wianamatta Group. The Ashfield Shale is described as being "black to dark-grey shale and laminite". The Ashfield Shale is underlain by Hawkesbury Sandstone. At most, sandstone rock was found across the site at ~4m.

4.5 Hydrogeology

Using Department of Natural Resources (DNR) records, a search of registered bores in the area was conducted. There were no bores within a 0.5km radius of the site. The closest bores were located within a 4 kilometre radius. Standing water levels between 0.7m and 19.2m were recorded within a number of the boreholes, whilst a number of the boreholes were empty. The maximum depth of the boreholes drilled was 90.0m. The main purpose for groundwater extraction within the wells was as monitoring bores, whilst other uses included domestic, general, recreational, dewatering, irrigation and test bores. During our investigation groundwater was encountered in one borehole, BH18, at a depth of 4.0m.

The nearest surface water body is an open stormwater channel (Hawthorne Channel) in the north-eastern portion of the site. Stormwater from the local and surrounding areas flows within this channel. The channel flows towards Iron Cove approximately 2.5km to the north. The closest water body to the site, other than Hawthorne Channel, is the Cooks River, approximately 2.3km to the south.

4.6 Site Operations

The site is used for the following activities:

- Receipt and unloading of bulk wheat from rail wagons.
- Storage of wheat in wooden and concrete silos.
- Screening, sieving, scouring, conditioning and milling of wheat in the flour mill.
- Storage of flour in steel silos.
- Storage of offal in steel silos.
- Loading of bulk road tankers with flour in the bulk flour outloading facility.
- Loading of offal into trucks in the bulk offal outloading facility.
- Filling of flour into 10, 25 and 1,000 kg bags.
- Palletising of bagged flour and stretch wrapping of pallets with plastic film.
- Conditioning of the wheat consists of adding water to moisten the grains and assist in the milling process. Sufficient water is added to raise the moisture content of the grain from approximately 10.5% to 15.5%.
- The flour mill building contains a laboratory on the ground and first floors.

Ancillary facilities on site include:

- Storage cylinders for LPG (liquefied petroleum gas) for fuelling the forklifts.
- A flammable liquids store.
- A workshop.
- A number of disused USTs.
- A weighbridge.
- A trade waste pit.
- A stormwater pit.

5.0 SITE HISTORY

A review of the "*Environmental Audit of Goodman Fielder Flour Mill, 2 Smith Street, Summer Hill, NSW*" report prepared by URS Australia Pty Ltd (Report ref no. 23409\020_558\Final, dated 3 April 2002) was utilised to supplement the history of the site for this report. In addition, a recent WorkCover search carried out by Aargus Pty Ltd has been included. A summary of the information reviewed can be found in the subsequent subsections. Reference may be made to Appendix K – Previous Reports for a copy of the URS report.

5.1 Aerial Photographs

A review of historic aerial photographs was undertaken in order to obtain better knowledge of the site's development. Relevant comments on the aerials are noted as follows.

1930

This aerial was of poor clarity and no detail could be seen. The flour mill and wooden clean wheat silo buildings were present on the site. Most of the rest of the site appeared to be grassed. There were residences along the full length of the western side of the site, that being the eastern side of Edward Street. A railway line bordered the eastern side of the site. Beyond the railway line, industrial type buildings were noted.

1951

The six concrete wheat silos had been constructed on the western side of the wooden wheat silos. There were additional industrial type buildings noted beyond the railway line.

1961

A building had been erected on the southern side of the wooden wheat silos in the current location of the four concrete wheat silos. There were buildings between the stormwater channel and the railway to the north-east of the site. The Merchant Shed had been constructed on the western side of the site. Some residences on the south-western side of the site (on the eastern side of Edward Street) had been removed and replaced by the present factory type building.

1970

The building that had been erected in the current location of the four concrete wheat silos had been removed and the four concrete wheat silos were constructed. The buildings that had been erected between the stormwater channel and the railway lines to the north-east of the site had been removed. More residences had been removed from the south-western side of the site (leaving the current four residences) and another factory type building had been constructed. The steel flour silos on the western side of the flour mill had been constructed. The Milling & Baking Technical Centre building had been constructed in the north-western corner of the site. The Merchant Shed on the western side of the site had been doubled in size with the addition of another bay.

1978

There was no significant change from the previous aerial.

1986

There was no significant change from the previous aerial.

1999

There was no significant change from the previous aerial, other than the growth of trees along the stormwater channel to the north-east of the site.

Summary comments from the aerial review are noted below:

- the review records the development of the site since 1930 with the mill building and the wooden wheat silos building present at that time; and
- there was no evidence from the aerial review that the site has been used for the dumping of waste.

5.2 Historical Land Titles

A review of historical title documents obtained by URS is provided below.

The Title information obtained comprised a portion of the site only, that pertaining to Lot 1 DP 73521. The search dated 1 November 2001 showed that the registered proprietor for the area of the site at the time of the search was Goodman Fielder Mills Limited.

The key points of the search are summarised below.

- On 22nd December 1994, the name of the owner of the site was changed from Mungo Scott Pty Limited to Goodman Fielder Mills Limited.
- On 12th March 1890, the land was purchased by Mungo Scott from the Railway Commissioners of NSW.
- The land was part of original Crown grants to Joseph Foveaux in 1794, to Henry Kable in 1804, and to George Gambling in 1810.

The search of historical Certificates of Title does not provide evidence that the site has been used in the past by companies or persons operating significantly polluting activities.

5.3 EPA Records

Based on a search of Environment Protection Authority (EPA) records, the site is not subject to any notices under the Unhealthy Building Land Act 1990.

5.4 Other Records

A Section 149 planning certificate was requested from Ashfield Municipal Council in order to obtain information Council may have on the presence of contamination on the site. Graham Prideaux of Ashfield Council indicated that the site is located on 16 lots. However the majority of the site (and the manufacturing areas of the site) is located on Lot 1 of Deposited Plan (DP) 73521. Therefore a Section 149 planning certificate was obtained for Lot 1 of DP 73521 as this was considered to be the area most likely to have been contaminated by past activities at the site, if such activities had occurred. It is likely that most or all of the other lots comprising the site are on the western part of the site which used to contain residences, and now contains the Technical Centre, Merchants Shed and carparking areas.

The Section 149 certificate issued by Ashfield Municipal Council under the Local Government Act details the planning requirements for the site. The certificate was undertaken on the major lot of the site. The key points relevant to the environmental assessment contained in this report are as follows:

- The land is subject to the provisions of the Ashfield Local Environmental Plan (LEP) 1985 as amended.
- Development which may be carried out without consent includes exempt development, flood mitigation, and public utility and railway undertakings.
- Development which may be carried out only with consent are listed in the Certificate.
- The land is not subject to any site-specific Development Control Plans.
- The land is not proclaimed to be a mine subsidence district under Section 15 of the Mine Subsidence Compensation Act 1961.
- Council has not by resolution adopted a policy to restrict the development of the land by reason of the likelihood of land slip, bushfire, flooding, tidal inundation, subsidence, storm or tempest.
- The land is subject to a tree preservation order.
- The Certificate does not state that the Council is aware of any contamination on the land. The Certificate states that "it is nevertheless open to the Council in considering an application to rezone the land or for consent to carry out development, to take appropriate steps where it knows or reasonably suspects that the land is contaminated. This may include the decision not to rezone the land or to grant consent to the carrying out of development, or, if consent is granted, to suspend its operation and impose appropriate conditions. Such a consent could include a requirement to produce satisfactory evidence that the site is not, or is no longer, contaminated or that the contamination that does exist is not harmful to persons.

5.5 Dangerous Goods Storage

Dangerous Goods (DG) were identified at several locations at the site. The type and location of the dangerous goods is summarised below:

- LPG cylinders north of the flour mill building.
- A UST south of the flour mill building.
- Cylinders of acetylene in the workshop.
- Pesticides and oil drums/containers in the flammable liquid store.

- Two disused USTs are located in the carpark on the south side of the Technical Centre.

5.6 Records of WorkCover NSW

A search of the WorkCover NSW database was carried out on the 19th March 2008. A Dangerous Goods License, No. 35/007986, in relation to the storage of dangerous goods at the site was listed on the Stored Chemical Information Database (SCID). A summary of the information obtained is summarised below:

- A storage depot, Depot No 1a, contained an UST of petrol, with a typical quantity of 20,000L and a maximum storage of 30,000L (UN No.1203, Class 3) was located within the bitumen car park adjacent to the main office and the site entrance off Smith Street.
- A storage depot, Depot No 1b, contained an UST of petrol, with a typical quantity of 20,000L and a maximum storage of 30,000L (UN No.1203, Class 3) was located within the bitumen car park adjacent to the main office and the site entrance off Smith Street.
- A storage depot, Depot No 2, contained decanting cylinders (2) of liquefied petroleum gas, with a typical quantity of 380L and a maximum storage of 750L (UN No.1075, Class 2.1) was located adjacent to the store and office block in the north eastern portion of the site.
- A storage depot, Depot No 3, was a roofed store which contained chlorine containers (2), with a typical quantity of 920kg each and a maximum storage of 1,840kg (UN No.1017, Class 2.3) was located at the rear of the mill.
- Other storage areas within the site that were visible on a plan were an oxygen and hydrogen storage area at the rear of the lab, a lubricating oil store within the wooden silos, a paint shop in the electrician's shop, a flammable liquid store to the south of the concrete silos, an oxygen and acetylene storage area within the workshop and an above ground diesel storage tank within the southern portion of the site.
- A site plan (not dated) showed the proposed location of a 10,000L diesel AST, the route of the fuel lines and of a diesel generator. The AST was located at the rear of the concrete silos, the fuel lines ran along the eastern boundary and the generator was located off the screen room.

- A site plan (not dated) showed the proposed location of a 1,000L diesel UST and of a diesel generator adjacent to and within the brick sub station along the Smith Street frontage.
- A site plan (dated 3 December 1973) showed the proposed location of a 4,000 gallon UST in the car park area adjacent to the two storey brick office and the site entrance of Edward Street.
- An application to keep inflammable liquid was lodged by Allied Mills Industries Pty Ltd, in relation to a 4,000 gallon UST (26 February 1974).
- Two site plans (dated 23 October and 6 December 1978) showed the location of an existing 4,000 gallon UST (License No. 7986) and a proposed 6,000 gallon UST, both containing super, in the car park area adjacent to the two storey brick office and the site entrance of Edward Street.
- An application to keep inflammable liquid and/or dangerous goods was lodged by Allied Mills Industries Pty Ltd, in relation to a 33,200L UST and a 20,000L UST, both containing 3.1.M.S. Petrol (27 February 1979).
- An application to keep inflammable liquid and/or dangerous goods was lodged by Mungo Scott Flour Mills (No. 35007986), in relation to a 30,000L UST, a 25,000L UST, 2x420L LPG cylinders, a roofed package store with 200L of paint and thinners, and a roofed package store with 150m^3 of L.P or Acetylene (20 August 1982).
- A letter dated 3rd September 1996, from Gilbarco Aust Ltd to WorkCover, mentions that two USTs on the site (Depot 1a and 1b) have been filled with an inert solid material, being sand or concrete. The volume of material filled in each tank was 17,800L and 33,200L.

Reference may be made to Appendix C for details of the WorkCover records.

5.7 Chemical Storage

A number of containers and drums were located within the site, found both inside and outside of the site buildings/sheds, and contained varying chemicals such as oil. The majority of chemicals used on site are food grade and the main chemicals of concern are based upon fuels and lubricants.

5.8 Historical Summary

A summary of the history includes:

- The primary land use of the site has been as a flour mill since 1890.
- The site was owned at sometime by a quarry and may have been used for quarrying purposes, indicating the potential for deep fill.
- The site historically contained a creek which since has been filled and replaced by the current stormwater channel.
- Residential dwellings have been demolished across parts of the site.
- Former use of boilers in the old industrial processes. Evidence on the site shows that a boiler used to exist on the site, therefore coal would have been used.
- The storage of dangerous goods and/or flammable liquids was evident at some stage within the site. The goods/liquids included but were not limited to petrol (super), diesel, chlorine, LPG, oxygen & hydrogen, lubricating oils, paints and oxygen & acetylene.

6.0 PREVIOUS INVESTIGATIONS

It is our understanding that a number of previous investigations have been undertaken at the site. The investigations included:

- *"Environmental Audit of Goodman Fielder Flour Mill, 2 Smith Street, Summer Hill, NSW"* report prepared by URS Australia Pty Ltd (Report ref no. 23409\020_558\Final, dated 3 April 2002).

The report details the findings of an environmental audit undertaken to identify actual and potential environmental liabilities at the site, and to identify non-compliances of the existing operations with current environmental legislation.

- *"Noise Compliance Report for Goodman Fielder, Edward Street, Summer Hill, NSW"* report prepared by Dick Benbow & Associates Pty Limited (report ref no. 11001rep, dated 15 February 2001).

The report details the findings of a noise compliance assessment that was initiated to ensure that the noise conditions of the Environmental Protection License as issued by the NSW EPA for the site are fulfilled. It was found that there were some noise exceedances at night, and recommendations were made for updating the site management plan.

- *"Preliminary Contamination Assessment, 2 Smith Street, Summer Hill"* report prepared by Douglas Partners Pty Ltd (report ref no. 23970, dated 6 August 1996).

The report details the findings of a contamination assessment that was commissioned in order to detect any potential contamination in the vicinity of the USTs which may have originated from the tanks. It was found that it is unlikely that any leakage has occurred from the tanks.

- *"Hazardous Materials Assessment, 2 Smith Street, Summer Hill, NSW"* report prepared by Aargus Pty Ltd (report ref no. E1559, dated 3 July 2007).

The report details the findings of a hazardous materials assessment of the buildings and sheds within the site. It was found that the site is likely to contain hazardous materials such as asbestos, synthetic building materials and PCBs.

7.0 AREAS OF ENVIRONMENTAL CONCERN

Based on the above information, site history and site walkover, the areas of environmental concern (AEC) and associated chemicals of concern (CoC) for the site were identified. These are summarised in the following table:

Table 1: Summary of potential areas and chemicals of concerns

Potential AEC	Description of potentially contaminating activity	CoC	Likelihood of contamination	Remarks
Whole site	Historic uses	Various	Medium to High	The site has been used for a range of purposes, not all being clearly identified. Some noted activities include quarrying, filling and use of coal fueled boilers.
Whole site	Current Activities	Various	Medium	The site contains active machinery, plus chemicals and oils are used and/or stored within the site.
Whole site	Fill materials	Various	Medium	The source of the fill materials is unknown but could be attributed to the quarrying activities, the demolition of previous buildings and boiler material (ash) waste. The quarry and a previous creek are likely to have been filled.
Whole site	Demolition of buildings	Various	Medium	The buildings may have contained hazardous materials.
Whole site	Hazardous materials within the buildings and other features inside the buildings	Asbestos, PCB, Lead, Mercury, Synthetic Mineral Fibres	Low	Likely to be restricted to the item of concern, such as fibro wall, tiles, paint on surfaces, light fixtures etc. To be removed by a qualified contractor.
Whole site	Potential for pesticides to have been sprayed or injected on or underneath concrete slabs or in open areas.	OCP	Low	If this has occurred, the impact is likely to have been localised. The vegetation at the site was found to be generally healthy.
Whole site	Chemical Storage in cylinders, drums and containers	Various	Low	Most drums and containers are secure, fixed or in bunded areas. Any leaks from unsecured drums/containers have small localised spills.
Disused USTs	Storage of diesel and/or petroleum and potential leakage from the USTs	TPH, BTEX, Pb	Medium	The USTs may have formerly contained leaded petroleum and could be leaking.
Former Diesel AST	Storage of Diesel fuel and potential leakage from the AST	TPH, BTEX	Low-Medium	The former diesel UST may have leaked in the past.

Grease Pit	Storage of waste oils	TPH, BTEX, Phenols	Medium	The pit may have leaked or could be leaking.
Interceptor Pit	Collection of wastewaters	Various	Low	The pit may have or could be leaking.
Oil staining on surface adjacent to Amenities Block	Leaking of heater oil from storage container	TPH, BTEX, PAH, Phenols, Pb	High	Visible staining on surface and to a depth of 0.5m.
Vicinity of Metal Features	Degradation of metal features	Metals	Low	If this has occurred, the impact is likely to be restricted to the surface soils.
Electrical Substation & Transformer Yard	Leaking of transformer fluids	Metals, PCB	Low	If this has occurred, the impact is likely to have been localised.
Carpark areas	Car parking. Vehicles may have leaked oil, petrol and other chemicals over time.	Metals, TPH, BTEX, PAH	Low	No significant staining was noted on any of the concrete and bitumen sealed surfaces.
Grassed Area (northern portion)	Discharge point for wastewaters	Various	Low	If any contaminants were in the wastewater, these would then infiltrate the soils in this area
Stormwater channel in north eastern corner	Contamination of surrounding soils by migration of contaminants through channel wall	Various	Low	The open channel appeared to be in good condition

8.0 REVIEW OF QUALITY OF DATA

The DQOs were also prepared using Appendix IV of the Site Auditor Guidelines. These require seven steps. The steps being:

a. State the problem
b. Identify the decisions
c. Identify inputs to decision
d. Define the study boundaries
e. Develop a decision rule
f. Specify limits on decision errors
g. Optimise the design for obtaining data

8.1 State the problem

The site requires to be confirmed suitable for future site development. The site is proposed to be redeveloped and has had some areas of potential concern, those being historical uses, current activities, imported fill of unknown origin, demolition of old buildings, hazardous materials in current buildings, historical pesticide use, chemical use and storage, disused USTs, former ASTs, grease pit, interceptor pit, oil staining, metal features, electrical substation and transformer, carpark areas, open area and stormwater channel.

8.2 Identify the decisions

The decisions made in completing this assessment are as follows:

- Does the site or is the site likely to present a risk of harm to humans or the environment?
- Is the site currently suitable for future site development (all potential land uses)?
- Is there a potential for soil and groundwater contamination?

- Is there a potential for offsite migration issues?
- Does the sampling results meet the site criteria proposed?
- If not, does the site require remediation works?

8.3 Identify inputs to decision

Inputs to the decision include:

- Existing site information
- Site history
- Regional geology, topography and hydrogeology
- Potential contaminants
- Site assessment criteria
- Results as measured against criteria

8.4 Define the study boundaries

The site boundary is identified as the entire boundary of the subject site as shown on the site plans (Appendix A) and located at the corner of Smith and Edward Streets, Summer Hill, NSW.

8.5 Develop a decision rule

The information obtained through this assessment will be used to characterise the soils and the groundwater on the site in terms of contamination issues and risks to human health and the environment. The decision rule in characterising the site will be as follows:

- Laboratory test results will be measured against the criteria provided within this report.
- The site will be deemed not contaminated if the following criteria are fulfilled:
    - Soil and groundwater concentrations are within background levels
    - QA/QC shows data can be relied upon

  - Results generally meet regulatory criteria
  - Statistical analysis of the laboratory data sets
  - Results are from NATA accredited laboratories
  - Detection limits are below assessment criteria

8.6 Specify limits on decision errors

The limits on decision errors for this assessment are as follows:

- Sampling was unable to be conducted underneath the existing buildings sealed surfaces; therefore no physical inspections underneath slabs could be conducted as the surfaces are still intact.
- The assessment criteria adopted from the guidelines within this report have risk probabilities already incorporated.
- The acceptable limits for inter/intra laboratory duplicate sample comparisons are laid out within our protocols.
- The acceptable limits for laboratory QA/QC parameters are based upon the laboratory reported acceptable limits and those stated within the NEPM 1999 Guidelines.

8.7 Optimise the design for obtaining data

The design for optimising data was achieved by the location of soil samples and the collection of groundwater samples. Samples were placed systematically at locations greater than the NSW EPA sampling density guidelines (EPA requires 35 locations – the site sampling was conducted at 33 locations, with two locations inaccessible). Further to this, only laboratories accredited by NATA for the analysis undertaken were used. The laboratory data was assessed from quality data calculated during this assessment. Field QA/QC protocols adopted and listed within appendices incorporate traceable documentation of procedures used in the sampling and analytical program and in data verification procedures.

9.0 SITE ASSESSMENT CRITERIA

9.1 Soil

To assess the contamination status of soils at a site, the NSW EPA refers to the document entitled National Environmental Protection Council (1999) *National Environmental Protection (Assessment of Site Contamination) Measure* (NEPM).

As reported above, this assessment is being carried out in relation to future site development. It is understood that the precise nature and form of the proposed development of the site is not known at this stage; therefore the criteria adopted for this assessment was based upon all permissible land uses (Health Investigation Levels (HIL)) and EPA criteria (Service Stations and Site Auditor Scheme).

The soils were assessed against the following guidelines:

- Residential use with gardens and accessible soils, including children’s day-care centres, preschools, primary schools, townhouses, and villas (HIL ‘A’).
- Residential use with minimal access to the soil (HIL ‘D’).
- Parks, recreational open space, playing fields including secondary schools (HIL ‘E’).
- Commercial/Industrial: includes premises such as shops and offices as well as factories and industrial sites” (HIL ‘F’).
- With respect to the protection of the environment, the provisional phytotoxicity based investigation levels (PPBIL) published in the *Guidelines for the NSW Site Auditor Scheme* (NSW EPA, 2006) and Ecological Investigation Levels (EIL) published in the NEPM for inorganics are used.
- The *Guidelines for Assessing Service Station Sites* (NSW EPA, 1994) provide guidance regarding petroleum hydrocarbons and BTEX compounds.

Reference may be made to Appendix J – Regulatory Criteria.

The NEPM also provides guidance for assessment of a statistical distribution of contaminant concentrations taken from a data set of random samples. There are a number of criteria to be fulfilled in order to establish that a site (or study area) is not contaminated, which are:

- the arithmetic mean of the data set must be less than the relevant threshold level; that is, it is acceptable for individuals to exceed the guideline, but the cumulative mean of the data set of soil sample results should not exceed the threshold level
- the standard deviation of the data set should be less than 50% of the relevant threshold level
- no individual sample result should be greater than 250% of the relevant threshold level

Where applicable, this statistical approach was adopted for assessment of the laboratory data provided. However, as opposed to the arithmetic mean, the 95% Upper Confidence Limit (UCL) of the mean, as discussed in Section 5 of the NSW EPA "*Sampling Design Guidelines for Contaminated Sites*" – 1995, was adopted as the governing value.

Assessment of statistical distribution of test data sets, where all or most concentrations are less than the laboratory PQL, was not carried out as there is no data distribution to consider.

9.2 Groundwater

9.2.1 Potential uses

The NSW DECC has endorsed the use of the Groundwater Investigation Levels (GILs) given in the 1999 NEPM '*Schedule B(1) Guideline on the Investigation Levels for Soil and Groundwater'* and the water quality trigger levels given in the *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* (ANZECC & ARMCANZ, 2000). These Guidelines provide criteria for:

- Aquatic ecosystems – both marine and fresh waters
- Primary Industries
- Recreational Water
- Drinking Water

The NEPM advises that '*when assessing groundwater contamination, the GILs are to be applied at the point of extraction and as response levels at the point of use, or where there is a likelihood of an adverse environmental effect at the point of discharge*'.

For assessing groundwater quality, it is first necessary to assess the potential uses of groundwater downgradient of the site being assessed.

Potential uses of groundwater downgradient of the site include:

- Extraction for irrigation use in parks downgradient of the site, such as Hawthorne Canal Reserve. We understand that groundwater will not be abstracted from the site as part of the proposed development.
- Discharge to water bodies sustaining aquatic ecosystems, particularly Iron Cove (around 2.5km to the north of the site).

Guidelines for irrigation and general water use are presented in the ANZECC (2000) *Fresh and Marine Waters Quality Guidelines* (Section 4.2 of the guidelines). The guidelines list long term trigger values (LTV) and short term trigger values (STV) depending on the duration of use – up to 100 years for LTV and up to 20 years for STV.

The threshold concentrations presented in the ANZECC (2000) *Fresh and Marine Waters Quality Guidelines* are considered applicable for the protection of aquatic ecosystems of the receiving waters. As these guidelines apply to receiving waters, it is generally conservative to apply these to groundwater discharging to receiving waters. It is important to note that these are not threshold values at which an environmental problem is likely to occur if exceeded, rather, if the trigger values are exceeded, then further action is required which may include either further site-specific investigations to assess whether or not there is an actual problem or management / remedial action should be undertaken.

It is considered that marine water trigger values are applicable for investigating chemical concentrations in groundwater at the site, as the receiving body, Iron Cove (around 2.5km to the north of the site) is a marine water body. It is understood that the NSW EPA policy is that the trigger values for the protection of 95% of aquatic ecosystems should be used as groundwater assessment criteria when considering moderately or highly disturbed receiving environments. The receiving waters for groundwater at the site are considered to be moderately disturbed ecosystems and the ANZECC (2000) 95% protection values are therefore considered appropriate groundwater assessment criteria for the site.

Receiving waters in Iron Cove (around 2.5km to the north of the site) are used for recreational purposes such as swimming and boating, and the aesthetic appeal of these water bodies has to be preserved, therefore Section 5 "*Guidelines for recreational water quality and aesthetics*" of the ANZECC (2000) *Fresh and Marine Waters Quality Guidelines* is considered to be applicable groundwater assessment criteria.

Reference may be made to Appendix J – Regulatory Criteria.

9.2.2 Unlikely uses

It is considered unlikely that groundwater at the site or down gradient of the site would be used for drinking.

The site is not in a rural area and the groundwater in the vicinity of the site would not be used for stock watering purposes.

9.3 Assessment of significant risk of harm

The NSW EPA (1999) *Guidelines on Significant Risk of Harm from Contaminated Land and the Duty to Report* state that significant risk of harm is probable where:

- Contamination is located in a place where there will be an impact on human health or the environment;
- There is a particularly toxic contaminant which is likely to cause harm, even in small quantities, to anything in which it has contact, even where there is limited exposure;
- A contaminant is present at such concentrations or over such a large area as to present a high probability of harm; and
- The contamination is already causing harm.

Under the provisions of the Contaminated Land Management Act 1997 (CLMA 1997), owners and/or operators of a site are required to notify the NSW EPA of contamination after they become aware that contamination is presenting a potential significant risk of harm.

More specifically DECC also advises that there is a statutory requirement to notify them when "contaminants are known, or are likely, to be migrating offsite at concentrations exceeding groundwater assessment criteria" (DEC 2004, *Contaminated Sites: Draft Guidelines for the assessment and Management of Groundwater Contamination*).

9.4 Export of Fill Material

To assess the waste classification of materials to be disposed of off-site, the NSW EPA refers to the *NSW EPA* (1999) *Environmental Guidelines: Assessment, Classification and Management of Liquid and Non-Liquid Wastes.*

To classify a non-liquid waste as Inert, Solid or Industrial waste, the threshold values of the "total concentration without TCLP" (referred to as CT in the text), or the threshold values for the "leachable and total concentration" together can be used.

10.0 SOIL BORING AND SAMPLING STRATEGY

10.1 Soil sampling

The NSW EPA "Sampling Design Guidelines" (September 1995) shows the minimum number of sampling points for a site of area of approximately 2.5 hectares (Ha) is thirty-five. During this investigation, soil samples were collected from thirty-three boreholes (BH1, BH2, BH4 to BH12 and BH14 to BH35) located on a semi regular grid over the site (modified to allow accesses to sample locations). Borehole locations, BH3 & BH13, were not able to be sampled due to access issues (services and presence of UST). All fieldwork and borehole logging was conducted by qualified environmental staff (refer Appendix I – Resumes of Client Team). Boreholes were drilled using a steel hand auger and/or a drill rig. Sampling was conducted on the 30th & 31st of May 2007 and 12th & 13th of March 2008.

To reach our stated objectives, a set of seventy-three (73) primary soil samples were submitted for analysis on the differing fill and natural soil profiles. Three QA/QC intra-laboratory duplicate samples and three QA/QC rinsate samples were analysed by the NATA accredited laboratory of LabMark (NATA accreditation number 13542). Two (2) QA/QC inter-laboratory duplicate samples were analysed by the NATA accredited laboratory of ALS Environmental (NATA accreditation number 825) and one QA/QC inter-laboratory duplicate sample was analysed by the NATA accredited laboratory of SGS (NATA accreditation number 2562).

The rationale for sampling depths was based upon the targeting of shallow topsoil, fill and natural soils on site. Samples were targeted in the homogeneous topsoil and fill material near the surface and then within the natural soil profile. Reference may be made to Table 3 in Section 10.4 – Laboratory Analysis for the soil analysis schedule of the recovered samples. The sample locations were chosen to provide site coverage and also target the most likely areas at which potential contamination could occur.

The approximate locations of the boreholes are shown on Figure 3 in Appendix A.

Boreholes BH7, (GW1), BH32 (GW2) & BH34 (GW3) were converted into groundwater monitoring wells, to investigate groundwater quality at the site.

10.2 Surface and Subsurface Conditions

This section should be read in conjunction with the site plan (Refer to Appendix A) and the borehole logs (Refer to Appendix D). No asbestos pieces were noted in the borehole samples.

Based on information from all boreholes, the surface and sub-surface profile across the site is generalised as follows:

- Asphaltic Concrete (bitumen), underlain by gravel to depths of 0.4m, then fill materials in BH2, BH18 to BH20, BH28, BH29, BH34 and BH35.
- Topsoil/fill, comprising silty sand with roots and root fibres, underlain by fill materials in BH5 to BH7, BH21, BH30, BH31 and BH33.
- Fill, comprising a mixture of silty clay and silty sandy clay, with a trace of gravels was encountered within BH1, BH 5 and BH6.
- Fill, comprising silty clay, with a trace of gravels was encountered within BH2, BH3, BH5, BH9 to BH11, BH17, BH18, BH23 and BH24 to BH26.
- Fill, comprising silty sandy clay, with a trace of fly ash and gravels was encountered within BH6 to BH8, BH11, BH12, BH14 to BH16, BH22, BH24 and BH27.
- Fill, comprising silty sand, with a trace of gravels and metal was encountered within BH4 and BH17.
- Fill, comprising silty sand, with a trace of gravels and metal was encountered within BH2 and BH18 to BH21.
- Fill, comprising silty clay, with a trace of gravels was encountered within BH2, BH3, BH5, BH9, BH17 and BH24.
- Concrete, underlain by fill, comprising sandstone and brick rubble was encountered within BH13 to a depth of 0.5m.

- Concrete, underlain by gravel, then fill, comprising gravelly clays was encountered within BH32.

- Fill materials were underlain by relatively impermeable natural silty clays or silty sandy clays, and were encountered at the majority of the locations across the site.

- Refusal on sandstone and/or shale was encountered at locations BH6, BH7, BH22, BH23, BH26, BH32 and BH34, whilst refusal on fill materials were encountered at BH1, BH8, BH13, BH16, BH17, BH21 & BH27.

The above borehole locations are shown on Figure 3 in Appendix A – Site plans.

Groundwater or seepage was encountered at 4.0m in BH18 during drilling. The maximum depth of drilling was 7.3m.

Hawthorne Channel is located in the north eastern portion of the site. It is therefore possible that surface water run-off exiting the site could impact on the creek.

10.3 Groundwater Sampling

Groundwater monitoring wells were installed at borehole locations BH7 (GW1), BH32 (GW2) & BH34 (GW3), to investigate groundwater quality at the site. Groundwater samples were collected from each well.

Materials encountered whilst drilling at the site are described in the groundwater well logs included in Appendix D. Groundwater well construction details are also shown on the relevant groundwater well logs. A summary of groundwater monitoring well details is provided in the following table.

Table 2: Summary of Monitoring Well Details

Well ID	Depth (m)	Screened depth interval (m)	Depth to Standing water (m)	Well volume of water removed during purging (L)
GW1	7.3	4.3-7.3	2.0	12
GW2	7.0	4.0-7.0	2.5	20
GW3	4.5	1.5-4.5	2.15	14

Groundwater monitoring well purging and sampling details is included on the well development work sheets included in Appendix F.

10.4 Laboratory analysis

The soil samples were selected for analysis based on a combination of sample location and field observations. The soil analysis schedule is shown in the following table.

Table 3: Schedule of Laboratory Analysis

Page 1 of 2

Analyte / Analyte Group Sample	Depth (m)	TYPE	SAMPLING DATE	DUPLICATE	SPLIT	MET-8	TPH & BTEX	PAH	OCP	PCB	PHENOLS	CYANIDES	VOC
Grease Pit													
BH1	0.5	F	30.05.2007			✔	✔	✔					✔
BH1	0.75	N	30.05.2007			✔	✔	✔					
Former UST													
BH2	0.12-0.5	F	30.05.2007			✔	✔	✔					
BH2	0.5-1.2	F	30.05.2007			✔	✔	✔					✔
BH2	1.25-1.5	N	30.05.2007			✔	✔	✔			✔		
Open Area													
BH4	0.1	F	30.05.2007			✔			✔				
BH4	0.4	F	30.05.2007			✔							
BH4	2.0	N	30.05.2007			✔							
Adj. Transformer													
BH5	0.1-0.5	F	30.05.2007			✔	✔			✔			
BH5	0.5-1.5	F	30.05.2007			✔				✔			
BH5	1.55-2.0	N	30.05.2007			✔				✔			
Open Area													
BH6	0.1-1.0	F	30.05.2007			✔	✔	✔					
BH6	1.0-2.0	F	30.05.2007			✔							
BH6	2.55-3.0	N	30.05.2007			✔							
BH7	0.1-0.5	F	30.05.2007	D1		✔	✔	✔	✔	✔	✔	✔	
BH7	0.5-1.5	F	30.05.2007			✔	✔	✔					
BH7	1.5-2.5	F	30.05.2007			✔							
Adj. LPG Store													
BH8	0.3	F	30.05.2007			✔	✔	✔					
BH8	1.8	N	30.05.2007			✔							
Vacant Block													
BH9	0-0.5	F	31.05.2007			✔							
BH9	0.5-1.5	F	31.05.2007			✔							
BH9	1.5-2.5	F	31.05.2007			✔	✔	✔					
BH9	2.75-3.0	N	31.05.2007			✔							
BH10	0-0.5	F	31.05.2007			✔	✔	✔					
BH10	0.5-1.5	F	31.05.2007			✔							
BH10	1.5-2.5	F	31.05.2007			✔							
BH10	3.55-3.8	N	31.05.2007			✔							
BH11	0-0.5	F	31.05.2007	D2		✔	✔	✔	✔	✔	✔	✔	
BH11	0.5-1.5	F	31.05.2007		SS2	✔	✔	✔	✔	✔	✔	✔	
BH11	1.85-2.1	N	31.05.2007			✔							
Inside Mill													
BH12	0.3	F	31.05.2007			✔	✔	✔	✔				
BH12	1.5	N	31.05.2007			✔							
Adj. Silos / General Store													
BH14	0-0.7	F	31.05.2007		SS1	✔	✔	✔	✔	✔	✔	✔	
BH14	0.75-1.0	N	31.05.2007			✔							
BH15	0-1.0	F	31.05.2007			✔		✔					
BH15	1.05-1.3	N	31.05.2007			✔							
Adj. Flammable Store													
BH16	0.3	F	31.05.2007			✔	✔	✔	✔	✔			✔
BH16	0.75	F	31.05.2007			✔							
Carpark													
BH17	0.4	F	30.05.2007			✔	✔	✔	✔			✔	
BH18	0.12-0.8	F	30.05.2007			✔	✔	✔			✔		
BH18	0.8-1.7	F	30.05.2007			✔							
BH18	1.75-2.0	N	30.05.2007			✔							
BH19	0.12-1.0	F	31.05.2007			✔	✔	✔					
BH19	1.05-1.3	N	31.05.2007			✔							
BH20	0.4-1.0	F	31.05.2007			✔	✔	✔					
BH20	1.05-1.3	N	31.05.2007			✔							
Adj. Workshop													
BH21	0.2	F	31.05.2007			✔	✔	✔			✔		

Notes
MET-8: arsenic, cadmium, chromium, copper, lead, mercury, nickel, zinc
VOC Volatile Organic Compounds
PAH: Polycyclic Aromatic Hydrocarbons
TPH: Total Petroleum Hydrcarbons
BTEX: Benzene, Toluene, Ethyl Benzene, Xylene
F,T,N: Fill, Topsoil, Natural
OCP : Organochlorine Pesticides
OPP : Organophosphorus Pesticides
PCB : Polychlorinated Biphenyls

Page 2 of 2

Analyte / Analyte Group Sample	Depth (m)	TYPE	SAMPLING DATE	DUPLICATE	SPLIT	METALS 8	TPH & BTEX	PAH	OCP	PCB	PHENOLS	CYANIDES	VOC
Adj. Workshop / Silos													
BH22	0-0.8	F	31.05.2007			✓	✓	✓	✓	✓			
BH22	0.85-1.1	N	31.05.2007			✓							
BH22	1.3-1.6	N	31.05.2007			✓							
Adj. Store													
BH23	0.15-0.4	F	31.05.2007			✓	✓	✓					
Adj. Former AST													
BH24	0-0.7	F	31.05.2007			✓	✓	✓			✓	✓	✓
BH24	0.7-1.3	F	31.05.2007			✓		✓					
BH24	1.35-1.6	N	31.05.2007			✓							
Adj. Store													
BH25 (BH5.10)		N	13.03.2008			✓	✓			✓			
Adj. Metal Plates													
BH26	0-1.0	F	31.05.2007			✓	✓	✓					
BH26	1.05-1.3	N	31.05.2007			✓							
Oil Spill													
BH27	0.5	F	30.05.2007			✓	✓	✓					✓
Former UST													
BH28	1.0	F	12.03.2008			✓	✓	✓					
BH29	1.0	F	12.03.2008	A		✓	✓	✓					
BH29	2.0	N	12.03.2008			✓	✓	✓					
Open Area													
BH30	1.0	F	12.03.2008			✓	✓	✓	✓				
BH30	3.0	N	12.03.2008			✓							
BH31	1.0	F	12.03.2008			✓							
BH31	1.5	N	12.03.2008			✓	✓	✓	✓	✓			
Adj. Mill & Office													
BH32 (BH4.10)	1.0	N	13.03.2008			✓			✓				
Adj. Amenities													
BH33	1.0	F	13.03.2008			✓		✓					
BH33	2.0	N				✓							
Carpark													
BH34	1.0	F	13.03.2008		BH6.10	✓	✓	✓					
BH34	3.0	N	13.03.2008			✓							
BH35	0.5	F	12.03.2008			✓	✓	✓					
BH35	1.0	F	12.03.2008			✓							
BH35	3.0	N	12.03.2008			✓							

Notes
MET-8: arsenic, cadmium, chromium, copper, lead, mercury, nickel, zinc
VOC Volatile Organic Compounds
PAH: Polycyclic Aromatic Hydrocarbons
TPH: Total Petroleum Hydrcarbons
BTEX: Benzene, Toluene, Ethyl Benzene, Xylene
F,T,N: Fill, Topsoil, Natural
OCP : Organochlorine Pesticides
OPP : Organophosphorus Pesticides
PCB : Polychlorinated Biphenyls

11.0 QUALITY ASSURANCE / QUALITY CONTROL

11.1 Data Quality Objectives

Data Quality Objectives (DQOs) were created to produce quality assured, accurate and useful data for the sampling plan. Blind samples were split in the field for testing or at the laboratory. Other areas reviewed are:

- sampling methods;
- decontamination procedures;
- sample preservation;
- container type;
- headspace within containers;
- disturbed or undisturbed sampling for organics;
- PQL's;
- preparation of CoC forms;
- review of laboratory surrogate and spike % returns; and
- review of Laboratory duplicate results.

LabMark Laboratory (primary laboratory), ALS Environmental (secondary laboratory and SGS (secondary laboratory) performed all analyses using test methods accredited by the National Association of Testing Authorities (NATA). All data quality objectives were reviewed and met and we therefore conclude that the DQOs were satisfactory for our stated objectives.

The Practical Quantitation Limits (PQLs) of the laboratory analyses were less than the threshold guidelines adopted for the purpose of this investigation, and therefore meet DQO's.

The results of all quality checking have been reviewed and are considered adequate in satisfying the reliability of the results and meet Data Quality Objectives (DQOs).

11.2 Field QAQC

11.2.1 Sampling procedures

Aargus procedures followed throughout the field investigation are presented in Appendix H – Aargus fieldwork protocols, which are based on industry accepted standard practice. The work was undertaken by appropriately qualified personnel; see Appendix I – Resumes of Client Team.

Soil sampling was carried out using a stainless steel hand auger and a truck mounted drill rig with TC bit. The decontamination of sampling equipment was achieved by washing the equipment with phosphate-free detergent and tap water, followed by a final rinse with distilled water. Decontamination was conducted after the collection of samples at each sample location. Soil samples were placed in 250g clean glass jars, leaving no headspace, and closed using Teflon-coated lids. Samples were then stored in an ice brick-cooled esky and transported to the laboratory under chain of custody conditions.

Samples were taken at varying depths as shown in the Borehole Logs (refer Appendix D – Borehole and Groundwater Logs).

11.2.2 Intra-laboratory Duplicates

A total of four (3 for soils & 1 for groundwater) intra-laboratory duplicate samples were collected for both soils and water and analysed in order to assess the variation in analyte concentration between samples collected from the same sampling point. The duplicate sample frequency was computed using the total number of samples analysed as part of this assessment.

The duplicate sample frequencies computed are presented in the following table.

Table 4: Soil - Duplicate Sample Analyses

Analyte	**Samples Analysed**	**Duplicate Samples**	**Frequency**
Metals - Fill	46	3	7%
Metals - Natural	27	0	0%
TPH/BTEX	35	3	8%
PAH	36	3	9%
OCP	12	2	17%
PCB	11	2	18%
Phenols	8	2	25%
Cyanides	6	2	33%
VOC	5	0	0%
Analyte - Water	**Samples Analysed**	**Duplicate Samples**	**Frequency**
Metals - 8	3	1	33%
TPH/BTEX	3	1	33%
PAH	3	1	33%

The duplicate frequency for most of the analytical suite adopted complies with the NEPM, which recommends a duplicate frequency of at least 5%. Duplicate samples were not recovered for the Metals in natural soils or for the VOCs because natural soils were analysed for metals only for use as background information, whilst the VOCs were not recovered as the duplicating process would disperse any volatiles into the atmosphere.

It is considered that the number of duplicate samples collected is adequate to assess the variation in analyte concentration between samples collected from the same sampling point. A summary of the test results with the Relative Percentage Difference (RPD) is presented in the following tables. A discussion of the test data is also presented below.

Table 5: Soil - Duplicate D1 – RPDs

ANALYTE	BH7 0.1-0.5m mg/kg	DUPLICATE D1 mg/kg	RELATIVE PERCENTAGE DIFFERENCE %
HEAVY METALS			
Arsenic	26	33	24
Cadmium	<0.1	0.1	-
Chromium	8	8	0
Copper	110	130	17
Nickel	4	5	22
Lead	86	130	41
Zinc	39	63	47
Mercury	0.14	0.20	35
TOTAL PETROLEUM HYDROCARBONS (TPH)			
C6 - C9	<10	<10	-
C10 - C14	<50	<50	-
C15 - C28	170	<100	-
C29-C36	120	<100	-
BTEX			
Benzene	<0.2	<0.2	-
Toluene	<0.5	<0.5	-
Ethyl Benzene	<0.5	<0.5	-
Total Xylenes	<1.5	<1.5	-
POLYCYCLIC AROMATIC HYDROCARBONS (PAH)			
BENZO(a)PYRENE	2.8	1.4	67
Total PAH	29.9	16	61
ORGANOCHLORINE PESTICIDES (OCP)			
Heptachlor	<0.05	<0.05	-
Aldrin	<0.05	<0.05	-
Dieldrin	<0.05	<0.05	-
DDD	<0.05	<0.05	-
DDE	<0.05	<0.05	-
DDT	<0.2	<0.2	-
Chlordane (trans & cis)	<0.1	<0.1	-
POLYCHLORINATED BIPHENYLS (PCB)			
Total PCB	<0.6	<0.6	-
PHENOLS & CYANIDES			
Total Phenols	<0.5	<0.5	-
Total Cyanides	<1	<1	-

Table 6: Soil - Duplicate D2 – RPDs

ANALYTE	BH11 0-0.5m mg/kg	DUPLICATE D2 mg/kg	RELATIVE PERCENTAGE DIFFERENCE %
HEAVY METALS			
Arsenic	28	25	11
Cadmium	0.2	0.2	0
Chromium	19	59	103
Copper	88	94	7
Nickel	110	62	56
Lead	46	95	70
Zinc	94	81	15
Mercury	0.15	0.06	86
TOTAL PETROLEUM HYDROCARBONS (TPH)			
C6 - C9	<10	<10	-
C10 - C14	<50	<50	-
C15 - C28	<100	<100	-
C29-C36	<100	<100	-
BTEX			
Benzene	<0.2	<0.2	-
Toluene	<0.5	<0.5	-
Ethyl Benzene	<0.5	<0.5	-
Total Xylenes	<1.5	<1.5	-
POLYCYCLIC AROMATIC HYDROCARBONS (PAH)			
BENZO(a)PYRENE	0.7	<0.5	-
Total PAH	10.5	<8	-
ORGANOCHLORINE PESTICIDES (OCP)			
Heptachlor	<0.05	<0.05	-
Aldrin	<0.05	<0.05	-
Dieldrin	<0.05	<0.05	-
DDD	<0.05	<0.05	-
DDE	0.18	<0.05	-
DDT	<0.2	<0.2	-
Chlordane (trans & cis)	<0.1	<0.1	-
POLYCHLORINATED BIPHENYLS (PCB)			
Total PCB	<0.6	<0.6	-
PHENOLS & CYANIDES			
Total Phenols	<0.5	<0.5	-
Total Cyanides	<1	<1	-

Table 7: Soil - Duplicate A – RPDs

ANALYTE	BH29 1.0m mg/kg	DUPLICATE A mg/kg	RELATIVE PERCENTAGE DIFFERENCE %
HEAVY METALS			
Arsenic	4	3	29
Cadmium	<0.1	<0.1	-
Chromium	17	5	109
Copper	11	22	67
Nickel	9	3	100
Lead	30	32	6
Zinc	22	36	48
Mercury	0.08	0.18	77
TOTAL PETROLEUM HYDROCARBONS (TPH)			
C6 - C9	<10	<10	-
C10 - C14	<50	<50	-
C15 - C28	<100	110	-
C29-C36	<100	<100	-
BTEX			
Benzene	<0.2	<0.2	-
Toluene	<0.5	<0.5	-
Ethyl Benzene	<0.5	<0.5	-
Total Xylenes	<1.5	<1.5	-
POLYCYCLIC AROMATIC HYDROCARBONS (PAH)			
BENZO(a)PYRENE	0.7	2.7	118
Total PAH	10.8	28.1	89

Table 8: Groundwater - Duplicate D1 – RPDs

ANALYTE	GW3 - µg/L	DUPLICATE D1 µg/L	RELATIVE PERCENTAGE DIFFERENCE %
HEAVY METALS			
Arsenic	<1	<1	-
Cadmium	<0.1	<0.1	-
Chromium	<5	<5	-
Copper	<1	<1	-
Lead	<1	<1	-
Mercury	<0.1	<0.1	-
Nickel	10	10	0
Zinc	27	26	4
TOTAL PETROLEUM HYDROCARBONS (TPH)			
C6 - C9	<50	<50	-
C10 - C14	240	270	12
C15 - C28	<200	<200	-
C29-C36	<50	<50	-
BTEX			
Benzene	<1	<1	-
Toluene	<1	<1	-
Ethyl Benzene	<1	<1	-
Total Xylenes	<3	<3	-
POLYCYCLIC AROMATIC HYDROCARBONS (PAH)			
Naphthalene	<1	<1	-
Anthracene	<1	<1	-
Phenanthrene	<1	<1	-
Fluoranthrene	<1	<1	-
Benzo(a)pyrene	<1	<1	-

The comparisons between the intra-laboratory duplicates and corresponding original samples indicated generally acceptable RPD overall, with the exception of the following:

- Benzo(a)pyrene (67%) and Total PAH (61%) in Table 5.
- Chromium (103%), nickel (56%), lead (70%) and mercury (86%) in Table 6.
- Chromium (109%), copper (67%), nickel (100%), mercury (77%), benzo(a)pyrene (118%) and Total PAH (89%) in Table 7.

The higher RPDs in Tables 5, 6 & 7 exceeded the DQOs for this project, however this exceedance is not considered to be significant as the concentrations of most samples are at generally low concentrations and the duplicates were prepared from fill samples, therefore heterogeneity of the samples might result in relatively higher RPD.

Overall, the duplicate sample comparisons indicate that the laboratory test data provided by LabMark are of adequate accuracy and reliability for this assessment.

11.2.3 Inter-laboratory Duplicates

A total of three inter-laboratory duplicate (split) samples were collected and analysed in order to assess the variation in analyte concentration between samples collected from the same sampling point. The split sample frequency was computed using the total number of samples analysed as part of this assessment.

The split sample frequencies computed are presented in the following table.

Table 9: Soil - Split Sample Analyses

Analyte	Samples Analysed	Split Samples	Frequency
Metals - Fill	46	3	7%
Metals - Natural	27	0	0%
TPH/BTEX	35	3	8%
PAH	36	3	9%
OCP	12	2	17%
PCB	11	2	18%
Phenols	8	2	25%
Cyanides	6	2	33%
VOC	5	0	0%

The split frequency for most of the analytical suite adopted complies with the NEPM, which recommends a split frequency of at least 5%. Split samples were not recovered for the Metals in natural soils or for the VOCs because natural soils were analysed for metals only for use as background information, whilst the VOCs were not recovered as the duplicating process would disperse any volatiles into the atmosphere.

It is considered that the number of split samples collected is adequate to assess the variation in analyte concentration between samples collected from the same sampling point. A summary of the test results with the Relative Percentage Difference (RPD) is presented in the following tables. A discussion of the test data is also presented below.

Table 10: Soil – Split SS1 – RPDs

ANALYTE	BH14 0-0.7m mg/kg (LABMARK)	SPLIT SS1 mg/kg (ALS)	RELATIVE PERCENTAGE DIFFERENCE %
HEAVY METALS			
Arsenic	5	6	18
Cadmium	0.3	<1	-
Chromium	18	18	0
Copper	69	63	9
Nickel	95	89	7
Lead	150	56	91
Zinc	200	174	14
Mercury	0.05	<0.1	-
TOTAL PETROLEUM HYDROCARBONS (TPH)			
C6 - C9	<10	<10	-
C10 - C14	<50	<50	-
C15 - C28	<100	<100	-
C29-C36	<100	<100	-
BTEX			
Benzene	<0.2	<0.2	-
Toluene	<0.5	<0.5	-
Ethyl Benzene	<0.5	<0.5	-
Total Xylenes	<1.5	<1.0	-
POLYCYCLIC AROMATIC HYDROCARBONS (PAH)			
BENZO(a)PYRENE	<0.5	<0.5	-
Total PAH	<8.0	<8.0	-
ORGANOCHLORINE PESTICIDES (OCP)			
Heptachlor	<0.05	<0.05	-
Aldrin	<0.05	<0.05	-
Dieldrin	<0.05	<0.05	-
DDD	<0.05	<0.05	-
DDE	<0.05	<0.05	-
DDT	<0.2	<0.2	-
Chlordane (trans & cis)	<0.1	0.11	-
POLYCHLORINATED BIPHENYLS (PCB)			
Total PCB	<0.6	<0.10	-
PHENOLS & CYANIDES			
Total Phenols	<0.5	<0.5	-
Total Cyanides	<1	<1.0	-

Table 11: Soil – Split SS2 – RPDs

ANALYTE	BH11 0.5-1.5m mg/kg (LABMARK)	SPLIT SS2 mg/kg (ALS)	RELATIVE PERCENTAGE DIFFERENCE %
HEAVY METALS			
Arsenic	9	15	50
Cadmium	<0.1	<1	-
Chromium	16	17	6
Copper	43	63	38
Nickel	15	6	86
Lead	23	14	49
Zinc	66	46	36
Mercury	<0.05	<0.1	-
TOTAL PETROLEUM HYDROCARBONS (TPH)			
C6 - C9	<10	<10	-
C10 - C14	<50	<50	-
C15 - C28	<100	<100	-
C29-C36	<100	<100	-
BTEX			
Benzene	<0.2	<0.2	-
Toluene	<0.5	<0.5	-
Ethyl Benzene	<0.5	<0.5	-
Total Xylenes	<1.5	<1.0	-
POLYCYCLIC AROMATIC HYDROCARBONS (PAH)			
BENZO(a)PYRENE	<0.5	<0.5	-
Total PAH	<8.0	<8.0	-
ORGANOCHLORINE PESTICIDES (OCP)			
Heptachlor	<0.05	<0.05	-
Aldrin	<0.05	<0.05	-
Dieldrin	<0.05	<0.05	-
DDD	<0.05	<0.05	-
DDE	<0.05	<0.05	-
DDT	<0.2	<0.2	-
Chlordane (trans & cis)	<0.1	<0.10	-
POLYCHLORINATED BIPHENYLS (PCB)			
Total PCB	<0.6	<0.10	-
PHENOLS & CYANIDES			
Total Phenols	<0.5	<0.5	-
Total Cyanides	<1	<1.0	-

Table 12: Soil – Split BH6.10 – RPDs

ANALYTE	BH6 (BH34) 1.0m mg/kg (LABMARK)	SPLIT BH6.10 mg/kg (SGS)	RELATIVE PERCENTAGE DIFFERENCE %
HEAVY METALS			
Arsenic	<1	<3	-
Cadmium	<0.1	<0.3	-
Chromium	9	19	71
Copper	2	3.3	49
Nickel	1	3.2	105
Lead	8	11	32
Zinc	6	5.8	3
Mercury	<0.05	<0.05	-
TOTAL PETROLEUM HYDROCARBONS (TPH)			
C6 - C9	<10	<20	-
C10 - C14	<50	<20	-
C15 - C28	<100	51	-
C29-C36	<100	<50	-

The comparisons between the inter-laboratory duplicates and corresponding original samples indicated generally acceptable RPD overall, with the exception of the following:

- Lead (91%) in Table 10.
- Nickel (100%) in Table 11.
- Chromium (71%) and nickel (105%) in Table 12.

The higher RPDs in Tables 10, 11 & 12 exceeded the DQOs for this project, however this exceedance is not considered to be significant as the concentrations of most samples are at generally low concentrations and the splits were prepared from fill samples, therefore heterogeneity of the samples might result in relatively higher RPD.

Overall, the split sample comparisons indicate that the laboratory test data provided by ALS and SGS are of adequate accuracy and reliability for this assessment.

11.2.4 Rinsate

Three rinsate samples were recovered over the course of the fieldwork in order to identify possible cross contamination between the sampling locations. The laboratory result for the rinsate samples are presented in the following table.

Table 13: Rinsate Analysis

ANALYTE	RINSATE R1 (mg/L) 30.05.2007	RINSATE R2 (mg/L) 31.05.2007	RINSATE A (mg/L) 12.03.2008	Practical Quantitation Limits (PQL)
HEAVY METALS				
Arsenic	<5	<5	<5	5
Cadmium	<0.5	<0.5	<0.5	0.5
Chromium	<5	<5	<5	5
Copper	580	530	<5	5
Nickel	<5	<5	<5	5
Lead	<5	<5	<5	5
Zinc	8	21	<5	5
Mercury	<0.1	<0.1	<0.1	<0.1

As indicated in table 13, the concentrations of the analytes were found to be the same as the PQL's, with the exception of copper and zinc in Rinsate R1 and R2, indicating that the cleaning and decontamination processes adopted in the field were adequate. The exceedances in the copper and zinc can be attributed to the quality of the distilled water that was used on these two dates.

11.3 Laboratory quality assurance quality control

Collected soil samples were analysed by LabMark, ALS and SGS Environmental laboratories. Laboratories used within this study are accredited by the National Association of Testing Authorities (NATA) for the analyses undertaken.

Review of the QAQC results provided with the laboratory reports by this laboratory indicated that the laboratory QAQC was satisfactory for the laboratory analyses undertaken, with exception for the following incidences:

Recoveries less than the lower DQO (ALS) were encountered in the Matrix Spikes for gamma-BHC, aldrin, dieldrin, DDT and toluene in Split SS2. The actual results showed that all samples were either less than the PQL or at low concentrations. If this loss was applied to the results with low concentrations, the adjusted results would still be well below the adopted criteria for this assessment.

Low surrogate recoveries were encountered in some of the samples analysed for phenols and VOCs due to matrix interference from the sample.

Nickel recovery in sample 146281s (LabMark) is 45%, the corresponding LCS recovery is 103%, therefore the sample is within the general analyte recovery range.

Metals in laboratory #146279d reported RPD range between 10-100%. Triplicate results were issued.

The Practical Quantitation Limits (PQLs) of the laboratory analyses were less than the threshold guidelines adopted for the purpose of this investigation, and therefore meet DQOs.

The results of all quality checking have been reviewed and are considered adequate in satisfying the reliability of the results and meet Data Quality Objectives (DQOs).

11.4 Conclusion for the QA/QC

The sampling methods (including sample preservation, transport and decontamination procedures) and laboratory methods followed during this investigation works were consistent with Aargus protocols and were found to meet the DQOs for this project. It is therefore considered that the data is sufficiently precise and accurate and that the results can be used for the purpose of this project.

12.0 DISCUSSION

A summary of the test results is presented in the following tables together with the assessment criteria adopted. A discussion of the test data is also presented in the following sub-sections. Reference may be made to Appendix G - Laboratory Certificates for the laboratory certificates.

12.1 Soil

12.1.1 Metals - Fill

The metals test data for the fill soil samples is presented in the following tables. The metals test data for the fill soil samples have been assessed, statistically, in separate sub-headings against the relevant assessment criteria. All concentrations greater than 250% of the assessment criteria were not included as part of the statistical analysis, and could be considered as 'hotspots'.

PPBIL & HIL 'A' (residential with accessible soils)

The metals test data for the fill soil samples assessed against the PPBIL and HIL 'A' for residential with accessible soils is presented in the following table.

Table 14: Metals Test Results - Fill

Analyte		METALS (mg/kg)							
Sample Reference	Depth(m)	ARSENIC	CADMIUM	CHROMIUM	COPPER	NICKEL	LEAD	ZINC	MERCURY
BH1	0.5	2	<0.1	12	7	5	23	17	0.1
BH2	0.12-0.5	3	0.4	11	26	4	530	***430***	0.52
BH2	0.5-1.2	6	0.7	15	33	16	440	**540**	0.31
BH4	0.1	3	<0.1	19	8	1	21	9	<0.05
BH4	0.4	6	0.3	11	31	18	100	80	0.25
BH5	0.1-0.5	4	<0.1	5	15	1	100	18	0.1
BH5	0.5-1.5	5	<0.1	11	18	2	100	41	0.18
BH6	0.1-1.0	18	<0.1	7	150	7	100	34	0.14
BH6	1.0-2.0	4	<0.1	9	75	5	88	85	0.1
BH7	0.1-0.5	26	<0.1	8	110	4	86	39	0.14
BH7	0.5-1.5	3	0.1	12	74	7	270	120	0.12
BH7	1.5-2.5	11	0.4	9	96	7	180	270	0.12
BH8	0.3	6	<0.1	11	17	5	43	37	0.38
BH9	0-0.5	5	0.2	14	30	6	250	130	0.23
BH9	0.5-1.5	33	1.3	23	**920**	21	**810**	**590**	0.13
BH9	1.5-2.5	17	0.6	24	**280**	28	530	340	0.16
BH10	0-0.5	6	<0.1	14	13	3	61	56	0.06
BH10	0.5-1.5	16	0.1	18	52	6	170	89	0.14
BH10	1.5-2.5	14	0.1	20	34	5	120	73	0.12
BH11	0-0.5	28	0.2	19	88	110	46	94	0.15
BH11	0.5-1.5	9	<0.1	16	43	15	23	66	<0.05
BH12	0.3	8	<0.1	6	60	5	110	53	0.44
BH14	0-0.7	5	0.3	18	69	95	150	200	0.05
BH15	0-1.0	**140**	1.5	38	120	26	270	**11200**	0.32
BH16	0.3	***43***	0.2	7	39	16	96	270	0.11
BH16	0.75	33	0.2	6	36	11	100	220	0.11
BH17	0.4	4	0.2	8	23	15	200	180	0.17
BH18	0.12-0.8	9	2.1	28	160	14	**3040**	**4730**	0.28
BH18	0.8-1.7	6	<0.1	6	12	<1	28	33	<0.05
BH19	0.12-1.0	2	0.1	13	29	38	28	32	<0.05
BH20	0.4-1.0	8	0.3	21	110	17	240	260	0.5
BH21	0.2	22	0.6	76	93	53	350	**2730**	0.19
BH22	0-0.8	31	0.3	36	56	28	97	**600**	0.06
BH23	0.15-0.4	23	0.3	15	150	19	130	**3280**	0.07
BH24	0-0.7	10	0.2	17	24	28	32	87	0.1
BH24	0.7-1.3	8	<0.1	15	17	16	58	71	0.08
BH26	0-1.0	18	0.2	12	29	83	74	80	0.08
BH27	0.5	35	2.3	20	170	13	**1060**	**1180**	0.57
BH28	1.0	6	<0.1	15	<2	<1	7	14	<0.05
BH29	1.0	4	<0.1	17	11	9	30	22	0.08
BH30	1.0	12	0.4	17	144	5	329	291	0.33
BH31	1.0	6	<0.1	28	12	6	38	38	0.12
BH33	1.0	7	0.3	14	31	15	100	78	0.64
BH6 (BH34)	1.0	<1	<0.1	9	2	1	8	6	<0.05
BH35	0.5	6	0.5	16	48	4	469	***421***	0.53
BH35	1.0	3	<0.1	20	11	2	97	83	0.08
Practical Quantitation Limits (PQL)		1	0.1	1	2	1	2	5	0.05
Procedure D [a] (Normal Distribution)									
Number of Samples		44	46	46	44	46	43	36	46
Mean [b]		11	0.4	17	54	17	147	100	0.19
Standard Deviation		10	0.5	12	48	24	141	91	0.16
95% Upper Confidence Limits (UCL)		14	0.5	20	66	23	183	126	0.23
GUIDELINES FOR THE NSW SITE AUDITOR SCHEME (2006)									
Provisional Phytotoxity-Based Investigation Levels (PPBIL)		20	3	400/1[b]	100	60	600	200	1
NATIONAL ENVIRONMENT PROTECTION MEASURE (1999)									
Health Investigation Levels (HIL) [a] (HIL 'A')		100	20	12%/100[c]	1000	600	300	7000	10/15[d]

Notes

a: Residential development with accessible soils, including childrens day care centres, kindergartens, preschools and primary schools.

b: 400mg/kg for Chromium (+3) and 1mg/kg for Chromium (+6).

c: 12% (120000mg/kg) for Chromium (+3) and 100mg/kg for Chromium (+6).

d: 10mg/kg for Methyl Mercury and 15mg/kg for Inorganic Mercury.

e: **Concentrations** in bold are greater than 250% of the guideline value and are not considered a part of the final 95%UCL.

f: ***Concentrations*** in bold, underlined and in italics were not included as part of the final 95%UCL.

As shown in Table 14, the 95% UCL of the mean concentrations of metals (with the exception of the highlighted arsenic, copper, nickel, lead & zinc concentrations – ‘hotspots’) were well below the assessment criteria of the PPBILs and the HIL ‘A’ for residential with accessible soils; the standard deviations were all less than 50% of the assessment criteria and no single concentration exceeded the assessment criteria by more than 250%.

As such, the majority of the data set satisfies the criteria for stating that metals contamination of the soil is not likely to be an issue within accessible garden areas. However, delineation, by sampling and testing, followed by remediation, will be required for each of the ‘hotspots’.

HIL ‘A’ (residential with accessible soils)

The metals test data for the fill soil samples assessed against the HIL ‘A’ for residential with accessible soils is presented in the following table.

Table 15: Metals Test Results - Fill

Analyte		METALS (mg/kg)							
Sample Reference	Depth(m)	ARSENIC	CADMIUM	CHROMIUM	COPPER	NICKEL	LEAD	ZINC	MERCURY
BH1	0.5	2	<0.1	12	7	5	23	17	0.1
BH2	0.12-0.5	3	0.4	11	26	4	530	430	0.52
BH2	0.5-1.2	6	0.7	15	33	16	440	540	0.31
BH4	0.1	3	<0.1	19	8	1	21	9	<0.05
BH4	0.4	6	0.3	11	31	18	100	80	0.25
BH5	0.1-0.5	4	<0.1	5	15	1	100	18	0.1
BH5	0.5-1.5	5	<0.1	11	18	2	100	41	0.18
BH6	0.1-1.0	18	<0.1	7	150	7	100	34	0.14
BH6	1.0-2.0	4	<0.1	9	75	5	88	85	0.1
BH7	0.1-0.5	26	<0.1	8	110	4	86	39	0.14
BH7	0.5-1.5	3	0.1	12	74	7	270	120	0.12
BH7	1.5-2.5	11	0.4	9	96	7	180	270	0.12
BH8	0.3	6	<0.1	11	17	5	43	37	0.38
BH9	0-0.5	5	0.2	14	30	6	250	130	0.23
BH9	0.5-1.5	33	1.3	23	920	21	**810**	590	0.13
BH9	1.5-2.5	17	0.6	24	280	28	530	340	0.16
BH10	0-0.5	6	<0.1	14	13	3	61	56	0.06
BH10	0.5-1.5	16	0.1	18	52	6	170	89	0.14
BH10	1.5-2.5	14	0.1	20	34	5	120	73	0.12
BH11	0-0.5	28	0.2	19	88	110	46	94	0.15
BH11	0.5-1.5	9	<0.1	16	43	15	23	66	<0.05
BH12	0.3	8	<0.1	6	60	5	110	53	0.44
BH14	0-0.7	5	0.3	18	69	95	150	200	0.05
BH15	0-1.0	140	1.5	38	120	26	270	11200	0.32
BH16	0.3	43	0.2	7	39	16	96	270	0.11
BH16	0.75	33	0.2	6	36	11	100	220	0.11
BH17	0.4	4	0.2	8	23	15	200	180	0.17
BH18	0.12-0.8	9	2.1	28	160	14	**3040**	4730	0.28
BH18	0.8-1.7	6	<0.1	6	12	<1	28	33	<0.05
BH19	0.12-1.0	2	0.1	13	29	38	28	32	<0.05
BH20	0.4-1.0	8	0.3	21	110	17	240	260	0.5
BH21	0.2	22	0.6	76	93	53	350	2730	0.19
BH22	0-0.8	31	0.3	36	56	28	97	600	0.06
BH23	0.15-0.4	23	0.3	15	150	19	130	3280	0.07
BH24	0-0.7	10	0.2	17	24	28	32	87	0.1
BH24	0.7-1.3	8	<0.1	15	17	16	58	71	0.08
BH26	0-1.0	18	0.2	12	29	83	74	80	0.08
BH27	0.5	35	2.3	20	170	13	**1060**	1180	0.57
BH28	1.0	6	<0.1	15	<2	<1	7	14	<0.05
BH29	1.0	4	<0.1	17	11	9	30	22	0.08
BH30	1.0	12	0.4	17	144	5	329	291	0.33
BH31	1.0	6	<0.1	28	12	6	38	38	0.12
BH33	1.0	7	0.3	14	31	15	100	78	0.64
BH6 (BH34)	1.0	<1	<0.1	9	2	1	8	6	<0.05
BH35	0.5	6	0.5	16	48	4	469	421	0.53
BH35	1.0	3	<0.1	20	11	2	97	83	0.08
Practical Quantitation Limits (PQL)		1	0.1	1	2	1	2	5	0.05
Procedure D [a] (Normal Distribution)									
Number of Samples		46	46	46	46	46	43	46	46
Mean [b]		15	0.4	17	78	17	147	637	0.19
Standard Deviation		22	0.5	12	139	24	141	1830	0.16
95% Upper Confidence Limits (UCL)		20	0.5	20	112	23	183	1091	0.23
NATIONAL ENVIRONMENT PROTECTION MEASURE (1999)									
Health Investigation Levels (HIL) [a] (HIL 'A')		**100**	**20**	**12%/100** [b]	**1000**	**600**	**300**	**7000**	**10/15** [c]

Notes
a: Residential development with accessible soils, including childrens day care centres, kindergartens, preschools and primary schools.
b: 12% (120000mg/kg) for Chromium (+3) and 100mg/kg for Chromium (+6).
c: 10mg/kg for Methyl Mercury and 15mg/kg for Inorganic Mercury.
d: Concentrations in **bold** are greater than 250% of the guideline value and are not considered a part of the final 95%UCL.

As shown in Table 15, the 95% UCL of the mean concentrations of metals (with the exception of the highlighted lead concentrations – 'hotspots') were well below the assessment criteria of the HIL 'A' for residential with accessible soils; the standard deviations were all less than 50% of the assessment criteria and no single concentration exceeded the assessment criteria by more than 250%.

As such, the majority of the data set satisfies the criteria for stating that metals contamination of the soil is not likely to be an issue within accessible garden areas. However, delineation, by sampling and testing, followed by remediation, will be required for each of the 'hotspots'.

HIL 'D' (residential with minimal access to soils)

The metals test data for the fill soil samples assessed against the HIL 'D' for residential with minimal access to soils, such as high-rise buildings, is presented in the following table.

Table 16: Metals Test Results - Fill

Analyte		METALS (mg/kg)							
Sample Reference	Depth(m)	ARSENIC	CADMIUM	CHROMIUM	COPPER	NICKEL	LEAD	ZINC	MERCURY
BH1	0.5	2	<0.1	12	7	5	23	17	0.1
BH2	0.12-0.5	3	0.4	11	26	4	530	430	0.52
BH2	0.5-1.2	6	0.7	15	33	16	440	540	0.31
BH4	0.1	3	<0.1	19	8	1	21	9	<0.05
BH4	0.4	6	0.3	11	31	18	100	80	0.25
BH5	0.1-0.5	4	<0.1	5	15	1	100	18	0.1
BH5	0.5-1.5	5	<0.1	11	18	2	100	41	0.18
BH6	0.1-1.0	18	<0.1	7	150	7	100	34	0.14
BH6	1.0-2.0	4	<0.1	9	75	5	88	85	0.1
BH7	0.1-0.5	26	<0.1	8	110	4	86	39	0.14
BH7	0.5-1.5	3	0.1	12	74	7	270	120	0.12
BH7	1.5-2.5	11	0.4	9	96	7	180	270	0.12
BH8	0.3	6	<0.1	11	17	5	43	37	0.38
BH9	0-0.5	5	0.2	14	30	6	250	130	0.23
BH9	0.5-1.5	33	1.3	23	920	21	810	590	0.13
BH9	1.5-2.5	17	0.6	24	280	28	530	340	0.16
BH10	0-0.5	6	<0.1	14	13	3	61	56	0.06
BH10	0.5-1.5	16	0.1	18	52	6	170	89	0.14
BH10	1.5-2.5	14	0.1	20	34	5	120	73	0.12
BH11	0-0.5	28	0.2	19	88	110	46	94	0.15
BH11	0.5-1.5	9	<0.1	16	43	15	23	66	<0.05
BH12	0.3	8	<0.1	6	60	5	110	53	0.44
BH14	0-0.7	5	0.3	18	69	95	150	200	0.05
BH15	0-1.0	140	1.5	38	120	26	270	11200	0.32
BH16	0.3	43	0.2	7	39	16	96	270	0.11
BH16	0.75	33	0.2	6	36	11	100	220	0.11
BH17	0.4	4	0.2	8	23	15	200	180	0.17
BH18	0.12-0.8	9	2.1	28	160	14	**3040**	4730	0.28
BH18	0.8-1.7	6	<0.1	6	12	<1	28	33	<0.05
BH19	0.12-1.0	2	0.1	13	29	38	28	32	<0.05
BH20	0.4-1.0	8	0.3	21	110	17	240	260	0.5
BH21	0.2	22	0.6	76	93	53	350	2730	0.19
BH22	0-0.8	31	0.3	36	56	28	97	600	0.06
BH23	0.15-0.4	23	0.3	15	150	19	130	3280	0.07
BH24	0-0.7	10	0.2	17	24	28	32	87	0.1
BH24	0.7-1.3	8	<0.1	15	17	16	58	71	0.08
BH26	0-1.0	18	0.2	12	29	83	74	80	0.08
BH27	0.5	35	2.3	20	170	13	1060	1180	0.57
BH28	1.0	6	<0.1	15	<2	<1	7	14	<0.05
BH29	1.0	4	<0.1	17	11	9	30	22	0.08
BH30	1.0	12	0.4	17	144	5	329	291	0.33
BH31	1.0	6	<0.1	28	12	6	38	38	0.12
BH33	1.0	7	0.3	14	31	15	100	78	0.64
BH6 (BH34)	1.0	<1	<0.1	9	2	1	8	6	<0.05
BH35	0.5	6	0.5	16	48	4	469	421	0.53
BH35	1.0	3	<0.1	20	11	2	97	83	0.08
Practical Quantitation Limits (PQL)		1	0.1	1	2	1	2	5	0.05
Procedure D [a] (Normal Distribution)									
Number of Samples		46	46	46	46	46	45	46	46
Mean [b]		15	0.4	17	78	17	182	637	0.19
Standard Deviation		22	0.5	12	139	24	216	1830	0.16
95% Upper Confidence Limits (UCL)		20	0.5	20	112	23	236	1091	0.23
NATIONAL ENVIRONMENT PROTECTION MEASURE (1999)									
Health Investigation Levels (HIL) [a] (HIL 'D')		**400**	**80**	**48%/400**[b]	**4000**	**2400**	**1200**	**28000**	**40/60**[c]

Notes
a: Residential with minimal opportunities for soil access, including high-rise, apartments and flats
b: 48% (480000mg/kg) for Chromium (+3) and 400mg/kg for Chromium (+6).
c: 40mg/kg for Methyl Mercury and 60mg/kg for Inorganic Mercury.
d: Concentrations in **bold** are greater than 250% of the guideline value and are not considered a part of the final 95%UCL.

As shown in Table 16, the 95% UCL of the mean concentrations of metals (with the exception of the highlighted lead concentration – ‘hotspot’) were well below the assessment criteria of the HIL ‘D’ for residential with minimal access to soils; the standard deviations were all less than 50% of the assessment criteria and no single concentration exceeded the assessment criteria by more than 250%.

As such, the majority of the data set satisfies the criteria for stating that metals contamination of the soil is not likely to be an issue within high-rise building areas. However, delineation, by sampling and testing, followed by remediation, will be required for the one ‘hotspot’.

HIL ‘E’ (parks and open space)

The metals test data for the fill soil samples assessed against the HIL ‘E’ for parks and open space, is presented in the following table.

Table 17: Metals Test Results - Fill

Analyte		METALS (mg/kg)							
Sample Reference	Depth(m)	ARSENIC	CADMIUM	CHROMIUM	COPPER	NICKEL	LEAD	ZINC	MERCURY
BH1	0.5	2	<0.1	12	7	5	23	17	0.1
BH2	0.12-0.5	3	0.4	11	26	4	530	430	0.52
BH2	0.5-1.2	6	0.7	15	33	16	440	540	0.31
BH4	0.1	3	<0.1	19	8	1	21	9	<0.05
BH4	0.4	6	0.3	11	31	18	100	80	0.25
BH5	0.1-0.5	4	<0.1	5	15	1	100	18	0.1
BH5	0.5-1.5	5	<0.1	11	18	2	100	41	0.18
BH6	0.1-1.0	18	<0.1	7	150	7	100	34	0.14
BH6	1.0-2.0	4	<0.1	9	75	5	88	85	0.1
BH7	0.1-0.5	26	<0.1	8	110	4	86	39	0.14
BH7	0.5-1.5	3	0.1	12	74	7	270	120	0.12
BH7	1.5-2.5	11	0.4	9	96	7	180	270	0.12
BH8	0.3	6	<0.1	11	17	5	43	37	0.38
BH9	0-0.5	5	0.2	14	30	6	250	130	0.23
BH9	0.5-1.5	33	1.3	23	920	21	810	590	0.13
BH9	1.5-2.5	17	0.6	24	280	28	530	340	0.16
BH10	0-0.5	6	<0.1	14	13	3	61	56	0.06
BH10	0.5-1.5	16	0.1	18	52	6	170	89	0.14
BH10	1.5-2.5	14	0.1	20	34	5	120	73	0.12
BH11	0-0.5	28	0.2	19	88	110	46	94	0.15
BH11	0.5-1.5	9	<0.1	16	43	15	23	66	<0.05
BH12	0.3	8	<0.1	6	60	5	110	53	0.44
BH14	0-0.7	5	0.3	18	69	95	150	200	0.05
BH15	0-1.0	140	1.5	38	120	26	270	11200	0.32
BH16	0.3	43	0.2	7	39	16	96	270	0.11
BH16	0.75	33	0.2	6	36	11	100	220	0.11
BH17	0.4	4	0.2	8	23	15	200	180	0.17
BH18	0.12-0.8	9	2.1	28	160	14	**3040**	4730	0.28
BH18	0.8-1.7	6	<0.1	6	12	<1	28	33	<0.05
BH19	0.12-1.0	2	0.1	13	29	38	28	32	<0.05
BH20	0.4-1.0	8	0.3	21	110	17	240	260	0.5
BH21	0.2	22	0.6	76	93	53	350	2730	0.19
BH22	0-0.8	31	0.3	36	56	28	97	600	0.06
BH23	0.15-0.4	23	0.3	15	150	19	130	3280	0.07
BH24	0-0.7	10	0.2	17	24	28	32	87	0.1
BH24	0.7-1.3	8	<0.1	15	17	16	58	71	0.08
BH26	0-1.0	18	0.2	12	29	83	74	80	0.08
BH27	0.5	35	2.3	20	170	13	1060	1180	0.57
BH28	1.0	6	<0.1	15	<2	<1	7	14	<0.05
BH29	1.0	4	<0.1	17	11	9	30	22	0.08
BH30	1.0	12	0.4	17	144	5	329	291	0.33
BH31	1.0	6	<0.1	28	12	6	38	38	0.12
BH33	1.0	7	0.3	14	31	15	100	78	0.64
BH6 (BH34)	1.0	<1	<0.1	9	2	1	8	6	<0.05
BH35	0.5	6	0.5	16	48	4	469	421	0.53
BH35	1.0	3	<0.1	20	11	2	97	83	0.08
Practical Quantitation Limits (PQL)		1	0.1	1	2	1	2	5	0.05
Procedure D ^{a} (Normal Distribution)									
Number of Samples		46	46	46	46	46	45	46	46
Mean ^{b}		15	0.4	17	78	17	182	637	0.19
Standard Deviation		22	0.5	12	139	24	216	1830	0.16
95% Upper Confidence Limits (UCL)		20	0.5	20	112	23	236	1091	0.23
NATIONAL ENVIRONMENT PROTECTION MEASURE (1999)									
Health Investigation Levels (HIL) ^{a} (HIL 'E')		**200**	**40**	**24%/200^{b}**	**2000**	**600**	**600**	**14000**	**20/30^{c}**

Notes
a: Parks, recreational open space and playing fields, including secondary schools
b: 24% (240000mg/kg) for Chromium (+3) and 200mg/kg for Chromium (+6).
c: 20mg/kg for Methyl Mercury and 30mg/kg for Inorganic Mercury.
d: Concentrations in **bold** are greater than 250% of the guideline value and are not considered a part of the final 95%UCL.

As shown in Table 17, the 95% UCL of the mean concentrations of metals (with the exception of the highlighted lead concentration – 'hotspot') were well below the assessment criteria of the HIL 'E' for parks and open space; the standard deviations were all less than 50% of the assessment criteria and no single concentration exceeded the assessment criteria by more than 250%.

As such, the majority of the data set satisfies the criteria for stating that metals contamination of the soil is not likely to be an issue within parks and open space areas. However, delineation, by sampling and testing, followed by remediation, will be required for the one 'hotspot'.

HIL 'F' (commercial)

The metals test data for the fill soil samples assessed against the HIL 'F' for commercial areas, is presented in the following table.

Table 18: Metals Test Results - Fill

Analyte		METALS (mg/kg)							
Sample Reference	Depth(m)	ARSENIC	CADMIUM	CHROMIUM	COPPER	NICKEL	LEAD	ZINC	MERCURY
BH1	0.5	2	<0.1	12	7	5	23	17	0.1
BH2	0.12-0.5	3	0.4	11	26	4	530	430	0.52
BH2	0.5-1.2	6	0.7	15	33	16	440	540	0.31
BH4	0.1	3	<0.1	19	8	1	21	9	<0.05
BH4	0.4	6	0.3	11	31	18	100	80	0.25
BH5	0.1-0.5	4	<0.1	5	15	1	100	18	0.1
BH5	0.5-1.5	5	<0.1	11	18	2	100	41	0.18
BH6	0.1-1.0	18	<0.1	7	150	7	100	34	0.14
BH6	1.0-2.0	4	<0.1	9	75	5	88	85	0.1
BH7	0.1-0.5	26	<0.1	8	110	4	86	39	0.14
BH7	0.5-1.5	3	0.1	12	74	7	270	120	0.12
BH7	1.5-2.5	11	0.4	9	96	7	180	270	0.12
BH8	0.3	6	<0.1	11	17	5	43	37	0.38
BH9	0-0.5	5	0.2	14	30	6	250	130	0.23
BH9	0.5-1.5	33	1.3	23	920	21	810	590	0.13
BH9	1.5-2.5	17	0.6	24	280	28	530	340	0.16
BH10	0-0.5	6	<0.1	14	13	3	61	56	0.06
BH10	0.5-1.5	16	0.1	18	52	6	170	89	0.14
BH10	1.5-2.5	14	0.1	20	34	5	120	73	0.12
BH11	0-0.5	28	0.2	19	88	110	46	94	0.15
BH11	0.5-1.5	9	<0.1	16	43	15	23	66	<0.05
BH12	0.3	8	<0.1	6	60	5	110	53	0.44
BH14	0-0.7	5	0.3	18	69	95	150	200	0.05
BH15	0-1.0	140	1.5	38	120	26	270	11200	0.32
BH16	0.3	43	0.2	7	39	16	96	270	0.11
BH16	0.75	33	0.2	6	36	11	100	220	0.11
BH17	0.4	4	0.2	8	23	15	200	180	0.17
BH18	0.12-0.8	9	2.1	28	160	14	3040	4730	0.28
BH18	0.8-1.7	6	<0.1	6	12	<1	28	33	<0.05
BH19	0.12-1.0	2	0.1	13	29	38	28	32	<0.05
BH20	0.4-1.0	8	0.3	21	110	17	240	260	0.5
BH21	0.2	22	0.6	76	93	53	350	2730	0.19
BH22	0-0.8	31	0.3	36	56	28	97	600	0.06
BH23	0.15-0.4	23	0.3	15	150	19	130	3280	0.07
BH24	0-0.7	10	0.2	17	24	28	32	87	0.1
BH24	0.7-1.3	8	<0.1	15	17	16	58	71	0.08
BH26	0-1.0	18	0.2	12	29	83	74	80	0.08
BH27	0.5	35	2.3	20	170	13	1060	1180	0.57
BH28	1.0	6	<0.1	15	<2	<1	7	14	<0.05
BH29	1.0	4	<0.1	17	11	9	30	22	0.08
BH30	1.0	12	0.4	17	144	5	329	291	0.33
BH31	1.0	6	<0.1	28	12	6	38	38	0.12
BH33	1.0	7	0.3	14	31	15	100	78	0.64
BH6 (BH34)	1.0	<1	<0.1	9	2	1	8	6	<0.05
BH35	0.5	6	0.5	16	48	4	469	421	0.53
BH35	1.0	3	<0.1	20	11	2	97	83	0.08
Practical Quantitation Limits (PQL)		1	0.1	1	2	1	2	5	0.05
Procedure D [a] (Normal Distribution)									
Number of Samples		46	46	46	46	46	46	46	46
Mean [b]		15	0.4	17	78	17	244	637	0.19
Standard Deviation		22	0.5	12	139	24	472	1830	0.16
95% Upper Confidence Limits (UCL)		20	0.5	20	112	23	361	1091	0.23
NATIONAL ENVIRONMENT PROTECTION MEASURE (1999)									
Health Investigation Levels (HIL) [a] (HIL 'F')		**500**	**100**	**60%/500** [b]	**5000**	**3000**	**1500**	**35000**	**50/75** [c]

Notes
a: Commercial or industrial development
b: 60% (600000mg/kg) for Chromium (+3) and 500mg/kg for Chromium (+6).
c: 50mg/kg for Methyl Mercury and 75mg/kg for Inorganic Mercury.

As shown in Table 18, the 95% UCL of the mean concentrations of all metals were well below the assessment criteria of HIL ‘F’ for commercial or industrial; the standard deviations were all less than 50% of the assessment criteria and no single concentration exceeded the assessment criteria by more than 250%. As such, the metals test data satisfied the criteria for stating that metals contamination of the soil is not likely to be an issue within commercial areas.

12.1.2 Metals – Natural

The metals test data for the natural soil samples is presented in the following table. The metals test data for natural soil samples have been assessed, statistically, against all the relevant assessment criteria.

Table 19: Metals Test Results - Natural

Analyte		METALS (mg/kg)							
Sample Reference	Depth(m)	ARSENIC	CADMIUM	CHROMIUM	COPPER	NICKEL	LEAD	ZINC	MERCURY
BH1	0.75	2	<0.1	13	2	<1	8	8	<0.05
BH2	1.25-1.5	3	<0.1	20	3	1	26	26	<0.05
BH4	2	<1	<0.1	3	<2	<1	2	<5	<0.05
BH5	1.55-2.0	2	<0.1	8	5	2	18	14	<0.05
BH6	2.55-3.0	7	<0.1	17	16	2	30	16	<0.05
BH8	1.8	6	<0.1	14	8	1	27	11	1.1
BH9	2.75-3.0	<1	<0.1	7	4	1	11	8	<0.05
BH10	3.55-3.8	8	<0.1	21	10	3	24	16	<0.05
BH11	1.85-2.1	9	<0.1	18	18	11	26	36	0.05
BH12	1.5	9	<0.1	20	7	2	28	12	<0.05
BH14	0.75-1.0	20	0.2	25	22	15	53	140	0.05
BH15	1.05-1.3	7	<0.1	21	5	3	16	76	<0.05
BH18	1.75-2.0	4	<0.1	11	7	<1	17	8	<0.05
BH19	1.05-1.3	6	<0.1	19	4	1	16	6	<0.05
BH20	1.05-1.3	5	<0.1	23	6	2	9	8	<0.05
BH22	0.85-1.1	8	0.1	17	30	8	58	130	0.05
BH24	1.35-1.6	3	<0.1	17	5	5	10	18	<0.05
BH5 (BH25)	1.0	2	<0.1	21	5	2	5	5	<0.05
BH26	1.05-1.3	2	<0.1	9	2	2	6	5	<0.05
BH29	2.0	7	<0.1	21	6	2	13	14	<0.05
BH30	3.0	2	<0.1	10	4	<1	7	8	<0.05
BH31	1.5	9	<0.1	38	9	2	21	18	0.08
BH32	1.0	5	<0.1	19	<2	1	8	5	0.05
BH33	2.0	14	<0.1	21	5	2	18	17	<0.05
BH6 (BH34)	3.0	7	<0.1	30	12	8	30	25	0.05
BH35	3.0	2	<0.1	10	2	<1	3	<5	<0.05
Practical Quantitation Limits (PQL)		1	0.1	1	2	1	2	5	0.05
Procedure D [a] (Normal Distribution)									
Number of Samples		26	26	26	26	26	26	26	26
Mean [b]		6	0.1	17	8	3	19	25	0.09
Standard Deviation		4	0.0	8	7	4	14	36	0.21
95% Upper Confidence Limits (UCL)		7	0.1	20	10	4	23	37	0.16
GUIDELINES FOR THE NSW SITE AUDITOR SCHEME (2006)									
Provisional Phytotoxity-Based Investigation Levels (PPBIL)		20	3	400/1[e]	100	60	600	200	1
NATIONAL ENVIRONMENT PROTECTION MEASURE (1999)									
Health Investigation Levels (HIL) [a] (HIL 'A')		100	20	12%/100 [f]	1000	600	300	7000	10/15 [g]
HIL 'D' [b]		400	80	48%/400	4000	2400	1200	28000	40/60
HIL 'E' [c]		200	40	24%/200	2000	600	600	14000	20/30
HIL 'F' [d]		500	100	60%/500	5000	3000	1500	35000	50/75

Notes
a: Residential development with accessible soils, including childrens day care centres, kindergartens, preschools and primary schools.
b: Residential with minimal opportunities for soil access, including high-rise, apartments and flats
c: Parks, recreational open space and playing fields, including secondary schools
d: Commercial or industrial development
e: 400mg/kg for Chromium (+3) and 1mg/kg for Chromium (+6).
f: 12% (120000mg/kg) for Chromium (+3) and 100mg/kg for Chromium (+6).
g: 10mg/kg for Methyl Mercury and 15mg/kg for Inorganic Mercury.

As shown in Table 19, the 95% UCL of the mean concentrations of all metals were well below all the assessment criteria those being PPBIL, HIL 'A', HIL 'D', HIL 'E' and HIL 'F'; the standard deviations were all less than 50% of the assessment criteria and no single concentration exceeded the assessment criteria by more than 250%. As such, the metals test data satisfied the criteria for stating that metals contamination of the natural soil is not likely to be an issue within site.

12.1.3 TPH and BTEX

The TPH and BTEX test data for the fill and natural soil samples is presented in the tables below.

Table 20: TPH Test Results - Fill

Analyte		TPH (mg/kg)					BTEX (mg/kg)			
Sample Location	Depth (m)	C6-C9	C10-C14	C15-C28	C29-C40	C10-C36 [b]	BENZENE	TOLUENE	ETHYL BENZENE	TOTAL XYLENES
BH1	0.5	<10	<50	<100	<100	250				
BH2	0.12-0.5	<10	<50	230	180	460	<0.2	<0.5	<0.5	<1.5
BH2	0.5-1.2	<10	<50	<100	<100	250	-	-	-	-
BH6	0.1-1.0	<10	<50	<100	<100	250	0.3	<0.5	<0.5	<1.5
BH7	0.1-0.5	<10	<50	170	120	340	<0.2	<0.5	<0.5	<1.5
BH7	0.5-1.5	<10	<50	2180	1950	**4,180**	<0.2	<0.5	<0.5	<1.5
BH8	0.3	<10	<50	<100	<100	250	<0.2	<0.5	<0.5	<1.5
BH9	1.5-2.5	<10	<50	<100	<100	250	<0.2	<0.5	<0.5	<1.5
BH10	0-0.5	<10	<50	<100	<100	250	<0.2	<0.5	<0.5	<1.5
BH11	0-0.5	<10	<50	<100	<100	250	<0.2	<0.5	<0.5	<1.5
BH11	0.5-1.5	<10	<50	<100	<100	250	<0.2	<0.5	<0.5	<1.5
BH12	0.3	<10	<50	<100	<100	250	<0.2	<0.5	<0.5	<1.5
BH14	0-0.7	<10	<50	<100	<100	250	<0.2	<0.5	<0.5	<1.5
BH16	0.3	<10	<50	<100	<100	250	-	-	-	-
BH17	0.4	<10	<50	<100	<100	250	<0.2	<0.5	<0.5	<1.5
BH18	0.12-0.8	<10	<50	<100	120	270	<0.2	<0.5	<0.5	<1.5
BH19	0.12-1.0	<10	<50	<100	<100	250	<0.2	<0.5	<0.5	<1.5
BH20	0.4-1.0	<10	<50	<100	<100	250	<0.2	<0.5	<0.5	<1.5
BH21	0.2	<10	<50	<100	140	290	-	-	-	-
BH22	0-0.8	<10	<50	<100	<100	250	<0.2	<0.5	<0.5	<1.5
BH23	0.15-0.4	<10	<50	<100	<100	250	<0.2	<0.5	<0.5	<1.5
BH24	0-0.7	<10	<50	<100	<100	250	-	-	-	-
BH24	0.7-1.3	<10	<50	<100	<100	250	<0.2	<0.5	<0.5	<1.5
BH26	0-1.0	<10	<50	<100	<100	250	<0.2	<0.5	<0.5	<1.5
BH27	0.5	<10	<50	6020	5500	**11,570**	<0.2	<0.5	<0.5	<1.5
BH28	1.0	<10	<50	<100	<100	250	<0.2	<0.5	<0.5	<1.5
BH29	1.0	<10	<50	<100	<100	250	<0.2	<0.5	<0.5	<1.5
BH30	1.0	<10	<50	350	180	580	<0.2	<0.5	<0.5	<1.5
BH6 (BH34)	1.0	<10	<50	<100	<100	250	<0.2	<0.5	<0.5	<1.5
BH35	0.5	<10	<50	<100	<100	250	<0.2	<0.5	<0.5	<1.5
Practical Quantitation Limits (PQL)		10	50	100	100	NA	0.2	0.5	0.5	1.5
EPA Levels [a]		65	C10-C36 =1000				1	1.4	3.1	14

Notes
a: Contaminated Sites: "Guidelines for Assessing Service Station Sites", 1994, EPA
b: C10-C36 = (C10-C14) + (C15-C28) + (C29-C36); concentrations less than PQL are assumed equal to PQL.
NA: Not Applicable

Table 21: TPH Test Results - Natural

Sample Location	Depth (m)	TPH (mg/kg) C6-C9	TPH (mg/kg) C10-C14	TPH (mg/kg) C15-C28	TPH (mg/kg) C29-C40	TPH (mg/kg) C10-C36 [b]	BTEX (mg/kg) BENZENE	BTEX (mg/kg) TOLUENE	BTEX (mg/kg) ETHYL BENZENE	BTEX (mg/kg) TOTAL XYLENES
BH1	0.75	<10	<50	<100	<100	250	<0.2	<0.5	<0.5	<1.5
BH2	1.25-1.5	<10	<50	<100	<100	250	<0.2	<0.5	<0.5	<1.5
BH5 (BH25)	1.0	<10	<50	<100	<100	250	<0.2	<0.5	<0.5	<1.5
BH29	2.0	<10	<50	<100	<100	250	<0.2	<0.5	<0.5	<1.5
BH31	1.5	<10	<50	<100	<100	250	<0.2	<0.5	<0.5	<1.5
BH6 (BH34)	1.0	<10	<50	<100	<100	250	<0.2	<0.5	<0.5	<1.5
Practical Quantitation Limits (PQL)		10	50	100	100	NA	0.2	0.5	0.5	1.5
EPA Levels [a]		65	C10-C36 =1000				1	1.4	3.1	14

Notes
a: Contaminated Sites: "Guidelines for Assessing Service Station Sites", 1994, EPA
b: C10-C36 = (C10-C14) + (C15-C28) + (C29-C36); concentrations less than PQL are assumed equal to PQL.
NA: Not Applicable

As indicated in Tables 20 & 21, with the exception of the highlighted concentrations of TPH (C_{10}-C_{36}) in the samples recovered from the BH7 (0.5-1.5m) and BH27 (0.5m), the remaining TPH and BTEX concentrations were all below the suggested levels in the EPA service station guidelines.

12.1.4 Polycyclic Aromatic Hydrocarbons (PAH) - Fill

The benzo(a)pyrene and Total PAH test data for the fill soil samples are presented in the following tables. The benzo(a)pyrene and Total PAH test data for the fill soil samples have been assessed, statistically, in separate sub-headings against the relevant assessment criteria. All concentrations greater than 250% of the assessment criteria were not included as part of the statistical analysis, and could be considered as ‘hotspots’.

HIL ‘A’ (residential with accessible soils)

The benzo(a)pyrene and Total PAH test data for the fill soil samples assessed against the HIL ‘A’ for residential with accessible soils is presented in the following table.

Table 22: PAH Test Results - Fill

Sample Location	Depth (m)	BENZO(a)PYRENE (mg/kg)	TOTAL PAH (mg/kg)
BH1	0.5	<0.5	8.0
BH2	0.12-0.5	**5.1**	**60.9**
BH2	0.5-1.2	0.7	10.1
BH6	0.1-1.0	1.2	17.0
BH7	0.1-0.5	**2.8**	29.9
BH7	0.5-1.5	**58**	**652.5**
BH8	0.3	0.7	10.0
BH9	1.5-2.5	1.1	15.2
BH10	0-0.5	0.9	11.0
BH11	0-0.5	0.7	10.5
BH11	0.5-1.5	<0.5	<8.0
BH12	0.3	<0.5	7.2
BH14	0-0.7	<0.5	<8.0
BH15	0-1.0	0.5	9.6
BH16	0.3	<0.5	<8.0
BH17	0.4	1.8	21.7
BH18	0.12-0.8	2.2	20.7
BH19	0.12-1.0	<0.5	<8.0
BH20	0.4-1.0	1.1	13.1
BH21	0.2	<0.5	11.6
BH22	0-0.8	<0.5	7.9
BH23	0.15-0.4	<0.5	<8.0
BH24	0-0.7	<0.5	7.6
BH24	0.7-1.3	<0.5	<8.0
BH26	0-1.0	0.9	10.9
BH27	0.5	0.8	12.4
BH28	1.0	<0.5	<8.0
BH29	1.0	0.7	10.8
BH33	1.0	**23**	**344.0**
BH6 (BH34)	1.0	<0.5	<8.0
BH35	0.5	1.1	13.9
Practical Quantitation Limit (PQL)		0.5	NA
Procedure D [a] (Normal Distribution)			
Number of Samples		27	28
Mean [b]		0.8	11.5
Standard Deviation		0.4	5.3
95% Upper Confidence Limits (UCL)		0.9	13.2
NATIONAL ENVIRONMENT PROTECTION MEASURE (1999)			
Health Investigation Levels (HIL) [a] (HIL 'A')		**1**	**20**

Notes

a: Residential with gardens and accessible soil including children's day-care centres, preschools, primary schools, townhouses and villas.

b: Concentrations in **bold** are greater than 250% of the guideline value and are not considered a part of the final 95%UCL

NA: Not Applicable

As shown in Table 22, the 95% UCL of the mean concentrations of benzo(a)pyrene and Total PAH (with the exception of the highlighted benzo(a)pyrene and Total PAH concentrations – 'hotspots') were well below the assessment criteria of the HIL 'A' for residential with accessible soils; the standard deviations were all less than 50% of the assessment criteria and no single concentration exceeded the assessment criteria by more than 250%.

As such, the majority of the data set satisfies the criteria for stating that benzo(a)pyrene and Total PAH contamination of the soil is not likely to be an issue within accessible garden areas. However, delineation, by sampling and testing, followed by remediation, will be required for each of the 'hotspots'.

HIL 'D' (residential with minimal access to soils)

The benzo(a)pyrene and Total PAH test data for the fill soil samples assessed against the HIL 'D' for residential with minimal access to soils, such as high-rise buildings, is presented in the following table.

Table 23: PAH Test Results - Fill

Sample Location	Depth (m)	BENZO(a)PYRENE (mg/kg)	TOTAL PAH (mg/kg)
BH1	0.5	<0.5	8.0
BH2	0.12-0.5	5.1	60.9
BH2	0.5-1.2	0.7	10.1
BH6	0.1-1.0	1.2	17.0
BH7	0.1-0.5	2.8	29.9
BH7	0.5-1.5	**58**	**652.5**
BH8	0.3	0.7	10.0
BH9	1.5-2.5	1.1	15.2
BH10	0-0.5	0.9	11.0
BH11	0-0.5	0.7	10.5
BH11	0.5-1.5	<0.5	<8.0
BH12	0.3	<0.5	7.2
BH14	0-0.7	<0.5	<8.0
BH15	0-1.0	0.5	9.6
BH16	0.3	<0.5	<8.0
BH17	0.4	1.8	21.7
BH18	0.12-0.8	2.2	20.7
BH19	0.12-1.0	<0.5	<8.0
BH20	0.4-1.0	1.1	13.1
BH21	0.2	<0.5	11.6
BH22	0-0.8	<0.5	7.9
BH23	0.15-0.4	<0.5	<8.0
BH24	0-0.7	<0.5	7.6
BH24	0.7-1.3	<0.5	<8.0
BH26	0-1.0	0.9	10.9
BH27	0.5	0.8	12.4
BH28	1.0	<0.5	<8.0
BH29	1.0	0.7	10.8
BH33	1.0	**23**	**344.0**
BH6 (BH34)	1.0	<0.5	<8.0
BH35	0.5	1.1	13.9
Practical Quantitation Limit (PQL)		0.5	NA
Procedure D [a] (Normal Distribution)			
Number of Samples		29	29
Mean [b]		1.0	13.2
Standard Deviation		1.0	10.5
95% Upper Confidence Limits (UCL)		1.3	16.6
NATIONAL ENVIRONMENT PROTECTION MEASURE (1999)			
Health Investigation Levels (HIL) [a] (HIL 'D')		**4**	**80**

Notes
a: Residential with minimal opportunities for soil access, including high-rise, apartments and flats
e: Concentrations in **bold** are greater than 250% of the guideline value and are not considered a part of the final 95%UCL
NA: Not Applicable

As shown in Table 23, the 95% UCL of the mean concentrations of benzo(a)pyrene and Total PAH (with the exception of the highlighted benzo(a)pyrene and Total PAH concentrations – 'hotspots') were well below the assessment criteria of the HIL 'D' for residential with minimal access to soils; the standard deviations were all less than 50% of the assessment criteria and no single concentration exceeded the assessment criteria by more than 250%.

As such, the majority of the data set satisfies the criteria for stating that benzo(a)pyrene and Total PAH contamination of the soil is not likely to be an issue within high-rise building areas. However, delineation, by sampling and testing, followed by remediation, will be required for each of the 'hotspots'.

HIL 'E' (parks and open space)

The benzo(a)pyrene and Total PAH test data for the fill soil samples assessed against the HIL 'E' for parks and open space, is presented in the following table.

Table 24: PAH Test Results - Fill

Sample Location	Depth (m)	BENZO(a)PYRENE (mg/kg)	TOTAL PAH (mg/kg)
BH1	0.5	<0.5	8.0
BH2	0.12-0.5	**5.1**	60.9
BH2	0.5-1.2	0.7	10.1
BH6	0.1-1.0	1.2	17.0
BH7	0.1-0.5	2.8	29.9
BH7	0.5-1.5	**58**	**652.5**
BH8	0.3	0.7	10.0
BH9	1.5-2.5	1.1	15.2
BH10	0-0.5	0.9	11.0
BH11	0-0.5	0.7	10.5
BH11	0.5-1.5	<0.5	<8.0
BH12	0.3	<0.5	7.2
BH14	0-0.7	<0.5	<8.0
BH15	0-1.0	0.5	9.6
BH16	0.3	<0.5	<8.0
BH17	0.4	1.8	21.7
BH18	0.12-0.8	2.2	20.7
BH19	0.12-1.0	<0.5	<8.0
BH20	0.4-1.0	1.1	13.1
BH21	0.2	<0.5	11.6
BH22	0-0.8	<0.5	7.9
BH23	0.15-0.4	<0.5	<8.0
BH24	0-0.7	<0.5	7.6
BH24	0.7-1.3	<0.5	<8.0
BH26	0-1.0	0.9	10.9
BH27	0.5	0.8	12.4
BH28	1.0	<0.5	<8.0
BH29	1.0	0.7	10.8
BH33	1.0	**23**	**344.0**
BH6 (BH34)	1.0	<0.5	<8.0
BH35	0.5	1.1	13.9
Practical Quantitation Limit (PQL)		0.5	NA
Procedure D [a] (Normal Distribution)			
Number of Samples		28	29
Mean [b]		0.8	13.2
Standard Deviation		0.6	10.5
95% Upper Confidence Limits (UCL)		1.0	16.6
NATIONAL ENVIRONMENT PROTECTION MEASURE (1999)			
Health Investigation Levels (HIL) [a] (HIL 'E')		**2**	**40**

Notes

Notes	a:	Parks, recreational open space and playing fields, including secondary schools
	b:	Concentrations in **bold** are greater than 250% of the guideline value and are not considered a part of the final 95%UCL
	NA:	Not Applicable

As shown in Table 24, the 95% UCL of the mean concentrations of benzo(a)pyrene and Total PAH (with the exception of the highlighted benzo(a)pyrene and Total PAH concentrations – 'hotspots') were well below the assessment criteria of the HIL 'E' for parks and open space; the standard deviations were all less than 50% of the assessment criteria and no single concentration exceeded the assessment criteria by more than 250%.

As such, the majority of the data set satisfies the criteria for stating that benzo(a)pyrene and Total PAH contamination of the soil is not likely to be an issue within parks and open space areas. However, delineation, by sampling and testing, followed by remediation, will be required for each of the 'hotspots'.

HIL 'F' (commercial)

The (a)pyrene and Total PAH test data for the fill soil samples assessed against the HIL 'F' for commercial areas, is presented in the following table.

Table 25: PAH Test Results - Fill

Sample Location	Depth (m)	BENZO(a)PYRENE (mg/kg)	TOTAL PAH (mg/kg)
BH1	0.5	<0.5	8.0
BH2	0.12-0.5	5.1	60.9
BH2	0.5-1.2	0.7	10.1
BH6	0.1-1.0	1.2	17.0
BH7	0.1-0.5	2.8	29.9
BH7	0.5-1.5	**58**	**652.5**
BH8	0.3	0.7	10.0
BH9	1.5-2.5	1.1	15.2
BH10	0-0.5	0.9	11.0
BH11	0-0.5	0.7	10.5
BH11	0.5-1.5	<0.5	<8.0
BH12	0.3	<0.5	7.2
BH14	0-0.7	<0.5	<8.0
BH15	0-1.0	0.5	9.6
BH16	0.3	<0.5	<8.0
BH17	0.4	1.8	21.7
BH18	0.12-0.8	2.2	20.7
BH19	0.12-1.0	<0.5	<8.0
BH20	0.4-1.0	1.1	13.1
BH21	0.2	<0.5	11.6
BH22	0-0.8	<0.5	7.9
BH23	0.15-0.4	<0.5	<8.0
BH24	0-0.7	<0.5	7.6
BH24	0.7-1.3	<0.5	<8.0
BH26	0-1.0	0.9	10.9
BH27	0.5	0.8	12.4
BH28	1.0	<0.5	<8.0
BH29	1.0	0.7	10.8
BH33	1.0	**23**	**344.0**
BH6 (BH34)	1.0	<0.5	<8.0
BH35	0.5	1.1	13.9
Practical Quantitation Limit (PQL)		0.5	NA
Procedure D [a] (Normal Distribution)			
Number of Samples		29	29
Mean [b]		1.0	13.2
Standard Deviation		1.0	10.5
95% Upper Confidence Limits (UCL)		1.3	16.6
NATIONAL ENVIRONMENT PROTECTION MEASURE (1999)			
Health Investigation Levels (HIL) [a] (HIL 'F')		**5**	**100**

Notes

a: Commercial or industrial development

b: Concentrations in **bold** are greater than 250% of the guideline value and are not considered a part of the final 95%UCL

NA: Not Applicable

As shown in Table 25, the 95% UCL of the mean concentrations of benzo(a)pyrene and Total PAH (with the exception of the highlighted benzo(a)pyrene and Total PAH concentrations – 'hotspots') were well below the assessment criteria of the HIL 'F' for commercial; the standard deviations were all less than 50% of the assessment criteria and no single concentration exceeded the assessment criteria by more than 250%.

As such, the majority of the data set satisfies the criteria for stating that benzo(a)pyrene and Total PAH contamination of the soil is not likely to be an issue within commercial areas. However, delineation, by sampling and testing, followed by remediation, will be required for each of the 'hotspots'.

12.1.5 Polycyclic Aromatic Hydrocarbons (PAH) – Natural

The benzo(a)pyrene and Total PAH test data for the natural soil samples is presented in the following table. The benzo(a)pyrene and Total PAH test data for natural soil samples have been assessed, discretely, against all the relevant assessment criteria.

Table 26: PAH Test Results - Natural

Sample Location	Depth (m)	BENZO(a)PYRENE (mg/kg)	TOTAL PAH (mg/kg)
BH1	0.75	<0.5	8.0
BH2	1.25-1.5	<0.5	<8.0
BH29	2.0	0.8	14.4
BH31	1.5	<0.5	<8.0
Practical Quantitation Limit (PQL)		0.5	NA
NATIONAL ENVIRONMENT PROTECTION MEASURE (1999)			
Health Investigation Levels (HIL) [a] (HIL 'A')		1	20
HIL 'D' [b]		4	80
HIL 'E' [c]		2	40
HIL 'F' [d]		5	100

Notes
a: Residential with gardens and accessible soil including children's day-care centres, preschools, primary schools, townhouses and villas.
b: Residential with minimal opportunities for soil access, including high-rise, apartments and flats
c: Parks, recreational open space and playing fields, including secondary schools
d: Commercial or industrial development
NA: Not Applicable

As shown in Table 26, the concentrations of benzo(a)pyrene and Total PAH are well below the assessment criteria, those being HIL ‘A’, HIL ‘D’, HIL ‘E’ and HIL ‘F’. As such, the benzo(a)pyrene and Total PAH test data satisfied the criteria for stating that benzo(a)pyrene and Total PAH contamination of the natural soil is not likely to be an issue within the site.

12.1.6 Other Organics

As indicated in Table 27, the concentrations of OCP, PCB, Phenols and Cyanides were either not detected or well below the assessment criteria, those being PPBIL, HIL ‘A’, HIL ‘D’, HIL ‘E’ and HIL ‘F’.

Table 27: OCP, PCB, Phenols & Cyanides Test Results

Analyte		Organochlorine Pesticides (mg/kg)									
Sample Reference	**Depth (m)**	HEPTACHLOR	ALDRIN	DIELDRIN	DDD	DDE	DDT	CHLORDANE (trans & cis)	TOTAL PCB (mg/kg)	TOTAL PHENOLS (mg/kg)	TOTAL CYANIDES (mg/kg)
BH1	0.75	-	-	-	-	-	-	-	-	<0.5	-
BH2	1.25-1.5	-	-	-	-	-	-	-	-	<0.5	-
BH4	0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.1	-		-
BH5	0.1-0.5	-	-	-	-	-	-	-	<0.6	-	-
BH5	0.5-1.5	-	-	-	-	-	-	-	<0.6		-
BH7	0.1-0.5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.1	<0.6	<0.5	<1
BH11	0-0.5	<0.05	<0.05	<0.05	<0.05	0.18	<0.2	<0.1	<0.6	<0.5	<1
BH11	0.5-1.5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.1	<0.6	<0.5	<1
BH12	0.3	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.1	-	-	-
BH14	0-0.7	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	0.1	<0.6	<0.5	<1
BH16	0.3	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.1	<0.6	-	-
BH17	0.4	<0.05	<0.05	0.7	<0.05	<0.05	<0.2	<0.1	-	-	-
BH18	0.12-0.8	-	-	-	-	-	-	-	-	<0.5	-
BH21	0.2	-	-	-	-	-	-	-	-	<0.5	-
BH22	0-0.8	<0.05	<0.05	<0.05	<0.05	0.23	<0.2	<0.1	<0.6	-	-
BH23	0.15-0.4	-	-	-	-	-	-	-	-	-	-
BH24	0-0.7	-	-	-	-	-	-	-	-	<0.5	<1
BH24	0.7-1.3	-	-	-	-	-	-	-	-	<0.5	-
BH5 (BH25)	1.0	-	-	-	-	-	-	-	<3	-	-
BH27	0.5	-	-	-	-	-	-	-	-	<0.5	-
BH29	2.0	-	-	-	-	-	-	-	-	<0.5	-
BH30	1.0	<0.05	<0.05	<0.05	<0.05	0.23	<0.2	<0.1	-	-	-
BH31	1.5	<0.05	<0.05	<0.05	<0.05	0.23	<0.2	<0.1	<3	-	-
BH4 (BH32)	1.0	<0.05	<0.05	<0.05	<0.05	0.23	<0.2	<0.1	-	-	-
Practical Quantitation Limits (PQL)		0.05	0.05	0.05	0.05	0.05	0.2	0.1	0.6	0.5	0.5
NATIONAL ENVIRONMENT PROTECTION MEASURE (1999)											
Health Investigation Levels (HIL) [a] (HIL 'A')		10	10 [e]	10 [e]		200 [f]		50	10	8500	250 [g] / 500 [h]
HIL 'D' [b]		40	40	40		800		200	20	34000	1000 / 2000
HIL 'E' [c]		20	20	20		400		100	40	17000	500 / 1000
HIL 'F' [d]		50	50	50		1000		250	50	42500	1250 / 2500
GUIDELINES FOR THE NSW SITE AUDITOR SCHEME (2006)											
Provosional Phytotoxity-Based Investigation Level (PPBIL)										70	

Notes

a: Residential with gardens and accessible soil including children's day-care centres, preschools, primary schools, townhouses and villas.

b: Residential with minimal opportunities for soil access, including high-rise, apartments and flats

c: Parks, recreational open space and playing fields, including secondary schools

d: Commercial or industrial development

e: Aldrin + Dieldrin

f: Total of DDD + DDE + DDT

g: Cyanide (free)

h: Cyanide (complex)

12.1.7 Volatile Organic Compunds (VOC's)

As indicated in Tables 28, 29 & 30, the concentrations of VOC's were less than the laboratory PQL's.

Table 28: VOC Test Results

Sample Compound	BH1 0.5 (mg/L)	BH2 0.5-1.2 (mg/L)	BH16 0.3 (mg/L)	BH21 0.2 (mg/L)	BH24 0-0.7 (mg/L)	BH27 0.5 (mg/L)	Laboratory PQL
Benzene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5
Toluene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5
Ethyl benzene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5
m/p-Xylenes	<1	<1	<1	<1	<1	<1	1
styrene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5
o-Xylene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5
Isopropylbenzene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5
n-Propylbenzene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5
1,3,5-Trimethylbenzene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5
tert-Butylbenzene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5
1,2,4-Trimethylbenzene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5
sec-Butylbenzene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5
p-Isopropyltoluene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5
n-Butylbenzene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5
Naphthalene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5

Table 29: VOC Test Results

Compound / Sample	BH1 0.5 (mg/L)	BH2 0.5-1.2 (mg/L)	BH16 0.3 (mg/L)	BH21 0.2 (mg/L)	BH24 0-0.7 (mg/L)	BH27 0.5 (mg/L)	Laboratory PQL
Dichlorodifluoromethane	<5	<5	<5	<5	<5	<5	5
Chloromethane	<5	<5	<5	<5	<5	<5	5
Vinyl chloride	<5	<5	<5	<5	<5	<5	5
Bromomethane	<5	<5	<5	<5	<5	<5	5
Chloroethane	<5	<5	<5	<5	<5	<5	5
Trichlorofluoromethane	<5	<5	<5	<5	<5	<5	5
1,1-dichloroethene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5
trans-1,2-dichloroethene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5
1,1-dichloroethane	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5
cis-1,2-dichloroethene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5
2,2-dichloropropane	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5
Chloroform	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5
1,1,1-trichloroethane	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5
1,2-dichloroethane	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5
1,1-dichloropropene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5
Carbon tetrachloride	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5
Trichloroethene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5
1,2-dichloropropane	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5
Dibromomethane	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5
Bromodichloromethane	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5
cis-1,3-dichloropropene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5
trans-1,3-dichloropropene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5
1,1,2-trichloroethane	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5
1,3-dichloropropane	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5
Chlorodibromomethane	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5
Tetrachloroethene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5
1,2-dibromoethane	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5
1,1,1,2-tetrachloroethane	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5
Bromoform	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5
1,1,2,2-tetrachloroethane	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5
1,2,3-trichloropropane	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5
1,2-dibromo-3-chloropropane	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5
Hexachlorobutadiene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5

Table 30: VOC Test Results

Sample Compound	BH1 0.5 (mg/L)	BH2 0.5-1.2 (mg/L)	BH16 0.3 (mg/L)	BH21 0.2 (mg/L)	BH24 0-0.7 (mg/L)	BH27 0.5 (mg/L)	Laboratory PQL
Halogenated Aromatics							
Chlorobenzene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5
Bromobenzene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5
2-chlorotoluene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5
4-chlorotoluene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5
1,3-dichlorobenzene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5
1,4-dichlorobenzene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5
1,2-dichlorobenzene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5
1,2,4-trichlorobenzene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5
1,2,3-trichlorobenzene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5
Oxygenated Compounds							
Vinyl acetate	<5	<5	<5	<5	<5	<5	5
Ethyl acetate	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5
tert-butylmethylether (TBME)	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5
Sulphonated Compounds							
Carbon disulfide	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5

12.2 Groundwater

12.2.1 Metals

Table 31: Metals Test Results - Groundwater

Analyte	HEAVY METALS (µg/L)							
Sample Location	ARSENIC (As) - Total	CADMIUM (Cd)	CHROMIUM (Cr) - Total	COPPER (Cu)	LEAD (Pb)	MERCURY (Hg) - Total	NICKEL (Ni)	ZINC (Zn)
GROUNDWATER SAMPLES								
GW1 -	<1	<0.1	<5	<1	<1	<0.1	15	26
GW2 -	<1	<0.1	<5	2	<1	<0.1	8	13
GW3 -	<1	<0.1	<5	<1	<1	<0.1	10	27
Practical Quantitation Limits (PQL)	1	0.1	1	1	1	0.1	1	5
ANZ [a] Guidelines for Fresh and Marine Water Quality (2000)								
Aquatic Ecosystems (Trigger Values)								
Fresh Water	24^{b}	0.2	$3.3^{d, h}$	1.4	3.4	0.6^{f}	11	8
	13^{c}		1^{e}			$0.4^{g, h}$		
Marine Water	$2.3^{b, h}$	5.5	27.4^{d}	1.3	4.4	ID	70	15
	$4.5^{c, h}$		4.4^{e}			ID		
Irrigation Water (Trigger Values)								
LTV	100	10	100	200	2000	2	200	2000
STV	2000	50	1000	5000	5000	2	2000	5000
Water for recreational purposes	50	5	50	1000	50	1	100	5000

Notes
a: ANZ = Australia and New Zealands
b: as As (III)
c: as As (V)
d: as Cr (III)
e: as Cr (VI)
f: as Hg (Inorganic)
g: as Hg (methyl)
h: Interim working values in the absence of reliable trigger values (Section 8.3.7)
ID: Insufficient Data to derive a reliable trigger value
LTV: Long Term Trigger Value (up to 100 years)
STV: Short Term Trigger Value (up to 20 years)

As shown in Table 31, the concentrations of metals were all below the relevant trigger values for aquatic ecosystems (marine), with the exception of the concentrations of copper (GW2) and zinc (GW1 & GW3).

As shown in Table 31, the concentrations of the metals were all below the relevant long-term and short-term trigger values in the “Australian and New Zealand Guidelines for Fresh and Marine Waters" – 2000 for irrigation water.

As shown in Table 31, the concentrations of metals were all below the relevant guidelines of water for recreational purposes in the ANZECC Guidelines 2000.

12.2.2 TPH and BTEX

Table 32: TPH Test Results - Groundwater

Analyte	TPH (µg/L)					BTEX (µg/L)			
Sample Location	C6-C9	C10-C14	C15-C28	C29-C36	C10-C36	BENZENE	TOLUENE	ETHYL BENZENE	TOTAL XYLENES
GROUNDWATER SAMPLES									
GW1 -	<50	300	360	<50	685	<1	<1	<1	<3
GW2 -	<50	<50	<200	<50	<150	<1	<1	<1	<3
GW3 -	<50	240	<200	<50	365	<1	<1	<1	<3
Practical Quantitation Limits (PQL)	50	50	200	50	NA	1	1	1	3
ANZ[a] Guidelines for Fresh and Marine Water Quality (2000)									
Aquatic Ecosystems (Trigger Values)									
Fresh water					-	950	180[e]	80[e]	350[b] 75[c, e] 200[d]
Marine water					-	700	180[e]	5[e]	625
Mineral Oil					600				
Water for recreational purposes					-	10			

Notes		
	a:	ANZ = Australia and New Zealand
	b:	as o-Xylene
	c:	as m-Xylene
	d:	as p-Xylene
	e:	Interim working values in the absence of reliable trigger values (Section 8.3.7)
	f:	Contaminated Sites: "Guidelines for Assessing Service Station Sites", 1994, EPA

As indicated in Table 32, the concentrations of BTEX for the samples were all below the relevant trigger values for aquatic ecosystems (marine). The concentrations of benzene were below the relevant guidelines of water for recreational purposes in the ANZECC Guidelines 2000.

The concentrations of C_{10}-C_{36} for the samples were all below the Dutch Target and Intervention Values, with the exception of GW1.

12.2.3 PAH

Table 33: PAH Test Results - Groundwater

Analyte Sample Location		PAH (µg/L)				
		NAPHTHALENE	ANTHRANCENE	PHENANTHRENE	FLUORANTHENE	BENZO(a)PYRENE
GROUNDWATER SAMPLES						
GW1	-	18	2	9	4	<1
GW2	-	<1	<1	<1	<1	<1
GW3	-	<1	<1	<1	<1	<1
Practical Quantitation Limits (PQL)		1	1	1	1	1
ANZ ^{a} Guidelines for Fresh and Marine Water Quality (2000) Aquatic Ecosystems (Trigger Values)						
Fresh		16	0.4^{b}	2^{b}	1.4^{b}	0.2^{b}
Marine		70	0.4^{b}	2^{b}	1.4^{b}	0.2^{b}
Water for recreational purposes						0.01

Notes a: ANZ = Australia and New Zealands
b: Interim working values in the absence of reliable trigger values (Section 8.3.7)

As indicated in Table 33, the concentrations of PAH for the samples were all below the relevant trigger values for aquatic ecosystems (marine) and the relevant guidelines of water for recreational purposes in the ANZECC Guidelines 2000.

12.3 Discussion

12.3.1 Water

A review of the Aargus database of groundwater assessments conducted in the Summer Hill area show indicative water levels and concentrations of minerals. The Geological Survey of NSW indicates that bores are infrequently constructed on Wianamatta Group rocks. This is due to slow production rates and high salinity making these waters unsatisfactory for domestic or agricultural use. Concentrations of salts in groundwater collected from Cumberland Plateau shales have been reported as high as 30,000mg/L. Elevated levels of copper, lead and zinc are often found in the saline groundwater of Wianamatta shales and natural groundwater is expected to have low levels of copper and zinc and occasionally lead.

The heavy metal concentrations exceeding the guidelines within the recovered groundwater samples can possibly be attributed to the regional groundwater quality and are therefore not of concern as up and down gradient levels were of similar concentrations.

An elevated concentration of C_{10}-C_{36} was recorded in GW1; furthermore, an elevated concentration of C_{10}-C_{36} in the soil sample recovered from the fill materials within this borehole was also reported. The elevated concentrations within the soils are likely impacted by the former UST that was located adjacent to this borehole. The concentration within the groundwater is not considered a concern due to the following reasons:

- The sampled groundwater appears to be perched water (depth of 2.0m);
- The attenuation of the natural clays (at a depth of 3.0m), being of low permeability, would minimise any impact of the C_{10}-C_{36} contamination;
- Based on Aargus' experience in the local area and on the regional topography, the depth of the regional groundwater would be greater than 15m below ground level; and

- The permeability of the underlying Hawkesbury Sandstone is relatively low; hence it is highly unlikely that the regional groundwater's would be reached.
- The potential sources of the contamination (contaminated fill materials and former UST) will be removed in the future as part of the remediation process.

Based on the observations provided, the minor groundwater contamination is unlikely to be of any further concern in the future, however it is recommended that the groundwater is re-assessed after the remediation process has been completed.

13.0 CONCLUSIONS AND RECOMMENDATIONS

Laboratory results and QA/QC data fulfil the DQOs. The results are therefore considered a reliable basis for the following conclusions and recommendations.

Statistical analysis of the laboratory results for the soil samples were generally lower than the most stringent regulatory guideline criteria adopted (PPBIL, HIL 'A' and EPA Service Station) with the exception of concentrations of arsenic, copper, lead, zinc, TPH (C_{10}-C_{36}), benzo(a)pyrene and Total PAH in a number of samples across the site.

Reference may be made to Figures 4 to 8 in Appendix A - Site Plans for sample locations with elevated concentrations above the relevant assessment criteria. The locations with elevated concentrations can be considered to be 'hotspots' and require some form of remediation and/or management.

Groundwater was encountered during drilling at the site, and concentrations of some heavy metals and TPH (C_{10}-C_{36}) were above the adopted assessment criteria. Based on the observations provided, elevated heavy metal concentrations can possibly be attributed to the regional groundwater quality, whilst the elevated concentration of TPH (C_{10}-C_{36}) can be attributed to the former UST located adjacent to this borehole. Based on the observations provided, the minor groundwater contamination is unlikely to be of any further concern in the future, however it is recommended that the groundwater is re-assessed after the remediation process has been completed and the UST removed.

In Summary

Based on the results of this investigation it is considered that the risks to human health and the environment associated with soil and groundwater contamination at the site are low in the context of the future development. The site is therefore considered ***to be suitable*** for the future development, subject to the following:

- It is recommended that an appropriate remedial / management strategy is developed, culminating in preparation of a Remedial Action Plan (RAP) in accordance with DECC guidelines, once the proposed development has been finalised.

- Any soils requiring removal from the site, as part of the remediation process, should be classified in accordance with the "*Waste Classification Guidelines Part 1: Classifying Wastes, NSW DECC 2008"*.

- Groundwater within GW1 is re-assessed after the remediation process has been completed and the UST and associated potentially impacted soils removed.

We would be pleased to provide further information on any aspects of this report.

For and on behalf of
Aargus Pty Ltd

Internal review by

Mark Kelly

Mark Kelly
Senior Environmental Geologist

Nick Kariotoglou
Managing Director

14.0 LIMITATIONS

Whilst to the best of our knowledge, information contained in this report is accurate at the date of issue, although subsurface conditions, including groundwater levels and contaminant concentrations, can change in a limited time. This should be borne in mind if the report is used after a protracted delay.

There is always some disparity in subsurface conditions across a site that cannot be fully defined by investigation. Hence it is unlikely that measurements and values obtained from sampling and testing during environmental works carried out at a site will characterise the extremes of conditions that exist within the site.

There is no investigation that is thorough enough to preclude the presence of material that presently or in the future, may be considered hazardous at the site. Since regulatory criteria are constantly changing, concentrations of contaminants presently considered low may, in the future, fall under different regulatory standards that require remediation.

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

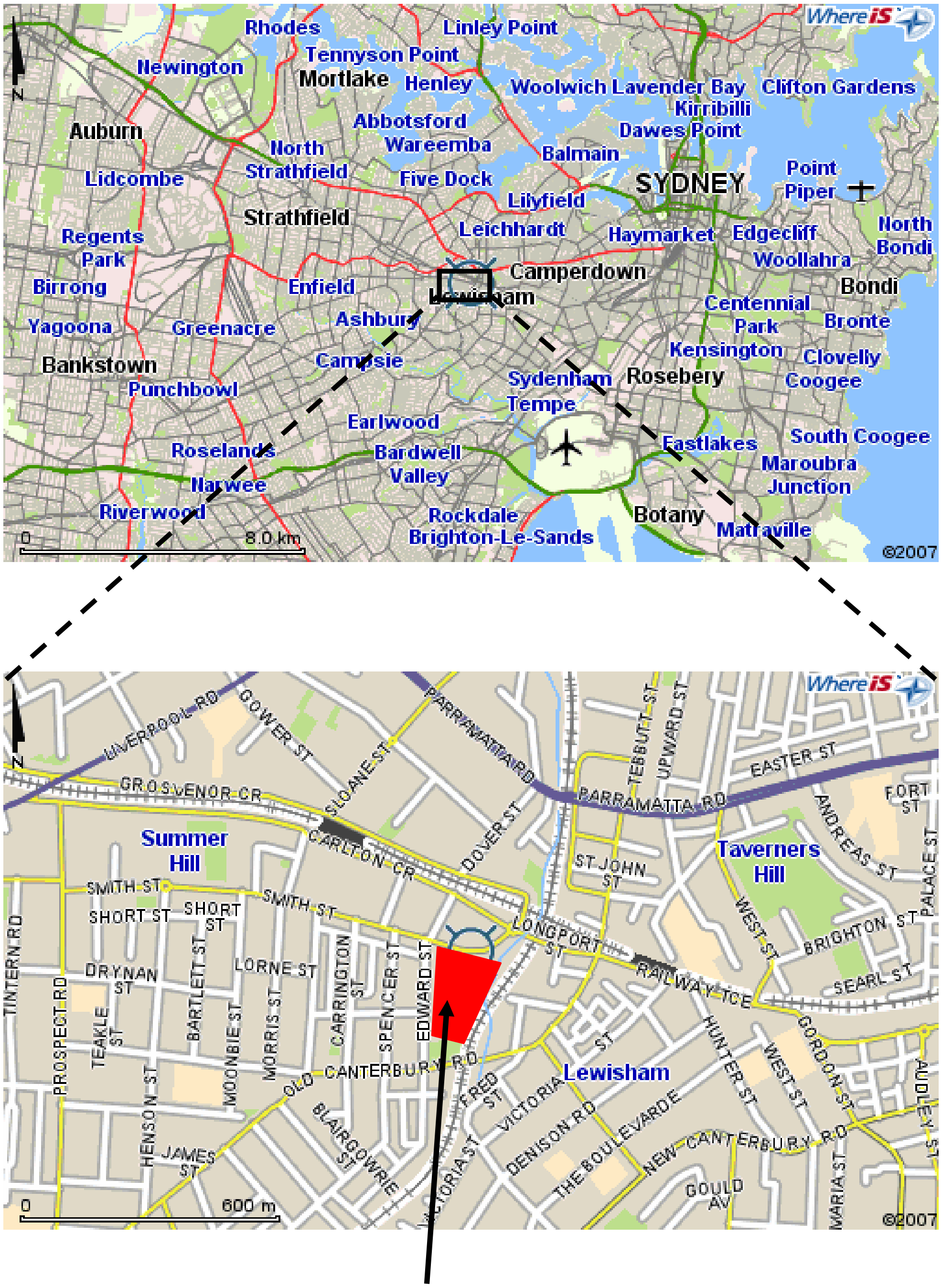
Appendix B – Important information about your environmental report, should also be read in conjunction with this report.

APPENDIX A

SITE PLANS

Aargus

LOCALITY MAP



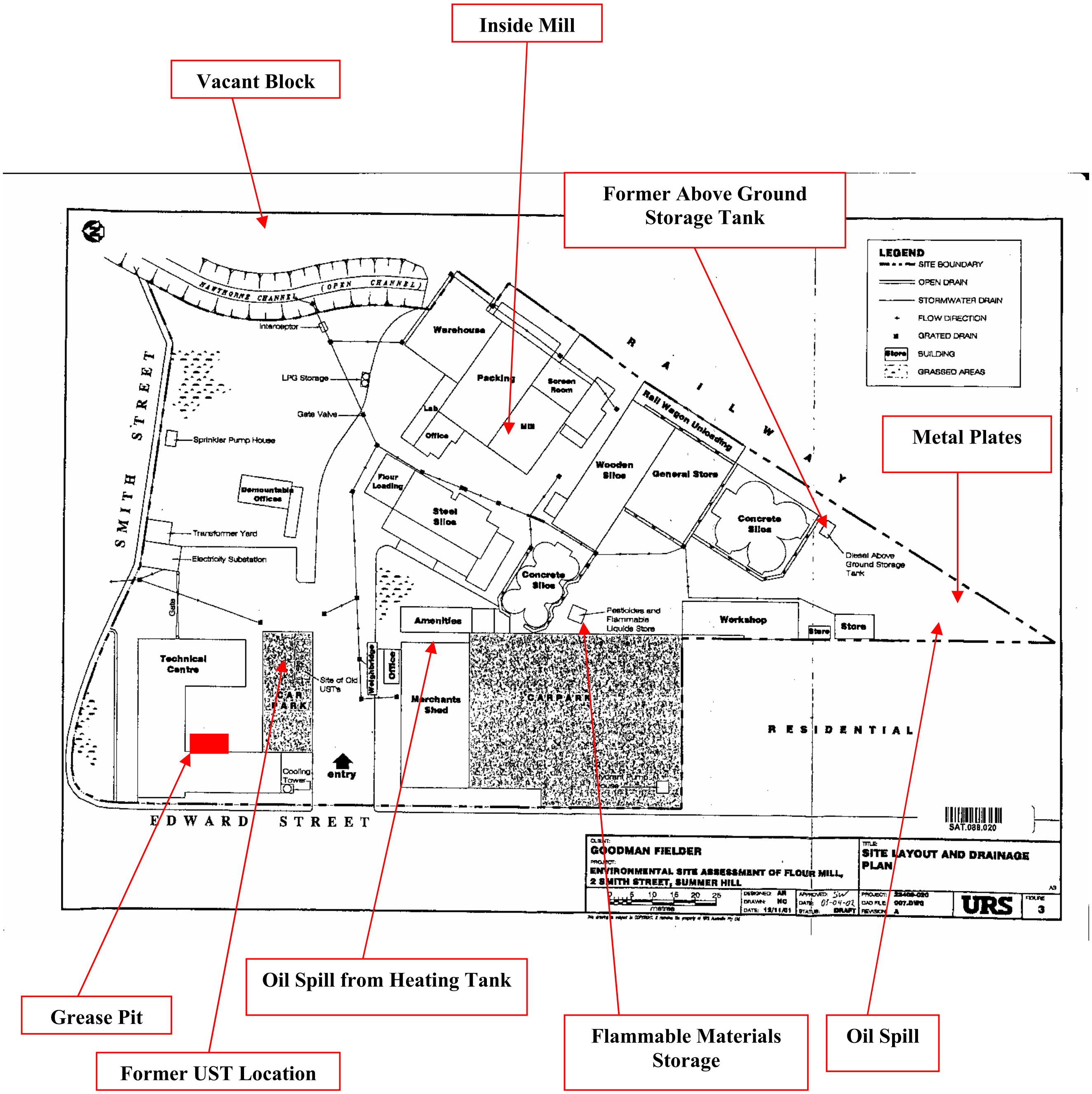
Site Location

Reference: www.whereis.com.au (2007)

ABN 46 063 579 313 Aargus Pty Limited Environment – Chemicals – Business Development

Drawn	DH	**Environmental Site Assessment** **EG FUNDS MANAGEMENT** **2 Smith St, Summer Hill, NSW**	Figure 1
Approved	NK		
Date	6/7/07		Job No: E1559
Scale	N/A		

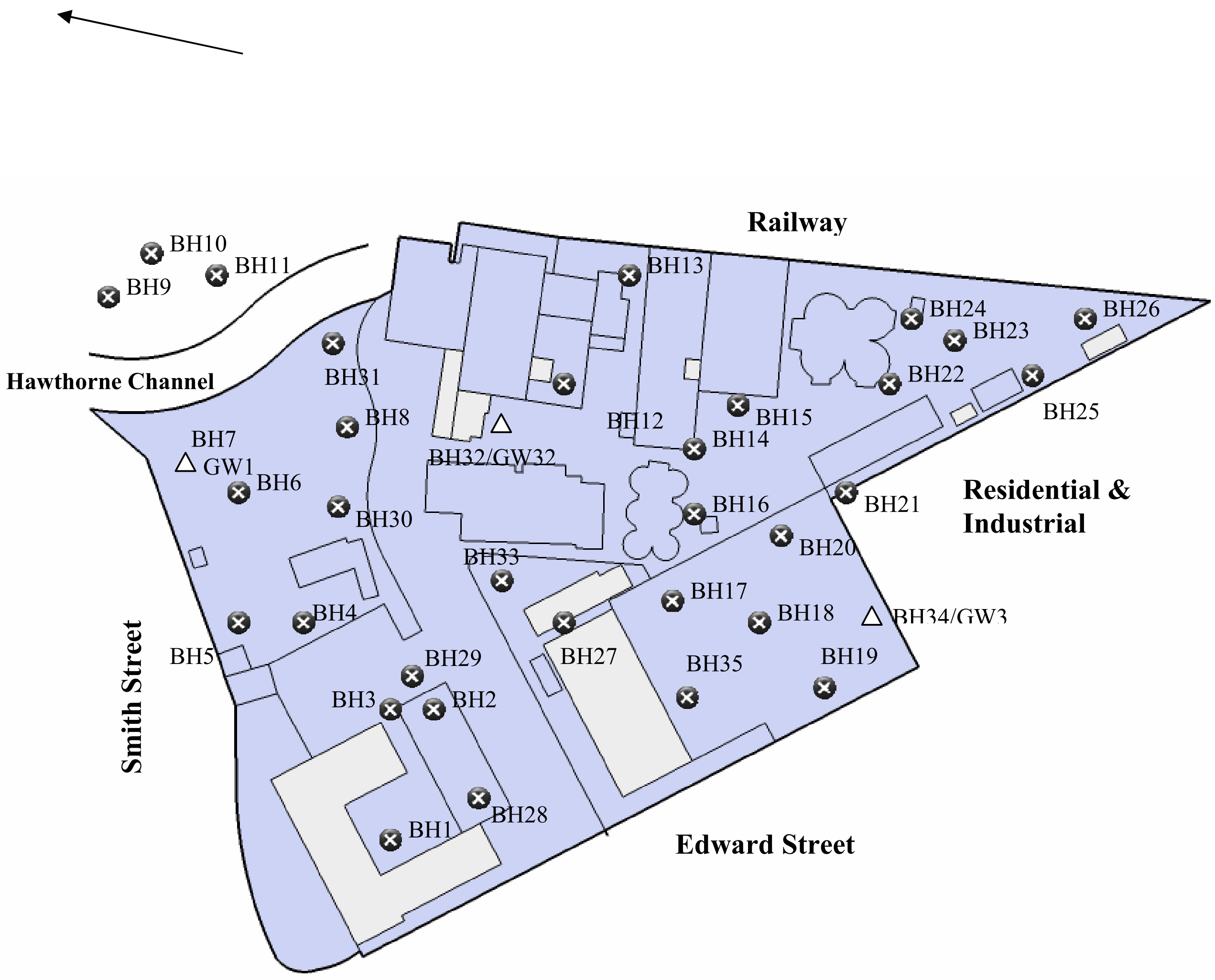
SITE FEATURES



ABN 46 063 579 313 Aargus Pty Limited Environment – Geotechnical – Remediation

Drawn	DH	**Environmental Site Assessment EG FUNDS MANAGEMENT 2 Smith St, Summer Hill, NSW**	Aargus AUSTRALIA	Figure 2
Approved	NK			
Date	3/7/07			Job No: E1559
Scale	N/A			

Borehole Locations



Legend

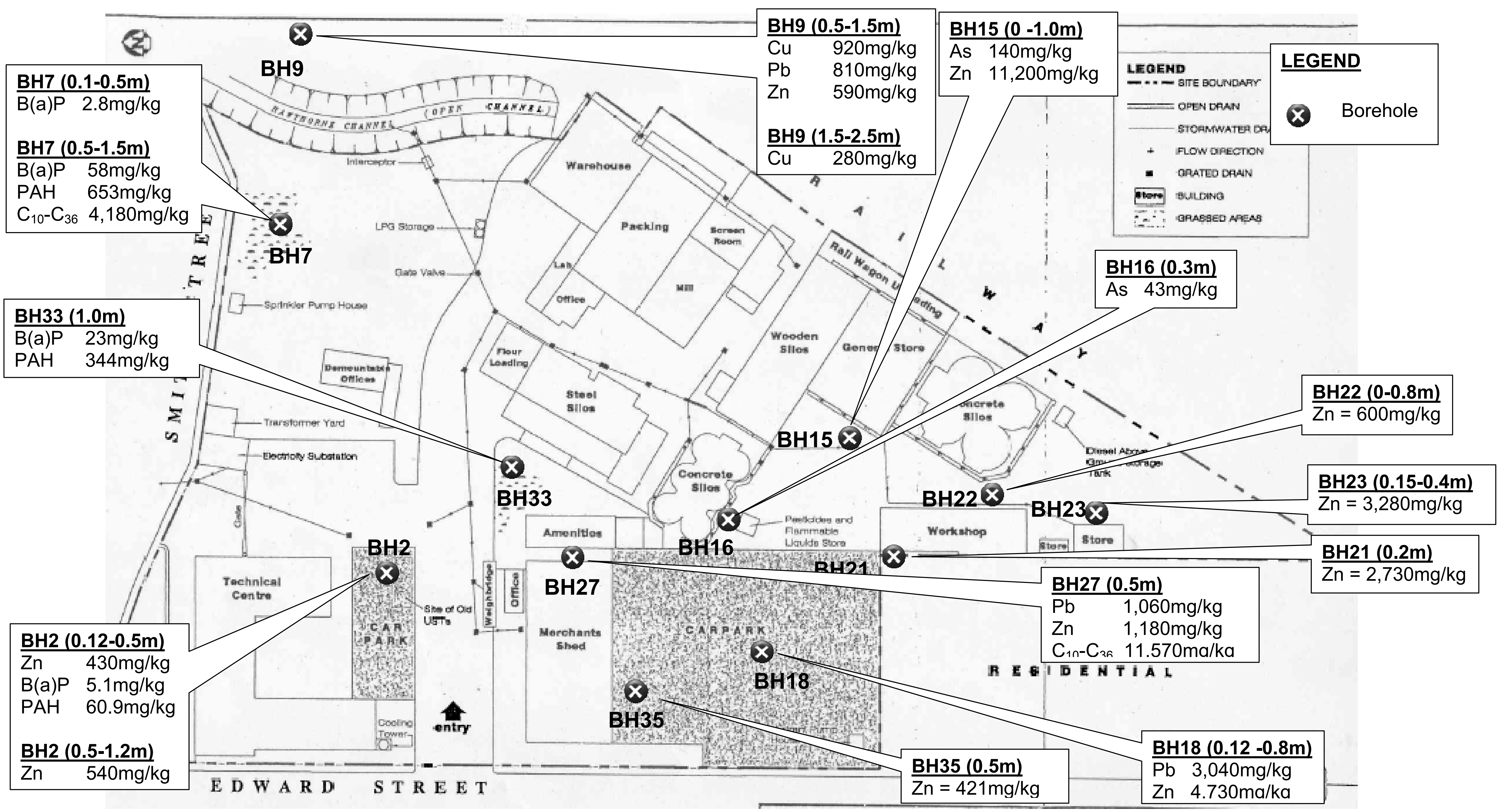
⊗ Borehole
△ Groundwater Well
— Site boundary

ABN 46 063 579 313 Aargus Pty Limited Environment – Geotechnical – Remediation

Drawn	DH	**Environmental Site Assessment** **EG FUNDS MANAGEMENT** **2 Smith St, Summer Hill, NSW**	Figure 3
Approved	MK		
Date	10/04/08		Job No: E1559
Scale	N/A		

Aargus AUSTRALIA

HOTSPOT LOCATIONS – PPBIL & HIL ‘A’



LEGEND

⊗ Borehole

BH9 (0.5-1.5m)

Cu	920mg/kg
Pb	810mg/kg
Zn	590mg/kg

BH9 (1.5-2.5m)

Cu	280mg/kg

BH15 (0 -1.0m)

As	140mg/kg
Zn	11,200mg/kg

BH7 (0.1-0.5m)

B(a)P 2.8mg/kg

BH7 (0.5-1.5m)

B(a)P	58mg/kg
PAH	653mg/kg
C_{10}-C_{36}	4,180mg/kg

BH16 (0.3m)

As 43mg/kg

BH33 (1.0m)

B(a)P	23mg/kg
PAH	344mg/kg

BH22 (0-0.8m)

Zn = 600mg/kg

BH23 (0.15-0.4m)

Zn = 3,280mg/kg

BH21 (0.2m)

Zn = 2,730mg/kg

BH27 (0.5m)

Pb	1,060mg/kg
Zn	1,180mg/kg
C_{10}-C_{36}	11.570ma/ka

BH2 (0.12-0.5m)

Zn	430mg/kg
B(a)P	5.1mg/kg
PAH	60.9mg/kg

BH2 (0.5-1.2m)

Zn	540mg/kg

BH35 (0.5m)

Zn = 421mg/kg

BH18 (0.12 -0.8m)

Pb	3,040mg/kg
Zn	4.730ma/ka

ABN 46 063 579 313 Aargus Pty Limited Environment – Chemicals – Business Development

Drawn	MK
Approved	MK
Date	10/04/2008
Approx Scale	NTS

Environmental Site Assessment

EG FUNDS MANAGEMENT

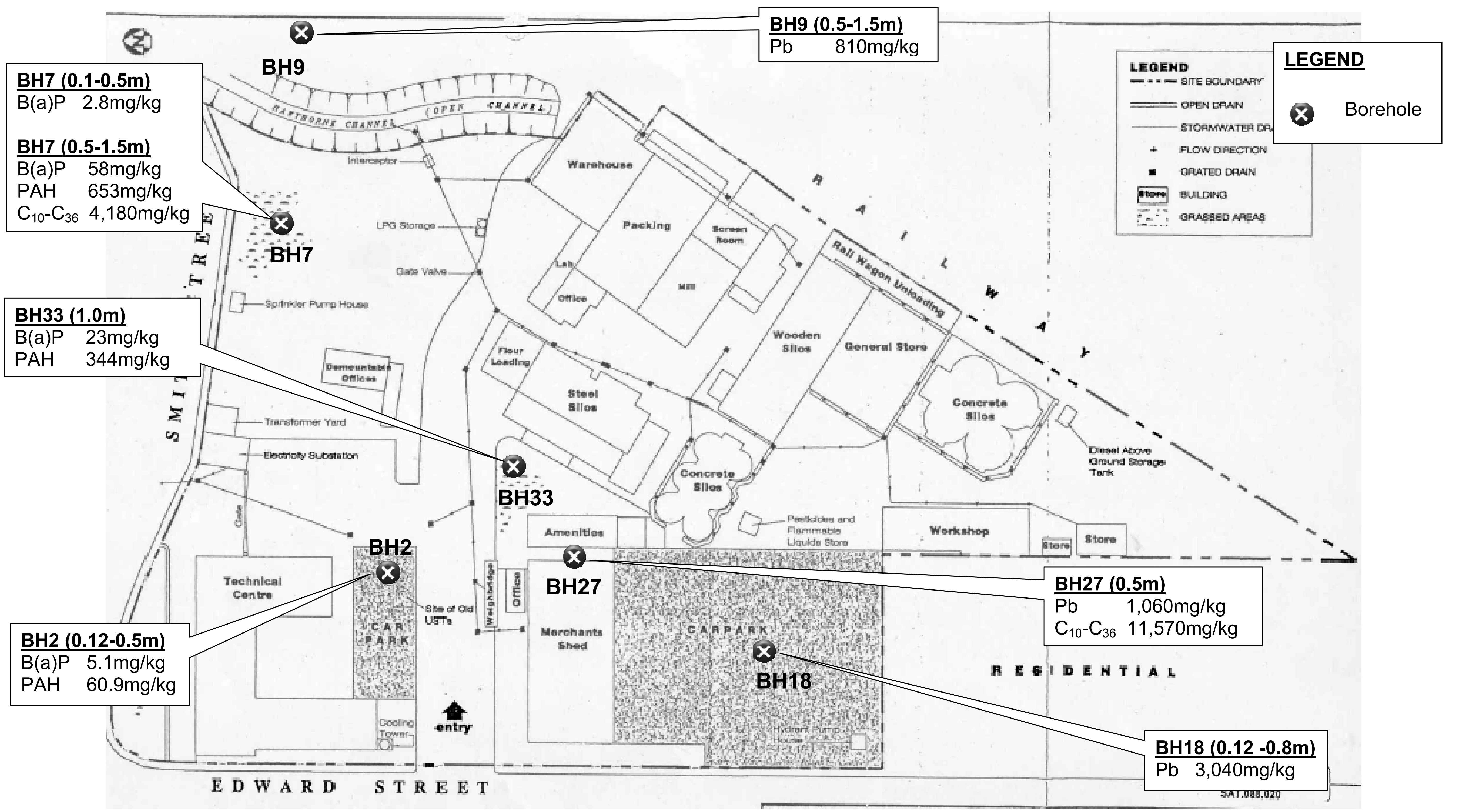
2 Smith Street, Summer Hill, NSW

Aargus
AUSTRALIA

Figure: 4

Job No: E1559

HOTSPOT LOCATIONS –HIL 'A'



BH9 (0.5-1.5m)
Pb 810mg/kg

BH7 (0.1-0.5m)
B(a)P 2.8mg/kg

BH7 (0.5-1.5m)
B(a)P 58mg/kg
PAH 653mg/kg
C_{10}-C_{36} 4,180mg/kg

BH33 (1.0m)
B(a)P 23mg/kg
PAH 344mg/kg

BH2 (0.12-0.5m)
B(a)P 5.1mg/kg
PAH 60.9mg/kg

BH27 (0.5m)
Pb 1,060mg/kg
C_{10}-C_{36} 11,570mg/kg

BH18 (0.12 -0.8m)
Pb 3,040mg/kg

ABN 46 063 579 313 Aargus Pty Limited Environment – Chemicals – Business Development

Drawn	MK
Approved	MK
Date	10/04/2008
Approx Scale	NTS

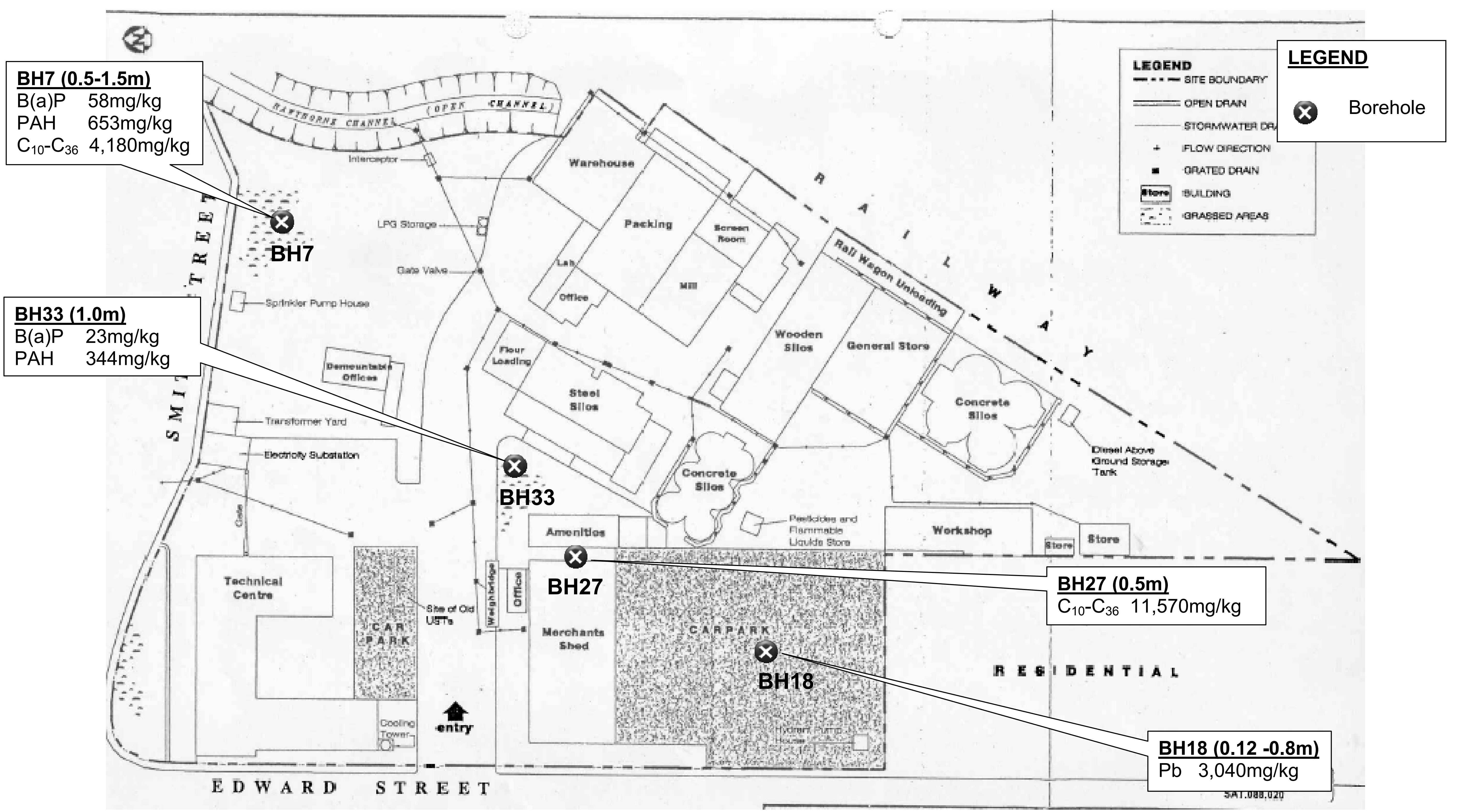
Environmental Site Assessment
EG FUNDS MANAGEMENT
2 Smith Street, Summer Hill, NSW

Aargus
AUSTRALIA

Figure:
5

Job No: E1559

HOTSPOT LOCATIONS –HIL 'D'



ABN 46 063 579 313 Aargus Pty Limited Environment – Chemicals – Business Development

Drawn	MK
Approved	MK
Date	10/04/2008
Approx Scale	NTS

Environmental Site Assessment

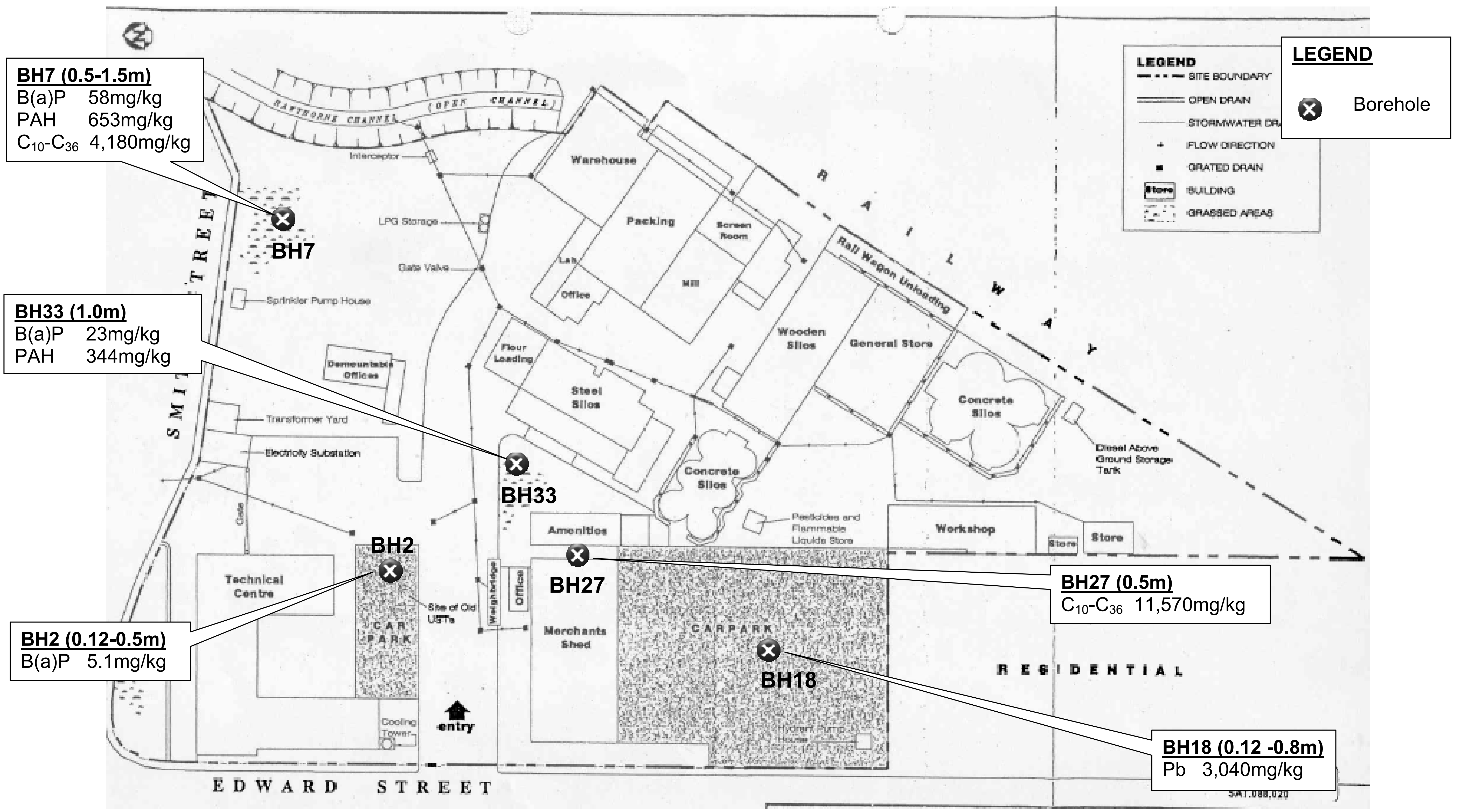
EG FUNDS MANAGEMENT

2 Smith Street, Summer Hill, NSW

Figure: 6

Job No: E1559

HOTSPOT LOCATIONS –HIL ‘E’



ABN 46 063 579 313 Aargus Pty Limited Environment – Chemicals – Business Development

Drawn	MK
Approved	MK
Date	10/04/2008
Approx Scale	NTS

Environmental Site Assessment

EG FUNDS MANAGEMENT

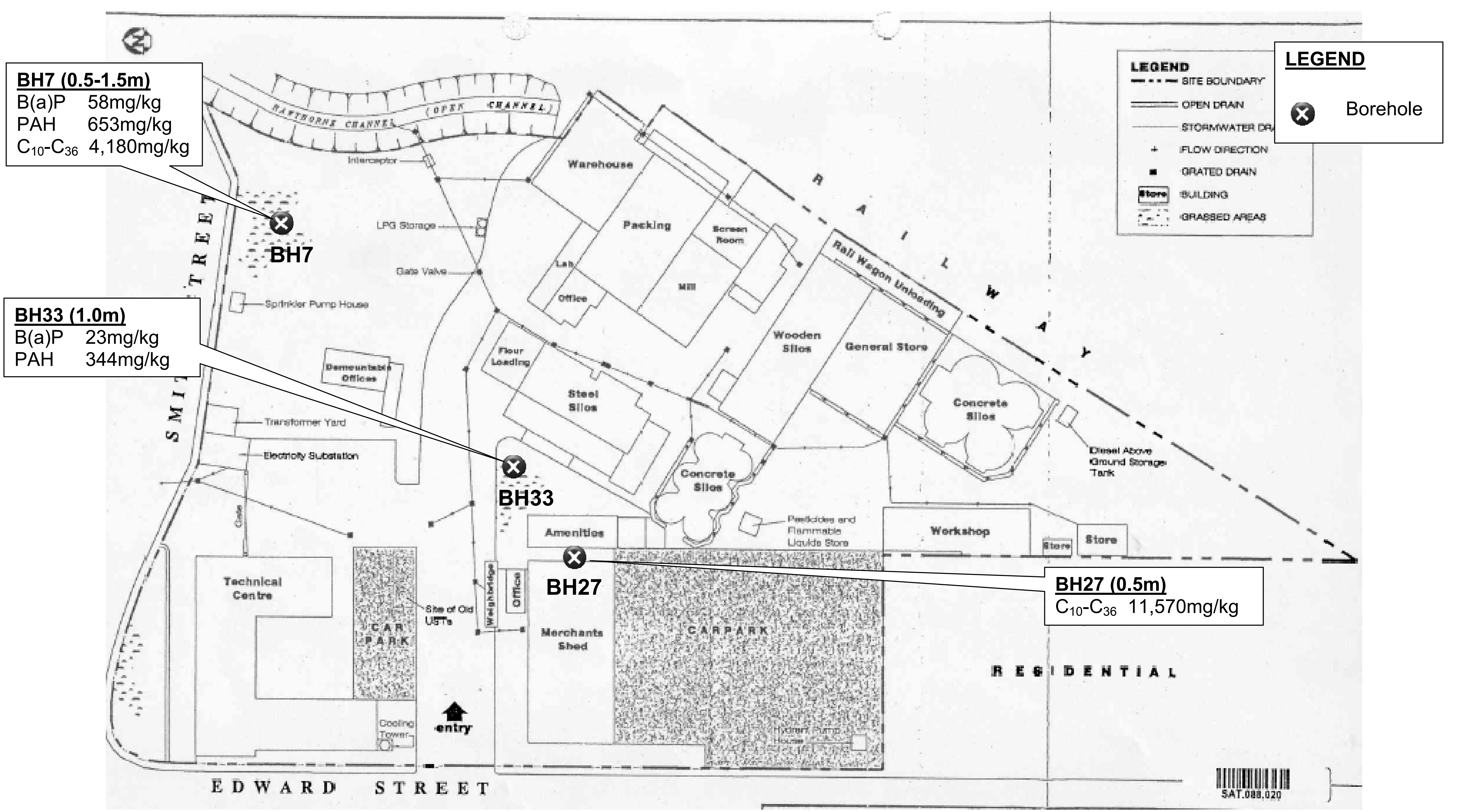
2 Smith Street, Summer Hill, NSW

Aargus AUSTRALIA

Figure: 7

Job No: E1559

HOTSPOT LOCATIONS –HIL ‘F’



BH7 (0.5-1.5m)
B(a)P 58mg/kg
PAH 653mg/kg
C_{10}-C_{36} 4,180mg/kg

BH33 (1.0m)
B(a)P 23mg/kg
PAH 344mg/kg

BH27 (0.5m)
C_{10}-C_{36} 11,570mg/kg

LEGEND
⊗ Borehole

ABN 46 063 579 313 Aargus Pty Limited Environment – Chemicals – Business Development

Drawn	MK
Approved	MK
Date	10/04/2008
Approx Scale	NTS

Environmental Site Assessment
EG FUNDS MANAGEMENT
2 Smith Street, Summer Hill, NSW

Figure: 8

Job No: E1559

APPENDIX B

IMPORTANT INFORMATION ABOUT YOUR ENVIROMENTAL REPORT

IMPORTANT INFORMATION ABOUT YOUR ENVIRONMENTAL REPORT

These notes have been prepared by Aargus Pty Ltd and its associated companies using guidelines prepared by ASFE, an Association of engineering firms that specialize in earth engineering and related applied science services. They are offered to help you in the interpretation of your environmental reports.

REASONS FOR PREPARING AN ENVIRONMENTAL REPORT

An environmental report has been prepared for a specific purpose on the basis of unique project requirements and only applies to the site subject of the study. Environmental reports are typically, though not exclusively, carried out in the following circumstances:

- prior to acquisition, on behalf of either purchaser or vender, when a property is to be sold;
- prior to development, when a property or area of land is to be redeveloped or have its use changed for example, from a factory to a residential subdivision;
- prior to development of greenfield sites, to establish "baseline" conditions and assess environmental, geological and hydrological constraints to the development; and
- as an assessment of the environmental effects of ongoing operations.

Each of these circumstances requires a specific approach to the assessment of soil and groundwater contamination. In all cases however, the objective is to identify and if possible quantify the risks that unrecognised contamination poses to the proposed activity. Such risks may be both financial, for example, cleanup costs or limitations on site use, and physical, for example, health risks to site users or the public.

THE LIMITATIONS OF AN ENVIRONMENTAL REPORT

Although the information provided by an environmental report could reduce exposure to potential risks, these can, however, never be completely eliminated. Even a rigorous professional assessment may fail to detect contamination existing at a site. Contaminants may be present in areas that were not surveyed or sampled, or may migrate to areas which showed no signs of contamination when sampled. Subsurface conditions can also change with time, natural processes or the activity of man.

AN ENVIRONMENTAL REPORT IS BASED ON A UNIQUE SET OF PROJECT SPECIFIC FACTORS

The conclusions of an environmental report may change:

- when the nature, location, size or configuration of the development proposed at the site is modified, for example, if a residential development is proposed instead of a commercial one;
- when there is a change of ownership; or
- for an adjacent site.

To help avoid costly and/or time delaying problems, it is advised to refer to the environmental consultant to determine how any factors which have changed subsequent to the date of the report may affect its conclusions and recommendations.

THE CONCLUSIONS OF A REPORT ARE PROFESSIONAL ESTIMATES

A contamination assessment identifies actual subsurface conditions only at those locations where samples were taken, when they were taken. Data derived through sampling and subsequent laboratory testing are interpreted by geologists, engineers or scientists who then render an opinion about overall subsurface conditions, the nature and extent of contamination (if any), its likely impact on a proposed development and possible remediation measures. Actual conditions may differ from those inferred to exist, because no professional, no matter how qualified, and no subsurface exploration program, no matter how comprehensive, can reveal what is hidden by earth, rock and time. The actual interface between materials may be far more gradual or abrupt than a report indicates. Actual conditions in areas not sampled may differ from predictions. For this reason owners should retain the services of their environmental consultants through the development stage, to identify variances, conduct additional tests which may be required, and to provide advice for the site.

SUBSURFACE CONDITIONS CAN CHANGE

Natural processes and the activity of man can change subsurface conditions. As an environmental report is based on conditions which existed at the time of subsurface exploration, decisions should not be based on a report whose adequacy may have been affected by time. It is recommended that you speak with your environmental consultant to see how time may have affected the conditions at the site.

ENVIRONMENTAL REPORTS ARE PREPARED FOR SPECIFIC PURPOSES AND PERSONS

Every environmental report is prepared in response to a specific brief to meet the specific needs of specific individuals. A report prepared for a consulting civil engineer may not be adequate for a construction contractor or for a development application. A report should not be used by other persons for any purpose, or by the client for a different purpose. No individual other than the client should apply a report even apparently for its intended purpose without first conferring with the environmental consultant. A report should not be used for any purpose other than that originally contemplated without first getting advice from the environmental consultant on this matter.

ENVIRONMENTAL REPORTS MAY BE MISINTERPRETATED

Problems can occur when design professionals develop their plans based on misinterpretations of an environmental report. To help avoiding these problems, the environmental consultant should be retained to work with appropriate design professionals to explain relevant findings and to review the adequacy of plans and specifications in relation to contamination issues.

DATA SHOULD NOT BE SEPARATED FROM THE REPORT

The report should not be copied in part or altered in any way. Logs, figures, field measurements, laboratory data, drawings, photographs, etc are prepared by environmental professionals based upon their interpretation of field conditions, field testing and assessment of laboratory results. This information should not under any circumstances be redrawn for inclusion in other documents or separated from the report.

To reduce the likelihood of data misinterpretation, the complete report must be available to persons or organisations involved in the project, such as contractors, for their use. Those who do not provide such access may proceed under the mistaken impression that simply disclaiming responsibility for the accuracy of subsurface information always insulates them from attendant liability. Providing all the available information to persons and organisations such as contractors may help preventing subsequent construction problems.

READ RESPONSIBILITY CLAUSES CLOSELY

Because an environmental report is based on judgement and opinion, it may be less exact than other disciplines. This has resulted in unwarranted claims being lodged against environmental consultants. To help prevent this, model clauses have been developed for use in transmittals. These are not exculpatory clauses designed to foist liabilities onto some other party. Rather, they are definitive clauses that identify where the environmental consultant's responsibilities begin and end. Their use helps all parties involved recognise their responsibilities and take appropriate action. Some of these definitive clauses are likely to appear in your environmental report, and you are encouraged to read them closely. Your environmental consultant will be able to clarify issues or answer your questions on these matters.

APPENDIX C

WORKCOVER RECORDS

WORKCOVER
NEW SOUTH WALES

Our Ref: D08/027344
Your Ref: Mark Kelly

20 March 2008

Attention: Mark Kelly
Aargus Pty Ltd
446 Parramatta Rd
PETERSHAM NSW 2049

Dear Mark,

RE SITE: 2 Smith St, Summer Hill

I refer to your search request of 19th March 2008 requesting information on a Licence to Keep Dangerous Goods on the above site.

Enclosed are copies of the documents, which WorkCover holds on Dangerous Goods Licence **35/007986** relating to the storage of dangerous goods at the above-mentioned premises as listed on the Stored Chemical Information Database (SCID).

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

Naomi James

Naomi James
A/Senior Licensing Officer
Dangerous Goods

WorkCover. **Watching out for you.**

WorkCover NSW ABN 77 682 742 966 92-100 Donnison Street Gosford NSW 2250 Locked Bag 2906 Lisarow NSW 2252
Telephone 02 4321 5000 Facsimile 02 4325 4145 WorkCover Assistance Service **13 10 50**
DX 731 Sydney Website **www.workcover.nsw.gov.au**

APPENDIX D

BOREHOLE & GROUNDWATER LOGS

BOREHOLE LOG

CLIENT	EG FUNDS MANAGEMENT	**BOREHOLE NO.**	**BH1**
PROJECT	Environmental Site Assessment	**DATE.**	**30.05.07**
LOCATION	Smith & Edwards St, Summer Hill	**JOB NO.**	**E1559**
METHOD	Hand Auger	**SURFACE ELEV.**	**N/A**
LOGGED BY	DH	**CHECKED BY**	**MK**

Depth (m)	Sample	Graphic Symbol	Ground Water	Classification Symbol	**Soil Description (Colour, particle characteristics, strength, placticity, moisture, etc)**	Observations
		▒		SL	TOPSOIL, SANDY LOAM, silty, fine to coarse grained, brown, root fibres	
0.25		▒				
	▇	▒				
		▒		SCL	FILL, MEDIUM CLAY low to medium plasticity, brown, silty	
0.5		▒				
0.75	▇	▒				
					End of Borehole @ 0.75m below ground level in fill	
1						
1.25						
1.5						
1.75						
2						
2.25						
2.5						
2.75						
3						

Log Symbols

▼ Standing groundwater level in borehole

▶ Water seepage in borehole (wet)

Samples

BH1.0.5 - Soil sample taken at indicated depth

S - Surface water sample

GW/W - Groundwater sample/water sample

Moisture Condition

D Dry - Runs freely through fingers

M Moist - Does not run freely but no free water visible on soil surface

W Wet - Free water visible on soil surface

Soil Classification

Clay - Particle size less than 0.002mm

Silt - Particle size between 0.002 and 0.06mm

Sand - Particle size between 0.06 and 2.0mm

Gravel - Particle size between 2.0 and 60mm

Strength

VS Very Soft - Unconfined compressive strength less than 25kPa

S Soft - Unconfined compressive strength 25-50kPa

F Firm - Unconfined compressive strength 50-100kPa

St Stiff - Unconfined compressive strength 100-200kPa

VSt Very Stiff - Unconfined compressive strength 200-400kPa

H Hard - Unconfined compressive strength greater than 400kPa

BOREHOLE LOG

Aargus
AUSTRALIA

CLIENT	EG FUNDS MANAGEMENT	**BOREHOLE NO.**	**BH2**
PROJECT	Environmental Site Assessment	**DATE.**	**30.05.07**
LOCATION	Smith & Edwards St, Summer Hill	**JOB NO.**	**E1559**
METHOD	Drill Rig	**SURFACE ELEV.**	**N/A**
LOGGED BY	MK	**CHECKED BY**	**DH**

Depth (m)	Sample	Graphic Symbol	Ground Water	Classification Symbol	Soil Description (Colour, particle characteristics, strength, placticity, moisture, etc)	Observations
		▨		AC	ASPHALTIC CONCRETE	
		▨		G	GRAVEL	
0.25	■	▨		SL	FILL, SANDY LOAM, fine to medium grained, brown, traces of gravel.	
0.5 0.75 **1**	■	▨		SiC	FILL, SILTY CLAY, medium plasticity, brown	
1.25 **1.5**	■	▨		SiC	NATURAL, SILTY CLAY, Sandy, medium plasticity, red-brown	
1.75 **2** 2.25 **2.5** 2.75 **3**					End of Borehole @ 1.7m below ground level in natural sandy clay	

Log Symbols

▼ Standing groundwater level in borehole

▶ Water seepage in borehole (wet)

Samples

BH1.0.5	- Soil sample taken at indicated depth
S	- Surface water sample
GW/W	- Groundwater sample/water sample

Moisture Condition

D Dry	- Runs freely through fingers
M Moist	- Does not run freely but no free water visible on soil surface
W Wet	- Free water visible on soil surface

Soil Classification

Clay	- Particle size less than 0.002mm
Silt	- Particle size between 0.002 and 0.06mm
Sand	- Particle size between 0.06 and 2.0mm
Gravel	- Particle size between 2.0 and 60mm

Strength

VS Very Soft	- Unconfined compressive strength less than 25kPa
S Soft	- Unconfined compressive strength 25-50kPa
F Firm	- Unconfined compressive strength 50-100kPa
St Stiff	- Unconfined compressive strength 100-200kPa
VSt Very Stiff	- Unconfined compressive strength 200-400kPa
H Hard	- Unconfined compressive strength greater than 400kPa

BOREHOLE LOG

CLIENT	EG FUNDS MANAGEMENT	**BOREHOLE NO.**	**BH3**
PROJECT	Environmental Site Assessment	**DATE.**	**30.05.07**
LOCATION	Smith & Edwards St, Summer Hill	**JOB NO.**	**E1559**
METHOD	Hand Auger	**SURFACE ELEV.**	**N/A**
LOGGED BY	DH	**CHECKED BY**	**DH**

Depth (m)	Sample	Graphic Symbol	Ground Water	Classification Symbol	Soil Description (Colour, particle characteristics, strength, placticity, moisture, etc)	Observations
		▨		SL	FILL, SANDY LOAM, fine to medium grained, brown, traces of gravel.	
0.25						
0.5		▨		SiC	FILL, SILTY CLAY, medium plasticity, brown	
					End of Borehole @ 0.6m below ground level in fill	
0.75						
1						
1.25						
1.5						
1.75						
2						
2.25						
2.5						
2.75						
3						

Log Symbols

▼ Standing groundwater level in borehole

▶ Water seepage in borehole (wet)

Samples

BH1.0.5	- Soil sample taken at indicated depth
S	- Surface water sample
GW/W	- Groundwater sample/water sample

Moisture Condition

D Dry	- Runs freely through fingers
M Moist	- Does not run freely but no free water visible on soil surface
W Wet	- Free water visible on soil surface

Soil Classification

Clay	- Particle size less than 0.002mm
Silt	- Particle size between 0.002 and 0.06mm
Sand	- Particle size between 0.06 and 2.0mm
Gravel	- Particle size between 2.0 and 60mm

Strength

VS Very Soft	- Unconfined compressive strength less than 25kPa
S Soft	- Unconfined compressive strength 25-50kPa
F Firm	- Unconfined compressive strength 50-100kPa
St Stiff	- Unconfined compressive strength 100-200kPa
VSt Very Stiff	- Unconfined compressive strength 200-400kPa
H Hard	- Unconfined compressive strength greater than 400kPa

BOREHOLE LOG

CLIENT	EG FUNDS MANAGEMENT	**BOREHOLE NO.**	**BH4**
PROJECT	Environmental Site Assessment	**DATE.**	**30.05.07**
LOCATION	Smith & Edwards St, Summer Hill	**JOB NO.**	**E1559**
METHOD	Hand Auger	**SURFACE ELEV.**	**N/A**
LOGGED BY	DH	**CHECKED BY**	**MK**

Depth (m)	Sample	Graphic Symbol	Ground Water	Classification Symbol	**Soil Description** **(Colour, particle characteristics, strength, placticity, moisture, etc)**	**Observations**
		░		SL	TOPSOIL, SANDY LOAM, silty, fine to coarse grained, brown, root fibres	
0.25		░				
	■	░				
0.5		▓		SiC	NATURAL, SILTY CLAY, medium-high plasticity, red-brown, mottled grey	
0.75		▓				
1		▓				
1.25		▓				
1.5		▓				
1.75		▓				
2		▓				
2.25		▓				
2.5	■	▓				
					End of Borehole @ 2.5m below ground level in natural silty clay	
2.75						
3						

Log Symbols

▼ Standing groundwater level in borehole

▶ Water seepage in borehole (wet)

Samples

BH1.0.5	- Soil sample taken at indicated depth
S	- Surface water sample
GW/W	- Groundwater sample/water sample

Moisture Condition

D Dry	- Runs freely through fingers
M Moist	- Does not run freely but no free water visible on soil surface
W Wet	- Free water visible on soil surface

Soil Classification

Clay	- Particle size less than 0.002mm
Silt	- Particle size between 0.002 and 0.06mm
Sand	- Particle size between 0.06 and 2.0mm
Gravel	- Particle size between 2.0 and 60mm

Strength

VS Very Soft	- Unconfined compressive strength less than 25kPa
S Soft	- Unconfined compressive strength 25-50kPa
F Firm	- Unconfined compressive strength 50-100kPa
St Stiff	- Unconfined compressive strength 100-200kPa
VSt Very Stiff	- Unconfined compressive strength 200-400kPa
H Hard	- Unconfined compressive strength greater than 400kPa

BOREHOLE LOG

CLIENT	EG FUNDS MANAGEMENT	**BOREHOLE NO.**	**BH5**
PROJECT	Environmental Site Assessment	**DATE.**	**30.05.07**
LOCATION	Smith & Edwards St, Summer Hill	**JOB NO.**	**E1559**
METHOD	Drill Rig	**SURFACE ELEV.**	**N/A**
LOGGED BY	MK	**CHECKED BY**	**DH**

Depth (m)	Sample	Graphic Symbol	Ground Water	Classification Symbol	**Soil Description** **(Colour, particle characteristics, strength, placticity, moisture, etc)**	**Observations**
		░		T	TOPSOIL, SAND, silty, fine to coarse grained, brown, root fibres	
		▒		SiC	FILL,SILTY CLAY, low-medium plasticity, brown/pale brown, gravel	
0.25		▒				
	■	▒				
0.5		▒		SiC	FILL, SILTY CLAY, medium plasticity, brown	
0.75		▒				
1	■	▒				
1.25		▒				
1.5		▓		SiC	NATURAL, SILTY CLAY, medium-high plasticity, red-brown, mottled grey	
1.75	■	▓				
2					End of Borehole @ 2.0m below ground level in natural silty clay	
2.25						
2.5						
2.75						
3						

Log Symbols

▼ Standing groundwater level in borehole

▶ Water seepage in borehole (wet)

Samples

BH1.0.5 - Soil sample taken at indicated depth
S - Surface water sample
GW/W - Groundwater sample/water sample

Moisture Condition

D Dry - Runs freely through fingers
M Moist - Does not run freely but no free water visible on soil surface
W Wet - Free water visible on soil surface

Soil Classification

Clay - Particle size less than 0.002mm
Silt - Particle size between 0.002 and 0.06mm
Sand - Particle size between 0.06 and 2.0mm
Gravel - Particle size between 2.0 and 60mm

Strength

VS Very Soft - Unconfined compressive strength less than 25kPa
S Soft - Unconfined compressive strength 25-50kPa
F Firm - Unconfined compressive strength 50-100kPa
St Stiff - Unconfined compressive strength 100-200kPa
VSt Very Stiff - Unconfined compressive strength 200-400kPa
H Hard - Unconfined compressive strength greater than 400kPa

BOREHOLE LOG

CLIENT	EG FUNDS MANAGEMENT	**BOREHOLE NO.**	**BH6**
PROJECT	Environmental Site Assessment	**DATE.**	**30.05.07**
LOCATION	Smith & Edwards St, Summer Hill	**JOB NO.**	**E1559**
METHOD	Drill Rig	**SURFACE ELEV.**	**N/A**
LOGGED BY	MK	**CHECKED BY**	**DH**

Depth (m)	Sample	Graphic Symbol	Ground Water	Classification Symbol	Soil Description (Colour, particle characteristics, strength, placticity, moisture, etc)	Observations
		░		T	TOPSOIL, SAND, silty, fine to coarse grained, brown, root fibres	
		░		SCL	FILL, SANDY CLAY LOAM, low to medium plasticity, brown, trace of fly ash	
0.5	▬	░				
1		░				
		░		SiC	FILL, SILTY CLAY, medium plasticity, brown	
1.5	▬	░				
2		░				
2.5		░				
		▓		SiCL	NATURAL, SILTY CLAY LOAM, medium plasticity, red-brown	
	▬	▓				
3		▓				
3.5		▓				
		▓		SiC	NATURAL, SILTY CLAY, medium-high plasticity, red-brown, mottled grey	
4		▓				
					Refusal on Sandstone, End of Borehole @ 4.3m below ground level	
4.5						
5						
5.5						
6						

Log Symbols

▼ Standing groundwater level in borehole

▶ Water seepage in borehole (wet)

Samples

BH1.0.5	- Soil sample taken at indicated depth
S	- Surface water sample
GW/W	- Groundwater sample/water sample

Moisture Condition

D Dry	- Runs freely through fingers
M Moist	- Does not run freely but no free water visible on soil surface
W Wet	- Free water visible on soil surface

Soil Classification

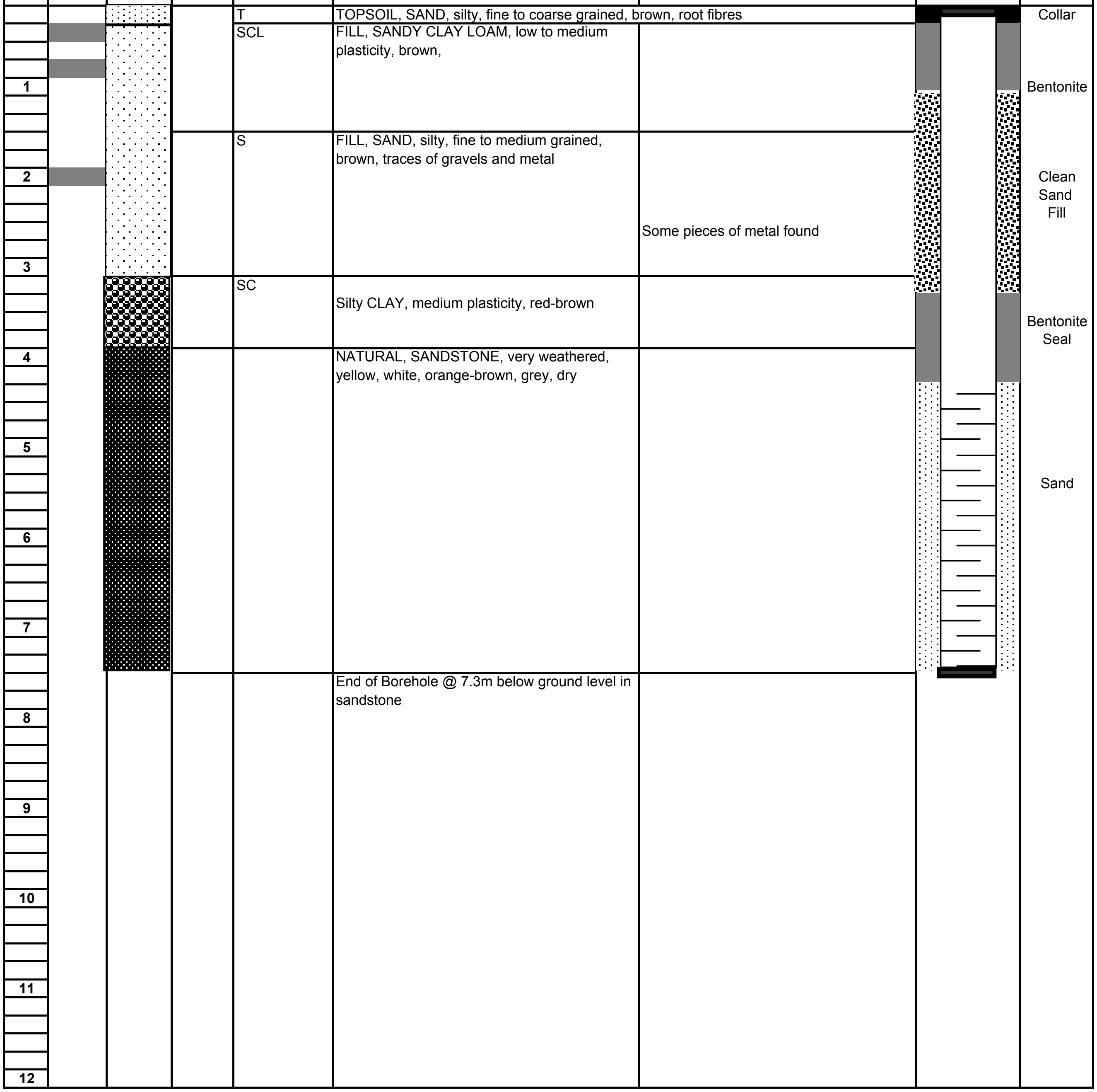
Clay	- Particle size less than 0.002mm
Silt	- Particle size between 0.002 and 0.06mm
Sand	- Particle size between 0.06 and 2.0mm
Gravel	- Particle size between 2.0 and 60mm

Strength

VS Very Soft	- Unconfined compressive strength less than 25kPa
S Soft	- Unconfined compressive strength 25-50kPa
F Firm	- Unconfined compressive strength 50-100kPa
St Stiff	- Unconfined compressive strength 100-200kPa
VSt Very Stiff	- Unconfined compressive strength 200-400kPa
H Hard	- Unconfined compressive strength greater than 400kPa

BOREHOLE & GROUNDWATER WELL LOG

CLIENT	EG FUNDS MANAGEMENT	**BOREHOLE NO.**	**7 / GW1**
PROJECT	Environmental Site Assessment	**DATE.**	**11.03.08**
LOCATION	Smith & Edwards St, Summer Hill	**JOB NO.**	**E1559**
METHOD	Drill Rig	**SURFACE ELEV.**	**N/A**
LOGGED BY	CK	**CHECKED BY**	**MK**



Sample	Classification Symbol	Soil Description (Plasticity, particle characteristics, colour, moisture, etc)	Observations	Design
	T	TOPSOIL, SAND, silty, fine to coarse grained, brown, root fibres		Collar
▨ ▨	SCL	FILL, SANDY CLAY LOAM, low to medium plasticity, brown,		Bentonite
▨	S	FILL, SAND, silty, fine to medium grained, brown, traces of gravels and metal	Some pieces of metal found	Clean Sand Fill
	SC	Silty CLAY, medium plasticity, red-brown		Bentonite Seal
		NATURAL, SANDSTONE, very weathered, yellow, white, orange-brown, grey, dry		Sand
		End of Borehole @ 7.3m below ground level in sandstone		

Log Symbols

Standing groundwater level in borehole

Water seepage in borehole (wet)

Samples

BH1.0.5	- Soil sample taken at indicated depth
S	- Surface water sample
GW/W	- Groundwater sample/water sample

Moisture Condition

D Dry	- Runs freely through fingers
M Moist	- Does not run freely but no free water visible on soil surface
W Wet	- Free water visible on soil surface

Soil Classification

Clay	- Particle size less than 0.002mm
Silt	- Particle size between 0.002 and 0.06mm
Sand	- Particle size between 0.06 and 2.0mm
Gravel	- Particle size between 2.0 and 60mm

Strength

VS	Very Soft	- Unconfined compressive strength less than 25kPa
S	Soft	- Unconfined compressive strength 25-50kPa
F	Firm	- Unconfined compressive strength 50-100kPa
St	Stiff	- Unconfined compressive strength 100-200kPa
VSt	Very Stiff	- Unconfined compressive strength 200-400kPa
H	Hard	- Unconfined compressive strength greater than 400kPa

BOREHOLE LOG

CLIENT	EG FUNDS MANAGEMENT	**BOREHOLE NO.**	**BH8**
PROJECT	Environmental Site Assessment	**DATE.**	**30.05.07**
LOCATION	Smith & Edwards St, Summer Hill	**JOB NO.**	**E1559**
METHOD	Hand Auger	**SURFACE ELEV.**	**N/A**
LOGGED BY	DH	**CHECKED BY**	**MK**

Depth (m)	Sample	Graphic Symbol	Ground Water	Classification Symbol	**Soil Description** **(Colour, particle characteristics, strength, placticity, moisture, etc)**	Observations
0.25	▬	░		SCL	FILL, SANDY CLAY LOAM, low to medium plasticity, brown, trace of fly ash	
0.5 0.75 **1** 1.25 **1.5** 1.75	▬	▓		SiC	NATURAL, SILTY CLAY, medium-high plasticity, red-brown, mottled grey	
2 2.25 **2.5** 2.75 **3**					End of Borehole @ 1.8m below ground level in natural silty clay due to refusal	

Log Symbols

▼ Standing groundwater level in borehole

▶ Water seepage in borehole (wet)

Samples

BH1.0.5	- Soil sample taken at indicated depth
S	- Surface water sample
GW/W	- Groundwater sample/water sample

Moisture Condition

D Dry	- Runs freely through fingers
M Moist	- Does not run freely but no free water visible on soil surface
W Wet	- Free water visible on soil surface

Soil Classification

Clay	- Particle size less than 0.002mm
Silt	- Particle size between 0.002 and 0.06mm
Sand	- Particle size between 0.06 and 2.0mm
Gravel	- Particle size between 2.0 and 60mm

Strength

VS Very Soft	- Unconfined compressive strength less than 25kPa
S Soft	- Unconfined compressive strength 25-50kPa
F Firm	- Unconfined compressive strength 50-100kPa
St Stiff	- Unconfined compressive strength 100-200kPa
VSt Very Stiff	- Unconfined compressive strength 200-400kPa
H Hard	- Unconfined compressive strength greater than 400kPa

BOREHOLE LOG

CLIENT	EG FUNDS MANAGEMENT	**BOREHOLE NO.**	**BH9**
PROJECT	Environmental Site Assessment	**DATE.**	**30.05.07**
LOCATION	Smith & Edwards St, Summer Hill	**JOB NO.**	**E1559**
METHOD	Drill Rig	**SURFACE ELEV.**	**N/A**
LOGGED BY	MK	**CHECKED BY**	**DH**

Depth (m)	Sample	Graphic Symbol	Ground Water	Classification Symbol	Soil Description (Colour, particle characteristics, strength, placticity, moisture, etc)	Observations
		░		SiC	FILL, SILTY CLAY, medium plasticity, brown	
	■	░				
0.5		░				
1	■	░				
1.5		░				
2	■	░				
2.5		░				
		▩		SiC	NATURAL, SILTY CLAY, medium-high plasticity, red-brown, mottled grey	
	■	▩				
3		▩				
3.5		▩				
4		▩				
					End of Borehole @ 4.0m BGL in silty clay	
4.5						
5						
5.5						
6						

Log Symbols

▼ Standing groundwater level in borehole

▶ Water seepage in borehole (wet)

Samples

BH1.0.5	- Soil sample taken at indicated depth
S	- Surface water sample
GW/W	- Groundwater sample/water sample

Moisture Condition

D Dry	- Runs freely through fingers
M Moist	- Does not run freely but no free water visible on soil surface
W Wet	- Free water visible on soil surface

Soil Classification

Clay	- Particle size less than 0.002mm
Silt	- Particle size between 0.002 and 0.06mm
Sand	- Particle size between 0.06 and 2.0mm
Gravel	- Particle size between 2.0 and 60mm

Strength

VS Very Soft	- Unconfined compressive strength less than 25kPa
S Soft	- Unconfined compressive strength 25-50kPa
F Firm	- Unconfined compressive strength 50-100kPa
St Stiff	- Unconfined compressive strength 100-200kPa
VSt Very Stiff	- Unconfined compressive strength 200-400kPa
H Hard	- Unconfined compressive strength greater than 400kPa

BOREHOLE LOG

CLIENT	EG FUNDS MANAGEMENT	**BOREHOLE NO.**	**BH10**
PROJECT	Environmental Site Assessment	**DATE.**	**30.05.07**
LOCATION	Smith & Edwards St, Summer Hill	**JOB NO.**	**E1559**
METHOD	Drill Rig	**SURFACE ELEV.**	**N/A**
LOGGED BY	MK	**CHECKED BY**	**DH**

Depth (m)	Sample	Graphic Symbol	Ground Water	Classification Symbol	**Soil Description** **(Colour, particle characteristics, strength, placticity, moisture, etc)**	**Observations**
0.5 1 1.5 2 2.5 3	▬ ▬ ▬	▒		SiC	FILL, SILTY CLAY, medium plasticity, red-brown	Some gravel, rail ballast for 200mm- depth
3.5 4 4.5	▬	▓		SiC	NATURAL, SILTY CLAY, medium-high plasticity, red-brown, mottled grey	
5 5.5 6					End of Borehole @ 4.5m BGL in silty clay	

Log Symbols

▼ Standing groundwater level in borehole

▶ Water seepage in borehole (wet)

Samples

BH1.0.5	- Soil sample taken at indicated depth
S	- Surface water sample
GW/W	- Groundwater sample/water sample

Moisture Condition

D Dry	- Runs freely through fingers
M Moist	- Does not run freely but no free water visible on soil surface
W Wet	- Free water visible on soil surface

Soil Classification

Clay	- Particle size less than 0.002mm
Silt	- Particle size between 0.002 and 0.06mm
Sand	- Particle size between 0.06 and 2.0mm
Gravel	- Particle size between 2.0 and 60mm

Strength

VS Very Soft	- Unconfined compressive strength less than 25kPa
S Soft	- Unconfined compressive strength 25-50kPa
F Firm	- Unconfined compressive strength 50-100kPa
St Stiff	- Unconfined compressive strength 100-200kPa
VSt Very Stiff	- Unconfined compressive strength 200-400kPa
H Hard	- Unconfined compressive strength greater than 400kPa

BOREHOLE LOG

CLIENT	EG FUNDS MANAGEMENT	**BOREHOLE NO.**	**BH11**
PROJECT	Environmental Site Assessment	**DATE.**	**30.05.07**
LOCATION	Smith & Edwards St, Summer Hill	**JOB NO.**	**E1559**
METHOD	Drill Rig	**SURFACE ELEV.**	**N/A**
LOGGED BY	MK	**CHECKED BY**	**DH**

Depth (m)	Sample	Graphic Symbol	Ground Water	Classification Symbol	Soil Description (Colour, particle characteristics, strength, placticity, moisture, etc)	Observations
		░		SCL	FILL, SANDY CLAY LOAM, low to medium plasticity, brown, trace of fly ash	
0.25	▬	░				
0.5		░				
		░		SiC	FILL, SILTY CLAY, medium to high plasticity, red-brown and grey with mottled red, pieces of gravel	
0.75	▬	░				
1		░				
1.25		░				
1.5		░				
1.75		░				
		▓		SiC	NATURAL, SILTY CLAY, medium-high plasticity, red-brown, mottled grey	
2	▬	▓				
2.25		▓				
2.5		▓				
					End of Borehole @ 2.5m below ground level in natural silty clay	
2.75						
3						

Log Symbols

▼ Standing groundwater level in borehole

▶ Water seepage in borehole (wet)

Samples

BH1.0.5	- Soil sample taken at indicated depth
S	- Surface water sample
GW/W	- Groundwater sample/water sample

Moisture Condition

D Dry	- Runs freely through fingers
M Moist	- Does not run freely but no free water visible on soil surface
W Wet	- Free water visible on soil surface

Soil Classification

Clay	- Particle size less than 0.002mm
Silt	- Particle size between 0.002 and 0.06mm
Sand	- Particle size between 0.06 and 2.0mm
Gravel	- Particle size between 2.0 and 60mm

Strength

VS Very Soft	- Unconfined compressive strength less than 25kPa
S Soft	- Unconfined compressive strength 25-50kPa
F Firm	- Unconfined compressive strength 50-100kPa
St Stiff	- Unconfined compressive strength 100-200kPa
VSt Very Stiff	- Unconfined compressive strength 200-400kPa
H Hard	- Unconfined compressive strength greater than 400kPa

BOREHOLE LOG

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CLIENT	EG FUNDS MANAGEMENT	**BOREHOLE NO.**	**BH12**
PROJECT	Environmental Site Assessment	**DATE.**	**30.05.07**
LOCATION	Smith & Edwards St, Summer Hill	**JOB NO.**	**E1559**
METHOD	Hand Auger	**SURFACE ELEV.**	**N/A**
LOGGED BY	DH	**CHECKED BY**	**MK**

Depth (m)	Sample	Graphic Symbol	Ground Water	Classification Symbol	Soil Description (Colour, particle characteristics, strength, placticity, moisture, etc)	Observations
		▩			BRICKS	
0.25		░		SCL	FILL, SANDY CLAY LOAM, low to medium plasticity, brown, trace of fly ash	
0.5 0.75 1	▬	░		SC	FILL, SANDY CLAY, fine to medium grained, with ash, moist	
1.25 **1.5**	▬	▩		SiC	NATURAL, SILTY CLAY, medium-high plasticity, red-brown, mottled grey	
1.75 2 2.25 **2.5** 2.75 3					End of Borehole @ 1.0m below ground level in natural silty clay	

Log Symbols

▼ Standing groundwater level in borehole

▶ Water seepage in borehole (wet)

Samples

BH1.0.5	- Soil sample taken at indicated depth
S	- Surface water sample
GW/W	- Groundwater sample/water sample

Moisture Condition

D Dry	- Runs freely through fingers
M Moist	- Does not run freely but no free water visible on soil surface
W Wet	- Free water visible on soil surface

Soil Classification

Clay	- Particle size less than 0.002mm
Silt	- Particle size between 0.002 and 0.06mm
Sand	- Particle size between 0.06 and 2.0mm
Gravel	- Particle size between 2.0 and 60mm

Strength

VS Very Soft	- Unconfined compressive strength less than 25kPa
S Soft	- Unconfined compressive strength 25-50kPa
F Firm	- Unconfined compressive strength 50-100kPa
St Stiff	- Unconfined compressive strength 100-200kPa
VSt Very Stiff	- Unconfined compressive strength 200-400kPa
H Hard	- Unconfined compressive strength greater than 400kPa

BOREHOLE LOG

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CLIENT	EG FUNDS MANAGEMENT	**BOREHOLE NO.**	**BH13**
PROJECT	Environmental Site Assessment	**DATE.**	**30.05.07**
LOCATION	Smith & Edwards St, Summer Hill	**JOB NO.**	**E1559**
METHOD	Hand Auger	**SURFACE ELEV.**	**N/A**
LOGGED BY	DH	**CHECKED BY**	**MK**

Depth (m)	Sample	Graphic Symbol	Ground Water	Classification Symbol	Soil Description (Colour, particle characteristics, strength, placticity, moisture, etc)	Observations
					CONCRETE	
					FILL, SANDSTONE, bricks and rubble	
0.25						
0.5					End of Borehole @ 0.5m below ground level in fill	
0.75						
1						
1.25						
1.5						
1.75						
2						
2.25						
2.5						
2.75						
3						

Log Symbols

▼ Standing groundwater level in borehole
▶ Water seepage in borehole (wet)

Samples

BH1.0.5	- Soil sample taken at indicated depth
S	- Surface water sample
GW/W	- Groundwater sample/water sample

Moisture Condition

D Dry	- Runs freely through fingers
M Moist	- Does not run freely but no free water visible on soil surface
W Wet	- Free water visible on soil surface

Soil Classification

Clay	- Particle size less than 0.002mm
Silt	- Particle size between 0.002 and 0.06mm
Sand	- Particle size between 0.06 and 2.0mm
Gravel	- Particle size between 2.0 and 60mm

Strength

VS Very Soft	- Unconfined compressive strength less than 25kPa
S Soft	- Unconfined compressive strength 25-50kPa
F Firm	- Unconfined compressive strength 50-100kPa
St Stiff	- Unconfined compressive strength 100-200kPa
VSt Very Stiff	- Unconfined compressive strength 200-400kPa
H Hard	- Unconfined compressive strength greater than 400kPa

BOREHOLE LOG

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CLIENT	EG FUNDS MANAGEMENT	**BOREHOLE NO.**	**BH14**
PROJECT	Environmental Site Assessment	**DATE.**	**30.05.07**
LOCATION	Smith & Edwards St, Summer Hill	**JOB NO.**	**E1559**
METHOD	Drill Rig	**SURFACE ELEV.**	**N/A**
LOGGED BY	DH	**CHECKED BY**	**MK**

Depth (m)	Sample	Graphic Symbol	Ground Water	Classification Symbol	**Soil Description** **(Colour, particle characteristics, strength, placticity, moisture, etc)**	**Observations**
		▨		SCL	FILL, SANDY CLAY LOAM, low to medium plasticity, brown, trace of fly ash	
0.25	■	▨				
0.5		▨				
0.75		▩		SiC	NATURAL, SILTY CLAY, medium-high plasticity, red-brown, mottled grey	
1	■	▩				
1.25					End of Borehole @ 1.0m below ground level in natural silty clay	
1.5						
1.75						
2						
2.25						
2.5						
2.75						
3						

Log Symbols

▼ Standing groundwater level in borehole

▶ Water seepage in borehole (wet)

Samples

BH1.0.5	- Soil sample taken at indicated depth
S	- Surface water sample
GW/W	- Groundwater sample/water sample

Moisture Condition

D Dry	- Runs freely through fingers
M Moist	- Does not run freely but no free water visible on soil surface
W Wet	- Free water visible on soil surface

Soil Classification

Clay	- Particle size less than 0.002mm
Silt	- Particle size between 0.002 and 0.06mm
Sand	- Particle size between 0.06 and 2.0mm
Gravel	- Particle size between 2.0 and 60mm

Strength

VS	Very Soft	- Unconfined compressive strength less than 25kPa
S	Soft	- Unconfined compressive strength 25-50kPa
F	Firm	- Unconfined compressive strength 50-100kPa
St	Stiff	- Unconfined compressive strength 100-200kPa
VSt	Very Stiff	- Unconfined compressive strength 200-400kPa
H	Hard	- Unconfined compressive strength greater than 400kPa

BOREHOLE LOG

CLIENT	EG FUNDS MANAGEMENT	**BOREHOLE NO.**	**BH15**
PROJECT	Environmental Site Assessment	**DATE.**	**30.05.07**
LOCATION	Smith & Edwards St, Summer Hill	**JOB NO.**	**E1559**
METHOD	Drill Rig	**SURFACE ELEV.**	**N/A**
LOGGED BY	DH	**CHECKED BY**	**MK**

Depth (m)	Sample	Graphic Symbol	Ground Water	Classification Symbol	**Soil Description** **(Colour, particle characteristics, strength, placticity, moisture, etc)**	**Observations**
		▨		SCL	FILL, SANDY CLAY LOAM, low to medium plasticity, brown, trace of fly ash	
0.25		▨				
0.5	▬	▨				
0.75		▨				
1		▨				
		▩		SiC	NATURAL, SILTY CLAY, medium-high plasticity, red-brown, mottled grey	
1.25	▬	▩				
1.5		▩				
					End of Borehole @ 1.5m below ground level in natural silty clay	
1.75						
2						
2.25						
2.5						
2.75						
3						

Log Symbols

▼ Standing groundwater level in borehole

▶ Water seepage in borehole (wet)

Samples

BH1.0.5	- Soil sample taken at indicated depth
S	- Surface water sample
GW/W	- Groundwater sample/water sample

Moisture Condition

D Dry	- Runs freely through fingers
M Moist	- Does not run freely but no free water visible on soil surface
W Wet	- Free water visible on soil surface

Soil Classification

Clay	- Particle size less than 0.002mm
Silt	- Particle size between 0.002 and 0.06mm
Sand	- Particle size between 0.06 and 2.0mm
Gravel	- Particle size between 2.0 and 60mm

Strength

VS Very Soft	- Unconfined compressive strength less than 25kPa
S Soft	- Unconfined compressive strength 25-50kPa
F Firm	- Unconfined compressive strength 50-100kPa
St Stiff	- Unconfined compressive strength 100-200kPa
VSt Very Stiff	- Unconfined compressive strength 200-400kPa
H Hard	- Unconfined compressive strength greater than 400kPa

BOREHOLE LOG

CLIENT	EG FUNDS MANAGEMENT	**BOREHOLE NO.**	**BH16**
PROJECT	Environmental Site Assessment	**DATE.**	**30.05.07**
LOCATION	Smith & Edwards St, Summer Hill	**JOB NO.**	**E1559**
METHOD	Hand Auger	**SURFACE ELEV.**	**N/A**
LOGGED BY	DH	**CHECKED BY**	**MK**

Depth (m)	Sample	Graphic Symbol	Ground Water	Classification Symbol	**Soil Description** **(Colour, particle characteristics, strength, placticity, moisture, etc)**	Observations
		▨		SCL	FILL, SANDY CLAY LOAM, low to medium plasticity, brown, trace of fly ash with gravel	
0.25	▨	▨				
0.5		▨				
0.75	▨	▨				
					End of Borehole @ 0.75m below ground level in fill	
1						
1.25						
1.5						
1.75						
2						
2.25						
2.5						
2.75						
3						

Log Symbols

▼ Standing groundwater level in borehole

▶ Water seepage in borehole (wet)

Samples

BH1.0.5	- Soil sample taken at indicated depth
S	- Surface water sample
GW/W	- Groundwater sample/water sample

Moisture Condition

D Dry	- Runs freely through fingers
M Moist	- Does not run freely but no free water visible on soil surface
W Wet	- Free water visible on soil surface

Soil Classification

Clay	- Particle size less than 0.002mm
Silt	- Particle size between 0.002 and 0.06mm
Sand	- Particle size between 0.06 and 2.0mm
Gravel	- Particle size between 2.0 and 60mm

Strength

VS Very Soft	- Unconfined compressive strength less than 25kPa
S Soft	- Unconfined compressive strength 25-50kPa
F Firm	- Unconfined compressive strength 50-100kPa
St Stiff	- Unconfined compressive strength 100-200kPa
VSt Very Stiff	- Unconfined compressive strength 200-400kPa
H Hard	- Unconfined compressive strength greater than 400kPa

BOREHOLE LOG

CLIENT	EG FUNDS MANAGEMENT	**BOREHOLE NO.**	**BH17**
PROJECT	Environmental Site Assessment	**DATE.**	**30.05.07**
LOCATION	Smith & Edwards St, Summer Hill	**JOB NO.**	**E1559**
METHOD	Hand Auger	**SURFACE ELEV.**	**N/A**
LOGGED BY	DH	**CHECKED BY**	**MK**

Depth (m)	Sample	Graphic Symbol	Ground Water	Classification Symbol	**Soil Description (Colour, particle characteristics, strength, placticity, moisture, etc)**	Observations
		▨		SL	TOPSOIL, SANDY LOAM, silty, fine to coarse grained, brown, root fibres	
0.25		▨				
		▨		SCL	FILL, SANY CLAY LOAM, low to medium plasticity, brown, silty	
0.5	■	▨				
0.75		▨				
					End of Borehole @ 0.75m below ground level in fill due to refusal	
1						
1.25						
1.5						
1.75						
2						
2.25						
2.5						
2.75						
3						

Log Symbols

▼ Standing groundwater level in borehole

▶ Water seepage in borehole (wet)

Samples

BH1.0.5 - Soil sample taken at indicated depth

S - Surface water sample

GW/W - Groundwater sample/water sample

Moisture Condition

D Dry - Runs freely through fingers

M Moist - Does not run freely but no free water visible on soil surface

W Wet - Free water visible on soil surface

Soil Classification

Clay - Particle size less than 0.002mm

Silt - Particle size between 0.002 and 0.06mm

Sand - Particle size between 0.06 and 2.0mm

Gravel - Particle size between 2.0 and 60mm

Strength

VS Very Soft - Unconfined compressive strength less than 25kPa

S Soft - Unconfined compressive strength 25-50kPa

F Firm - Unconfined compressive strength 50-100kPa

St Stiff - Unconfined compressive strength 100-200kPa

VSt Very Stiff - Unconfined compressive strength 200-400kPa

H Hard - Unconfined compressive strength greater than 400kPa

BOREHOLE LOG

CLIENT	EG FUNDS MANAGEMENT	**BOREHOLE NO.**	**BH18**
PROJECT	Environmental Site Assessment	**DATE.**	**30.05.07**
LOCATION	Smith & Edwards St, Summer Hill	**JOB NO.**	**E1559**
METHOD	Drill Rig	**SURFACE ELEV.**	**N/A**
LOGGED BY	MK	**CHECKED BY**	**DH**

Depth (m)	Sample	Graphic Symbol	Ground Water	Classification Symbol	**Soil Description** **(Colour, particle characteristics, strength, placticity, moisture, etc)**	**Observations**
		▤		AC	ASPHALTIC CONCRETE	
		▦		G	GRAVEL	
0.5	■	▒		SL	FILL, SANDY LOAM, fine to medium grained, brown, traces of gravel.	
1 1.5	■	▒		SiC	FILL, SILTY CLAY, medium plasticity, grey motteled orange and brown	
2 2.5 3 3.5 4	■	▩		SiC	NATURAL, SILTY CLAY, medium-high plasticity, pale brown, moist	Water encountered at 4m BGL
4.5 5 5.5 6			▶		End of Borehole @ 4.0m BGL in silty clay	

Log Symbols

▼ Standing groundwater level in borehole

▶ Water seepage in borehole (wet)

Samples

BH1.0.5	- Soil sample taken at indicated depth
S	- Surface water sample
GW/W	- Groundwater sample/water sample

Moisture Condition

D Dry	- Runs freely through fingers
M Moist	- Does not run freely but no free water visible on soil surface
W Wet	- Free water visible on soil surface

Soil Classification

Clay	- Particle size less than 0.002mm
Silt	- Particle size between 0.002 and 0.06mm
Sand	- Particle size between 0.06 and 2.0mm
Gravel	- Particle size between 2.0 and 60mm

Strength

VS	Very Soft	- Unconfined compressive strength less than 25kPa
S	Soft	- Unconfined compressive strength 25-50kPa
F	Firm	- Unconfined compressive strength 50-100kPa
St	Stiff	- Unconfined compressive strength 100-200kPa
VSt	Very Stiff	- Unconfined compressive strength 200-400kPa
H	Hard	- Unconfined compressive strength greater than 400kPa

BOREHOLE LOG

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CLIENT	EG FUNDS MANAGEMENT	**BOREHOLE NO.**	**BH19**
PROJECT	Environmental Site Assessment	**DATE.**	**30.05.07**
LOCATION	Smith & Edwards St, Summer Hill	**JOB NO.**	**E1559**
METHOD	Drill Rig	**SURFACE ELEV.**	**N/A**
LOGGED BY	MK	**CHECKED BY**	**DH**

Depth (m)	Sample	Graphic Symbol	Ground Water	Classification Symbol	Soil Description (Colour, particle characteristics, strength, placticity, moisture, etc)	Observations
		▤		AC	ASPHALTIC CONCRETE	
		▦		G	GRAVEL	
		░		SiC	FILL, SILTY CLAY, medium plasticity, grey motteled orange and browr	
0.25		░				
0.5	■	░				
0.75		░				
1		░				
		▓		SiC	NATURAL, SILTY CLAY, Sandy, medium plasticity, red-brown	
1.25	■	▓				
1.5		▓				
					End of Borehole @ 1.5m below ground level in natural silty clay	
1.75						
2						
2.25						
2.5						
2.75						
3						

BOREHOLE LOG

CLIENT	EG FUNDS MANAGEMENT	**BOREHOLE NO.**	**BH20**
PROJECT	Environmental Site Assessment	**DATE.**	**30.05.07**
LOCATION	Smith & Edwards St, Summer Hill	**JOB NO.**	**E1559**
METHOD	Drill Rig	**SURFACE ELEV.**	**N/A**
LOGGED BY	MK	**CHECKED BY**	**DH**

Depth (m)	Sample	Graphic Symbol	Ground Water	Classification Symbol	Soil Description (Colour, particle characteristics, strength, placticity, moisture, etc)	Observations
				AC	ASPHALTIC CONCRETE	
				G	GRAVEL	
0.25 **0.5** 0.75 **1**	▨			SiC	FILL, SILTY CLAY, medium plasticity, grey motteled orange and browr	
1.25 **1.5**	▨			SiC	NATURAL, SILTY CLAY, Sandy, medium plasticity, red-brown	
1.75 **2** 2.25 **2.5** 2.75 **3**					End of Borehole @ 1.5m below ground level in natural silty clay	

BOREHOLE LOG

CLIENT	EG FUNDS MANAGEMENT	**BOREHOLE NO.**	**BH21**
PROJECT	Environmental Site Assessment	**DATE.**	**30.05.07**
LOCATION	Smith & Edwards St, Summer Hill	**JOB NO.**	**E1559**
METHOD	Hand Auger	**SURFACE ELEV.**	**N/A**
LOGGED BY	DH	**CHECKED BY**	**MK**

Depth (m)	Sample	Graphic Symbol	Ground Water	Classification Symbol	**Soil Description** **(Colour, particle characteristics, strength, placticity, moisture, etc)**	Observations
		▨		SCL	FILL, SANDY CLAY LOAM, low to medium plasticity, brown, trace of fly ash with gravel	
0.25	■	▨				
0.5					End of Borehole @ 0.5m below ground level in fill due to refusal	
0.75						
1						
1.25						
1.5						
1.75						
2						
2.25						
2.5						
2.75						
3						

Log Symbols

▼ Standing groundwater level in borehole

▶ Water seepage in borehole (wet)

Samples

BH1.0.5	- Soil sample taken at indicated depth
S	- Surface water sample
GW/W	- Groundwater sample/water sample

Moisture Condition

D Dry	- Runs freely through fingers
M Moist	- Does not run freely but no free water visible on soil surface
W Wet	- Free water visible on soil surface

Soil Classification

Clay	- Particle size less than 0.002mm
Silt	- Particle size between 0.002 and 0.06mm
Sand	- Particle size between 0.06 and 2.0mm
Gravel	- Particle size between 2.0 and 60mm

Strength

VS Very Soft	- Unconfined compressive strength less than 25kPa
S Soft	- Unconfined compressive strength 25-50kPa
F Firm	- Unconfined compressive strength 50-100kPa
St Stiff	- Unconfined compressive strength 100-200kPa
VSt Very Stiff	- Unconfined compressive strength 200-400kPa
H Hard	- Unconfined compressive strength greater than 400kPa

BOREHOLE LOG

CLIENT	EG FUNDS MANAGEMENT	**BOREHOLE NO.**	**BH22**
PROJECT	Environmental Site Assessment	**DATE.**	**30.05.07**
LOCATION	Smith & Edwards St, Summer Hill	**JOB NO.**	**E1559**
METHOD	Drill Rig	**SURFACE ELEV.**	**N/A**
LOGGED BY	MK	**CHECKED BY**	**DH**

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Depth (m)	Sample	Graphic Symbol	Ground Water	Classification Symbol	Soil Description **(Colour, particle characteristics, strength, plasticity, moisture, etc)**	Observations
		▨		SCL	FILL, SANDY CLAY LOAM, low to medium plasticity, brown, trace of fly ash	
0.25		▨				
	■	▨				
0.5		▨				
0.75	■	▨				
		▩		SiC	NATURAL, SILTY CLAY, medium-high plasticity, pale brown, moist	
1		▩				
1.25		▩				
		▩		SiC	NATURAL, SILTY CLAY, Sandy, medium plasticity, red-brown	
	■	▩				
1.5		▩				
1.75		▩				
		▩		SiC	NATURAL, SILTY CLAY, Sandy, medium plasticity, yellow-brown	
2		▩				
2.25		▩				
2.5		▩				
2.75		▩				
					End of Borehole @ 2.8m BGL in natural silty clay, refusal on Sandstone	
3						

BOREHOLE LOG

CLIENT	EG FUNDS MANAGEMENT	**BOREHOLE NO.**	**BH23**
PROJECT	Environmental Site Assessment	**DATE.**	**30.05.07**
LOCATION	Smith & Edwards St, Summer Hill	**JOB NO.**	**E1559**
METHOD	Drill Rig	**SURFACE ELEV.**	**N/A**
LOGGED BY	MK	**CHECKED BY**	**DH**

Depth (m)	Sample	Graphic Symbol	Ground Water	Classification Symbol	**Soil Description** **(Colour, particle characteristics, strength, placticity, moisture, etc)**	**Observations**
		▩		G	GRAVEL	
0.25	■	▨		SiC	FILL, SILTY CLAY, medium plasticity, red brown pieces of grave	
0.5					End of Borehole @ 0.4m BGL, due to refusual on Sandstone	
0.75						
1						
1.25						
1.5						
1.75						
2						
2.25						
2.5						
2.75						
3						

BOREHOLE LOG

CLIENT	EG FUNDS MANAGEMENT	**BOREHOLE NO.**	**BH24**
PROJECT	Environmental Site Assessment	**DATE.**	**30.05.07**
LOCATION	Smith & Edwards St, Summer Hill	**JOB NO.**	**E1559**
METHOD	Drill Rig	**SURFACE ELEV.**	**N/A**
LOGGED BY	MK	**CHECKED BY**	**DH**

Depth (m)	Sample	Graphic Symbol	Ground Water	Classification Symbol	**Soil Description** **(Colour, particle characteristics, strength, placticity, moisture, etc)**	**Observations**
0.25 **0.5**	▬	░		SCL	FILL, SANDY CLAY LOAM, low to medium plasticity, brown, trace of fly ash	
0.75 **1** 1.25	▬	░		SiC	FILL, SILTY CLAY, medium plasticity, brown	
1.5 1.75	▬	▓		SiC	NATURAL, SILTY CLAY, Sandy, medium plasticity, red-brown	
2 2.25 **2.5** 2.75 **3**					End of Borehole @ 1.8m below ground level in natural silty clay	

BOREHOLE LOG

CLIENT	EG FUNDS MANAGEMENT	**BOREHOLE NO.**	**BH25**
PROJECT	Environmental Site Assessment	**DATE.**	**13.03.08**
LOCATION	Smith & Edwards St, Summer Hill	**JOB NO.**	**E1559**
METHOD	Drill Rig	**SURFACE ELEV.**	**N/A**
LOGGED BY	CK	**CHECKED BY**	**MK**

Depth (m)	Sample	Graphic Symbol	Ground Water	Classification Symbol	**Soil Description (Colour, particle characteristics, strength, placticity, moisture, etc)**	**Observations**
0.25 0.5 0.75 1		░		SiC	FILL, SILTY CLAY, medium plasticity, red-brown	
1.25 1.5	■	▒		SiC	NATURAL, SILTY CLAY, Sandy, medium plasticity, red-brown	
1.75		▓			NATURAL, SANDSTONE, very weathered, white, dry	
2 2.25 2.5 2.75 3					End of Borehole @ 1.8m below ground level in sandstone	

BOREHOLE LOG

CLIENT	EG FUNDS MANAGEMENT	**BOREHOLE NO.**	**BH26**
PROJECT	Environmental Site Assessment	**DATE.**	**30.05.07**
LOCATION	Smith & Edwards St, Summer Hill	**JOB NO.**	**E1559**
METHOD	Drill Rig	**SURFACE ELEV.**	**N/A**
LOGGED BY	MK	**CHECKED BY**	**DH**

Depth (m)	Sample	Graphic Symbol	Ground Water	Classification Symbol	**Soil Description** **(Colour, particle characteristics, strength, placticity, moisture, etc)**	**Observations**
				SiC	FILL, SILTY CLAY, medium plasticity, red-brown	
0.25						
0.5						
	■					
0.75						
1						
				SiC	NATURAL, SILTY CLAY, Sandy, medium plasticity, red-brown	
1.25						
	■					
1.5						
					NATURAL, SANDSTONE, very weathered, white, dry	
1.75						
					End of Borehole @ 1.8m below ground level in sandstone	
2						
2.25						
2.5						
2.75						
3						

BOREHOLE LOG

CLIENT	EG FUNDS MANAGEMENT	**BOREHOLE NO.**	**BH27**
PROJECT	Environmental Site Assessment	**DATE.**	**30.05.07**
LOCATION	Smith & Edwards St, Summer Hill	**JOB NO.**	**E1559**
METHOD	Hand Auger	**SURFACE ELEV.**	**N/A**
LOGGED BY	DH	**CHECKED BY**	**MK**

Depth (m)	Sample	Graphic Symbol	Ground Water	Classification Symbol	Soil Description (Colour, particle characteristics, strength, placticity, moisture, etc)	Observations
		░		T	TOPSOIL, mulch, brown, traces of roots and root fibres	Saturated with oil
		▒		SCL	FILL, SANDY CLAY LOAM, low to medium plasticity, brown, trace of fly ash	
0.25	▬	▒				Saturated with oil
0.5					End of Borehole @ 0.5m below ground level in natural sandy clay Refusal on storm drain	
0.75						
1						
1.25						
1.5						
1.75						
2						
2.25						
2.5						
2.75						
3						

Log Symbols

▼ Standing groundwater level in borehole
▶ Water seepage in borehole (wet)

Samples

BH1.0.5	- Soil sample taken at indicated depth
S	- Surface water sample
GW/W	- Groundwater sample/water sample

Moisture Condition

D Dry	- Runs freely through fingers
M Moist	- Does not run freely but no free water visible on soil surface
W Wet	- Free water visible on soil surface

Soil Classification

Clay	- Particle size less than 0.002mm
Silt	- Particle size between 0.002 and 0.06mm
Sand	- Particle size between 0.06 and 2.0mm
Gravel	- Particle size between 2.0 and 60mm

Strength

VS Very Soft	- Unconfined compressive strength less than 25kPa
S Soft	- Unconfined compressive strength 25-50kPa
F Firm	- Unconfined compressive strength 50-100kPa
St Stiff	- Unconfined compressive strength 100-200kPa
VSt Very Stiff	- Unconfined compressive strength 200-400kPa
H Hard	- Unconfined compressive strength greater than 400kPa

BOREHOLE LOG

CLIENT	EG FUNDS MANAGEMENT	**BOREHOLE NO.**	**BH28**
PROJECT	Environmental Site Assessment	**DATE.**	**12.03.08**
LOCATION	Smith & Edwards St, Summer Hill	**JOB NO.**	**E1559**
METHOD	Drill Rig	**SURFACE ELEV.**	**N/A**
LOGGED BY	CK	**CHECKED BY**	**MK**

Depth (m)	Sample	Graphic Symbol	Ground Water	Classification Symbol	Soil Description (Colour, particle characteristics, strength, placticity, moisture, etc)	Observations
		▤		AC	ASPHALTIC CONCRETE	
		▩		G	GRAVEL	
0.25		░		SL	FILL, SANDY LOAM, fine to medium grained, brown, traces of gravel.	
0.5 0.75 1	▬	░		SiC	FILL, SILTY CLAY, medium plasticity, brown	
1.25 1.5		▦		SiC	NATURAL, SILTY CLAY, Sandy, medium plasticity, red-brown	
1.75 2 2.25 2.5 2.75 3					End of Borehole @ 1.7m below ground level in natural sandy clay	

Log Symbols

▼ Standing groundwater level in borehole

▶ Water seepage in borehole (wet)

Samples

BH1.0.5	- Soil sample taken at indicated depth
S	- Surface water sample
GW/W	- Groundwater sample/water sample

Moisture Condition

D Dry	- Runs freely through fingers
M Moist	- Does not run freely but no free water visible on soil surface
W Wet	- Free water visible on soil surface

Soil Classification

Clay	- Particle size less than 0.002mm
Silt	- Particle size between 0.002 and 0.06mm
Sand	- Particle size between 0.06 and 2.0mm
Gravel	- Particle size between 2.0 and 60mm

Strength

VS Very Soft	- Unconfined compressive strength less than 25kPa
S Soft	- Unconfined compressive strength 25-50kPa
F Firm	- Unconfined compressive strength 50-100kPa
St Stiff	- Unconfined compressive strength 100-200kPa
VSt Very Stiff	- Unconfined compressive strength 200-400kPa
H Hard	- Unconfined compressive strength greater than 400kPa

BOREHOLE LOG

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CLIENT	EG FUNDS MANAGEMENT	**BOREHOLE NO.**	**BH29**
PROJECT	Environmental Site Assessment	**DATE.**	**12.03.08**
LOCATION	Smith & Edwards St, Summer Hill	**JOB NO.**	**E1559**
METHOD	Drill Rig	**SURFACE ELEV.**	**N/A**
LOGGED BY	CK	**CHECKED BY**	**MK**

Depth (m)	Sample	Graphic Symbol	Ground Water	Classification Symbol	Soil Description (Colour, particle characteristics, strength, placticity, moisture, etc)	Observations
				AC	ASPHALTIC CONCRETE	
				G	GRAVEL	
				SL	FILL, SANDY LOAM, fine to medium grained, brown, traces of gravel.	
0.25						
0.5						
				SiC	FILL, SILTY CLAY, medium plasticity, brown	
0.75						
1						
	▨					
1.25				SiC	NATURAL, SILTY CLAY, Sandy, medium plasticity, red-brown	
1.5						
1.75						
2	▨					
2.25						
2.5						
2.75						
3					End of Borehole @ 3.0m below ground level in natural sandy clay	

Log Symbols

▼ Standing groundwater level in borehole
▶ Water seepage in borehole (wet)

Samples

BH1.0.5	- Soil sample taken at indicated depth
S	- Surface water sample
GW/W	- Groundwater sample/water sample

Moisture Condition

D Dry	- Runs freely through fingers
M Moist	- Does not run freely but no free water visible on soil surface
W Wet	- Free water visible on soil surface

Soil Classification

Clay	- Particle size less than 0.002mm
Silt	- Particle size between 0.002 and 0.06mm
Sand	- Particle size between 0.06 and 2.0mm
Gravel	- Particle size between 2.0 and 60mm

Strength

VS Very Soft	- Unconfined compressive strength less than 25kPa
S Soft	- Unconfined compressive strength 25-50kPa
F Firm	- Unconfined compressive strength 50-100kPa
St Stiff	- Unconfined compressive strength 100-200kPa
VSt Very Stiff	- Unconfined compressive strength 200-400kPa
H Hard	- Unconfined compressive strength greater than 400kPa

BOREHOLE LOG

CLIENT	EG FUNDS MANAGEMENT	**BOREHOLE NO.**	**BH30**
PROJECT	Environmental Site Assessment	**DATE.**	**12.03.08**
LOCATION	Smith & Edwards St, Summer Hill	**JOB NO.**	**E1559**
METHOD	Drill Rig	**SURFACE ELEV.**	**N/A**
LOGGED BY	CK	**CHECKED BY**	**MK**

Depth (m)	Sample	Graphic Symbol	Ground Water	Classification Symbol	Soil Description (Colour, particle characteristics, strength, placticity, moisture, etc)	Observations
				T	TOPSOIL, SAND, silty, fine to coarse grained, brown, root fibres	
				SCL	FILL, SANDY CLAY LOAM, low to medium plasticity, brown, trace of fly ash	
0.5						
1	■					
				SiC	FILL, SILTY CLAY, medium plasticity, brown	
1.5						
2						
2.5						
				SiCL	NATURAL, SILTY CLAY LOAM, medium plasticity, red-brown	
3	■					
3.5						
				SiC	NATURAL, SILTY CLAY, medium-high plasticity, red-brown, mottled grey	
4						
					Refusal on Sandstone, End of Borehole @ 4.3m below ground level	
4.5						
5						
5.5						
6						

Log Symbols

▼ Standing groundwater level in borehole

▶ Water seepage in borehole (wet)

Samples

BH1.0.5	- Soil sample taken at indicated depth
S	- Surface water sample
GW/W	- Groundwater sample/water sample

Moisture Condition

D Dry	- Runs freely through fingers
M Moist	- Does not run freely but no free water visible on soil surface
W Wet	- Free water visible on soil surface

Soil Classification

Clay	- Particle size less than 0.002mm
Silt	- Particle size between 0.002 and 0.06mm
Sand	- Particle size between 0.06 and 2.0mm
Gravel	- Particle size between 2.0 and 60mm

Strength

VS	Very Soft	- Unconfined compressive strength less than 25kPa
S	Soft	- Unconfined compressive strength 25-50kPa
F	Firm	- Unconfined compressive strength 50-100kPa
St	Stiff	- Unconfined compressive strength 100-200kPa
VSt	Very Stiff	- Unconfined compressive strength 200-400kPa
H	Hard	- Unconfined compressive strength greater than 400kPa

BOREHOLE LOG

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CLIENT	EG FUNDS MANAGEMENT	**BOREHOLE NO.**	**BH31**
PROJECT	Environmental Site Assessment	**DATE.**	**12.03.08**
LOCATION	Smith & Edwards St, Summer Hill	**JOB NO.**	**E1559**
METHOD	Drill Rig	**SURFACE ELEV.**	**N/A**
LOGGED BY	CK	**CHECKED BY**	**MK**

Depth (m)	Sample	Graphic Symbol	Ground Water	Classification Symbol	Soil Description (Colour, particle characteristics, strength, placticity, moisture, etc)	Observations
		░		T	TOPSOIL, SAND, silty, fine to coarse grained, brown, root fibres	
		░		SCL	FILL, SANDY CLAY LOAM, low to medium plasticity, brown, trace of fly ash	
0.5		░				
1	■	░				
		░		SiC	FILL, SILTY CLAY, medium plasticity, brown	
1.5	■	▓		SiCL	NATURAL, SILTY CLAY LOAM, medium plasticity, red-brown	
2		▓				
2.5					End of Borehole @ 2.5m below ground level in natural clay	
3						
3.5						
4						
4.5						
5						
5.5						
6						

Log Symbols

▼ Standing groundwater level in borehole
▶ Water seepage in borehole (wet)

Samples

BH1.0.5	- Soil sample taken at indicated depth
S	- Surface water sample
GW/W	- Groundwater sample/water sample

Moisture Condition

D Dry	- Runs freely through fingers
M Moist	- Does not run freely but no free water visible on soil surface
W Wet	- Free water visible on soil surface

Soil Classification

Clay	- Particle size less than 0.002mm
Silt	- Particle size between 0.002 and 0.06mm
Sand	- Particle size between 0.06 and 2.0mm
Gravel	- Particle size between 2.0 and 60mm

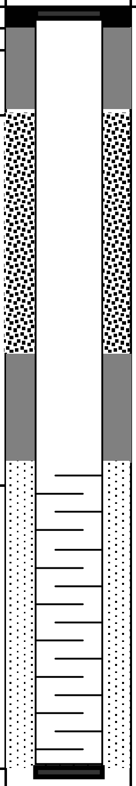
Strength

VS Very Soft	- Unconfined compressive strength less than 25kPa
S Soft	- Unconfined compressive strength 25-50kPa
F Firm	- Unconfined compressive strength 50-100kPa
St Stiff	- Unconfined compressive strength 100-200kPa
VSt Very Stiff	- Unconfined compressive strength 200-400kPa
H Hard	- Unconfined compressive strength greater than 400kPa

BOREHOLE & GROUNDWATER WELL LOG

Aargus AUSTRALIA

CLIENT	EG FUNDS MANAGEMENT	**BOREHOLE NO.**	**32 / GW2**
PROJECT	Environmental Site Assessment	**DATE.**	**13.03.08**
LOCATION	Smith & Edwards St, Summer Hill	**JOB NO.**	**E1559**
METHOD	Drill Rig	**SURFACE ELEV.**	**N/A**
LOGGED BY	CK	**CHECKED BY**	**MK**

Depth (m)	Sample	Graphic Symbol	Ground Water	Classification Symbol	Soil Description (Plasticity, particle characteristics, colour, moisture, etc)	Observations	Well Construction	Design
					Concrete			Collar
					Gravel			
1				F	FILL, Gravelly Clay, medium plasticity, grey			Bentonite
2 3 4				SC	Silty CLAY, medium plasticity, red-brown			Clean Sand Fill Bentonite Seal
5 6 7					NATURAL, SANDSTONE, very weathered, yellow, white, orange-brown, grey, dry			Sand
8 9 10 11 12					End of Borehole @ 7.0m below ground level in sandstone			

Log Symbols

Standing groundwater level in borehole

Water seepage in borehole (wet)

Samples

BH1.0.5	- Soil sample taken at indicated depth
S	- Surface water sample
GW/W	- Groundwater sample/water sample

Moisture Condition

D Dry	- Runs freely through fingers
M Moist	- Does not run freely but no free water visible on soil surface
W Wet	- Free water visible on soil surface

Soil Classification

Clay	- Particle size less than 0.002mm
Silt	- Particle size between 0.002 and 0.06mm
Sand	- Particle size between 0.06 and 2.0mm
Gravel	- Particle size between 2.0 and 60mm

Strength

VS	Very Soft	- Unconfined compressive strength less than 25kPa
S	Soft	- Unconfined compressive strength 25-50kPa
F	Firm	- Unconfined compressive strength 50-100kPa
St	Stiff	- Unconfined compressive strength 100-200kPa
VSt	Very Stiff	- Unconfined compressive strength 200-400kPa
H	Hard	- Unconfined compressive strength greater than 400kPa

BOREHOLE LOG

CLIENT	EG FUNDS MANAGEMENT	**BOREHOLE NO.**	**BH33**
PROJECT	Environmental Site Assessment	**DATE.**	**13.03.08**
LOCATION	Smith & Edwards St, Summer Hill	**JOB NO.**	**E1559**
METHOD	Drill Rig	**SURFACE ELEV.**	**N/A**
LOGGED BY	CK	**CHECKED BY**	**MK**

Depth (m)	Sample	Graphic Symbol	Ground Water	Classification Symbol	**Soil Description** **(Colour, particle characteristics, strength, placticity, moisture, etc)**	**Observations**
				T	TOPSOIL, SAND, silty, fine to coarse grained, brown, root fibres	
				SCL	FILL, SANDY CLAY LOAM, low to medium plasticity, brown, trace of fly ash	
0.5						
1	■					
				SiC	FILL, SILTY CLAY, medium plasticity, brown	
1.5				SiCL	NATURAL, SILTY CLAY LOAM, medium plasticity, red-brown	
2	■					
2.5					End of Borehole @ 2.5m below ground level in natural clay	
3						
3.5						
4						
4.5						
5						
5.5						
6						

Log Symbols

▼ Standing groundwater level in borehole

▶ Water seepage in borehole (wet)

Samples

BH1.0.5	- Soil sample taken at indicated depth
S	- Surface water sample
GW/W	- Groundwater sample/water sample

Moisture Condition

D Dry	- Runs freely through fingers
M Moist	- Does not run freely but no free water visible on soil surface
W Wet	- Free water visible on soil surface

Soil Classification

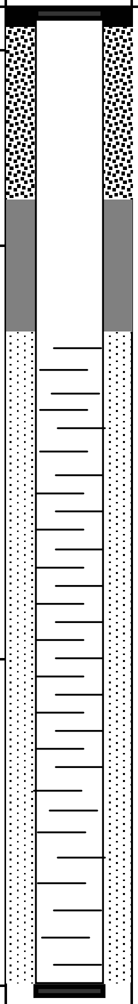
Clay	- Particle size less than 0.002mm
Silt	- Particle size between 0.002 and 0.06mm
Sand	- Particle size between 0.06 and 2.0mm
Gravel	- Particle size between 2.0 and 60mm

Strength

VS Very Soft	- Unconfined compressive strength less than 25kPa
S Soft	- Unconfined compressive strength 25-50kPa
F Firm	- Unconfined compressive strength 50-100kPa
St Stiff	- Unconfined compressive strength 100-200kPa
VSt Very Stiff	- Unconfined compressive strength 200-400kPa
H Hard	- Unconfined compressive strength greater than 400kPa

BOREHOLE & GROUNDWATER WELL LOG

CLIENT	EG FUNDS MANAGEMENT	**BOREHOLE NO.**	**34 / GW3**
PROJECT	Environmental Site Assessment	**DATE.**	**13.03.08**
LOCATION	Smith & Edwards St, Summer Hill	**JOB NO.**	**E1559**
METHOD	Drill Rig	**SURFACE ELEV.**	**N/A**
LOGGED BY	CK	**CHECKED BY**	**MK**

Depth (m)	Sample	Graphic Symbol	Ground Water	Classification Symbol	Soil Description (Plasticity, particle characteristics, colour, moisture, etc)	Observations	Well Construction	Design
		▨			Asphaltic Concrete / Gravel			Collar
		▨		F	FILL, Silty Clay,			Clean Sand Fill
0.5								
1	■							Bentonite Seal
		▨		SC	Clayey SAND, medium to coarse grained, white			
1.5								
2								
2.5								Sand
3	■							
		▨			NATURAL, SANDSTONE, very weathered, yellow, white, orange-brown, grey, dry			
3.5								
4								
4.5								
					End of Borehole @ 4.5m below ground level in sandstone			
5								
5.5								
6								

Log Symbols

▼ Standing groundwater level in borehole

▶ Water seepage in borehole (wet)

Samples

BH1.0.5	- Soil sample taken at indicated depth
S	- Surface water sample
GW/W	- Groundwater sample/water sample

Moisture Condition

D Dry	- Runs freely through fingers
M Moist	- Does not run freely but no free water visible on soil surface
W Wet	- Free water visible on soil surface

Soil Classification

Clay	- Particle size less than 0.002mm
Silt	- Particle size between 0.002 and 0.06mm
Sand	- Particle size between 0.06 and 2.0mm
Gravel	- Particle size between 2.0 and 60mm

Strength

VS	Very Soft	- Unconfined compressive strength less than 25kPa
S	Soft	- Unconfined compressive strength 25-50kPa
F	Firm	- Unconfined compressive strength 50-100kPa
St	Stiff	- Unconfined compressive strength 100-200kPa
VSt	Very Stiff	- Unconfined compressive strength 200-400kPa
H	Hard	- Unconfined compressive strength greater than 400kPa

BOREHOLE LOG

CLIENT	EG FUNDS MANAGEMENT	**BOREHOLE NO.**	**BH35**
PROJECT	Environmental Site Assessment	**DATE.**	**12.03.08**
LOCATION	Smith & Edwards St, Summer Hill	**JOB NO.**	**E1559**
METHOD	Drill Rig	**SURFACE ELEV.**	**N/A**
LOGGED BY	CK	**CHECKED BY**	**MK**

Depth (m)	Sample	Graphic Symbol	Ground Water	Classification Symbol	Soil Description (Colour, particle characteristics, strength, placticity, moisture, etc)	Observations
				AC	ASPHALTIC CONCRETE	
				G	GRAVEL	
				SiC	FILL, SILTY CLAY, medium plasticity, grey motteled orange and browr	
0.25						
0.5	▨					
0.75						
1	▨					
1.25						
1.5						
				SiC	NATURAL, SILTY CLAY, Sandy, medium plasticity, red-brown	
1.75						
2						
2.25						
2.5						
2.75						
3	▨				End of Borehole @ 3.0m below ground level in natural silty clay	

APPENDIX E

SITE PHOTOGRAPHS

Aargus

SITE PHOTOGRAPHS

Client	EG FUNDS MANAGEMENT
Project	ESA
Location	2 Smith Street, Summer Hill
Job No.	E1559
Checked By	NK

Photograph N° 1

View of site from airphoto

Photograph N° 2

View of truck mounted drill rig used during soil sampling

Photograph N° 3

View of hand auger used during soil sampling inside processing plant

Photograph N° 4

View of edge of creek showing exposed fill in edge of bank

Photograph N° 5

View of Technical Centre, where grease trap is located in grass area and two disused USTs are located in carpark

Photograph N° 6

View of oil drums stored near sheds

APPENDIX F

WELL DEVELOPMENT WORK SHEETS

AARGUS PTY LTD

WELL DEVELOPMENT – WORK SHEET

Client:	EG Property Group	Job No. :	E1559
Project:	Summer Hill Allied Mills	Well No. :	GW1
Location:	2 Smith St Summer Hill	Depth (m):	7.8
Test Method:	Drill Rig		

WELL FINISH:	☐ Gatic Cover	☐ Monument	☑ PVC Pipe

DEVELOPMENT:

	Stage 1	Stage 2		Stage 1	Stage 2
Method:	Bailer		SWL – Before (m)	2.0	
Date:	12/3/08		Time – Before (hrs)	1.05	
Undertaken By:	CK		SWL – After (m)	4.0	
Volume of Water Removed:	12 L		Time – After (hrs)	1.20	

Comments:

PURGING DETAILS:

Method:	Hand Bailer	SWL – Before (m)	2.0
Date:	20/3/08	Time – Before (hrs)	1.05
Undertaken By:	CK	SWL – After (m)	4.5
Well Atmos. (PID):ppm	0.0	Time – After (hrs)	1.20
Total Volume Removed: (L)	12 L		

PURGING MEASUREMENTS:

	Volume Removed (L)	Temp. (°C)	pH	EC (µS/cm)	Eh (mV) TDS g/L
20/3	12	23.6	6.46	0.38	0.18
25/3	14	23.5	6.45	0.36	0.19
28/3	12	23.6	6.46	0.37	0.18

SAMPLING DETAILS:

Method:	Hand Bailer	SWL – Before (m)	2.0
Date:	20/3/08	Time – Before (hrs)	1.05
Undertaken By:	CK	Water Temperature (°C)	23.6
pH:	6.46	EC: (µS/cm)	0.38
TDS ~~Eh~~: TDS ~~(mV)~~ g/L	0.18		

Containers used/ Comments:

Tested By:	CK	Remarks: - All measurements are from the top of monument (or PVC pipe)
Date Tested:	20/3/08	- All volumes stated are in litres
Checked By:	MK	- SWL is an abbreviation for 'standing water level'
Date:	10/07/04	- Please refer to Aargus protocols for well construction details

AARGUS PTY LTD

WELL DEVELOPMENT – WORK SHEET

Client:	EG Property Group	Job No. :	E1559
Project:	Summer Hill Allied Mills	Well No. :	GW2
Location:	2 Smith St Summer Hill	Depth (m):	7.0
Test Method:	Drill Rig		

WELL FINISH:	☐ Gatic Cover	☐ Monument	☑ PVC Pipe

DEVELOPMENT:

	Stage 1	Stage 2		Stage 1	Stage 2
Method:	Bailer		SWL – Before (m)	2.5	
Date:	12/3/08		Time – Before (hrs)	1.30	
Undertaken By:	CK		SWL – After (m)	5.5	
Volume of Water Removed:	20		Time – After (hrs)	1.45	

Comments:

PURGING DETAILS:

Method:	Hand Bailer	SWL – Before (m)	2.5
Date:	20/3/08	Time – Before (hrs)	1.30
Undertaken By:	CK	SWL – After (m)	5.5
Well Atmos. (PID):ppm	0.0	Time – After (hrs)	1.45
Total Volume Removed: (L)	20 L		

PURGING MEASUREMENTS:

	Volume Removed (L)	Temp. (°C)	pH	EC (µS/cm)	~~Eh (mV)~~ TDS (g/L)
20/3	20	26.7	6.08	0.50	2.5
25/3	19	26.6	6.09	0.51	2.5
28/3	21	26.6	6.08	0.50	2.4

SAMPLING DETAILS:

Method:	Hand Bailer	SWL – Before (m)	2.5
Date:	20/3/08	Time – Before (hrs)	1.30
Undertaken By:	CK	Water Temperature (°C)	26.7
pH:	6.08	EC: (µS/cm)	0.5
~~Eh:~~ TDS (~~mV~~ g/L)	2.5		

Containers used/ Comments:

Tested By:	CK	Remarks: - All measurements are from the top of monument (or PVC pipe)
Date Tested:	20/3/08	- All volumes stated are in litres
Checked By:	MK	- SWL is an abbreviation for 'standing water level'
Date:	10/7/08	- Please refer to Aargus protocols for well construction details

AARGUS PTY LTD

WELL DEVELOPMENT – WORK SHEET

Client:	EG Property Group	Job No. :	E1559
Project:	Summer Hill Allied Mills	Well No. :	GW3
Location:	2 Smith St Summer Hill	Depth (m):	4.5
Test Method:	Drill Rig		

WELL FINISH:	☐ Gatic Cover	☐ Monument	☑ PVC Pipe

DEVELOPMENT:

	Stage 1	Stage 2		Stage 1	Stage 2
Method:	Bailer		SWL – Before (m)	2.15	
Date:	12/3/08		Time – Before (hrs)	2.00	
Undertaken By:	CK		SWL – After (m)	3.5	
Volume of Water Removed:	14		Time – After (hrs)	2.15	

Comments:

PURGING DETAILS:

Method:	Hand Bailer	SWL – Before (m)	2.15
Date:	20/3/08	Time – Before (hrs)	2.00
Undertaken By:	~~14~~ CK	SWL – After (m)	3.5
Well Atmos. (PID):ppm	0.0	Time – After (hrs)	2.15
Total Volume Removed: (L)	14		

PURGING MEASUREMENTS:

	Volume Removed (L)	Temp. (°C)	pH	EC (µS/cm)	~~Eh (mV)~~ TDS (g/L)
20/3	14	26.6	6.05	3.0	0.15
25/3	13	26.8	6.10	3.2	0.17
28/3	15	26.6	6.05	3.0	0.15

SAMPLING DETAILS:

Method:	Hand Bailer	SWL – Before (m)	2.15
Date:	20/3/08	Time – Before (hrs)	2.00.
Undertaken By:	CK	Water Temperature (°C)	26.6
pH:	6.05	EC: (µS/cm)	0.15
~~Eh~~ TDS (~~mV~~) g/L	0.15		

Containers used/ Comments:

Tested By:	CK	Remarks: - All measurements are from the top of monument (or PVC pipe)
Date Tested:	20/3/08	- All volumes stated are in litres
Checked By:	MK	- SWL is an abbreviation for 'standing water level'
Date:	10/7/08	- Please refer to Aargus protocols for well construction details

APPENDIX G

LABORATORY CERTIFICATES

LabMark

CUSTOMER CENTRIC - ANALYTICAL CHEMISTS

ilac-MRA
NATA
Accreditation No. 13542

Accredited for compliance with ISO/IEC 17025. The results of tests, calibrations and/or measurements included in this document are traceable to Australian/national standards. NATA is a signatory to the APLAC mutual recognition arrangement for the mutual recognition of the equivalence of testing, calibration and inspection reports.

AQIS
AUSTRALIAN QUARANTINE AND INSPECTION SERVICE
SYDNEY License No. N0356.

Quarantine Approved Premises criteria 5.1 for quarantine containment level 1 (QCI) facilities. Class five criteria cover premises utilised for research, analysis and testing of biological material, soil, animal, plant and human products.

FINAL CERTIFICATE OF ANALYSIS - ENVIRONMENTAL DIVISION

Laboratory Report No: E032339
Client Name: Aargus Pty. Ltd
Client Reference: Smith St Summer Hill
Contact Name: Nick Kariotoglou
Chain of Custody No: na
Sample Matrix: SOIL & WATER

Cover Page 1 of 4
plus Sample Results

Date Received: 01/06/2007
Date Reported: 18/06/2007

This Final Certificate of Analysis consists of sample results, DQI's, method descriptions, laboratory definitions, and internationally recognised NATA accreditation and endorsement. The DQO compliance relates specifically to QA/QC results as performed as part of the sample analysis, and may provide an indication of sample result quality. Transfer of report ownership from Labmark to the client shall only occur once full & final payment has been settled and verified. All report copies may be retracted where full payment has not occured within the agreed settlement period.

QUALITY ASSURANCE CRITERIA

Accuracy:	matrix spike:	1 in first 5-20, then 1 every 20 samples
	lcs, crm, method:	1 per analytical batch
	surrogate spike:	addition per target organic method
Precision:	laboratory duplicate:	1 in first 5-10, then 1 every 10 samples
	laboratory triplicate:	re-extracted & reported when duplicate RPD values exceed acceptance criteria
Holding Times:	soils, waters:	Refer to LabMark Preservation & THT table VOC's 14 days water / soil VAC's 7 days water or 14 days acidified VAC's 14 days soil SVOC's 7 days water, 14 days soil Pesticides 7 days water, 14 days soil Metals 6 months general elements Mercury 28 days
Confirmation:	target organic analysis:	GC/MS, or confirmatory column
Sensitivity:	EQL:	Typically 2-5 x Method Detection Limit (MDL)

QUALITY CONTROL GLOBAL ACCEPTANCE CRITERIA (GAC)

Accuracy:	spike, lcs, crm surrogate:	general analytes 70% - 130% recovery phenol analytes 50% - 130% recovery organophosphorous pesticide analytes 60% - 130% recovery phenoxy acid herbicides 50% - 130% recovery
	anion/cation bal:	+/- 10% (0-3 meq/l), +/- 5% (>3 meq/l)
Precision:	method blank:	not detected >95% of the reported EQL
	duplicate lab RPD (metals):	0-30% (>10xEQL), 0-75% (5-10xEQL) 0-100% (<5xEQL)
	duplicate lab RPD:	0-50% (>10xEQL), 0-75% (5-10xEQL) 0-100% (<5xEQL)

QUALITY CONTROL ANALYTE SPECIFIC ACCEPTANCE CRITERIA (ASAC)

Accuracy:	spike, lcs, crm surrogate:	analyte specific recovery data <3xsd of historical mean
Uncertainty:	spike, lcs:	measurement calculated from historical analyte specific control charts

RESULT ANNOTATION

Data Quality Objective	s:	matrix spike recovery	p:	pending	bcs:	batch specific lcs
Data Quality Indicator	d:	laboratory duplicate	lcs:	laboratory control sample	bmb:	batch specific mb
Estimated Quantitation Limit	t:	laboratory triplicate	crm:	certified reference material		
not applicable	r:	RPD relative % difference	mb:	method blank		

David Burns
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This document is issued in accordance with NATA's accreditation requirements.

Environmental Laboratory Industry Group

Foundation
Member

Laboratory Report: E032339

Cover Page 2 of 4

NEPC GUIDELINE COMPLIANCE - DQO

1. GENERAL

A. Results relate specifically to samples as received. Sample results are not corrected for matrix spike, lcs, or surrogate recovery data.

B. EQL's are matrix dependant and may be increased due to sample dilution or matrix interference.

C. Laboratory QA/QC samples are specific to this project.

D. Inter-laboratory proficiency results are available upon request. NATA accreditation details available at www.nata.asn.au.

E. VOC spikes & surrogates added to samples during extraction, SVOC spikes & surrogates added prior to extraction.

F. Recovery data outside GAC limits shall be investigated and compared to ASAC (historical mean +/- 3sd). If recovery data <20%, then the relevant results for that compound are considered not reliable.

G. Recovery data (ms, surrogate, crm, lcs) outside ASAC limits shall initiate an investigative action. Anomolous QC data is examined in conjunction with other QC samples and a final decision whether to accept or reject results is provided by the professional judgement of the senior analyst. The USEPA-CLP National Functional Guidelines are referred to for specific recommendations.

H. Extraction (preparation) date refers to the date that sample preparation was initiated. Note that certain methods not requiring sample preparation (eg. VOCs in water, etc) may report a common extraction and analysis date.

I. LabMark shall maintain an official copy of this Certificate of Analysis for all tracable reference purposes.

2. CHAIN OF CUSTODY (COC) & SAMPLE RECEIPT NOTICE (SRN) REQUIREMENTS

A. SRN issued to client upon sample receipt & login verification.

B. Preservation & sampling date details specified on COC and SRN, unless noted.

C. Sample Integrity & Validated Time of Sample Receipt (VTSR) Holding Times verified (preservation may extend holding time, refer to preservation chart).

3. NATA ACCREDITED METHODS

A. NATA accreditation held for each in-house method and sample matrix type reported, unless noted below (Refer to subcontracted test reports for NATA accreditation status).

B. NATA accredited in-house laboratory methods are referenced from NEPC, ASTM, modified USEPA / APHA documents. Corporate Accreditation No. 13542.

C. Subcontracted analyses: Refer to Sample Receipt Notice and additional DQO comments.

Laboratory Report: E032339

Cover Page 3 of 4

4. QA/QC FREQUENCY COMPLIANCE TABLE SPECIFIC TO THIS REPORT

Matrix: **SOIL**

Page:	Method:	Totals:	#d	%d-ratio	#t	#s	%s-ratio
1	BTEX by P&T	24	3	13%	0	2	8%
1	Volatile TPH by P&T (vTPH)	30	3	10%	0	2	7%
5	Petroleum Hydrocarbons (TPH)	30	3	10%	0	2	7%
9	Polyaromatic Hydrocarbons (PAH)	30	3	10%	0	2	7%
13	Phenols by GC/MS	13	2	15%	0	1	8%
15	Volatile Organic Compounds (VOC)	6	1	17%	0	1	17%
21	Organochlorine Pesticides (OC)	11	2	18%	0	1	9%
23	Polychlorinated Biphenyls (PCB)	11	2	18%	0	1	9%
27	Acid extractable metals (M7)	58	6	10%	1	3	5%
35	Acid extractable mercury	58	6	10%	0	3	5%
39	Total Cyanide	7	1	14%	0	1	14%
40	Moisture	58	--	--	--	--	--

Matrix: **WATER**

Page:	Method:	Totals:	#d	%d-ratio	#t	#s	%s-ratio
25	Unfiltered metals (M7)	2	0	0%	0	0	0%
26	Unfiltered metals	2	0	0%	0	0	0%

GLOSSARY:

#d	number of discrete duplicate extractions/analyses performed.
%d-ratio	NEPC guideline for laboratory duplicates is 1 in 10 samples (min 10%).
#t	number of triplicate extractions/analyses performed.
#s	number of spiked samples analysed.
%s-ratio	USEPA guideline for laboratory matrix spikes is 1 in 20 samples (min 5%).

This document is issued in accordance with NATA's accreditation requirements.

CUSTOMER CENTRIC - ANALYTICAL CHEMISTS

Environmental Laboratory Industry Group
Foundation Member

Laboratory Report: E032339

Cover Page 4 of 4

5. ADDITIONAL COMMENTS SPECIFIC TO THIS REPORT

A. All tests were conducted by LabMark Environmental Sydney, NATA accreditation No. 13542, Corporate Site No. 13535., unless indicated below.
B. Total Cyanide spike recovery lab # 92834s reported recovery at 51%, corresponding LCS recovery is 98%.
C. Metals; Lab # 92863d RPD range is 0 - 110%, triplicate result issued.

Laboratory QA/QC data shall relate specifically to this report, and may provide an indication of site specific sample result quality. LabMark DOES NOT report NON-RELEVANT BATCH QA/QC data. Acceptance of this self assessment certificate does not preclude any requirement for a QA/QC review by a accredited contaminated site EPA auditor, when and wherever necessary. Laboratory QA/QC self assessment references available upon request.

Laboratory Report No: E032339

Client Name: Aargus Pty. Ltd

Contact Name: Nick Kariotoglou

Client Reference Smith St Summer Hill E1559

Page: 1 of 43
plus cover page

Date: 18/06/07

This report supercedes reports issued on: 14/06/07

Final
Certificate
of Analysis

Laboratory Identification		**92800**	**92807**	**92808**	**92809**	**92810**	**92814**	**92817**	**92820**	**92821**	**92823**
Sample Identification		BH1	BH1	BH2	BH2	BH2	BH5	BH6	BH7	BH7	BH8
Depth (m)		0.5	0.75	0.12-0.5	0.5-1.2	1.25-1.5	0.1-0.5	0.1-1.0	0.1-0.5	0.5-1.5	0.3
Sampling Date recorded on COC		30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07
Laboratory Extraction (Preparation) Date		8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	8/6/07
Laboratory Analysis Date		13/6/07	12/6/07	12/6/07	13/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07
Method : E002.2											
BTEX by P&T	**EQL**										
Benzene	0.2	--	<0.2	<0.2	--	<0.2	<0.2	0.3	<0.2	<0.2	<0.2
Toluene	0.5	--	<0.5	<0.5	--	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5	--	<0.5	<0.5	--	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
meta- and para-Xylene	1	--	<1	<1	--	<1	<1	<1	<1	<1	<1
ortho-Xylene	0.5	--	<0.5	<0.5	--	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Total Xylene	--	--	--	--	--	--	--	--	--	--	--
CDFB (Surr @ 10mg/kg)	--	--	*105%*	*108%*	--	*108%*	*105%*	*105%*	*103%*	*109%*	*110%*
Method : E003.2											
Volatile TPH by P&T (vTPH)	**EQL**										
C6 - C9 Fraction	10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10

Results expressed in mg/kg dry weight unless otherwise specified

Comments:

E003.2: 8-10g soil extracted with 20ml methanol. Analysis by P&T/GC/FID.
E002.2: 8-10g soil extracted with 20ml methanol. Analysis by P&T/GC/PID/MSD.

Laboratory Identification		**92827**	**92829**	**92833**	**92834**	**92836**	**92838**	**92842**	**92844**	**92845**	**92848**
Sample Identification		BH9	BH10	BH11	BH11	BH12	BH14	BH16	BH17	BH18	BH19
Depth (m)		1.5-2.5	0-0.5	0-0.5	0.5-1.5	0.3	0-0.7	0.3	0.4	0.12-0.8	0.12-1.0
Sampling Date recorded on COC		30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07
Laboratory Extraction (Preparation) Date		8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	8/6/07
Laboratory Analysis Date		12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	13/6/07	12/6/07	12/6/07	12/6/07
Method : E002.2											
BTEX by P&T	**EQL**										
Benzene	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	--	<0.2	<0.2	<0.2
Toluene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	--	<0.5	<0.5	<0.5
Ethylbenzene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	--	<0.5	<0.5	<0.5
meta- and para-Xylene	1	<1	<1	<1	<1	<1	<1	--	<1	<1	<1
ortho-Xylene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	--	<0.5	<0.5	<0.5
Total Xylene	--	--	--	--	--	--	--	--	--	--	--
CDFB (Surr @ 10mg/kg)	--	*103%*	*101%*	*108%*	*101%*	*106%*	*105%*	--	*105%*	*103%*	*101%*
Method : E003.2											
Volatile TPH by P&T (vTPH)	**EQL**										
C6 - C9 Fraction	10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10

Results expressed in mg/kg dry weight unless otherwise specified

Comments:

E003.2: 8-10g soil extracted with 20ml methanol. Analysis by P&T/GC/FID.
E002.2: 8-10g soil extracted with 20ml methanol. Analysis by P&T/GC/PID/MSD.

Laboratory Report No: E032339
Client Name: Aargus Pty. Ltd
Contact Name: Nick Kariotoglou
Client Reference Smith St Summer Hill E1559

Page: 3 of 43
plus cover page
Date: 18/06/07
This report supercedes reports issued on: 14/06/07

Final
Certificate
of Analysis

Laboratory Identification		**92850**	**92852**	**92853**	**92856**	**92857**	**92858**	**92860**	**92862**	**92863**	**92864**
Sample Identification		BH20	BH21	BH22	BH23	BH24	BH24	BH26	BH27	Duplicate D1	Duplicate D2
Depth (m)		0.4-1.0	0.2	0-0.8	0.15-0.4	0-0.7	0.7-1.3	0-1.0	0.5	--	--
Sampling Date recorded on COC		30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07
Laboratory Extraction (Preparation) Date		8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	8/6/07
Laboratory Analysis Date		12/6/07	13/6/07	12/6/07	12/6/07	13/6/07	12/6/07	12/6/07	13/6/07	12/6/07	12/6/07
Method : E002.2											
BTEX by P&T	**EQL**										
Benzene	0.2	<0.2	--	<0.2	<0.2	--	<0.2	<0.2	--	<0.2	<0.2
Toluene	0.5	<0.5	--	<0.5	<0.5	--	<0.5	<0.5	--	<0.5	<0.5
Ethylbenzene	0.5	<0.5	--	<0.5	<0.5	--	<0.5	<0.5	--	<0.5	<0.5
meta- and para-Xylene	1	<1	--	<1	<1	--	<1	<1	--	<1	<1
ortho-Xylene	0.5	<0.5	--	<0.5	<0.5	--	<0.5	<0.5	--	<0.5	<0.5
Total Xylene	--	--	--	--	--	--	--	--	--	--	--
CDFB (Surr @ 10mg/kg)	--	*105%*	--	*105%*	*103%*	--	*104%*	*101%*	--	*103%*	*101%*
Method : E003.2											
Volatile TPH by P&T (vTPH)	**EQL**										
C6 - C9 Fraction	10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10

Results expressed in mg/kg dry weight unless otherwise specified

Comments:

E003.2: 8-10g soil extracted with 20ml methanol. Analysis by P&T/GC/FID.
E002.2: 8-10g soil extracted with 20ml methanol. Analysis by P&T/GC/PID/MSD.

Laboratory Identification		**92820d**	**92820r**	**92845d**	**92845r**	**92863d**	**92863r**	**92834s**	**92848s**	**lcs**	**mb**
Sample Identification		QC	QC	QC	QC	QC	QC	QC	QC	QC	QC
Depth (m)		--	--	--	--	--	--	--	--	--	--
Sampling Date recorded on COC		--	--	--	--	--	--	--	--	--	--
Laboratory Extraction (Preparation) Date		8/6/07	--	8/6/07	--	8/6/07	--	8/6/07	8/6/07	8/6/07	8/6/07
Laboratory Analysis Date		12/6/07	--	12/6/07	--	12/6/07	--	12/6/07	12/6/07	12/6/07	12/6/07
Method : E002.2											
BTEX by P&T	**EQL**										
Benzene	0.2	<0.2	--	<0.2	--	<0.2	--	97%	107%	116%	<0.2
Toluene	0.5	<0.5	--	<0.5	--	<0.5	--	95%	101%	110%	<0.5
Ethylbenzene	0.5	<0.5	--	<0.5	--	<0.5	--	88%	93%	105%	<0.5
meta- and para-Xylene	1	<1	--	<1	--	<1	--	91%	95%	109%	<1
ortho-Xylene	0.5	<0.5	--	<0.5	--	<0.5	--	96%	101%	114%	<0.5
Total Xylene	--	--	--	--	--	--	--	--	--	--	--
CDFB (Surr @ 10mg/kg)	--	*104%*	*1%*	*103%*	*0%*	*101%*	*2%*	*104%*	*109%*	*117%*	*112%*
Method : E003.2											
Volatile TPH by P&T (vTPH)	**EQL**										
C6 - C9 Fraction	10	<10	--	<10	--	<10	--	85%	91%	111%	<10

Results expressed in mg/kg dry weight unless otherwise specified

Comments:

E003.2: 8-10g soil extracted with 20ml methanol. Analysis by P&T/GC/FID.
E002.2: 8-10g soil extracted with 20ml methanol. Analysis by P&T/GC/PID/MSD.

Laboratory Identification		**92800**	**92807**	**92808**	**92809**	**92810**	**92814**	**92817**	**92820**	**92821**	**92823**
Sample Identification		BH1	BH1	BH2	BH2	BH2	BH5	BH6	BH7	BH7	BH8
Depth (m)		0.5	0.75	0.12-0.5	0.5-1.2	1.25-1.5	0.1-0.5	0.1-1.0	0.1-0.5	0.5-1.5	0.3
Sampling Date recorded on COC		30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07
Laboratory Extraction (Preparation) Date		8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	8/6/07
Laboratory Analysis Date		13/6/07	13/6/07	13/6/07	13/6/07	13/6/07	13/6/07	13/6/07	13/6/07	13/6/07	13/6/07
Method : E006.2											
Petroleum Hydrocarbons (TPH)	**EQL**										
C10 - C14 Fraction	50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
C15 - C28 Fraction	100	<100	<100	230	<100	<100	150	<100	170	2180	<100
C29 - C36 Fraction	100	<100	<100	180	<100	<100	170	<100	120	1950	<100
Sum of TPH C10 - C36	--	--	--	410	--	--	320	--	290	4130	--

Results expressed in mg/kg dry weight unless otherwise specified

Comments:

E006.2: 8-10g soil extracted with 20ml DCM/Acetone (8:2). Analysis by GC/FID.

Laboratory Identification		**92827**	**92829**	**92833**	**92834**	**92836**	**92838**	**92842**	**92844**	**92845**	**92848**
Sample Identification		BH9	BH10	BH11	BH11	BH12	BH14	BH16	BH17	BH18	BH19
Depth (m)		1.5-2.5	0-0.5	0-0.5	0.5-1.5	0.3	0-0.7	0.3	0.4	0.12-0.8	0.12-1.0
Sampling Date recorded on COC		30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07
Laboratory Extraction (Preparation) Date		8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	8/6/07
Laboratory Analysis Date		13/6/07	13/6/07	13/6/07	13/6/07	13/6/07	13/6/07	13/6/07	13/6/07	13/6/07	13/6/07
Method : E006.2											
Petroleum Hydrocarbons (TPH)	**EQL**										
C10 - C14 Fraction	50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
C15 - C28 Fraction	100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
C29 - C36 Fraction	100	<100	<100	<100	<100	<100	<100	<100	<100	120	<100
Sum of TPH C10 - C36	--	--	--	--	--	--	--	--	--	120	--

Results expressed in mg/kg dry weight unless otherwise specified

Comments:

E006.2: 8-10g soil extracted with 20ml DCM/Acetone (8:2). Analysis by GC/FID.

Laboratory Identification		**92850**	**92852**	**92853**	**92856**	**92857**	**92858**	**92860**	**92862**	**92863**	**92864**
Sample Identification		BH20	BH21	BH22	BH23	BH24	BH24	BH26	BH27	Duplicate D1	Duplicate D2
Depth (m)		0.4-1.0	0.2	0-0.8	0.15-0.4	0-0.7	0.7-1.3	0-1.0	0.5	--	--
Sampling Date recorded on COC		30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07
Laboratory Extraction (Preparation) Date		8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	8/6/07
Laboratory Analysis Date		13/6/07	13/6/07	13/6/07	13/6/07	13/6/07	13/6/07	13/6/07	13/6/07	13/6/07	13/6/07
Method : E006.2											
Petroleum Hydrocarbons (TPH)	**EQL**										
C10 - C14 Fraction	50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
C15 - C28 Fraction	100	<100	<100	<100	<100	<100	<100	<100	6020	<100	<100
C29 - C36 Fraction	100	<100	140	<100	<100	<100	<100	<100	5500	<100	<100
Sum of TPH C10 - C36	--	--	140	--	--	--	--	--	11520	--	--

Results expressed in mg/kg dry weight unless otherwise specified

Comments:

E006.2: 8-10g soil extracted with 20ml DCM/Acetone (8:2). Analysis by GC/FID.

Laboratory Identification		**92820d**	**92820r**	**92845d**	**92845r**	**92863d**	**92863r**	**92834s**	**92848s**	**lcs**	**mb**
Sample Identification		QC	QC	QC	QC	QC	QC	QC	QC	QC	QC
Depth (m)		--	--	--	--	--	--	--	--	--	--
Sampling Date recorded on COC		--	--	--	--	--	--	--	--	--	--
Laboratory Extraction (Preparation) Date		8/6/07	--	8/6/07	--	8/6/07	--	8/6/07	8/6/07	8/6/07	8/6/07
Laboratory Analysis Date		13/6/07	--	13/6/07	--	13/6/07	--	13/6/07	13/6/07	8/6/07	8/6/07
Method : E006.2											
Petroleum Hydrocarbons (TPH)	**EQL**										
C10 - C14 Fraction	50	<50	--	<50	--	<50	--	--	--	--	<50
C15 - C28 Fraction	100	130	27%	<100	--	<100	--	86%	83%	87%	<100
C29 - C36 Fraction	100	<100	--	120	0%	<100	--	--	--	--	<100
Sum of TPH C10 - C36	--	130	76%	120	0%	--	--	--	--	--	--

Results expressed in mg/kg dry weight unless otherwise specified

Comments:

E006.2: 8-10g soil extracted with 20ml DCM/Acetone (8:2). Analysis by GC/FID.

Laboratory Identification		**92800**	**92807**	**92808**	**92809**	**92810**	**92817**	**92820**	**92821**	**92823**	**92827**
Sample Identification		BH1	BH1	BH2	BH2	BH2	BH6	BH7	BH7	BH8	BH9
Depth (m)		0.5	0.75	0.12-0.5	0.5-1.2	1.25-1.5	0.1-1.0	0.1-0.5	0.5-1.5	0.3	1.5-2.5
Sampling Date recorded on COC		30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07
Laboratory Extraction (Preparation) Date		8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	8/6/07
Laboratory Analysis Date		12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	13/6/07	12/6/07	12/6/07
Method : E007.2											
Polyaromatic Hydrocarbons (PAH)	**EQL**										
Naphthalene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	4.9	<0.5	<0.5
Acenaphthylene	0.5	<0.5	<0.5	1.0	<0.5	<0.5	<0.5	<0.5	10	<0.5	<0.5
Acenaphthene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.9	<0.5	<0.5
Fluorene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	6.7	<0.5	<0.5
Phenanthrene	0.5	0.5	<0.5	5.6	0.6	<0.5	1.7	2.0	80	0.9	1.3
Anthracene	0.5	<0.5	<0.5	1.3	<0.5	<0.5	<0.5	0.5	18	<0.5	<0.5
Fluoranthene	0.5	<0.5	<0.5	11	1.3	<0.5	2.6	4.3	117	1.4	2.2
Pyrene	0.5	<0.5	<0.5	11	1.2	<0.5	2.7	4.5	113	1.4	2.2
Benz(a)anthracene	0.5	<0.5	<0.5	5.4	0.6	<0.5	1.2	2.8	52	0.5	1.0
Chrysene	0.5	<0.5	<0.5	4.4	0.7	<0.5	1.3	2.6	50	0.6	1.0
Benzo(b)&(k)fluoranthene	1	<1	<1	8	1	<1	2	5	77	1	2
Benzo(a) pyrene	0.5	<0.5	<0.5	5.1	0.7	<0.5	1.2	2.8	58	0.7	1.1
Indeno(1,2,3-c,d)pyrene	0.5	<0.5	<0.5	2.8	<0.5	<0.5	0.6	1.3	28	<0.5	0.6
Dibenz(a,h)anthracene	0.5	<0.5	<0.5	0.7	<0.5	<0.5	<0.5	<0.5	6.0	<0.5	<0.5
Benzo(g,h,i)perylene	0.5	<0.5	<0.5	3.1	0.5	<0.5	0.7	1.5	30	0.5	0.8
Sum of reported PAHs	--	0.5	--	59.4	6.6	--	14.0	27.9	652.5	7.0	12.2
2-FBP (Surr @ 5mg/kg)	--	*106%*	*101%*	*100%*	*91%*	*103%*	*99%*	*93%*	*92%*	*91%*	*95%*
TP-d14 (Surr @ 5mg/kg)	--	*117%*	*94%*	*107%*	*88%*	*96%*	*105%*	*106%*	*124%*	*99%*	*106%*

Results expressed in mg/kg dry weight unless otherwise specified

Comments:

E007.2: 8-10g soil extracted with 20ml DCM/acetone (8:2). Analysis by GC/MS.

Laboratory Identification		**92829**	**92833**	**92834**	**92836**	**92838**	**92840**	**92842**	**92844**	**92845**	**92848**
Sample Identification		BH10	BH11	BH11	BH12	BH14	BH15	BH16	BH17	BH18	BH19
Depth (m)		0-0.5	0-0.5	0.5-1.5	0.3	0-0.7	0-1.0	0.3	0.4	0.12-0.8	0.12-1.0
Sampling Date recorded on COC		30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07
Laboratory Extraction (Preparation) Date		8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	8/6/07
Laboratory Analysis Date		12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	13/6/07	13/6/07	13/6/07
Method : E007.2 **Polyaromatic Hydrocarbons (PAH)**	**EQL**										
Naphthalene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	0.5	0.6	0.8	<0.5	<0.5	<0.5	0.6	<0.5	2.2	0.5	<0.5
Anthracene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5	<0.5	<0.5
Fluoranthene	0.5	1.4	1.5	<0.5	0.6	<0.5	1.2	<0.5	3.4	2.5	<0.5
Pyrene	0.5	1.4	1.4	<0.5	0.6	<0.5	1.2	<0.5	3.3	2.5	<0.5
Benz(a)anthracene	0.5	0.8	0.6	<0.5	<0.5	<0.5	0.5	<0.5	1.5	1.6	<0.5
Chrysene	0.5	0.8	0.5	<0.5	0.5	<0.5	0.6	<0.5	1.5	1.6	<0.5
Benzo(b)&(k)fluoranthene	1	1	1	<1	<1	<1	<1	<1	3	4	<1
Benzo(a) pyrene	0.5	0.9	0.7	<0.5	<0.5	<0.5	0.5	<0.5	1.8	2.2	<0.5
Indeno(1,2,3-c,d)pyrene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.9	1.3	<0.5
Dibenz(a,h)anthracene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g,h,i)perylene	0.5	0.6	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.1	1.5	<0.5
Sum of reported PAHs	--	7.5	7.0	--	1.7	--	4.6	--	19.2	17.7	--
2-FBP (Surr @ 5mg/kg)	--	*95%*	*95%*	*97%*	*96%*	*95%*	*98%*	*96%*	*94%*	*97%*	*92%*
TP-d14 (Surr @ 5mg/kg)	--	*98%*	*100%*	*99%*	*101%*	*104%*	*97%*	*94%*	*97%*	*98%*	*97%*

Results expressed in mg/kg dry weight unless otherwise specified

Comments:

E007.2: 8-10g soil extracted with 20ml DCM/acetone (8:2). Analysis by GC/MS.

Laboratory Identification		**92850**	**92852**	**92853**	**92856**	**92857**	**92858**	**92860**	**92862**	**92863**	**92864**
Sample Identification		BH20	BH21	BH22	BH23	BH24	BH24	BH26	BH27	Duplicate D1	Duplicate D2
Depth (m)		0.4-1.0	0.2	0-0.8	0.15-0.4	0-0.7	0.7-1.3	0-1.0	0.5	--	--
Sampling Date recorded on COC		30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07
Laboratory Extraction (Preparation) Date		8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	8/6/07
Laboratory Analysis Date		13/6/07	13/6/07	13/6/07	13/6/07	13/6/07	13/6/07	13/6/07	13/6/07	13/6/07	13/6/07
Method : E007.2 **Polyaromatic Hydrocarbons (PAH)**	**EQL**										
Naphthalene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	0.5	0.5	0.9	0.7	<0.5	0.6	<0.5	0.5	0.5	0.8	<0.5
Anthracene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	0.5	1.6	1.6	0.9	<0.5	0.8	<0.5	1.4	1.8	2.2	<0.5
Pyrene	0.5	1.6	1.6	0.8	<0.5	0.7	<0.5	1.4	2.4	2.4	<0.5
Benz(a)anthracene	0.5	1	0.7	<0.5	<0.5	<0.5	<0.5	0.8	1.2	1.4	<0.5
Chrysene	0.5	0.9	0.9	<0.5	<0.5	<0.5	<0.5	0.8	0.7	1.2	<0.5
Benzo(b)&(k)fluoranthene	1	2	1	<1	<1	<1	<1	1	1	2	<1
Benzo(a) pyrene	0.5	1.1	0.8	<0.5	<0.5	<0.5	<0.5	0.9	0.8	1.4	<0.5
Indeno(1,2,3-c,d)pyrene	0.5	0.6	0.5	<0.5	<0.5	<0.5	<0.5	0.5	<0.5	0.8	<0.5
Dibenz(a,h)anthracene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g,h,i)perylene	0.5	0.8	0.6	<0.5	<0.5	<0.5	<0.5	0.6	<0.5	0.8	<0.5
Sum of reported PAHs	--	10.1	8.6	2.4	--	2.1	--	7.9	8.4	13.0	--
2-FBP (Surr @ 5mg/kg)	--	*94%*	*88%*	*97%*	*93%*	*97%*	*89%*	*94%*	*88%*	*94%*	*87%*
TP-d14 (Surr @ 5mg/kg)	--	*99%*	*104%*	*98%*	*92%*	*98%*	*93%*	*100%*	*195%*	*95%*	*90%*

Results expressed in mg/kg dry weight unless otherwise specified

Comments:

E007.2: 8-10g soil extracted with 20ml DCM/acetone (8:2). Analysis by GC/MS.

Laboratory Identification		**92820d**	**92820r**	**92845d**	**92845r**	**92863d**	**92863r**	**92834s**	**92848s**	**lcs**	**mb**
Sample Identification		QC	QC	QC	QC	QC	QC	QC	QC	QC	QC
Depth (m)		--	--	--	--	--	--	--	--	--	--
Sampling Date recorded on COC		--	--	--	--	--	--	--	--	--	--
Laboratory Extraction (Preparation) Date		8/6/07	--	8/6/07	--	8/6/07	--	8/6/07	8/6/07	8/6/07	8/6/07
Laboratory Analysis Date		12/6/07	--	13/6/07	--	13/6/07	--	12/6/07	13/6/07	10/6/07	10/6/07
Method : E007.2											
Polyaromatic Hydrocarbons (PAH)	**EQL**										
Naphthalene	0.5	0.5	18%	<0.5	--	<0.5	--	101%	95%	95%	<0.5
Acenaphthylene	0.5	<0.5	--	<0.5	--	<0.5	--	99%	89%	96%	<0.5
Acenaphthene	0.5	<0.5	--	<0.5	--	<0.5	--	105%	88%	93%	<0.5
Fluorene	0.5	<0.5	--	<0.5	--	<0.5	--	105%	93%	95%	<0.5
Phenanthrene	0.5	1.3	42%	0.7	33%	1.8	77%	102%	94%	97%	<0.5
Anthracene	0.5	<0.5	>0%	<0.5	--	0.5	>0%	106%	96%	102%	<0.5
Fluoranthene	0.5	2.8	42%	2.5	0%	3.7	51%	110%	96%	102%	<0.5
Pyrene	0.5	2.9	43%	2.7	8%	4.0	50%	108%	97%	99%	<0.5
Benz(a)anthracene	0.5	1.9	38%	1.8	12%	2.0	35%	105%	94%	96%	<0.5
Chrysene	0.5	2.0	26%	1.7	6%	2.0	50%	109%	99%	113%	<0.5
Benzo(b)&(k)fluoranthene	1	3	50%	4	0%	4	67%	108%	103%	100%	<1
Benzo(a) pyrene	0.5	2.0	33%	2.3	4%	2.1	40%	103%	93%	93%	<0.5
Indeno(1,2,3-c,d)pyrene	0.5	1	26%	1.3	0%	1.1	32%	94%	90%	104%	<0.5
Dibenz(a,h)anthracene	0.5	<0.5	--	<0.5	--	<0.5	--	106%	91%	94%	<0.5
Benzo(g,h,i)perylene	0.5	1.1	31%	1.6	6%	1.2	40%	101%	93%	97%	<0.5
Sum of reported PAHs	--	18.5	41%	18.6	5%	22.4	53%	--	--	--	--
2-FBP (Surr @ 5mg/kg)	--	*101%*	*8%*	*91%*	*6%*	*90%*	*4%*	*94%*	*87%*	*95%*	*102%*
TP-d14 (Surr @ 5mg/kg)	--	*108%*	*2%*	*102%*	*4%*	*97%*	*2%*	*99%*	*95%*	*94%*	*103%*

Results expressed in mg/kg dry weight unless otherwise specified

Comments:

E007.2: 8-10g soil extracted with 20ml DCM/acetone (8:2). Analysis by GC/MS.

Laboratory Identification		**92807**	**92810**	**92820**	**92833**	**92834**	**92838**	**92845**	**92852**	**92857**	**92858**
Sample Identification		BH1	BH2	BH7	BH11	BH11	BH14	BH18	BH21	BH24	BH24
Depth (m)		0.75	1.25-1.5	0.1-0.5	0-0.5	0.5-1.5	0-0.7	0.12-0.8	0.2	0-0.7	0.7-1.3
Sampling Date recorded on COC		30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07
Laboratory Extraction (Preparation) Date		8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	8/6/07
Laboratory Analysis Date		12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	13/6/07	13/6/07	13/6/07	13/6/07
Method : E008.2											
Phenols by GC/MS	**EQL**										
Phenol	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
2-chlorophenol	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
2-methylphenol	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
3-&4-methylphenol	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
2-nitrophenol	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
2,4-dimethylphenol	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
2,4-dichlorophenol	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
4-chloro-3-methylphenol	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
2,4,6-trichlorophenol	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
2,4,5-trichlorophenol	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Pentachlorophenol	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Sum of reported phenols	--	--	--	--	--	--	--	--	--	--	--
2-FP (Surr @ 5mg/kg)	--	*99%*	*95%*	*83%*	*83%*	*91%*	*88%*	*92%*	*88%*	*83%*	*86%*
Phenol-d5 (Surr @ 5mg/kg)	--	*98%*	*95%*	*85%*	*89%*	*86%*	*94%*	*88%*	*84%*	*97%*	*80%*
2,4,6-TBP (Surr @ 5mg/kg)	--	*97%*	*96%*	*85%*	*82%*	*90%*	*88%*	*85%*	*90%*	*##*	*81%*

Results expressed in mg/kg dry weight unless otherwise specified

Comments: ## Percent recovery not available due to interference from the sample. ~ Low surrogate recovery due to matrix interference.

E008.2: 8-10g soil extracted with 20ml DCM/acetone (8:2). Analysis by GC/MS.

Laboratory Identification		**92862**	**92863**	**92864**	**92820d**	**92820r**	**92863d**	**92863r**	**92834s**	**lcs**	**mb**
Sample Identification		BH27	Duplicate D1	Duplicate D2	QC	QC	QC	QC	QC	QC	QC
Depth (m)		0.5	--	--	--	--	--	--	--	--	--
Sampling Date recorded on COC		30/5/07	30/5/07	30/5/07	--	--	--	--	--	--	--
Laboratory Extraction (Preparation) Date		8/6/07	8/6/07	8/6/07	8/6/07	--	8/6/07	--	8/6/07	8/6/07	8/6/07
Laboratory Analysis Date		13/6/07	13/6/07	13/6/07	12/6/07	--	13/6/07	--	12/6/07	10/6/07	10/6/07
Method : E008.2											
Phenols by GC/MS	**EQL**										
Phenol	0.5	<0.5	<0.5	<0.5	<0.5	--	<0.5	--	100%	102%	<0.5
2-chlorophenol	0.5	<0.5	<0.5	<0.5	<0.5	--	<0.5	--	101%	101%	<0.5
2-methylphenol	0.5	<0.5	<0.5	<0.5	<0.5	--	<0.5	--	101%	94%	<0.5
3-&4-methylphenol	1.0	<1.0	<1.0	<1.0	<1.0	--	<1.0	--	101%	96%	<0.5
2-nitrophenol	0.5	<0.5	<0.5	<0.5	<0.5	--	<0.5	--	93%	87%	<0.5
2,4-dimethylphenol	0.5	<0.5	<0.5	<0.5	<0.5	--	<0.5	--	94%	101%	<0.5
2,4-dichlorophenol	0.5	<0.5	<0.5	<0.5	<0.5	--	<0.5	--	96%	91%	<0.5
4-chloro-3-methylphenol	0.5	<0.5	<0.5	<0.5	<0.5	--	<0.5	--	89%	84%	<0.5
2,4,6-trichlorophenol	0.5	<0.5	<0.5	<0.5	<0.5	--	<0.5	--	97%	95%	<0.5
2,4,5-trichlorophenol	0.5	<0.5	<0.5	<0.5	<0.5	--	<0.5	--	118%	102%	<0.5
Pentachlorophenol	1	<1	<1	<1	<1	--	<1	--	75%	100%	<1
Sum of reported phenols	--	--	--	--	--	--	--	--	--	--	--
2-FP (Surr @ 5mg/kg)	--	*91%*	*92%*	*~ 30*	*85%*	*2%*	*88%*	*4%*	*88%*	*96%*	*98%*
Phenol-d5 (Surr @ 5mg/kg)	--	*90%*	*91%*	*~ 45*	*88%*	*3%*	*89%*	*2%*	*93%*	*98%*	*102%*
2,4,6-TBP (Surr @ 5mg/kg)	--	*88%*	*78%*	*##*	*91%*	*7%*	*76%*	*3%*	*93%*	*101%*	*98%*

Results expressed in mg/kg dry weight unless otherwise specified

Comments: ## Percent recovery not available due to interference from the sample. ~ Low surrogate recovery due to matrix interference.

E008.2: 8-10g soil extracted with 20ml DCM/acetone (8:2). Analysis by GC/MS.

Laboratory Identification		**92800**	**92809**	**92842**	**92852**	**92857**	**92862**	**92800d**	**92800r**	**92809s**	**lcs**
Sample Identification		BH1	BH2	BH16	BH21	BH24	BH27	QC	QC	QC	QC
Depth (m)		0.5	0.5-1.2	0.3	0.2	0-0.7	0.5	--	--	--	--
Sampling Date recorded on COC		30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	--	--	--	--
Laboratory Extraction (Preparation) Date		8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	--	8/6/07	8/6/07
Laboratory Analysis Date		13/6/07	13/6/07	13/6/07	13/6/07	13/6/07	13/6/07	13/6/07	--	13/6/07	15/6/07
Method : E016.2 **Volatile Organic Compounds (VOC)** **Volatile Aromatic Compounds**	**EQL**										
Benzene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	--	90%	101%
Toluene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	--	90%	88%
Ethylbenzene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	--	91%	83%
m- & p-xylene	1	<1	<1	<1	<1	<1	<1	<1	--	90%	77%
o-xylene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	--	91%	79%
Styrene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	--	84%	89%
Isopropylbenzene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	--	93%	87%
n-propylbenzene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	--	91%	89%
1,3,5-trimethylbenzene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	--	92%	89%
sec-butylbenzene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	--	95%	91%
1,2,4-trimethylbenzene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	--	92%	85%
tert-butylbenzene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	--	92%	89%
p-isopropyltoluene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	--	90%	89%
n-butylbenzene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	--	91%	93%
Naphthalene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	--	71%	121%
Halogenated Aliphatics											
Dichlorodifluoromethane	5	<5	<5	<5	<5	<5	<5	<5	--	108%	129%
Chloromethane	5	<5	<5	<5	<5	<5	<5	<5	--	98%	129%
Vinyl chloride	5	<5	<5	<5	<5	<5	<5	<5	--	101%	130%
Bromomethane	5	<5	<5	<5	<5	<5	<5	<5	--	130%	120%
Chloroethane	5	<5	<5	<5	<5	<5	<5	<5	--	127%	121%
Trichlorofluoromethane	5	<5	<5	<5	<5	<5	<5	<5	--	121%	114%
1,1-dichloroethene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	--	96%	98%
trans-1,2-dichloroethene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	--	94%	100%
1,1-dichloroethane	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	--	92%	104%
cis-1,2-dichloroethene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	--	89%	100%

Laboratory Report No: E032339
Client Name: Aargus Pty. Ltd
Contact Name: Nick Kariotoglou
Client Reference Smith St Summer Hill E1559

Page: 16 of 43
plus cover page
Date: 18/06/07
This report supercedes reports issued on: 14/06/07

Final
Certificate
of Analysis

Laboratory Identification		**92800**	**92809**	**92842**	**92852**	**92857**	**92862**	**92800d**	**92800r**	**92809s**	**lcs**
Sample Identification		BH1	BH2	BH16	BH21	BH24	BH27	QC	QC	QC	QC
Depth (m)		0.5	0.5-1.2	0.3	0.2	0-0.7	0.5	--	--	--	--
Sampling Date recorded on COC		30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	--	--	--	--
Laboratory Extraction (Preparation) Date		8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	--	8/6/07	8/6/07
Laboratory Analysis Date		13/6/07	13/6/07	13/6/07	13/6/07	13/6/07	13/6/07	13/6/07	--	13/6/07	15/6/07
Method : E016.2											
Volatile Organic Compounds (VOC)	**EQL**										
2,2-dichloropropane	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	--	90%	108%
Chloroform	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	--	89%	104%
1,1,1-trichloroethane	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	--	89%	102%
1,2-dichloroethane	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	--	85%	108%
1,1-dichloropropene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	--	86%	104%
Carbon tetrachloride	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	--	87%	104%
Trichloroethene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	--	88%	111%
1,2-dichloropropane	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	--	92%	101%
Dibromomethane	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	--	83%	111%
Bromodichloromethane	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	--	89%	108%
cis-1,3-dichloropropene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	--	89%	102%
trans-1,3-dichloropropene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	--	89%	108%
1,1,2-trichloroethane	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	--	84%	103%
1,3-dichloropropane	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	--	83%	102%
Chlorodibromomethane	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	--	84%	107%
Tetrachloroethene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	--	87%	103%
1,2-dibromoethane	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	--	82%	108%
1,1,1,2-tetrachloroethane	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	--	93%	87%
Bromoform	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	--	81%	94%
1,1,2,2-tetrachloroethane	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	--	80%	89%
1,2,3-trichloropropane	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	--	76%	98%
1,2-dibromo-3-chloropropane	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	--	75%	102%
Hexachlorobutadiene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	--	95%	100%
Halogenated Aromatics											
Chlorobenzene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	--	95%	85%
Bromobenzene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	--	88%	91%
2-chlorotoluene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	--	90%	92%

Laboratory Identification		**92800**	**92809**	**92842**	**92852**	**92857**	**92862**	**92800d**	**92800r**	**92809s**	**lcs**
Sample Identification		BH1	BH2	BH16	BH21	BH24	BH27	QC	QC	QC	QC
Depth (m)		0.5	0.5-1.2	0.3	0.2	0-0.7	0.5	--	--	--	--
Sampling Date recorded on COC		30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	--	--	--	--
Laboratory Extraction (Preparation) Date		8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	--	8/6/07	8/6/07
Laboratory Analysis Date		13/6/07	13/6/07	13/6/07	13/6/07	13/6/07	13/6/07	13/6/07	--	13/6/07	15/6/07
Method : E016.2											
Volatile Organic Compounds (VOC)	**EQL**										
4-chlorotoluene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	--	90%	92%
1,3-dichlorobenzene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	--	88%	93%
1,4-dichlorobenzene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	--	87%	91%
1,2-dichlorobenzene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	--	84%	93%
1,2,4-trichlorobenzene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	--	77%	108%
1,2,3-trichlorobenzene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	--	70%	124%
Oxygenated Compounds											
Vinyl acetate	5	<5	<5	<5	<5	<5	<5	<5	--	120%	100%
Ethyl acetate	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	--	##	85%
tert-butylmethylether (TBME)	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	--	83%	110%
Sulphonated Compounds											
Carbon disulfide	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	--	78%	91%
Surrogate Standards											
BCP (Surr @ 20mg/kg)	--	*96%*	*101%*	*98%*	*97%*	*88%*	*87%*	*89%*	*8%*	*92%*	*100%*
DCFB (Surr @ 20mg/kg)	--	*81%*	*86%*	*82%*	*81%*	*76%*	*73%*	*74%*	*9%*	*88%*	*89%*

Results expressed in mg/kg dry weight unless otherwise specified

Comments: ## Percent recovery not available due to interference from the sample.

E016.2: 8-10g soil extracted with 20ml methanol. Analysis by P&T/GC/MS. (NB) Acetone and Dichloromethane not reported unless requested.

Laboratory Identification		**mb**									
Sample Identification		QC									
Depth (m)		--									
Sampling Date recorded on COC		--									
Laboratory Extraction (Preparation) Date		8/6/07									
Laboratory Analysis Date		15/6/07									
Method : E016.2											
Volatile Organic Compounds (VOC)	**EQL**										
Volatile Aromatic Compounds											
Benzene	0.5	<0.5									
Toluene	0.5	<0.5									
Ethylbenzene	0.5	<0.5									
m- & p-xylene	1	<1									
o-xylene	0.5	<0.5									
Styrene	0.5	<0.5									
Isopropylbenzene	0.5	<0.5									
n-propylbenzene	0.5	<0.5									
1,3,5-trimethylbenzene	0.5	<0.5									
sec-butylbenzene	0.5	<0.5									
1,2,4-trimethylbenzene	0.5	<0.5									
tert-butylbenzene	0.5	<0.5									
p-isopropyltoluene	0.5	<0.5									
n-butylbenzene	0.5	<0.5									
Naphthalene	0.5	<0.5									
Halogenated Aliphatics											
Dichlorodifluoromethane	5	<5									
Chloromethane	5	<5									
Vinyl chloride	5	<5									
Bromomethane	5	<5									
Chloroethane	5	<5									
Trichlorofluoromethane	5	<5									
1,1-dichloroethene	0.5	<0.5									
trans-1,2-dichloroethene	0.5	<0.5									
1,1-dichloroethane	0.5	<0.5									
cis-1,2-dichloroethene	0.5	<0.5									

Laboratory Identification		**mb**									
Sample Identification		QC									
Depth (m)		--									
Sampling Date recorded on COC		--									
Laboratory Extraction (Preparation) Date		8/6/07									
Laboratory Analysis Date		15/6/07									
Method : E016.2											
Volatile Organic Compounds (VOC)	**EQL**										
2,2-dichloropropane	0.5	<0.5									
Chloroform	0.5	<0.5									
1,1,1-trichloroethane	0.5	<0.5									
1,2-dichloroethane	0.5	<0.5									
1,1-dichloropropene	0.5	<0.5									
Carbon tetrachloride	0.5	<0.5									
Trichloroethene	0.5	<0.5									
1,2-dichloropropane	0.5	<0.5									
Dibromomethane	0.5	<0.5									
Bromodichloromethane	0.5	<0.5									
cis-1,3-dichloropropene	0.5	<0.5									
trans-1,3-dichloropropene	0.5	<0.5									
1,1,2-trichloroethane	0.5	<0.5									
1,3-dichloropropane	0.5	<0.5									
Chlorodibromomethane	0.5	<0.5									
Tetrachloroethene	0.5	<0.5									
1,2-dibromoethane	0.5	<0.5									
1,1,1,2-tetrachloroethane	0.5	<0.5									
Bromoform	0.5	<0.5									
1,1,2,2-tetrachloroethane	0.5	<0.5									
1,2,3-trichloropropane	0.5	<0.5									
1,2-dibromo-3-chloropropane	0.5	<0.5									
Hexachlorobutadiene	0.5	<0.5									
Halogenated Aromatics											
Chlorobenzene	0.5	<0.5									
Bromobenzene	0.5	<0.5									
2-chlorotoluene	0.5	<0.5									

Laboratory Identification		**mb**									
Sample Identification		QC									
Depth (m)		--									
Sampling Date recorded on COC		--									
Laboratory Extraction (Preparation) Date		8/6/07									
Laboratory Analysis Date		15/6/07									
Method : E016.2											
Volatile Organic Compounds (VOC)	**EQL**										
4-chlorotoluene	0.5	<0.5									
1,3-dichlorobenzene	0.5	<0.5									
1,4-dichlorobenzene	0.5	<0.5									
1,2-dichlorobenzene	0.5	<0.5									
1,2,4-trichlorobenzene	0.5	<0.5									
1,2,3-trichlorobenzene	0.5	<0.5									
Oxygenated Compounds											
Vinyl acetate	5	<5									
Ethyl acetate	0.5	<0.5									
tert-butylmethylether (TBME)	0.5	<0.5									
Sulphonated Compounds											
Carbon disulfide	0.5	<0.5									
Surrogate Standards											
BCP (Surr @ 20mg/kg)	--	*97%*									
DCFB (Surr @ 20mg/kg)	--	*98%*									

Results expressed in mg/kg dry weight unless otherwise specified

Comments: ## Percent recovery not available due to interference from the sample.

E016.2: 8-10g soil extracted with 20ml methanol. Analysis by P&T/GC/MS. (NB) Acetone and Dichloromethane not reported unless requested.

Laboratory Identification		**92811**	**92820**	**92833**	**92834**	**92836**	**92838**	**92842**	**92844**	**92853**	**92863**
Sample Identification		BH4	BH7	BH11	BH11	BH12	BH14	BH16	BH17	BH22	Duplicate D1
Depth (m)		0.1	0.1-0.5	0-0.5	0.5-1.5	0.3	0-0.7	0.3	0.4	0-0.8	--
Sampling Date recorded on COC		30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07
Laboratory Extraction (Preparation) Date		8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	8/6/07
Laboratory Analysis Date		14/6/07	14/6/07	14/6/07	14/6/07	14/6/07	14/6/07	14/6/07	14/6/07	14/6/07	14/6/07
Method : E013.2											
Organochlorine Pesticides (OC)	**EQL**										
a-BHC	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Hexachlorobenzene	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
b-BHC	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
g-BHC (Lindane)	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
d-BHC	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Aldrin	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor epoxide	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
trans-chlordane	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	<0.05	<0.05	<0.05	<0.05
Endosulfan I	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
cis-chlordane	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	<0.05	<0.05	<0.05	<0.05
Dieldrin	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.07	<0.05	<0.05
4,4-DDE	0.05	<0.05	<0.05	0.18	<0.05	<0.05	<0.05	<0.05	<0.05	0.23	<0.05
Endrin	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Endosulfan II	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
4,4-DDD	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Endosulfan sulphate	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
4,4-DDT	0.2	<0.2	<0.2	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.4	<0.2
Methoxychlor	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
DBC (Surr @ 0.2mg/kg)	--	*93%*	*96%*	*94%*	*94%*	*94%*	*94%*	*96%*	*97%*	*96%*	*95%*

Results expressed in mg/kg dry weight unless otherwise specified

Comments:

E013.2: 8-10g soil extracted with 20ml hexane/acetone (1:1). Analysis by GC/dual ECD.

Laboratory Report No: E032339
Client Name: Aargus Pty. Ltd
Contact Name: Nick Kariotoglou
Client Reference Smith St Summer Hill E1559

Page: 22 of 43
plus cover page
Date: 18/06/07
This report supercedes reports issued on: 14/06/07

Final
Certificate
of Analysis

Laboratory Identification		**92864**	**92820d**	**92820r**	**92863d**	**92863r**	**92834s**	**lcs**	**mb**		
Sample Identification		Duplicate D2	QC	QC	QC	QC	QC	QC	QC		
Depth (m)		--	--	--	--	--	--	--	--		
Sampling Date recorded on COC		30/5/07	--	--	--	--	--	--	--		
Laboratory Extraction (Preparation) Date		8/6/07	8/6/07	--	8/6/07	--	8/6/07	8/6/07	8/6/07		
Laboratory Analysis Date		14/6/07	14/6/07	--	14/6/07	--	13/6/07	8/6/07	8/6/07		
Method : E013.2											
Organochlorine Pesticides (OC)	**EQL**										
a-BHC	0.05	<0.05	<0.05	--	<0.05	--	106%	107%	<0.05		
Hexachlorobenzene	0.05	<0.05	<0.05	--	<0.05	--	111%	111%	<0.05		
b-BHC	0.05	<0.05	<0.05	--	<0.05	--	107%	106%	<0.05		
g-BHC (Lindane)	0.05	<0.05	<0.05	--	<0.05	--	105%	105%	<0.05		
d-BHC	0.05	<0.05	<0.05	--	<0.05	--	104%	105%	<0.05		
Heptachlor	0.05	<0.05	<0.05	--	<0.05	--	102%	101%	<0.05		
Aldrin	0.05	<0.05	<0.05	--	<0.05	--	104%	103%	<0.05		
Heptachlor epoxide	0.05	<0.05	<0.05	--	<0.05	--	110%	106%	<0.05		
trans-chlordane	0.05	<0.05	<0.05	--	<0.05	--	105%	102%	<0.05		
Endosulfan I	0.05	<0.05	<0.05	--	<0.05	--	109%	106%	<0.05		
cis-chlordane	0.05	<0.05	<0.05	--	<0.05	--	110%	106%	<0.05		
Dieldrin	0.05	<0.05	<0.05	--	<0.05	--	104%	101%	<0.05		
4,4-DDE	0.05	<0.05	<0.05	--	<0.05	--	105%	100%	<0.05		
Endrin	0.05	<0.05	<0.05	--	<0.05	--	104%	100%	<0.05		
Endosulfan II	0.05	<0.05	<0.05	--	<0.05	--	107%	101%	<0.05		
4,4-DDD	0.05	<0.05	<0.05	--	<0.05	--	109%	105%	<0.05		
Endosulfan sulphate	0.05	<0.05	<0.05	--	<0.05	--	113%	106%	<0.05		
4,4-DDT	0.2	<0.2	<0.2	--	<0.2	--	96%	97%	<0.2		
Methoxychlor	0.2	<0.2	<0.2	--	<0.2	--	116%	101%	<0.2		
DBC (Surr @ 0.2mg/kg)	--	*96%*	*98%*	*2%*	*93%*	*2%*	*99%*	*92%*	*108%*		

Results expressed in mg/kg dry weight unless otherwise specified

Comments:

E013.2: 8-10g soil extracted with 20ml hexane/acetone (1:1). Analysis by GC/dual ECD.

Laboratory Identification		**92814**	**92815**	**92816**	**92820**	**92833**	**92834**	**92838**	**92842**	**92853**	**92863**
Sample Identification		BH5	BH5	BH5	BH7	BH11	BH11	BH14	BH16	BH22	Duplicate D1
Depth (m)		0.1-0.5	0.5-1.5	1.55-2.0	0.1-0.5	0-0.5	0.5-1.5	0-0.7	0.3	0-0.8	--
Sampling Date recorded on COC		30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07
Laboratory Extraction (Preparation) Date		8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	8/6/07
Laboratory Analysis Date		14/6/07	14/6/07	14/6/07	14/6/07	14/6/07	14/6/07	14/6/07	14/6/07	14/6/07	14/6/07
Method : E013.2 **Polychlorinated Biphenyls (PCB)**	**EQL**										
Arochlor 1016	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Arochlor 1232	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Arochlor 1242	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Arochlor 1248	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Arochlor 1254	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Arochlor 1260	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Sum of reported PCBs	--	--	--	--	--	--	--	--	--	--	--
DBC (Surr @ 0.2mg/kg)	--	*93%*	*97%*	*97%*	*96%*	*94%*	*94%*	*94%*	*96%*	*96%*	*95%*

Results expressed in mg/kg dry weight unless otherwise specified

Comments:

E013.2: 8-10g soil extracted with 20ml hexane/acetone (1:1). Analysis by GC/dual ECD.

Laboratory Identification		**92864**	**92820d**	**92820r**	**92863d**	**92863r**	**92834s**	**lcs**	**mb**		
Sample Identification		Duplicate D2	QC	QC	QC	QC	QC	QC	QC		
Depth (m)		--	--	--	--	--	--	--	--		
Sampling Date recorded on COC		30/5/07	--	--	--	--	--	--	--		
Laboratory Extraction (Preparation) Date		8/6/07	8/6/07	--	8/6/07	--	8/6/07	8/6/07	8/6/07		
Laboratory Analysis Date		14/6/07	14/6/07	--	14/6/07	--	13/6/07	8/6/07	8/6/07		
Method : E013.2											
Polychlorinated Biphenyls (PCB)	**EQL**										
Arochlor 1016	0.5	<0.5	<0.5	--	<0.5	--	--	--	<0.5		
Arochlor 1232	0.5	<0.5	<0.5	--	<0.5	--	--	--	<0.5		
Arochlor 1242	0.5	<0.5	<0.5	--	<0.5	--	--	--	<0.5		
Arochlor 1248	0.5	<0.5	<0.5	--	<0.5	--	122%	118%	<0.5		
Arochlor 1254	0.5	<0.5	<0.5	--	<0.5	--	--	--	<0.5		
Arochlor 1260	0.5	<0.5	<0.5	--	<0.5	--	--	--	<0.5		
Sum of reported PCBs	--	--	--	--	--	--	--	--	--		
DBC (Surr @ 0.2mg/kg)	--	*96%*	*98%*	*2%*	*93%*	*2%*	*97%*	*93%*	*108%*		

Results expressed in mg/kg dry weight unless otherwise specified

Comments:

E013.2: 8-10g soil extracted with 20ml hexane/acetone (1:1). Analysis by GC/dual ECD.

Laboratory Identification		**92865**	**92866**	**lcs**	**mb**						
Sample Identification		Rinsate R1	Rinsate R2	QC	QC						
Depth (m)		--	--	--	--						
Sampling Date recorded on COC		30/5/07	30/5/07	--	--						
Laboratory Extraction (Preparation) Date		14/6/07	14/6/07	14/6/07	14/6/07						
Laboratory Analysis Date		14/6/07	14/6/07	15/6/07	15/6/07						
Method : E022.1											
Unfiltered metals (M7)	**EQL**										
Arsenic	5	<5	<5	104%	<5						
Cadmium	0.5	<0.5	<0.5	91%	<0.5						
Chromium	5	<5	<5	108%	<5						
Copper	5	580	530	104%	<5						
Nickel	5	<5	<5	106%	<5						
Lead	5	<5	<5	101%	<5						
Zinc	5	8	21	100%	<5						

Results expressed in ug/l unless otherwise specified

Comments: -

E022.1: 25 ml digested in nitric/hydrochloric acid. Analysis by ICP-MS.

Laboratory Identification		**92865**	**92866**	**lcs**	**mb**						
Sample Identification		Rinsate R1	Rinsate R2	QC	QC						
Depth (m)		--	--	--	--						
Sampling Date recorded on COC		30/5/07	30/5/07	--	--						
Laboratory Extraction (Preparation) Date		14/6/07	14/6/07	14/6/07	14/6/07						
Laboratory Analysis Date		14/6/07	14/6/07	15/6/07	15/6/07						
Method : E026.1 **Unfiltered metals**	**EQL**										
Mercury	0.1	<0.1	<0.1	98%	<0.1						

Results expressed in ug/l unless otherwise specified

Comments:

E026.1: 25ml digested with nitric/hydrochloric acid. Analysis by CV-ICP-MS or FIMS.

Laboratory Identification		**92800**	**92807**	**92808**	**92809**	**92810**	**92811**	**92812**	**92813**	**92814**	**92815**
Sample Identification		BH1	BH1	BH2	BH2	BH2	BH4	BH4	BH4	BH5	BH5
Depth (m)		0.5	0.75	0.12-0.5	0.5-1.2	1.25-1.5	0.1	0.4	2.0	0.1-0.5	0.5-1.5
Sampling Date recorded on COC		30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07
Laboratory Extraction (Preparation) Date		12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07
Laboratory Analysis Date		12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07
Method : E022.2											
Acid extractable metals (M7)	**EQL**										
Arsenic	1	2	2	3	6	3	3	6	<1	4	5
Cadmium	0.1	<0.1	<0.1	0.4	0.7	<0.1	<0.1	0.3	<0.1	<0.1	<0.1
Chromium	1	12	13	11	15	20	19	11	3	5	11
Copper	2	7	2	26	33	3	8	31	<2	15	18
Nickel	1	5	<1	4	16	1	1	18	<1	1	2
Lead	2	23	8	530	440	26	21	100	2	100	100
Zinc	5	17	8	430	540	26	9	80	<5	18	41

Results expressed in mg/kg dry weight unless otherwise specified

Comments: # Percent recovery not available due to significant background levels of analyte in sample.

E022.2: 0.5g digested in nitric/hydrochloric acid. Analysis by ICP-MS.

Laboratory Identification		**92816**	**92817**	**92818**	**92819**	**92820**	**92821**	**92822**	**92823**	**92824**	**92825**
Sample Identification		BH5	BH6	BH6	BH6	BH7	BH7	BH7	BH8	BH8	BH9
Depth (m)		1.55-2.0	0.1-1.0	1.0-2.0	2.55-3.0	0.1-0.5	0.5-1.5	1.5-2.5	0.3	1.8	0-0.5
Sampling Date recorded on COC		30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07
Laboratory Extraction (Preparation) Date		12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07
Laboratory Analysis Date		12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07
Method : E022.2											
Acid extractable metals (M7)	**EQL**										
Arsenic	1	2	18	4	7	26	3	11	6	6	5
Cadmium	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	0.4	<0.1	<0.1	0.2
Chromium	1	8	7	9	17	8	12	9	11	14	14
Copper	2	5	150	75	16	110	74	96	17	8	30
Nickel	1	2	7	5	2	4	7	7	5	1	6
Lead	2	18	100	88	30	86	270	180	43	27	250
Zinc	5	14	34	85	16	39	120	270	37	11	130

Results expressed in mg/kg dry weight unless otherwise specified

Comments: # Percent recovery not available due to significant background levels of analyte in sample.

E022.2: 0.5g digested in nitric/hydrochloric acid. Analysis by ICP-MS.

Laboratory Identification		**92826**	**92827**	**92828**	**92829**	**92830**	**92831**	**92832**	**92833**	**92834**	**92835**
Sample Identification		BH9	BH9	BH9	BH10	BH10	BH10	BH10	BH11	BH11	BH11
Depth (m)		0.5-1.5	1.5-2.5	2.75-3.0	0-0.5	0.5-1.5	1.5-2.5	3.55-3.8	0-0.5	0.5-1.5	1.85-2.1
Sampling Date recorded on COC		30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07
Laboratory Extraction (Preparation) Date		12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07
Laboratory Analysis Date		12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	13/6/07
Method : E022.2											
Acid extractable metals (M7)	**EQL**										
Arsenic	1	33	17	<1	6	16	14	8	28	9	9
Cadmium	0.1	1.3	0.6	<0.1	<0.1	0.1	0.1	<0.1	0.2	<0.1	<0.1
Chromium	1	23	24	7	14	18	20	21	19	16	18
Copper	2	920	280	4	13	52	34	10	88	43	18
Nickel	1	21	28	1	3	6	5	3	110	15	11
Lead	2	810	530	11	61	170	120	24	46	23	26
Zinc	5	590	340	8	56	89	73	16	94	66	36

Results expressed in mg/kg dry weight unless otherwise specified

Comments: # Percent recovery not available due to significant background levels of analyte in sample.

E022.2: 0.5g digested in nitric/hydrochloric acid. Analysis by ICP-MS.

Laboratory Identification		**92836**	**92837**	**92838**	**92839**	**92840**	**92841**	**92842**	**92843**	**92844**	**92845**
Sample Identification		BH12	BH12	BH14	BH14	BH15	BH15	BH16	BH16	BH17	BH18
Depth (m)		0.3	1.5	0-0.7	0.75-1.0	0-1.0	1.05-1.3	0.3	0.75	0.4	0.12-0.8
Sampling Date recorded on COC		30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07
Laboratory Extraction (Preparation) Date		12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07
Laboratory Analysis Date		13/6/07	13/6/07	13/6/07	13/6/07	13/6/07	13/6/07	13/6/07	13/6/07	13/6/07	13/6/07
Method : E022.2											
Acid extractable metals (M7)	**EQL**										
Arsenic	1	8	9	5	20	140	7	43	33	4	9
Cadmium	0.1	<0.1	<0.1	0.3	0.2	1.5	<0.1	0.2	0.2	0.2	2.1
Chromium	1	6	20	18	25	38	21	7	6	8	28
Copper	2	60	7	69	22	120	5	39	36	23	160
Nickel	1	5	2	95	15	26	3	16	11	15	14
Lead	2	110	28	150	53	270	16	96	100	200	3040
Zinc	5	53	12	200	140	11200	76	270	220	180	4730

Results expressed in mg/kg dry weight unless otherwise specified

Comments: # Percent recovery not available due to significant background levels of analyte in sample.

E022.2: 0.5g digested in nitric/hydrochloric acid. Analysis by ICP-MS.

Laboratory Identification		**92846**	**92847**	**92848**	**92849**	**92850**	**92851**	**92852**	**92853**	**92854**	**92856**
Sample Identification		BH18	BH18	BH19	BH19	BH20	BH20	BH21	BH22	BH22	BH23
Depth (m)		0.8-1.7	1.75-2.0	0.12-1.0	1.05-1.3	0.4-1.0	1.05-1.3	0.2	0-0.8	0.85-1.1	0.15-0.4
Sampling Date recorded on COC		30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07
Laboratory Extraction (Preparation) Date		12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07
Laboratory Analysis Date		13/6/07	13/6/07	13/6/07	13/6/07	13/6/07	13/6/07	13/6/07	13/6/07	13/6/07	13/6/07
Method : E022.2 **Acid extractable metals (M7)**	**EQL**										
Arsenic	1	6	4	2	6	8	5	22	31	8	23
Cadmium	0.1	<0.1	<0.1	0.1	<0.1	0.3	<0.1	0.6	0.3	0.1	0.3
Chromium	1	6	11	13	19	21	23	76	36	17	15
Copper	2	12	7	29	4	110	6	93	56	30	150
Nickel	1	<1	<1	38	1	17	2	53	28	8	19
Lead	2	28	17	28	16	240	9	350	97	58	130
Zinc	5	33	8	32	6	260	8	2730	600	130	3280

Results expressed in mg/kg dry weight unless otherwise specified

Comments: # Percent recovery not available due to significant background levels of analyte in sample.

E022.2: 0.5g digested in nitric/hydrochloric acid. Analysis by ICP-MS.

Laboratory Identification		**92857**	**92858**	**92859**	**92860**	**92861**	**92862**	**92863**	**92864**	**92812d**	**92812r**
Sample Identification		BH24	BH24	BH24	BH26	BH26	BH27	Duplicate D1	Duplicate D2	QC	QC
Depth (m)		0-0.7	0.7-1.3	1.35-1.6	0-1.0	1.05-1.3	0.5	--	--	--	--
Sampling Date recorded on COC		30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	--	--
Laboratory Extraction (Preparation) Date		12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	--
Laboratory Analysis Date		13/6/07	13/6/07	13/6/07	13/6/07	13/6/07	13/6/07	13/6/07	13/6/07	12/6/07	--
Method : E022.2											
Acid extractable metals (M7)	**EQL**										
Arsenic	1	10	8	3	18	2	35	33	25	6	0%
Cadmium	0.1	0.2	<0.1	<0.1	0.2	<0.1	2.3	0.1	0.2	0.3	0%
Chromium	1	17	15	17	12	9	20	8	59	9	20%
Copper	2	24	17	5	29	2	170	130	94	31	0%
Nickel	1	28	16	5	83	2	13	5	62	18	0%
Lead	2	32	58	10	74	6	1060	130	95	90	11%
Zinc	5	87	71	18	80	5	1180	63	150	81	1%

Results expressed in mg/kg dry weight unless otherwise specified

Comments: # Percent recovery not available due to significant background levels of analyte in sample.

E022.2: 0.5g digested in nitric/hydrochloric acid. Analysis by ICP-MS.

Laboratory Identification		**92820d**	**92820r**	**92824d**	**92824r**	**92837d**	**92837r**	**92845d**	**92845r**	**92863d**	**92863r**
Sample Identification		QC	QC	QC	QC	QC	QC	QC	QC	QC	QC
Depth (m)		--	--	--	--	--	--	--	--	--	--
Sampling Date recorded on COC		--	--	--	--	--	--	--	--	--	--
Laboratory Extraction (Preparation) Date		12/6/07	--	12/6/07	--	12/6/07	--	12/6/07	--	12/6/07	--
Laboratory Analysis Date		12/6/07	--	12/6/07	--	13/6/07	--	13/6/07	--	13/6/07	--
Method : E022.2 **Acid extractable metals (M7)**	**EQL**										
Arsenic	1	27	4%	6	0%	10	11%	9	0%	35	6%
Cadmium	0.1	<0.1	--	<0.1	--	<0.1	--	2.4	13%	0.1	0%
Chromium	1	8	0%	14	0%	22	10%	27	4%	8	0%
Copper	2	100	10%	8	0%	8	13%	150	6%	170	27%
Nickel	1	4	0%	1	0%	2	0%	15	7%	5	0%
Lead	2	87	1%	28	4%	30	7%	3150	4%	450	110%
Zinc	5	36	8%	12	9%	13	8%	5020	6%	59	7%

Results expressed in mg/kg dry weight unless otherwise specified

Comments: # Percent recovery not available due to significant background levels of analyte in sample.

E022.2: 0.5g digested in nitric/hydrochloric acid. Analysis by ICP-MS.

Laboratory Identification		**92863t**	**92834s**	**92848s**	**92813s**	**crm**	**crm**	**lcs**	**lcs**	**mb**	**mb**
Sample Identification		QC	QC	QC	QC	QC	QC	QC	QC	QC	QC
Depth (m)		--	--	--	--	--	--	--	--	--	--
Sampling Date recorded on COC		--	--	--	--	--	--	--	--	--	--
Laboratory Extraction (Preparation) Date		14/6/07	12/6/07	12/6/07	12/6/07	12/6/07	14/6/07	12/6/07	14/6/07	12/6/07	14/6/07
Laboratory Analysis Date		15/6/07	12/6/07	13/6/07	12/6/07	12/6/07	14/6/07	12/6/07	15/6/07	12/6/07	15/6/07
Method : E022.2											
Acid extractable metals (M7)	**EQL**										
Arsenic	1	--	92%	97%	90%	89%	--	90%	--	<1	--
Cadmium	0.1	--	109%	93%	101%	95%	--	98%	--	<0.1	--
Chromium	1	--	102%	103%	91%	92%	--	85%	--	<1	--
Copper	2	--	101%	104%	86%	87%	--	88%	--	<2	--
Nickel	1	--	96%	99%	91%	84%	--	87%	--	<1	--
Lead	2	120	119%	95%	101%	95%	107%	99%	85%	<2	<2
Zinc	5	--	#	104%	92%	85%	--	95%	--	<5	--

Results expressed in mg/kg dry weight unless otherwise specified

Comments: # Percent recovery not available due to significant background levels of analyte in sample.

E022.2: 0.5g digested in nitric/hydrochloric acid. Analysis by ICP-MS.

Laboratory Identification		**92800**	**92807**	**92808**	**92809**	**92810**	**92811**	**92812**	**92813**	**92814**	**92815**
Sample Identification		BH1	BH1	BH2	BH2	BH2	BH4	BH4	BH4	BH5	BH5
Depth (m)		0.5	0.75	0.12-0.5	0.5-1.2	1.25-1.5	0.1	0.4	2.0	0.1-0.5	0.5-1.5
Sampling Date recorded on COC		30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07
Laboratory Extraction (Preparation) Date		12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07
Laboratory Analysis Date		12/6/07	13/6/07	13/6/07	13/6/07	13/6/07	13/6/07	13/6/07	13/6/07	13/6/07	13/6/07
Method : E026.2											
Acid extractable mercury	**EQL**										
Mercury	0.05	0.1	<0.05	0.52	0.31	<0.05	<0.05	0.25	<0.05	0.1	0.18

Results expressed in mg/kg dry weight unless otherwise specified

Comments:

E026.2: 0.5g digested with nitric/hydrochloric acid. Analysis by CV-ICP-MS or FIMS.

Laboratory Identification		**92816**	**92817**	**92818**	**92819**	**92820**	**92821**	**92822**	**92823**	**92824**	**92825**
Sample Identification		BH5	BH6	BH6	BH6	BH7	BH7	BH7	BH8	BH8	BH9
Depth (m)		1.55-2.0	0.1-1.0	1.0-2.0	2.55-3.0	0.1-0.5	0.5-1.5	1.5-2.5	0.3	1.8	0-0.5
Sampling Date recorded on COC		30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07
Laboratory Extraction (Preparation) Date		12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07
Laboratory Analysis Date		13/6/07	13/6/07	13/6/07	13/6/07	13/6/07	13/6/07	13/6/07	13/6/07	13/6/07	13/6/07
Method : E026.2											
Acid extractable mercury	**EQL**										
Mercury	0.05	<0.05	0.14	0.1	<0.05	0.14	0.12	0.12	0.38	1.1	0.23

Results expressed in mg/kg dry weight unless otherwise specified

Comments:

E026.2: 0.5g digested with nitric/hydrochloric acid. Analysis by CV-ICP-MS or FIMS.

Laboratory Identification		**92826**	**92827**	**92828**	**92829**	**92830**	**92831**	**92832**	**92833**	**92834**	**92835**
Sample Identification		BH9	BH9	BH9	BH10	BH10	BH10	BH10	BH11	BH11	BH11
Depth (m)		0.5-1.5	1.5-2.5	2.75-3.0	0-0.5	0.5-1.5	1.5-2.5	3.55-3.8	0-0.5	0.5-1.5	1.85-2.1
Sampling Date recorded on COC		30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07
Laboratory Extraction (Preparation) Date		12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07
Laboratory Analysis Date		13/6/07	13/6/07	13/6/07	13/6/07	13/6/07	13/6/07	13/6/07	13/6/07	13/6/07	13/6/07
Method : E026.2 **Acid extractable mercury**	**EQL**										
Mercury	0.05	0.13	0.16	<0.05	0.06	0.14	0.12	<0.05	0.15	<0.05	0.05

Results expressed in mg/kg dry weight unless otherwise specified

Comments:

E026.2: 0.5g digested with nitric/hydrochloric acid. Analysis by CV-ICP-MS or FIMS.

Laboratory Identification		**92836**	**92837**	**92838**	**92839**	**92840**	**92841**	**92842**	**92843**	**92844**	**92845**
Sample Identification		BH12	BH12	BH14	BH14	BH15	BH15	BH16	BH16	BH17	BH18
Depth (m)		0.3	1.5	0-0.7	0.75-1.0	0-1.0	1.05-1.3	0.3	0.75	0.4	0.12-0.8
Sampling Date recorded on COC		30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07
Laboratory Extraction (Preparation) Date		12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07
Laboratory Analysis Date		13/6/07	13/6/07	13/6/07	13/6/07	13/6/07	13/6/07	13/6/07	13/6/07	13/6/07	13/6/07
Method : E026.2 **Acid extractable mercury**	**EQL**										
Mercury	0.05	0.44	<0.05	0.05	0.05	0.32	<0.05	0.11	0.11	0.17	0.28

Results expressed in mg/kg dry weight unless otherwise specified

Comments:

E026.2: 0.5g digested with nitric/hydrochloric acid. Analysis by CV-ICP-MS or FIMS.

Laboratory Identification		**92846**	**92847**	**92848**	**92849**	**92850**	**92851**	**92852**	**92853**	**92854**	**92856**
Sample Identification		BH18	BH18	BH19	BH19	BH20	BH20	BH21	BH22	BH22	BH23
Depth (m)		0.8-1.7	1.75-2.0	0.12-1.0	1.05-1.3	0.4-1.0	1.05-1.3	0.2	0-0.8	0.85-1.1	0.15-0.4
Sampling Date recorded on COC		30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07
Laboratory Extraction (Preparation) Date		12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07
Laboratory Analysis Date		13/6/07	13/6/07	13/6/07	13/6/07	13/6/07	13/6/07	13/6/07	13/6/07	13/6/07	13/6/07
Method : E026.2											
Acid extractable mercury	**EQL**										
Mercury	0.05	<0.05	<0.05	<0.05	<0.05	0.50	<0.05	0.19	0.06	0.05	0.07

Results expressed in mg/kg dry weight unless otherwise specified

Comments:

E026.2: 0.5g digested with nitric/hydrochloric acid. Analysis by CV-ICP-MS or FIMS.

Laboratory Identification		**92857**	**92858**	**92859**	**92860**	**92861**	**92862**	**92863**	**92864**	**92812d**	**92812r**
Sample Identification		BH24	BH24	BH24	BH26	BH26	BH27	Duplicate D1	Duplicate D2	QC	QC
Depth (m)		0-0.7	0.7-1.3	1.35-1.6	0-1.0	1.05-1.3	0.5	--	--	--	--
Sampling Date recorded on COC		30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	--	--
Laboratory Extraction (Preparation) Date		12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	--
Laboratory Analysis Date		13/6/07	13/6/07	13/6/07	13/6/07	13/6/07	13/6/07	13/6/07	13/6/07	13/6/07	--
Method : E026.2											
Acid extractable mercury	**EQL**										
Mercury	0.05	0.1	0.08	<0.05	0.08	<0.05	0.57	0.20	0.06	0.25	0%

Results expressed in mg/kg dry weight unless otherwise specified

Comments:

E026.2: 0.5g digested with nitric/hydrochloric acid. Analysis by CV-ICP-MS or FIMS.

Laboratory Identification		**92820d**	**92820r**	**92824d**	**92824r**	**92837d**	**92837r**	**92845d**	**92845r**	**92863d**	**92863r**
Sample Identification		QC	QC	QC	QC	QC	QC	QC	QC	QC	QC
Depth (m)		--	--	--	--	--	--	--	--	--	--
Sampling Date recorded on COC		--	--	--	--	--	--	--	--	--	--
Laboratory Extraction (Preparation) Date		12/6/07	--	12/6/07	--	12/6/07	--	12/6/07	--	12/6/07	--
Laboratory Analysis Date		13/6/07	--	13/6/07	--	13/6/07	--	13/6/07	--	13/6/07	--
Method : E026.2 **Acid extractable mercury**	**EQL**										
Mercury	0.05	0.14	0%	1.2	9%	<0.05	--	0.28	0%	0.21	5%

Results expressed in mg/kg dry weight unless otherwise specified

Comments:

E026.2: 0.5g digested with nitric/hydrochloric acid. Analysis by CV-ICP-MS or FIMS.

Laboratory Identification		**92834s**	**92848s**	**92813s**	**crm**	**lcs**	**mb**				
Sample Identification		QC	QC	QC	QC	QC	QC				
Depth (m)		--	--	--	--	--	--				
Sampling Date recorded on COC		--	--	--	--	--	--				
Laboratory Extraction (Preparation) Date		12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07				
Laboratory Analysis Date		13/6/07	13/6/07	13/6/07	12/6/07	12/6/07	12/6/07				
Method : E026.2 **Acid extractable mercury**	**EQL**										
Mercury	0.05	106%	103%	98%	101%	99%	<0.05				

Results expressed in mg/kg dry weight unless otherwise specified

Comments:

E026.2: 0.5g digested with nitric/hydrochloric acid. Analysis by CV-ICP-MS or FIMS.

Laboratory Identification		**92820**	**92833**	**92834**	**92838**	**92857**	**92863**	**92864**	**92820d**	**92820r**	**92834s**
Sample Identification		BH7	BH11	BH11	BH14	BH24	Duplicate D1	Duplicate D2	QC	QC	QC
Depth (m)		0.1-0.5	0-0.5	0.5-1.5	0-0.7	0-0.7	--	--	--	--	--
Sampling Date recorded on COC		30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	--	--	--
Laboratory Extraction (Preparation) Date		8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	--	8/6/07
Laboratory Analysis Date		12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	--	12/6/07
Method : E040.2/E054.2											
Total Cyanide	**EQL**										
Total Cyanide	1	<1	<1	<1	<1	<1	<1	<1	<1	--	51%

Results expressed in mg/kg dry weight unless otherwise specified

Comments:

E040.2/E054.2: Caustic extract followed by strong acid distillion. Analysis by colour.

Laboratory Identification		**lcs**	**mb**								
Sample Identification		QC	QC								
Depth (m)		--	--								
Sampling Date recorded on COC		--	--								
Laboratory Extraction (Preparation) Date		8/6/07	8/6/07								
Laboratory Analysis Date		12/6/07	12/6/07								
Method : E040.2/E054.2											
Total Cyanide	**EQL**										
Total Cyanide	1	98%	<1								

Results expressed in mg/kg dry weight unless otherwise specified

Comments:

E040.2/E054.2: Caustic extract followed by strong acid distillion. Analysis by colour.

Laboratory Identification		**92800**	**92807**	**92808**	**92809**	**92810**	**92811**	**92812**	**92813**	**92814**	**92815**
Sample Identification		BH1	BH1	BH2	BH2	BH2	BH4	BH4	BH4	BH5	BH5
Depth (m)		0.5	0.75	0.12-0.5	0.5-1.2	1.25-1.5	0.1	0.4	2.0	0.1-0.5	0.5-1.5
Sampling Date recorded on COC		30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07
Laboratory Extraction (Preparation) Date		8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	8/6/07
Laboratory Analysis Date		12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07
Method : E005.2											
Moisture	**EQL**										
Moisture	--	16	13	8	9	8	9	6	7	12	19

Results expressed in % w/w unless otherwise specified

Comments:

E005.2: Moisture by gravimetric analysis. Results are in % w/w.

Laboratory Identification		**92816**	**92817**	**92818**	**92819**	**92820**	**92821**	**92822**	**92823**	**92824**	**92825**
Sample Identification		BH5	BH6	BH6	BH6	BH7	BH7	BH7	BH8	BH8	BH9
Depth (m)		1.55-2.0	0.1-1.0	1.0-2.0	2.55-3.0	0.1-0.5	0.5-1.5	1.5-2.5	0.3	1.8	0-0.5
Sampling Date recorded on COC		30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07
Laboratory Extraction (Preparation) Date		8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	8/6/07
Laboratory Analysis Date		12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07
Method : E005.2											
Moisture	**EQL**										
Moisture	--	12	12	11	12	13	7	6	13	13	12

Results expressed in % w/w unless otherwise specified

Comments:

E005.2: Moisture by gravimetric analysis. Results are in % w/w.

Laboratory Identification		**92826**	**92827**	**92828**	**92829**	**92830**	**92831**	**92832**	**92833**	**92834**	**92835**
Sample Identification		BH9	BH9	BH9	BH10	BH10	BH10	BH10	BH11	BH11	BH11
Depth (m)		0.5-1.5	1.5-2.5	2.75-3.0	0-0.5	0.5-1.5	1.5-2.5	3.55-3.8	0-0.5	0.5-1.5	1.85-2.1
Sampling Date recorded on COC		30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07
Laboratory Extraction (Preparation) Date		8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	8/6/07
Laboratory Analysis Date		12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07
Method : E005.2											
Moisture	**EQL**										
Moisture	--	13	13	15	13	14	12	13	7	15	14

Results expressed in % w/w unless otherwise specified

Comments:

E005.2: Moisture by gravimetric analysis. Results are in % w/w.

Laboratory Identification		**92836**	**92837**	**92838**	**92839**	**92840**	**92841**	**92842**	**92843**	**92844**	**92845**
Sample Identification		BH12	BH12	BH14	BH14	BH15	BH15	BH16	BH16	BH17	BH18
Depth (m)		0.3	1.5	0-0.7	0.75-1.0	0-1.0	1.05-1.3	0.3	0.75	0.4	0.12-0.8
Sampling Date recorded on COC		30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07
Laboratory Extraction (Preparation) Date		8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	8/6/07
Laboratory Analysis Date		12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07
Method : E005.2											
Moisture	**EQL**										
Moisture	--	14	15	6	10	16	12	7	5	11	11

Results expressed in % w/w unless otherwise specified

Comments:

E005.2: Moisture by gravimetric analysis. Results are in % w/w.

Laboratory Identification		**92846**	**92847**	**92848**	**92849**	**92850**	**92851**	**92852**	**92853**	**92854**	**92856**
Sample Identification		BH18	BH18	BH19	BH19	BH20	BH20	BH21	BH22	BH22	BH23
Depth (m)		0.8-1.7	1.75-2.0	0.12-1.0	1.05-1.3	0.4-1.0	1.05-1.3	0.2	0-0.8	0.85-1.1	0.15-0.4
Sampling Date recorded on COC		30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07
Laboratory Extraction (Preparation) Date		8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	8/6/07
Laboratory Analysis Date		12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07
Method : E005.2											
Moisture	**EQL**										
Moisture	--	17	21	7	12	9	12	6	9	10	11

Results expressed in % w/w unless otherwise specified

Comments:

E005.2: Moisture by gravimetric analysis. Results are in % w/w.

Laboratory Identification		**92857**	**92858**	**92859**	**92860**	**92861**	**92862**	**92863**	**92864**	**92800d**	**92800r**
Sample Identification		BH24	BH24	BH24	BH26	BH26	BH27	Duplicate D1	Duplicate D2	QC	QC
Depth (m)		0-0.7	0.7-1.3	1.35-1.6	0-1.0	1.05-1.3	0.5	--	--	--	--
Sampling Date recorded on COC		30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	30/5/07	--	--
Laboratory Extraction (Preparation) Date		8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	8/6/07	--
Laboratory Analysis Date		12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	--
Method : E005.2											
Moisture	**EQL**										
Moisture	--	13	11	12	15	12	18	13	14	16	0%

Results expressed in % w/w unless otherwise specified

Comments:

E005.2: Moisture by gravimetric analysis. Results are in % w/w.

Laboratory Identification		**92812d**	**92812r**	**92820d**	**92820r**	**92824d**	**92824r**	**92837d**	**92837r**	**92845d**	**92845r**
Sample Identification		QC	QC	QC	QC	QC	QC	QC	QC	QC	QC
Depth (m)		--	--	--	--	--	--	--	--	--	--
Sampling Date recorded on COC		--	--	--	--	--	--	--	--	--	--
Laboratory Extraction (Preparation) Date		8/6/07	--	8/6/07	--	8/6/07	--	8/6/07	--	8/6/07	--
Laboratory Analysis Date		12/6/07	--	12/6/07	--	12/6/07	--	12/6/07	--	12/6/07	--
Method : E005.2 **Moisture**	**EQL**										
Moisture	--	7	15%	13	0%	14	7%	16	6%	11	0%

Results expressed in % w/w unless otherwise specified

Comments:

E005.2: Moisture by gravimetric analysis. Results are in % w/w.

Laboratory Identification		**92863d**	**92863r**								
Sample Identification		QC	QC								
Depth (m)		--	--								
Sampling Date recorded on COC		--	--								
Laboratory Extraction (Preparation) Date		8/6/07	--								
Laboratory Analysis Date		12/6/07	--								
Method : E005.2 **Moisture**	**EQL**										
Moisture	--	13	0%								

Results expressed in % w/w unless otherwise specified

Comments:

E005.2: Moisture by gravimetric analysis. Results are in % w/w.

Report Date : 6/06/2007
Report Time : 2:55:17PM

Quality, Service, Support

Sample **Receipt** Notice (SRN) for **E032339**

Client Details

Client Name: Aargus Pty. Ltd
Client Phone: 02 9568 6159
Client Fax: 1300 136 038
Contact Name: Nick Kariotoglou
Contact Email: admin@aargus.net
Client Address: P.O Box 398
Drummoyne NSW 2047

Project Name: Smith St Summer Hill
Project Number: E1559
CoC Number: - Not provided -
Purchase Order: - Not provided -
Surcharge: No surcharge applied (results by 6:30pm on due date)
Sample Matrix: SOIL & WATER

Date Sampled (earliest date): 30/05/2007
Date Samples Received: 01/06/2007
Date Sample Receipt Notice issued: 06/06/2007
Date Preliminary Report Due: 13/06/2007

Laboratory Reference Information

Please have this information ready when contacting Labmark.

Laboratory Report: **E032339**
Quotation Number: - Not provided, standard prices apply
Laboratory Address: Unit 1, 8 Leighton Pl.
Asquith NSW 2077

Phone: 61 2 9476 6533
Fax: 61 2 9476 8219

Sample Receipt Contact: Jakleen El Galada
Email: jakleen.galada@labmark.com.au
Reporting Contact: Jyothi Lal
Email: jyothi.lal@labmark.com.au

NATA Accreditation: 13542
TGA GMP License: 185-336 (Sydney)
APVMA License: 6105 (Sydney)
AQIS Approval: NO356 (Sydney)
AQIS Entry Permit: 200521534 (Sydney)

Reporting Requirements: Electronic Data Download required:No

Sample Condition: COC received with samples. Report number and lab ID's defined on COC.
Samples received in good order .
Samples received with cooling media: Ice bricks .
Samples received chilled.
Security seals not used .
Sample container & chemical preservation suitable .

Comments: Analysis received 05/06/07. SRN re-issued additional sampled added and put on hold as per clients request.

Holding Times: Date received allows for sufficient time to meet Technical Holding Times.

Preservation: Chemical preservation of samples satisfactory for requested analytes.

Important Notes:
LabMark shall responsibly dispose of spent customer soil and water samples which includes the disintegration of the sample label. A sample disposal fee of $1.00 is applicable on all samples received by the laboratory regardless of whether they have undergone analytical testing. Sample disposal of environmental samples shall be 31 days (water) and 3 months (soil, HN03 preserved samples) after laboratory receipt, unless otherwise requested in writing by the client. Samples requested to be held in non-refrigerated storage shall incur $5.00/ sample/ 3 months. Additional refrigerated storage shall incur $30/ sample/ 3 months. Combination prices apply only if requested. Transfer of report ownership from LabMark to the client shall occur once full and final payment has been settled and verified. All report copies may be retracted where full payment does not occur within the agreed settlement period.

Analysis comments:
VOC E016.2: Acetone and Dichloromethane not reported unless requested.

Subcontracted Analyses:

Thank you for choosing Labmark to analyse your project samples.
Additional information on www.labmark.com.au

Report Date : 6/06/2007
Report Time : 2:55:17PM

Quality, Service, Support

Sample **Receipt** Notice (SRN) for **E032339**

The table below represents LabMark's understanding and interpretation of the customer supplied sample COC request. Please confirm that your COC request has been entered correctly. Due to THT and TAT requirements, testing shall commence immediately as per this table, unless the customer intervenes with a correction prior to testing.

GRID REVIEW TABLE

Requested Analysis

No.	Date	Depth	Client Sample ID	BTEX by P&T	Acid extractable mercury	Unfiltered metals	HOLD ON HOLD	Acid extractable metals (M7)	Unfiltered metals (M7)	Moisture	Organochlorine Pesticides (OC)	Polyaromatic Hydrocarbons (PAH)	Polychlorinated Biphenyls (PCB)	Phenols by GC/MS	PREP Not Reported	PREP Not Reported	Total Cyanide	Petroleum Hydrocarbons (TPH)	Volatile Organic Compounds (VOC)	Volatile TPH by P&T (vTPH)			
92800	30/05	0.5	BH1		●			●		●		●			●			●	●	●			
92807	30/05	0.75	BH1	●	●			●		●		●		●	●			●		●			
92808	30/05	0.12-0.5	BH2	●	●			●		●		●			●			●		●			
92809	30/05	0.5-1.2	BH2		●			●		●		●			●			●	●	●			
92810	30/05	1.25-1.5	BH2	●	●			●		●		●		●	●			●		●			
92811	30/05	0.1	BH4		●			●		●	●				●								
92812	30/05	0.4	BH4		●			●		●					●								
92813	30/05	2.0	BH4		●			●		●					●								
92814	30/05	0.1-0.5	BH5	●	●			●		●			●		●			●		●			
92815	30/05	0.5-1.5	BH5		●			●		●			●		●								
92816	30/05	1.55-2.0	BH5		●			●		●			●		●								
92817	30/05	0.1-1.0	BH6	●	●			●		●		●			●			●		●			
92818	30/05	1.0-2.0	BH6		●			●		●					●								
92819	30/05	2.55-3.0	BH6		●			●		●					●								
92820	30/05	0.1-0.5	BH7	●	●			●		●	●	●	●	●	●		●	●		●			
92821	30/05	0.5-1.5	BH7	●	●			●		●		●			●			●		●			
92822	30/05	1.5-2.5	BH7		●			●		●					●								
92823	30/05	0.3	BH8	●	●			●		●		●			●			●		●			
92824	30/05	1.8	BH8		●			●		●					●								
92825	30/05	0-0.5	BH9		●			●		●					●								
92826	30/05	0.5-1.5	BH9		●			●		●					●								
92827	30/05	1.5-2.5	BH9	●	●			●		●		●			●			●		●			
92828	30/05	2.75-3.0	BH9		●			●		●					●								
92829	30/05	0-0.5	BH10	●	●			●		●		●			●			●		●			
92830	30/05	0.5-1.5	BH10		●			●		●					●								
92831	30/05	1.5-2.5	BH10		●			●		●					●								
92832	30/05	3.55-3.8	BH10		●			●		●					●								
92833	30/05	0-0.5	BH11	●	●			●		●	●	●	●	●	●		●	●		●			
92834	30/05	0.5-1.5	BH11	●	●			●		●	●	●	●	●	●		●	●		●			
92835	30/05	1.85-2.1	BH11		●			●		●					●								
92836	30/05	0.3	BH12	●	●			●		●	●	●			●			●		●			
92837	30/05	1.5	BH12		●			●		●					●								

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Additional information on www.labmark.com.au

Quality, Service, Support

Report Date : 6/06/2007
Report Time : 2:55:17PM

Sample **Receipt** Notice (SRN) for **E032339**

The table below represents LabMark's understanding and interpretation of the customer supplied sample COC request. Please confirm that your COC request has been entered correctly. Due to THT and TAT requirements, testing shall commence immediately as per this table, unless the customer intervenes with a correction prior to testing.

GRID REVIEW TABLE

				Requested Analysis																			
No.	Date	Depth	Client Sample ID	BTEX by P&T	Acid extractable mercury	Unfiltered metals	HOLD ON HOLD	Acid extractable metals (M7)	Unfiltered metals (M7)	Moisture	Organochlorine Pesticides (OC)	Polyaromatic Hydrocarbons (PAH)	Polychlorinated Biphenyls (PCB)	Phenols by GC/MS	PREP Not Reported	PREP Not Reported	Total Cyanide	Petroleum Hydrocarbons (TPH)	Volatile Organic Compounds (VOC)	Volatile TPH by P&T (vTPH)			
92838	30/05	0-0.7	BH14	●	●			●		●	●	●	●	●	●		●	●		●			
92839	30/05	0.75-1.0	BH14		●			●		●					●								
92840	30/05	0-1.0	BH15		●			●		●		●			●								
92841	30/05	1.05-1.3	BH15		●			●		●					●								
92842	30/05	0.3	BH16		●			●		●	●	●	●		●			●	●	●			
92843	30/05	0.75	BH16		●			●		●					●								
92844	30/05	0.4	BH17	●	●			●		●	●	●			●			●		●			
92845	30/05	0.12-0.8	BH18	●	●			●		●		●		●	●			●		●			
92846	30/05	0.8-1.7	BH18		●			●		●					●								
92847	30/05	1.75-2.0	BH18		●			●		●					●								
92848	30/05	0.12-1.0	BH19	●	●			●		●		●			●			●		●			
92849	30/05	1.05-1.3	BH19		●			●		●					●								
92850	30/05	0.4-1.0	BH20	●	●			●		●		●			●			●		●			
92851	30/05	1.05-1.3	BH20		●			●		●					●								
92852	30/05	0.2	BH21		●			●		●		●		●	●			●	●	●			
92853	30/05	0-0.8	BH22	●	●			●		●	●	●	●		●			●		●			
92854	30/05	0.85-1.1	BH22		●			●		●					●								
92855	30/05	1.3-1.6	BH22				●																
92856	30/05	0.15-0.4	BH23	●	●			●		●		●			●			●		●			
92857	30/05	0-0.7	BH24		●			●		●		●		●	●		●	●	●	●			
92858	30/05	0.7-1.3	BH24	●	●			●		●		●		●	●			●		●			
92859	30/05	1.35-1.6	BH24		●			●		●					●								
92860	30/05	0-1.0	BH26	●	●			●		●		●			●			●		●			
92861	30/05	1.05-1.3	BH26		●			●		●					●								
92862	30/05	0.5	BH27		●			●		●		●		●	●			●	●	●			
92863	30/05		Duplicate D1	●	●			●		●	●	●	●	●	●		●	●		●			
92864	30/05		Duplicate D2	●	●			●		●	●	●	●	●	●		●	●		●			
92865	30/05		Rinsate R1			●			●							●							
92866	30/05		Rinsate R2			●			●							●							
93166	31/05		BH2 0.5-1.0				●																
			Totals:	24	58	2	2	58	2	58	11	30	11	13	58	2	7	30	6	30			

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Report Date : 6/06/2007
Report Time : 2:55:17PM

Sample **Receipt** Notice (SRN) for **E032339**

				Requested Analysis																			
No.	**Date**	**Depth**	**Client Sample ID**	M8 - M7-T_S	M8 - M7-T_W																		
92800	30/05	0.5	BH1	●																			
92807	30/05	0.75	BH1	●																			
92808	30/05	0.12-0.5	BH2	●																			
92809	30/05	0.5-1.2	BH2	●																			
92810	30/05	1.25-1.5	BH2	●																			
92811	30/05	0.1	BH4	●																			
92812	30/05	0.4	BH4	●																			
92813	30/05	2.0	BH4	●																			
92814	30/05	0.1-0.5	BH5	●																			
92815	30/05	0.5-1.5	BH5	●																			
92816	30/05	1.55-2.0	BH5	●																			
92817	30/05	0.1-1.0	BH6	●																			
92818	30/05	1.0-2.0	BH6	●																			
92819	30/05	2.55-3.0	BH6	●																			
92820	30/05	0.1-0.5	BH7	●																			
92821	30/05	0.5-1.5	BH7	●																			
92822	30/05	1.5-2.5	BH7	●																			
92823	30/05	0.3	BH8	●																			
92824	30/05	1.8	BH8	●																			
92825	30/05	0-0.5	BH9	●																			
92826	30/05	0.5-1.5	BH9	●																			
92827	30/05	1.5-2.5	BH9	●																			
92828	30/05	2.75-3.0	BH9	●																			
92829	30/05	0-0.5	BH10	●																			
92830	30/05	0.5-1.5	BH10	●																			
92831	30/05	1.5-2.5	BH10	●																			
92832	30/05	3.55-3.8	BH10	●																			
92833	30/05	0-0.5	BH11	●																			
92834	30/05	0.5-1.5	BH11	●																			
92835	30/05	1.85-2.1	BH11	●																			
92836	30/05	0.3	BH12	●																			
92837	30/05	1.5	BH12	●																			
92838	30/05	0-0.7	BH14	●																			

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Quality, Service, Support

Report Date : 6/06/2007
Report Time : 2:55:17PM

Sample
Receipt
Notice (SRN) for **E032339**

				Requested Analysis																			
No.	**Date**	**Depth**	**Client Sample ID**	M8 - M7-T_S	M8 - M7-T_W																		
92839	30/05	0.75-1.0	BH14	●																			
92840	30/05	0-1.0	BH15	●																			
92841	30/05	1.05-1.3	BH15	●																			
92842	30/05	0.3	BH16	●																			
92843	30/05	0.75	BH16	●																			
92844	30/05	0.4	BH17	●																			
92845	30/05	0.12-0.8	BH18	●																			
92846	30/05	0.8-1.7	BH18	●																			
92847	30/05	1.75-2.0	BH18	●																			
92848	30/05	0.12-1.0	BH19	●																			
92849	30/05	1.05-1.3	BH19	●																			
92850	30/05	0.4-1.0	BH20	●																			
92851	30/05	1.05-1.3	BH20	●																			
92852	30/05	0.2	BH21	●																			
92853	30/05	0-0.8	BH22	●																			
92854	30/05	0.85-1.1	BH22	●																			
92856	30/05	0.15-0.4	BH23	●																			
92857	30/05	0-0.7	BH24	●																			
92858	30/05	0.7-1.3	BH24	●																			
92859	30/05	1.35-1.6	BH24	●																			
92860	30/05	0-1.0	BH26	●																			
92861	30/05	1.05-1.3	BH26	●																			
92862	30/05	0.5	BH27	●																			
92863	30/05		Duplicate D1	●																			
92864	30/05		Duplicate D2	●																			
92865	30/05		Rinsate R1		●																		
92866	30/05		Rinsate R2		●																		
			Totals:	58	2																		

Thank you for choosing Labmark to analyse your project samples.
Additional information on www.labmark.com.au

AARGUS PTY LTD

Laboratory Test Request / Chain of Custody Record

446 Parramatta Road
PETERSHAM NSW 2049

P O Box 398
DRUMMOYNE NSW 1470

Tel: 1300 137 038
Fax: 1300 136 038
email: admin@aargus.net

Page 6 **of** 6

TO:	**LABMARK PTY LTD** **UNIT 1** **8 LEIGHTON PLACE** **ASQUITH NSW 2077**		
PH:	**02 9476 6533**	**FAX:**	**02 9476 8219**
ATTN:	**MS JAKLEEN EL GALADA**		

Sampling Date:	30 & 31.05.2007	**Job No:**	E1559
Sampled By:	MK/DH	**Project:**	E032339
Project Manager:	NK	**Location:**	SMITH STREET, SUMMER HILL

Sampling details		**Sample type**		**Results required by: WEDNESDAY, 13 - 06 - 2007**									
Location	**Depth (m)**	**Soil**	**Water**	**Heavy Metals As, Cd, Cr, Cu, Pb, Hg, Ni and Zn**	**OCP**	**PCB**	**TPH* and BTEX**	**PAH**	**Phenols**	**Cyanides**	**VOC**	**BTEX**	**KEEP SAMPLE**
92863 DUPLICATE D1	-	DSG		✓	✓	✓	✓	✓	✓	✓			YES
92864 DUPLICATE D2	-	DSG		✓	✓	✓	✓	✓	✓	✓			YES
92865 RINSATE R1	-		WG	✓									YES
92866 RINSATE R2	-		WG	✓									YES
93166 BH2 0.5-1.0													

Relinquished by			Received by		
Name	Signature	Date	Name	Signature	Date
MARK KELLY	mk	04.06.2007	Ros Schacht		5/6/07

Legend:

WG	Water sample, glass bottle	USG	Undisturbed soil sample (glass jar)	DSP	Disturbed soil sample (small plastic bag)	* Purge & Trap	@ mole H^+/tonne
WP	Water sample, plastic bottle	DSG	Disturbed soil sample (glass jar)	✓	Test required	# Geotechnique Screen	

Form No 4.7F2-4 SGS

Report Date : 6/06/2007
Report Time : 12:17:00PM

Quality, Service, Support

Sample **Receipt** Notice (SRN) for E032339

Client Details

Client Name: Aargus Pty. Ltd
Client Phone: 02 9568 6159
Client Fax: 1300 136 038
Contact Name: Nick Kariotoglou
Contact Email: admin@aargus.net
Client Address: P.O Box 398
Drummoyne NSW 2047

Project Name: Smith St Summer Hill
Project Number: E1559
CoC Number: - Not provided -
Purchase Order: - Not provided -
Surcharge: No surcharge applied (results by 6:30pm on due date)
Sample Matrix: SOIL & WATER

Date Sampled (earliest date): 30/05/2007
Date Samples Received: 01/06/2007
Date Sample Receipt Notice issued: 06/06/2007
Date Preliminary Report Due: 13/06/2007

Laboratory Reference Information

Please have this information ready when contacting Labmark.

Laboratory Report: **E032339**
Quotation Number: - Not provided, standard prices apply
Laboratory Address: Unit 1, 8 Leighton Pl.
Asquith NSW 2077

Phone: 61 2 9476 6533
Fax: 61 2 9476 8219

Sample Receipt Contact: Jakleen El Galada
Email: jakleen.galada@labmark.com.au
Reporting Contact: Jyothi Lal
Email: jyothi.lal@labmark.com.au

NATA Accreditation: 13542
TGA GMP License: 185-336 (Sydney)
APVMA License: 6105 (Sydney)
AQIS Approval: NO356 (Sydney)
AQIS Entry Permit: 200521534 (Sydney)

Reporting Requirements: Electronic Data Download required:No

Sample Condition: COC received with samples. Report number and lab ID's defined on COC.
Samples received in good order .
Samples received with cooling media: Ice bricks .
Samples received chilled.
Security seals not used .
Sample container & chemical preservation suitable .

Comments: Analysis received 05/06/07.

Holding Times: Date received allows for sufficient time to meet Technical Holding Times.

Preservation: Chemical preservation of samples satisfactory for requested analytes.

Important Notes:
LabMark shall responsibly dispose of spent customer soil and water samples which includes the disintegration of the sample label. A sample disposal fee of $1.00 is applicable on all samples received by the laboratory regardless of whether they have undergone analytical testing. Sample disposal of environmental samples shall be 31 days (water) and 3 months (soil, HN03 preserved samples) after laboratory receipt, unless otherwise requested in writing by the client. Samples requested to be held in non-refrigerated storage shall incur $5.00/ sample/ 3 months. Additional refrigerated storage shall incur $30/ sample/ 3 months. Combination prices apply only if requested. Transfer of report ownership from LabMark to the client shall occur once full and final payment has been settled and verified. All report copies may be retracted where full payment does not occur within the agreed settlement period.

Analysis comments:
VOC E016.2: Acetone and Dichloromethane not reported unless requested.

Subcontracted Analyses:

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Additional information on www.labmark.com.au

Quality, Service, Support

Report Date : 6/06/2007
Report Time : 12:17:00PM

Sample **Receipt** Notice (SRN) for **E032339**

The table below represents LabMark's understanding and interpretation of the customer supplied sample COC request. Please confirm that your COC request has been entered correctly. Due to THT and TAT requirements, testing shall commence immediately as per this table, unless the customer intervenes with a correction prior to testing.

GRID REVIEW TABLE

Requested Analysis

No.	Date	Depth	Client Sample ID	BTEX by P&T	Acid extractable mercury	Unfiltered metals	HOLD ON HOLD	Acid extractable metals (M7)	Unfiltered metals (M7)	Moisture	Organochlorine Pesticides (OC)	Polyaromatic Hydrocarbons (PAH)	Polychlorinated Biphenyls (PCB)	Phenols by GC/MS	PREP Not Reported	PREP Not Reported	Total Cyanide	Petroleum Hydrocarbons (TPH)	Volatile Organic Compounds (VOC)	Volatile TPH by P&T (vTPH)			
92800	30/05	0.5	BH1		●			●		●		●			●			●	●	●			
92807	30/05	0.75	BH1	●	●			●		●		●		●	●			●		●			
92808	30/05	0.12-0.5	BH2	●	●			●		●		●			●			●		●			
92809	30/05	0.5-1.2	BH2		●			●		●		●			●			●	●	●			
92810	30/05	1.25-1.5	BH2	●	●			●		●		●		●	●			●		●			
92811	30/05	0.1	BH4		●			●		●	●				●								
92812	30/05	0.4	BH4		●			●		●					●								
92813	30/05	2.0	BH4		●			●		●					●								
92814	30/05	0.1-0.5	BH5	●	●			●		●			●		●			●		●			
92815	30/05	0.5-1.5	BH5		●			●		●			●		●								
92816	30/05	1.55-2.0	BH5		●			●		●			●		●								
92817	30/05	0.1-1.0	BH6	●	●			●		●		●			●			●		●			
92818	30/05	1.0-2.0	BH6		●			●		●					●								
92819	30/05	2.55-3.0	BH6		●			●		●					●								
92820	30/05	0.1-0.5	BH7	●	●			●		●	●	●	●	●	●		●	●		●			
92821	30/05	0.5-1.5	BH7	●	●			●		●		●			●			●		●			
92822	30/05	1.5-2.5	BH7		●			●		●					●								
92823	30/05	0.3	BH8	●	●			●		●		●			●			●		●			
92824	30/05	1.8	BH8		●			●		●					●								
92825	30/05	0-0.5	BH9		●			●		●					●								
92826	30/05	0.5-1.5	BH9		●			●		●					●								
92827	30/05	1.5-2.5	BH9	●	●			●		●		●			●			●		●			
92828	30/05	2.75-3.0	BH9		●			●		●					●								
92829	30/05	0-0.5	BH10	●	●			●		●		●			●			●		●			
92830	30/05	0.5-1.5	BH10		●			●		●					●								
92831	30/05	1.5-2.5	BH10		●			●		●					●								
92832	30/05	3.55-3.8	BH10		●			●		●					●								
92833	30/05	0-0.5	BH11	●	●			●		●	●	●	●	●	●		●	●		●			
92834	30/05	0.5-1.5	BH11	●	●			●		●	●	●	●	●	●		●	●		●			
92835	30/05	1.85-2.1	BH11		●			●		●					●								
92836	30/05	0.3	BH12	●	●			●		●	●	●			●			●		●			
92837	30/05	1.5	BH12		●			●		●					●								

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Additional information on www.labmark.com.au

Quality, Service, Support

Report Date : 6/06/2007
Report Time : 12:17:00PM

Sample
Receipt
Notice (SRN) for **E032339**

The table below represents LabMark's understanding and interpretation of the customer supplied sample COC request. Please confirm that your COC request has been entered correctly. Due to THT and TAT requirements, testing shall commence immediately as per this table, unless the customer intervenes with a correction prior to testing.

GRID REVIEW TABLE				**Requested Analysis**																			
No.	**Date**	**Depth**	**Client Sample ID**	BTEX by P&T	Acid extractable mercury	Unfiltered metals	HOLD ON HOLD	Acid extractable metals (M7)	Unfiltered metals (M7)	Moisture	Organochlorine Pesticides (OC)	Polyaromatic Hydrocarbons (PAH)	Polychlorinated Biphenyls (PCB)	Phenols by GC/MS	PREP Not Reported	PREP Not Reported	Total Cyanide	Petroleum Hydrocarbons (TPH)	Volatile Organic Compounds (VOC)	Volatile TPH by P&T (vTPH)			
92838	30/05	0-0.7	BH14	●	●			●		●	●	●	●	●	●		●	●		●			
92839	30/05	0.75-1.0	BH14		●			●		●					●								
92840	30/05	0-1.0	BH15		●			●		●		●			●								
92841	30/05	1.05-1.3	BH15		●			●		●					●								
92842	30/05	0.3	BH16		●			●		●	●	●	●		●			●	●	●			
92843	30/05	0.75	BH16		●			●		●					●								
92844	30/05	0.4	BH17	●	●			●		●	●	●			●			●		●			
92845	30/05	0.12-0.8	BH18	●	●			●		●		●		●	●			●		●			
92846	30/05	0.8-1.7	BH18		●			●		●					●								
92847	30/05	1.75-2.0	BH18		●			●		●					●								
92848	30/05	0.12-1.0	BH19	●	●			●		●		●			●			●		●			
92849	30/05	1.05-1.3	BH19		●			●		●					●								
92850	30/05	0.4-1.0	BH20	●	●			●		●		●			●			●		●			
92851	30/05	1.05-1.3	BH20		●			●		●					●								
92852	30/05	0.2	BH21		●			●		●		●		●	●			●	●	●			
92853	30/05	0-0.8	BH22	●	●			●		●	●	●	●		●			●		●			
92854	30/05	0.85-1.1	BH22		●			●		●					●								
92855	30/05	1.3-1.6	BH22				●																
92856	30/05	0.15-0.4	BH23	●	●			●		●		●			●			●		●			
92857	30/05	0-0.7	BH24		●			●		●		●		●	●		●	●	●	●			
92858	30/05	0.7-1.3	BH24	●	●			●		●		●		●	●			●		●			
92859	30/05	1.35-1.6	BH24		●			●		●					●								
92860	30/05	0-1.0	BH26	●	●			●		●		●			●			●		●			
92861	30/05	1.05-1.3	BH26		●			●		●					●								
92862	30/05	0.5	BH27		●			●		●		●		●	●			●	●	●			
92863	30/05		Duplicate D1	●	●			●		●	●	●	●	●	●		●	●		●			
92864	30/05		Duplicate D2	●	●			●		●	●	●	●	●	●		●	●		●			
92865	30/05		Rinsate R1			●			●							●							
92866	30/05		Rinsate R2			●			●							●							
			Totals:	24	58	2	1	58	2	58	11	30	11	13	58	2	7	30	6	30			

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Additional information on www.labmark.com.au

Report Date : 6/06/2007
Report Time : 12:17:00PM

Quality, Service, Support

Sample **Receipt** Notice (SRN) for **E032339**

				Requested Analysis																			
No.	Date	Depth	Client Sample ID	M8 - M7-T_S	M8 - M7-T_W																		
92800	30/05	0.5	BH1	●																			
92807	30/05	0.75	BH1	●																			
92808	30/05	0.12-0.5	BH2	●																			
92809	30/05	0.5-1.2	BH2	●																			
92810	30/05	1.25-1.5	BH2	●																			
92811	30/05	0.1	BH4	●																			
92812	30/05	0.4	BH4	●																			
92813	30/05	2.0	BH4	●																			
92814	30/05	0.1-0.5	BH5	●																			
92815	30/05	0.5-1.5	BH5	●																			
92816	30/05	1.55-2.0	BH5	●																			
92817	30/05	0.1-1.0	BH6	●																			
92818	30/05	1.0-2.0	BH6	●																			
92819	30/05	2.55-3.0	BH6	●																			
92820	30/05	0.1-0.5	BH7	●																			
92821	30/05	0.5-1.5	BH7	●																			
92822	30/05	1.5-2.5	BH7	●																			
92823	30/05	0.3	BH8	●																			
92824	30/05	1.8	BH8	●																			
92825	30/05	0-0.5	BH9	●																			
92826	30/05	0.5-1.5	BH9	●																			
92827	30/05	1.5-2.5	BH9	●																			
92828	30/05	2.75-3.0	BH9	●																			
92829	30/05	0-0.5	BH10	●																			
92830	30/05	0.5-1.5	BH10	●																			
92831	30/05	1.5-2.5	BH10	●																			
92832	30/05	3.55-3.8	BH10	●																			
92833	30/05	0-0.5	BH11	●																			
92834	30/05	0.5-1.5	BH11	●																			
92835	30/05	1.85-2.1	BH11	●																			
92836	30/05	0.3	BH12	●																			
92837	30/05	1.5	BH12	●																			
92838	30/05	0-0.7	BH14	●																			

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Quality, Service, Support

Report Date : 6/06/2007
Report Time : 12:17:00PM

Sample **Receipt** Notice (SRN) for **E032339**

				Requested Analysis																			
No.	Date	Depth	Client Sample ID	M8 - M7-T_S	M8 - M7-T_W																		
92839	30/05	0.75-1.0	BH14	●																			
92840	30/05	0-1.0	BH15	●																			
92841	30/05	1.05-1.3	BH15	●																			
92842	30/05	0.3	BH16	●																			
92843	30/05	0.75	BH16	●																			
92844	30/05	0.4	BH17	●																			
92845	30/05	0.12-0.8	BH18	●																			
92846	30/05	0.8-1.7	BH18	●																			
92847	30/05	1.75-2.0	BH18	●																			
92848	30/05	0.12-1.0	BH19	●																			
92849	30/05	1.05-1.3	BH19	●																			
92850	30/05	0.4-1.0	BH20	●																			
92851	30/05	1.05-1.3	BH20	●																			
92852	30/05	0.2	BH21	●																			
92853	30/05	0-0.8	BH22	●																			
92854	30/05	0.85-1.1	BH22	●																			
92856	30/05	0.15-0.4	BH23	●																			
92857	30/05	0-0.7	BH24	●																			
92858	30/05	0.7-1.3	BH24	●																			
92859	30/05	1.35-1.6	BH24	●																			
92860	30/05	0-1.0	BH26	●																			
92861	30/05	1.05-1.3	BH26	●																			
92862	30/05	0.5	BH27	●																			
92863	30/05		Duplicate D1	●																			
92864	30/05		Duplicate D2	●																			
92865	30/05		Rinsate R1		●																		
92866	30/05		Rinsate R2		●																		
			Totals:	58	2																		

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AARGUS PTY LTD

Laboratory Test Request / Chain of Custody Record

446 Parramatta Road
PETERSHAM NSW 2049

P O Box 398
DRUMMOYNE NSW 1470

Tel: 1300 137 038
Fax: 1300 136 038
email: admin@aargus.net

Page 1 **of** 6

TO: **LABMARK PTY LTD**
UNIT 1
8 LEIGHTON PLACE
ASQUITH NSW 2077

PH: **02 9476 6533** **FAX:** **02 9476 8219**
ATTN: **MS JAKLEEN EL GALADA**

Sampling Date: 30 & 31.05.2007 **Job No:** E1559
Sampled By: MK/DH **Project:** E032339
Project Manager: NK **Location:** SMITH STREET, SUMMER HILL

Results required by: WEDNESDAY, 13 - 06 - 2007

Sampling details			**Sample type**											
Location		**Depth (m)**	**Soil**	**Water**	**Heavy Metals As, Cd, Cr, Cu, Pb, Hg, Ni and Zn**	**OCP**	**PCB**	**TPH* and BTEX**	**PAH**	**Phenols**	**Cyanides**	**VOC**		**KEEP SAMPLE**
92800	BH1	0.5	DSG		✓			✓	✓			✓		YES
92807	BH1	0.75	DSG		✓			✓	✓	✓				YES
92808	BH2	0.12-0.5	DSG		✓			✓	✓					YES
92809	BH2	0.5-1.2	DSG		✓			✓	✓			✓		YES
92810	BH2	1.25-1.5	DSG		✓			✓	✓	✓				YES
92811	BH4	0.1	DSG		✓	✓								YES
92812	BH4	0.4	DSG		✓									YES
92813	BH4	2.0	DSG		✓									YES
92814	BH5	0.1-0.5	DSG		✓		✓	✓						YES
92815	BH5	0.5-1.5	DSG		✓		✓							YES
92816	BH5	1.55-2.0	DSG		✓		✓							YES
92817	BH6	0.1-1.0	DSG		✓			✓	✓					YES
~~92818~~														

Relinquished by			Received by		
Name	Signature	Date	Name	Signature	Date
MARK KELLY	mk	04.06.2007	RoS Schacht		6/6/07

Legend:

WG	Water sample, glass bottle	USG	Undisturbed soil sample (glass jar)	DSP	Disturbed soil sample (small plastic bag)	* Purge & Trap
WP	Water sample, plastic bottle	DSG	Disturbed soil sample (glass jar)	✓	Test required	# Geotechnique Screen

@ mole H^+/tonne

AARGUS PTY LTD

Laboratory Test Request / Chain of Custody Record

446 Parramatta Road
PETERSHAM NSW 2049

P O Box 398
DRUMMOYNE NSW 1470

Tel: 1300 137 038
Fax: 1300 136 038
email: admin@aargus.net

Page 2 **of** 6

TO: **LABMARK PTY LTD**
UNIT 1
8 LEIGHTON PLACE
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PH: **02 9476 6533** **FAX:** **02 9476 8219**
ATTN: **MS JAKLEEN EL GALADA**

Sampling Date: 30 & 31.05.2007 **Job No:** E1559
Sampled By: MK/DH **Project:** E032339
Project Manager: NK **Location:** SMITH STREET, SUMMER HILL

Sampling details		**Sample type**		**Results required by: WEDNESDAY, 13 - 06 - 2007**									
Location	**Depth (m)**	**Soil**	**Water**	**Heavy Metals As, Cd, Cr, Cu, Pb, Hg, Ni and Zn**	**OCP**	**PCB**	**TPH* and BTEX**	**PAH**	**Phenols**	**Cyanides**	**VOC**		**KEEP SAMPLE**
92818 BH6	1.0-2.0	DSG		✓									YES
92819 BH6	2.55-3.0	DSG		✓									YES
92820 BH7	0.1-0.5	DSG		✓	✓	✓	✓	✓	✓	✓			YES
92821 BH7	0.5-1.5	DSG		✓			✓	✓					YES
92822 BH7	1.5-2.5	DSG		✓									YES
92823 BH8	0.3	DSG		✓			✓	✓					YES
92824 BH8	1.8	DSG		✓									YES
92825 BH9	0-0.5	DSG		✓									YES
92826 BH9	0.5-1.5	DSG		✓									YES
92827 BH9	1.5-2.5	DSG		✓			✓	✓					YES
92828 BH9	2.75-3.0	DSG		✓									YES
92829 BH10	0-0.5	DSG		✓			✓	✓					YES

Relinquished by			Received by		
Name	Signature	Date	Name	Signature	Date
MARK KELLY	mk	04.06.2007	Ros Schacht		5/6/07

Legend:

WG	Water sample, glass bottle	USG	Undisturbed soil sample (glass jar)	DSP	Disturbed soil sample (small plastic bag)	* Purge & Trap	@ mole H^+/tonne
WP	Water sample, plastic bottle	DSG	Disturbed soil sample (glass jar)	✓	Test required	# Geotechnique Screen	

Form No 4.7F2-4 SGS

AARGUS PTY LTD

Laboratory Test Request / Chain of Custody Record

446 Parramatta Road
PETERSHAM NSW 2049

P O Box 398
DRUMMOYNE NSW 1470

Tel: 1300 137 038
Fax: 1300 136 038
email: admin@aargus.net

Page 3 **of** 6

TO:	**LABMARK PTY LTD UNIT 1 8 LEIGHTON PLACE ASQUITH NSW 2077**		
PH:	**02 9476 6533**	**FAX:**	**02 9476 8219**
ATTN:	**MS JAKLEEN EL GALADA**		

Sampling Date:	30 & 31.05.2007	**Job No:**	E1559
Sampled By:	MK/DH	**Project:**	E032339
Project Manager:	NK	**Location:**	SMITH STREET, SUMMER HILL

Results required by: WEDNESDAY, 13 - 06 - 2007

Sampling details		**Sample type**											
Location	**Depth (m)**	**Soil**	**Water**	**Heavy Metals As, Cd, Cr, Cu, Pb, Hg, Ni and Zn**	**OCP**	**PCB**	**TPH* and BTEX**	**PAH**	**Phenols**	**Cyanides**	**VOC**		**KEEP SAMPLE**
92830 BH10	0.5-1.5	DSG		✓									YES
92831 BH10	1.5-2.5	DSG		✓									YES
92832 BH10	3.55-3.8	DSG		✓									YES
92833 BH11	0-0.5	DSG		✓	✓	✓	✓	✓	✓	✓			YES
92834 BH11	0.5-1.5	DSG		✓	✓	✓	✓	✓	✓	✓			YES
92835 BH11	1.85-2.1	DSG		✓									YES
92836 BH12	0.3	DSG		✓	✓		✓	✓					YES
92837 BH12	1.5	DSG		✓									YES
92838 BH14	0-0.7	DSG		✓	✓	✓	✓	✓	✓	✓			YES
92839 BH14	0.75-1.0	DSG		✓									YES
92840 BH15	0-1.0	DSG		✓				✓					YES
92841 BH15	1.05-1.3	DSG		✓									YES

Relinquished by			Received by		
Name	Signature	Date	Name	Signature	Date
MARK KELLY	mk	04.06.2007	Ros Schacht		5/6/07

Legend:

WG	Water sample, glass bottle	USG	Undisturbed soil sample (glass jar)	DSP	Disturbed soil sample (small plastic bag)	* Purge & Trap	@ mole H^+/tonne
WP	Water sample, plastic bottle	DSG	Disturbed soil sample (glass jar)	✓	Test required	# Geotechnique Screen	

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Page 4 **of** 6

TO:	**LABMARK PTY LTD** **UNIT 1** **8 LEIGHTON PLACE** **ASQUITH NSW 2077**	**Sampling Date:**	30 & 31.05.2007	**Job No:**	E1559
		Sampled By:	MK/DH	**Project:**	E032339
PH:	**02 9476 6533** **FAX:** **02 9476 8219**	**Project Manager:**	NK	**Location:**	SMITH STREET, SUMMER HILL
ATTN:	**MS JAKLEEN EL GALADA**				

Sampling details		**Sample type**		**Results required by: WEDNESDAY, 13 - 06 - 2007**									
Location	**Depth (m)**	**Soil**	**Water**	**Heavy Metals As, Cd, Cr, Cu, Pb, Hg, Ni and Zn**	**OCP**	**PCB**	**TPH* and BTEX**	**PAH**	**Phenols**	**Cyanides**	**VOC**		**KEEP SAMPLE**
92842 BH16	0.3	DSG		✓	✓	✓	✓	✓			✓		YES
92843 BH16	0.75	DSG		✓									YES
92844 BH17	0.4	DSG		✓	✓		✓	✓					YES
92845 BH18	0.12-0.8	DSG		✓			✓	✓	✓				YES
92846 BH18	0.8-1.7	DSG		✓									YES
92847 BH18	1.75-2.0	DSG		✓									YES
92848 BH19	0.12-1.0	DSG		✓			✓	✓					YES
92849 BH19	1.05-1.3	DSG		✓									YES
92850 BH20	0.4-1.0	DSG		✓			✓	✓					YES
92851 BH20	1.05-1.3	DSG		✓									YES
92852 BH21	0.2	DSG		✓			✓	✓	✓		✓		YES
92853 BH22	0-0.8	DSG		✓	✓	✓	✓	✓					YES

Relinquished by			**Received by**		
Name	Signature	Date	Name	Signature	Date
MARK KELLY	mk	04.06.2007	Ros Schacht		5/6/07

Legend:

WG	Water sample, glass bottle	USG	Undisturbed soil sample (glass jar)	DSP	Disturbed soil sample (small plastic bag)	* Purge & Trap @ mole H^+/tonne
WP	Water sample, plastic bottle	DSG	Disturbed soil sample (glass jar)	✓	Test required	# Geotechnique Screen

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Page 5 **of** 6

TO:	**LABMARK PTY LTD** **UNIT 1** **8 LEIGHTON PLACE** **ASQUITH NSW 2077**		
PH:	**02 9476 6533**	**FAX:**	**02 9476 8219**
ATTN:	**MS JAKLEEN EL GALADA**		

Sampling Date:	30 & 31.05.2007	**Job No:**	E1559
Sampled By:	MK/DH	**Project:**	E032339
Project Manager:	NK	**Location:**	SMITH STREET, SUMMER HILL

Results required by: WEDNESDAY, 13 - 06 - 2007

Sampling details		**Sample type**												
Location	**Depth (m)**	**Soil**	**Water**	**Heavy Metals As, Cd, Cr, Cu, Pb, Hg, Ni and Zn**	**OCP**	**PCB**	**TPH* and BTEX**	**PAH**	**Phenols**	**Cyanides**	**VOC**		**KEEP SAMPLE**
92854 BH22	0.85-1.1	DSG		✓									YES
92855 BH22	1.3-1.6	DSG											YES
92856 BH23	0.15-0.4	DSG		✓			✓	✓					YES
92857 BH24	0-0.7	DSG		✓			✓	✓	✓	✓	✓		YES
92858 BH24	0.7-1.3	DSG		✓			✓	✓	✓				YES
92859 BH24	1.35-1.6	DSG		✓									YES
92860 BH26	0-1.0	DSG		✓			✓	✓					YES
92861 BH26	1.05-1.3	DSG		✓									YES
92862 BH27	0.5	DSG		✓			✓	✓	✓		✓		YES

Relinquished by			Received by		
Name	Signature	Date	Name	Signature	Date
MARK KELLY	mk	04.06.2007	Ros Schacht		5/6/07

Legend:

WG	Water sample, glass bottle	USG	Undisturbed soil sample (glass jar)	DSP	Disturbed soil sample (small plastic bag)	* Purge & Trap	@ mole H^+/tonne
WP	Water sample, plastic bottle	DSG	Disturbed soil sample (glass jar)	✓	Test required	# Geotechnique Screen	

Form No 4.7F2-4 SGS

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Page 6 **of** 6

TO: **LABMARK PTY LTD**
UNIT 1
8 LEIGHTON PLACE
ASQUITH NSW 2077

PH: **02 9476 6533** **FAX:** **02 9476 8219**
ATTN: **MS JAKLEEN EL GALADA**

Sampling Date: 30 & 31.05.2007
Job No: E1559
Sampled By: MK/DH
Project: E032339
Project Manager: NK
Location: SMITH STREET, SUMMER HILL

Results required by: WEDNESDAY, 13 - 06 - 2007

Sampling details		Sample type											
Location	Depth (m)	Soil	Water	Heavy Metals As, Cd, Cr, Cu, Pb, Hg, Ni and Zn	OCP	PCB	TPH* and BTEX	PAH	Phenols	Cyanides	VOC	BTEX	KEEP SAMPLE
92863 DUPLICATE D1	-	DSG		✓	✓	✓	✓	✓	✓	✓			YES
92864 DUPLICATE D2	-	DSG		✓	✓	✓	✓	✓	✓	✓			YES
92865 RINSATE R1	-		WG	✓									YES
92866 RINSATE R2	-		WG	✓									YES

Relinquished by			Received by		
Name	Signature	Date	Name	Signature	Date
MARK KELLY	mk	04.06.2007	Ros Schacht		5/6/07

Legend:

WG	Water sample, glass bottle	USG	Undisturbed soil sample (glass jar)	DSP	Disturbed soil sample (small plastic bag)	* Purge & Trap
WP	Water sample, plastic bottle	DSG	Disturbed soil sample (glass jar)	✓	Test required	# Geotechnique Screen

@ mole H^+/tonne

Form No 4.7F2-4 SGS

CERTIFICATE OF ANALYSIS

Client	: **AARGUS PTY LTD**	*Laboratory*	: **Environmental Division Sydney**	*Page*	: **1 of 6**
Contact	: **CASH SALE**	*Contact*	: **Victor Kedicioglu**	*Work Order*	: **ES0707601**
Address	: **PO BOX 398 DRUMMOYNE NSW AUSTRALIA 2047**	*Address*	: **277-289 Woodpark Road Smithfield NSW Australia 2164**		
E-mail	: **brenda.hong@alsenviro.com**	*E-mail*	: **Victor.Kedicioglu@alsenviro.com**		
Telephone	: **1300137038**	*Telephone*	: **61-2-8784 8555**		
Facsimile	: **1300136038**	*Facsimile*	: **61-2-8784 8500**		
Project	: **E1559**	*Quote number*	: **SY/021/05**	*Date received*	: **7 Jun 2007**
Order number	: **- Not provided -**			*Date issued*	: **14 Jun 2007**
C-O-C number	: **- Not provided -**			*No. of samples*	- *Received* : **2**
Site	: **SMITH STREET, SUMMER HILL**				*Analysed* : **2**

ALSE - Excellence in Analytical Testing

NATA Accredited Laboratory
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Accredited for compliance with ISO/IEC 17025.

This document has been electronically signed by those names that appear on this report and are the authorised signatories. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatory	*Position*	*Department*
Ankit Joshi		**Inorganics - NATA 825 (10911 - Sydney)**
EDWANDY FADJAR	**Senior Organic Chemist**	**Organics - NATA 825 (10911 - Sydney)**
Phyu Phyu Lwin	**Spectroscopist**	**Inorganics - NATA 825 (10911 - Sydney)**
Rassem Ayoubi	**Senior Organic Chemist**	**Organics - NATA 825 (10911 - Sydney)**

Comments

This report for the ALSE reference ES0707601 supersedes any previous reports with this reference. Results apply to the samples as submitted. All pages of this report have been checked and approved for release.

This report contains the following information:

- **Analytical Results for Samples Submitted**
- **Surrogate Recovery Data**

The analytical procedures used by ALS Environmental have been developed from established internationally-recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported herein. Reference methods from which ALSE methods are based are provided in parenthesis.

When moisture determination has been performed, results are reported on a dry weight basis. When a reported 'less than' result is higher than the LOR, this may be due to primary sample extracts/digestion dilution and/or insuffient sample amount for analysis. Surrogate Recovery Limits are static and based on USEPA SW846 or ALS-QWI/EN38 (in the absence of specified USEPA limits). Where LOR of reported result differ from standard LOR, this may be due to high moisture, reduced sample amount or matrix interference. When date(s) and/or time(s) are shown bracketed, these have been assumed by the laboratory for process purposes. Abbreviations: CAS number = Chemical Abstract Services number, LOR = Limit of Reporting. * Indicates failed Surrogate Recoveries.

Specific comments for Work Order **ES0707601**

EP068: Poor matrix spike recovery due to sample heterogeneity. Confirmed by re-extraction and re-analysis.

Analytical Results

			Client Sample ID :	**SPLIT SS1**	**SPLIT SS2**			
			Sample Matrix Type / Description :	SOIL	SOIL			
			Sample Date / Time :	31 May 2007 15:00	31 May 2007 15:00			
			Laboratory Sample ID :					
Analyte	***CAS number***	***LOR***	***Units***	**ES0707601-001**	**ES0707601-002**			
EA055: Moisture Content								
Moisture Content (dried @ 103°C)		1.0	%	6.7	17.2			
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	6	15			
Cadmium	7440-43-9	1	mg/kg	<1	<1			
Chromium	7440-47-3	2	mg/kg	18	17			
Copper	7440-50-8	5	mg/kg	63	63			
Lead	7439-92-1	5	mg/kg	56	14			
Nickel	7440-02-0	2	mg/kg	89	6			
Zinc	7440-66-6	5	mg/kg	174	46			
EG035T: Total Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1			
EK026G: Total Cyanide By Discrete Analyser								
Total Cyanide	57-12-5	1.0	mg/kg	<1.0	<1.0			
EP066: Polychlorinated Biphenyls (PCB)								
Total Polychlorinated biphenyls		0.10	mg/kg	<0.10	<0.10			
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05			
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05			
beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05			
gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05			
delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05			
Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05			
Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05			
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05			
trans-Chlordane	5103-74-2	0.05	mg/kg	0.06	<0.05			
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05			
cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05			
Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05			
4.4’-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05			
Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05			
beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05			
4.4’-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05			
Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05			
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05			
4.4’-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2			
Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05			
Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2			

Analytical Results

			Client Sample ID :	**SPLIT SS1**	**SPLIT SS2**			
			Sample Matrix Type / Description :	SOIL	SOIL			
			Sample Date / Time :	31 May 2007 15:00	31 May 2007 15:00			
			Laboratory Sample ID :	**ES0707601-001**	**ES0707601-002**			
Analyte	***CAS number***	***LOR***	***Units***					
EP075(SIM)A: Phenolic Compounds								
Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5			
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5			
2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5			
3- & 4-Methylphenol	1319-77-3	1.0	mg/kg	<1.0	<1.0			
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5			
2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5			
2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5			
2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5			
4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5			
2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5			
2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5			
Pentachlorophenol	87-86-5	2.0	mg/kg	<2.0	<2.0			
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5			
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5			
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5			
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5			
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5			
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5			
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5			
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5			
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5			
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5			
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5			
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5			
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5			
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5			
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5			
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5			
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction		10	mg/kg	<10	<10			
C10 - C14 Fraction		50	mg/kg	<50	<50			
C15 - C28 Fraction		100	mg/kg	<100	<100			
C29 - C36 Fraction		100	mg/kg	<100	<100			
EP080: BTEX								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2			
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5			

Analytical Results

Analyte	CAS number	LOR	Units	SPLIT SS1	SPLIT SS2			
Client Sample ID :				**SPLIT SS1**	**SPLIT SS2**			
Sample Matrix Type / Description :				SOIL	SOIL			
Sample Date / Time :				31 May 2007 15:00	31 May 2007 15:00			
Laboratory Sample ID :				**ES0707601-001**	**ES0707601-002**			
EP080: BTEX								
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5			
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5			
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5			
EP066S: PCB Surrogate								
Decachlorobiphenyl	2051-24-3	0.1	%	83.0	85.4			
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.1	%	61.8	81.7			
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.1	%	72.8	97.0			
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	108	107			
2-Chlorophenol-D4	93951-73-6	0.1	%	129	112			
2.4.6-Tribromophenol	118-79-6	0.1	%	91.2	69.4			
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	110	91.8			
Anthracene-d10	1719-06-8	0.1	%	106	89.1			
4-Terphenyl-d14	1718-51-0	0.1	%	113	96.2			
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	90.6	81.5			
Toluene-D8	2037-26-5	0.1	%	87.4	77.8			
4-Bromofluorobenzene	460-00-4	0.1	%	95.2	104			

Surrogate Control Limits

Matrix Type: SOIL - Surrogate Control Limits — ***Surrogate Control Limits***

Method name	***Analyte name***	***Lower Limit***	***Upper Limit***
EP066: Polychlorinated Biphenyls (PCB)			
EP066S: PCB Surrogate	Decachlorobiphenyl	10	164
EP068: Pesticides by GCMS			
EP068S: Organochlorine Pesticide Surrogate	Dibromo-DDE	10	136
EP068T: Organophosphorus Pesticide Surrogate	DEF	10	136
EP075(SIM): PAH/Phenols (SIM)			
EP075(SIM)S: Phenolic Compound Surrogates	Phenol-d6	24	113
	2-Chlorophenol-D4	23	134
	2,4,6-Tribromophenol	19	122
EP075(SIM)T: PAH Surrogates	2-Fluorobiphenyl	30	115
	Anthracene-d10	27	133
	4-Terphenyl-d14	18	137
EP080: TPH Volatiles/BTEX			
EP080S: TPH(V)/BTEX Surrogates	1,2-Dichloroethane-D4	80	120
	Toluene-D8	81	117
	4-Bromofluorobenzene	74	121

ALS Environmental

QUALITY CONTROL REPORT

Client	**AARGUS PTY LTD**	**Laboratory**	Environmental Division Sydney	**Page**	**1 of 13**
Contact	CASH SALE	**Contact**	Victor Kedicioglu		
Address	PO BOX 398 DRUMMOYNE NSW AUSTRALIA 2047	**Address**	277-289 Woodpark Road Smithfield NSW Australia 2164	**Work order**	**ES0707601**
				Amendment No.	
Project	E1559	**Quote number**	SY/021/05	**Date received**	**7 Jun 2007**
Order number	- Not provided -			**Date issued**	**14 Jun 2007**
C-O-C number	- Not provided -				
Site	SMITH STREET, SUMMER HILL				
E-mail	brenda.hong@alsenviro.com	**E-mail**	Victor.Kedicioglu@alsenviro.com	**No. of samples**	
Telephone	1300137038	**Telephone**	61-2-8784 8555	**Received**	2
Facsimile	1300136038	**Facsimile**	61-2-8784 8500	**Analysed**	2

This final report for the ALSE work order reference ES0707601 supersedes any previous reports with this reference.

Results apply to the samples as submitted. All pages of this report have been checked and approved for release.

This report contains the following information:

- Laboratory Duplicates (DUP); Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Samples (LCS); Recovery and Acceptance Limits
- Matrix Spikes (MS); Recovery and Acceptance Limits

Work order specific comments

EP068: Poor matrix spike recovery due to sample heterogeneity. Confirmed by re-extraction and re-analysis.

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Quality Control Report - Laboratory Duplicates (DUP)

The quality control term **Laboratory Duplicate** refers to an intralaboratory split sample randomly selected from the sample batch. Laboratory duplicates provide information on method precision and sample heterogeneity.
- Anonymous - Client Sample IDs refer to samples which are not specifically part of this work order but formed part of the QC process lot. *Abbreviations: **LOR** = Limit of Reporting, **RPD** = Relative Percent Difference.*
* Indicates failed QC. The permitted ranges for the RPD of Laboratory Duplicates (relative percent deviation) are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting:- Result < 10 times LOR, no limit - Result between 10 and 20 times LOR, 0% - 50% - Result > 20 times LOR, 0% - 20%

Matrix Type: SOIL

Laboratory Duplicates (DUP) Report

Laboratory Sample ID	*Client Sample ID*	*Analyte name*	*LOR*	*Original Result*	*Duplicate Result*	*RPD*
EA055: Moisture Content						
EA055: Moisture Content - (QC Lot: 426489)				%	%	%
ES0707570-011	Anonymous	Moisture Content (dried @ 103°C)	1.0 %	25.2	26.1	3.4
ES0707603-001	Anonymous	Moisture Content (dried @ 103°C)	1.0 %	21.4	19.6	8.5
EG005T: Total Metals by ICP-AES						
EG005T: Total Metals by ICP-AES - (QC Lot: 426625)				mg/kg	mg/kg	%
ES0707585-002	Anonymous	Arsenic	5 mg/kg	<5	<5	0.0
		Cadmium	1 mg/kg	<1	<1	0.0
		Chromium	2 mg/kg	20	21	0.0
		Copper	5 mg/kg	6	5	0.0
		Lead	5 mg/kg	6	6	0.0
		Nickel	2 mg/kg	10	9	0.0
		Zinc	5 mg/kg	26	26	0.0
EG035T: Total Mercury by FIMS						
EG035T: Total Mercury by FIMS - (QC Lot: 426623)				mg/kg	mg/kg	%
ES0707366-001	Anonymous	Mercury	0.1 mg/kg	0.2	<0.1	0.0
ES0707584-002	Anonymous	Mercury	0.1 mg/kg	<0.1	<0.1	0.0
EK026G: Total Cyanide By Discrete Analyser						
EK026G: Total Cyanide By Discrete Analyser - (QC Lot: 426436)				mg/kg	mg/kg	%
ES0707601-001	SPLIT SS1	Total Cyanide	1.0 mg/kg	<1.0	<1.0	0.0
EP066: Polychlorinated Biphenyls (PCB)						
EP066: Polychlorinated Biphenyls (PCB) - (QC Lot: 426837)				mg/kg	mg/kg	%
ES0707601-001	SPLIT SS1	Total Polychlorinated biphenyls	0.10 mg/kg	<0.10	<0.10	0.0
EP068A: Organochlorine Pesticides (OC)						
EP068A: Organochlorine Pesticides (OC) - (QC Lot: 426836)				mg/kg	mg/kg	%
ES0707601-001	SPLIT SS1	alpha-BHC	0.05 mg/kg	<0.05	<0.05	0.0
		Hexachlorobenzene (HCB)	0.05 mg/kg	<0.05	<0.05	0.0

Matrix Type: SOIL

Laboratory Duplicates (DUP) Report

Laboratory Sample ID	*Client Sample ID*	*Analyte name*	*LOR*	*Original Result*	*Duplicate Result*	*RPD*
EP068A: Organochlorine Pesticides (OC) - continued						
EP068A: Organochlorine Pesticides (OC) - (QC Lot: 426836) - continued				mg/kg	mg/kg	%
ES0707601-001	SPLIT SS1	beta-BHC	0.05 mg/kg	<0.05	<0.05	0.0
		gamma-BHC	0.05 mg/kg	<0.05	<0.05	0.0
		delta-BHC	0.05 mg/kg	<0.05	<0.05	0.0
		Heptachlor	0.05 mg/kg	<0.05	<0.05	0.0
		Aldrin	0.05 mg/kg	<0.05	<0.05	0.0
		Heptachlor epoxide	0.05 mg/kg	<0.05	<0.05	0.0
		trans-Chlordane	0.05 mg/kg	0.06	0.06	0.0
		alpha-Endosulfan	0.05 mg/kg	<0.05	<0.05	0.0
		cis-Chlordane	0.05 mg/kg	<0.05	<0.05	0.0
		Dieldrin	0.05 mg/kg	<0.05	<0.05	0.0
		4,4’-DDE	0.05 mg/kg	<0.05	<0.05	0.0
		Endrin	0.05 mg/kg	<0.05	<0.05	0.0
		beta-Endosulfan	0.05 mg/kg	<0.05	<0.05	0.0
		4,4’-DDD	0.05 mg/kg	<0.05	<0.05	0.0
		Endrin aldehyde	0.05 mg/kg	<0.05	<0.05	0.0
		Endosulfan sulfate	0.05 mg/kg	<0.05	<0.05	0.0
		4,4’-DDT	0.2 mg/kg	<0.2	<0.2	0.0
		Endrin ketone	0.05 mg/kg	<0.05	<0.05	0.0
		Methoxychlor	0.2 mg/kg	<0.2	<0.2	0.0
EP075(SIM)A: Phenolic Compounds						
EP075(SIM)A: Phenolic Compounds - (QC Lot: 426746)				mg/kg	mg/kg	%
ES0707585-002	Anonymous	Phenol	0.5 mg/kg	<0.5	<0.5	0.0
		2-Chlorophenol	0.5 mg/kg	<0.5	<0.5	0.0
		2-Methylphenol	0.5 mg/kg	<0.5	<0.5	0.0
		3- & 4-Methylphenol	1.0 mg/kg	<1.0	<1.0	0.0
		2-Nitrophenol	0.5 mg/kg	<0.5	<0.5	0.0
		2,4-Dimethylphenol	0.5 mg/kg	<0.5	<0.5	0.0
		2,4-Dichlorophenol	0.5 mg/kg	<0.5	<0.5	0.0
		2,6-Dichlorophenol	0.5 mg/kg	<0.5	<0.5	0.0

Matrix Type: SOIL

Laboratory Duplicates (DUP) Report

Laboratory Sample ID	*Client Sample ID*	*Analyte name*	*LOR*	*Original Result*	*Duplicate Result*	*RPD*
EP075(SIM)A: Phenolic Compounds - continued						
EP075(SIM)A: Phenolic Compounds - (QC Lot: 426746) - continued				**mg/kg**	**mg/kg**	**%**
ES0707585-002	Anonymous	4-Chloro-3-Methylphenol	0.5 mg/kg	<0.5	<0.5	0.0
		2,4,6-Trichlorophenol	0.5 mg/kg	<0.5	<0.5	0.0
		2,4,5-Trichlorophenol	0.5 mg/kg	<0.5	<0.5	0.0
		Pentachlorophenol	2.0 mg/kg	<2.0	<2.0	0.0
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons						
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - (QC Lot: 426746)				**mg/kg**	**mg/kg**	**%**
ES0707585-002	Anonymous	Naphthalene	0.5 mg/kg	<0.5	<0.5	0.0
		Acenaphthylene	0.5 mg/kg	<0.5	<0.5	0.0
		Acenaphthene	0.5 mg/kg	<0.5	<0.5	0.0
		Fluorene	0.5 mg/kg	<0.5	<0.5	0.0
		Phenanthrene	0.5 mg/kg	<0.5	<0.5	0.0
		Anthracene	0.5 mg/kg	<0.5	<0.5	0.0
		Fluoranthene	0.5 mg/kg	<0.5	<0.5	0.0
		Pyrene	0.5 mg/kg	<0.5	<0.5	0.0
		Benz(a)anthracene	0.5 mg/kg	<0.5	<0.5	0.0
		Chrysene	0.5 mg/kg	<0.5	<0.5	0.0
		Benzo(b)fluoranthene	0.5 mg/kg	<0.5	<0.5	0.0
		Benzo(k)fluoranthene	0.5 mg/kg	<0.5	<0.5	0.0
		Benzo(a)pyrene	0.5 mg/kg	<0.5	<0.5	0.0
		Indeno(1,2,3,cd)pyrene	0.5 mg/kg	<0.5	<0.5	0.0
		Dibenz(a,h)anthracene	0.5 mg/kg	<0.5	<0.5	0.0
		Benzo(g,h,i)perylene	0.5 mg/kg	<0.5	<0.5	0.0
EP080/071: Total Petroleum Hydrocarbons						
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 426453)				**mg/kg**	**mg/kg**	**%**
ES0707566-001	Anonymous	C6 - C9 Fraction	10 mg/kg	<10	<10	0.0
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 426745)				**mg/kg**	**mg/kg**	**%**
ES0707585-002	Anonymous	C10 - C14 Fraction	50 mg/kg	<50	<50	0.0
		C15 - C28 Fraction	100 mg/kg	<100	<100	0.0
		C29 - C36 Fraction	100 mg/kg	<100	<100	0.0

Matrix Type: SOIL

Laboratory Duplicates (DUP) Report

Laboratory Sample ID	*Client Sample ID*	*Analyte name*	*LOR*	*Original Result*	*Duplicate Result*	*RPD*
EP080: BTEX						
EP080: BTEX - (QC Lot: 426453)				**mg/kg**	**mg/kg**	**%**
ES0707566-001	Anonymous	Benzene	0.2 mg/kg	<0.2	<0.2	0.0
		Toluene	0.5 mg/kg	<0.5	<0.5	0.0
		Ethylbenzene	0.5 mg/kg	<0.5	<0.5	0.0
		meta- & para-Xylene	0.5 mg/kg	<0.5	<0.5	0.0
		ortho-Xylene	0.5 mg/kg	<0.5	<0.5	0.0

Quality Control Report - Method Blank (MB) and Laboratory Control Samples (LCS)

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC type is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a known, interference free matrix spiked with target analytes or certified reference material. The purpose of this QC type is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of actual laboratory data. Flagged outliers on control limits for inorganics tests may be within the NEPM specified data quality objective of recoveries in the range of 70 to 130%. Where this occurs, no corrective action is taken. Abbreviations: LOR = Limit of reporting.

Matrix Type: SOIL

Method Blank (MB) and Laboratory Control Samples (LCS) Report

		Method blank result	*Actual Results*		*Recovery Limits*	
			Spike concentration	*Spike Recovery*	*Dynamic Recovery Limits*	
Analyte name	*LOR*			*LCS*	*Low*	*High*
EG005T: Total Metals by ICP-AES						
EG005T: Total Metals by ICP-AES - (QC Lot: 426625)		mg/kg	mg/kg	%	%	%
Arsenic	5 mg/kg	----	13.1	109	86.6	123
	5 mg/kg	<5	----	----	----	----
Cadmium	1 mg/kg	----	2.76	95.8	79.9	120
	1 mg/kg	<1	----	----	----	----
Chromium	2 mg/kg	<2	----	----	----	----
	2 mg/kg	----	60.9	100	87.1	119
Copper	5 mg/kg	----	54.7	99.8	85.2	117
	5 mg/kg	<5	----	----	----	----
Lead	5 mg/kg	<5	----	----	----	----
	5 mg/kg	----	55.2	96.1	82.1	117
Nickel	2 mg/kg	----	54.8	104	88	122
	2 mg/kg	<2	----	----	----	----
Zinc	5 mg/kg	----	104	99.2	79	116
	5 mg/kg	<5	----	----	----	----
EG035T: Total Mercury by FIMS						
EG035T: Total Mercury by FIMS - (QC Lot: 426623)		mg/kg	mg/kg	%	%	%
Mercury	0.1 mg/kg	<0.1	----	----	----	----
	0.1 mg/kg	----	1.4	82.1	73.7	108
EK026G: Total Cyanide By Discrete Analyser						
EK026G: Total Cyanide By Discrete Analyser - (QC Lot: 426436)		mg/kg	mg/kg	%	%	%
Total Cyanide	1.0 mg/kg	<1.0	----	----	----	----
	1 mg/kg	----	50	86.2	70	130
EP066: Polychlorinated Biphenyls (PCB)						
EP066: Polychlorinated Biphenyls (PCB) - (QC Lot: 426837)		mg/kg	mg/kg	%	%	%

Matrix Type: SOIL

Method Blank (MB) and Laboratory Control Samples (LCS) Report

Analyte name	*LOR*	*Method blank result*	*Actual Results*		*Recovery Limits*	
			Spike concentration	*Spike Recovery*	*Dynamic Recovery Limits*	
				LCS	*Low*	*High*
EP066: Polychlorinated Biphenyls (PCB) - continued						
EP066: Polychlorinated Biphenyls (PCB) - (QC Lot: 426837) - continued		mg/kg	mg/kg	%	%	%
Total Polychlorinated biphenyls	0.10 mg/kg	<0.10	----	----	----	----
	0.1 mg/kg	----	0.5	103	57.4	117
EP068A: Organochlorine Pesticides (OC)						
EP068A: Organochlorine Pesticides (OC) - (QC Lot: 426836)		mg/kg	mg/kg	%	%	%
4,4'-DDD	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	76.9	65.3	116
4,4'-DDE	0.05 mg/kg	----	0.25	75.8	67.5	114
	0.05 mg/kg	<0.05	----	----	----	----
4,4'-DDT	0.2 mg/kg	<0.2	----	----	----	----
	0.2 mg/kg	----	0.25	88.9	58.4	127
Aldrin	0.05 mg/kg	----	0.25	79.6	67	113
	0.05 mg/kg	<0.05	----	----	----	----
alpha-BHC	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	80.4	60.8	116
alpha-Endosulfan	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	85.9	65.8	116
beta-BHC	0.05 mg/kg	----	0.25	79.7	59.8	117
	0.05 mg/kg	<0.05	----	----	----	----
beta-Endosulfan	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	76.6	66.1	117
cis-Chlordane	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	75.7	57.3	120
delta-BHC	0.05 mg/kg	----	0.25	79.0	65.8	114
	0.05 mg/kg	<0.05	----	----	----	----
Dieldrin	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	99.5	67.4	116
Endosulfan sulfate	0.05 mg/kg	----	0.25	77.7	63.6	119
	0.05 mg/kg	<0.05	----	----	----	----
Endrin	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	92.8	63	121

Matrix Type: SOIL

Method Blank (MB) and Laboratory Control Samples (LCS) Report

Analyte name	*LOR*	*Method blank result*	*Actual Results* *Spike concentration*	*Actual Results* *Spike Recovery* *LCS*	*Recovery Limits* *Dynamic Recovery Limits* *Low*	*Recovery Limits* *Dynamic Recovery Limits* *High*
EP068A: Organochlorine Pesticides (OC) - continued						
EP068A: Organochlorine Pesticides (OC) - (QC Lot: 426836) - continued		mg/kg	mg/kg	%	%	%
Endrin aldehyde	0.05 mg/kg	----	0.25	57.7	57.3	115
	0.05 mg/kg	<0.05	----	----	----	----
Endrin ketone	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	81.7	63.6	117
gamma-BHC	0.05 mg/kg	----	0.25	81.8	59.8	118
	0.05 mg/kg	<0.05	----	----	----	----
Heptachlor	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	91.8	65.6	115
Heptachlor epoxide	0.05 mg/kg	----	0.25	78.1	65.6	113
	0.05 mg/kg	<0.05	----	----	----	----
Hexachlorobenzene (HCB)	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	77.2	59.4	115
Methoxychlor	0.2 mg/kg	<0.2	----	----	----	----
	0.2 mg/kg	----	0.25	95.0	50.4	132
trans-Chlordane	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	75.7	60.7	113
EP075(SIM)A: Phenolic Compounds						
EP075(SIM)A: Phenolic Compounds - (QC Lot: 426746)		mg/kg	mg/kg	%	%	%
2,4,5-Trichlorophenol	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	90.7	68.9	112
2,4,6-Trichlorophenol	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	95.9	62.2	115
2,4-Dichlorophenol	0.5 mg/kg	----	4	106	71.6	113
	0.5 mg/kg	<0.5	----	----	----	----
2,4-Dimethylphenol	0.5 mg/kg	----	4	105	74.5	119
	0.5 mg/kg	<0.5	----	----	----	----
2,6-Dichlorophenol	0.5 mg/kg	----	4	107	74.8	115
	0.5 mg/kg	<0.5	----	----	----	----
2-Chlorophenol	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	80.8	80.2	115

Matrix Type: SOIL

Method Blank (MB) and Laboratory Control Samples (LCS) Report

		Method blank result	*Actual Results*		*Recovery Limits*	
			Spike concentration	*Spike Recovery*	*Dynamic Recovery Limits*	
Analyte name	*LOR*			*LCS*	*Low*	*High*
EP075(SIM)A: Phenolic Compounds - continued						
EP075(SIM)A: Phenolic Compounds - (QC Lot: 426746) - continued		mg/kg	mg/kg	%	%	%
2-Methylphenol	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	84.5	76.8	114
2-Nitrophenol	0.5 mg/kg	----	4	99.6	60.3	117
	0.5 mg/kg	<0.5	----	----	----	----
3- & 4-Methylphenol	1.0 mg/kg	----	8	106	72	119
	1.0 mg/kg	<1.0	----	----	----	----
4-Chloro-3-Methylphenol	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	108	76.4	114
Pentachlorophenol	1.0 mg/kg	----	8	26.1	1.23	91.6
	1.0 mg/kg	<1.0	----	----	----	----
Phenol	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	106	73.9	115
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons						
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - (QC Lot: 426746)		mg/kg	mg/kg	%	%	%
Acenaphthene	0.5 mg/kg	----	4	108	81.5	112
	0.5 mg/kg	<0.5	----	----	----	----
Acenaphthylene	0.5 mg/kg	----	4	106	79.6	113
	0.5 mg/kg	<0.5	----	----	----	----
Anthracene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	82.3	81.1	112
Benz(a)anthracene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	106	77.2	112
Benzo(a)pyrene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	102	76.4	113
Benzo(b)fluoranthene	0.5 mg/kg	----	4	93.4	71.8	118
	0.5 mg/kg	<0.5	----	----	----	----
Benzo(g,h,i)perylene	0.5 mg/kg	----	4	109	72.4	114
	0.5 mg/kg	<0.5	----	----	----	----
Benzo(k)fluoranthene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	106	74.2	117

Matrix Type: SOIL

Method Blank (MB) and Laboratory Control Samples (LCS) Report

Analyte name	*LOR*	*Method blank result*	*Actual Results*		*Recovery Limits*	
			Spike concentration	*Spike Recovery*	*Dynamic Recovery Limits*	
				LCS	*Low*	*High*
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - continued						
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - (QC Lot: 426746) - continued		mg/kg	mg/kg	%	%	%
Chrysene	0.5 mg/kg	----	4	106	79.8	114
	0.5 mg/kg	<0.5	----	----	----	----
Dibenz(a,h)anthracene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	106	71.7	113
Fluoranthene	0.5 mg/kg	----	4	107	78.8	113
	0.5 mg/kg	<0.5	----	----	----	----
Fluorene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	100	79.9	112
Indeno(1,2,3,cd)pyrene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	108	71	113
Naphthalene	0.5 mg/kg	----	4	107	81.9	113
	0.5 mg/kg	<0.5	----	----	----	----
Phenanthrene	0.5 mg/kg	----	4	109	79.4	114
	0.5 mg/kg	<0.5	----	----	----	----
Pyrene	0.5 mg/kg	----	4	110	78.9	113
	0.5 mg/kg	<0.5	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons						
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 426453)		mg/kg	mg/kg	%	%	%
C6 - C9 Fraction	10 mg/kg	----	26	97.6	68.4	128
	10 mg/kg	<10	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 426745)		mg/kg	mg/kg	%	%	%
C10 - C14 Fraction	50 mg/kg	<50	----	----	----	----
	50 mg/kg	----	200	105	75.2	116
C15 - C28 Fraction	100 mg/kg	<100	----	----	----	----
	100 mg/kg	----	200	104	75.3	113
C29 - C36 Fraction	100 mg/kg	<100	----	----	----	----
	100 mg/kg	----	200	105	72.6	117
EP080: BTEX						
EP080: BTEX - (QC Lot: 426453)		mg/kg	mg/kg	%	%	%

Matrix Type: SOIL

Method Blank (MB) and Laboratory Control Samples (LCS) Report

		Method blank result	*Actual Results*		*Recovery Limits*	
			Spike concentration	*Spike Recovery*	*Dynamic Recovery Limits*	
Analyte name	*LOR*			*LCS*	*Low*	*High*
EP080: BTEX - continued						
EP080: BTEX - (QC Lot: 426453) - continued		mg/kg	mg/kg	%	%	%
Benzene	0.2 mg/kg	<0.2	----	----	----	----
	0.2 mg/kg	----	1	93.8	67.5	125
Ethylbenzene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	1	93.6	65.3	126
meta- & para-Xylene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	2	96.0	66.5	124
ortho-Xylene	0.5 mg/kg	----	1	98.2	66.7	123
	0.5 mg/kg	<0.5	----	----	----	----
Toluene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	1	98.0	69	122

Quality Control Report - Matrix Spikes (MS)

The quality control term **Matrix Spike (MS)** refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC type is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQO's). 'Ideal' recovery ranges stated may be waived in the event of sample matrix interferences. - Anonymous - Client Sample IDs refer to samples which are not specifically part of this work order but formed part of the QC process lot. *Abbreviations: **LOR** = Limit of Reporting, **RPD** = Relative Percent Difference.*

* Indicates failed QC

Matrix Type: SOIL ***Matrix Spike (MS) Report***

					Actual Results		*Recovery Limits*	
					Sample Result	*Spike Recovery*	*Static Limits*	
Analyte name	*Laboratory Sample ID*	*Client Sample ID*	*LOR*	*Spike Concentration*		*MS*	*Low*	*High*
EG005T: Total Metals by ICP-AES								
EG005T: Total Metals by ICP-AES - (QC Lot: 426625)				mg/kg	mg/kg	%	%	%
Arsenic	ES0707585-002	Anonymous	5 mg/kg	50	<5	84.9	70	130
Cadmium			1 mg/kg	50	<1	97.0	70	130
Chromium			2 mg/kg	50	20	97.8	70	130
Copper			5 mg/kg	250	6	104	70	130
Lead			5 mg/kg	250	6	97.4	70	130
Nickel			2 mg/kg	50	10	101	70	130
Zinc			5 mg/kg	250	26	97.4	70	130
EG035T: Total Mercury by FIMS								
EG035T: Total Mercury by FIMS - (QC Lot: 426623)				mg/kg	mg/kg	%	%	%
Mercury	ES0707366-001	Anonymous	0.1 mg/kg	5	0.2	92.1	70	130
EK026G: Total Cyanide By Discrete Analyser								
EK026G: Total Cyanide By Discrete Analyser - (QC Lot: 426436)				mg/kg	mg/kg	%	%	%
Total Cyanide	ES0707601-001	SPLIT SS1	1 mg/kg	50	<1.0	104	70	130
EP066: Polychlorinated Biphenyls (PCB)								
EP066: Polychlorinated Biphenyls (PCB) - (QC Lot: 426837)				mg/kg	mg/kg	%	%	%
Total Polychlorinated biphenyls	ES0707601-001	SPLIT SS1	0.1 mg/kg	0.5	<0.10	94.0	70	130
EP068A: Organochlorine Pesticides (OC)								
EP068A: Organochlorine Pesticides (OC) - (QC Lot: 426836)				mg/kg	mg/kg	%	%	%
gamma-BHC	ES0707601-002	SPLIT SS2	0.05 mg/kg	0.25	<0.05	70.2	75.65	110.44
Heptachlor			0.05 mg/kg	0.25	<0.05	83.7	72.2	106.71
Aldrin			0.05 mg/kg	0.25	<0.05	58.0	77.54	107.0
Dieldrin			0.05 mg/kg	0.25	<0.05	66.1	76.37	109.7
Endrin			0.05 mg/kg	1	<0.05	79.7	68.51	119.47

Matrix Type: SOIL ***Matrix Spike (MS) Report***

Analyte name	*Laboratory Sample ID*	*Client Sample ID*	*LOR*	*Spike Concentration*	*Actual Results*		*Recovery Limits*	
					Sample Result	*Spike Recovery*	*Static Limits*	
						MS	*Low*	*High*
EP068A: Organochlorine Pesticides (OC) - continued								
EP068A: Organochlorine Pesticides (OC) - (QC Lot: 426836) - continued				mg/kg	mg/kg	%	%	%
4,4'-DDT	ES0707601-002	SPLIT SS2	0.20 mg/kg	1	<0.2	64.4	67.12	118.10
EP075(SIM)A: Phenolic Compounds								
EP075(SIM)A: Phenolic Compounds - (QC Lot: 426746)				mg/kg	mg/kg	%	%	%
Phenol	ES0707585-002	Anonymous	0.5 mg/kg	10	<0.5	123	70	130
2-Chlorophenol			0.5 mg/kg	10	<0.5	121	70	130
2-Nitrophenol			0.5 mg/kg	10	<0.5	95.8	60	130
4-Chloro-3-Methylphenol			0.5 mg/kg	10	<0.5	105	70	130
Pentachlorophenol			2.0 mg/kg	10	<2.0	25.5	20	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - (QC Lot: 426746)				mg/kg	mg/kg	%	%	%
Acenaphthene	ES0707585-002	Anonymous	0.5 mg/kg	10	<0.5	107	70	130
Pyrene			0.5 mg/kg	10	<0.5	111	70	130
EP080/071: Total Petroleum Hydrocarbons								
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 426453)				mg/kg	mg/kg	%	%	%
C6 - C9 Fraction	ES0707566-001	Anonymous	10 mg/kg	26	<10	108	70	130
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 426745)				mg/kg	mg/kg	%	%	%
C10 - C14 Fraction	ES0707585-002	Anonymous	50 mg/kg	490	<50	98.8	70	130
C15 - C28 Fraction			100 mg/kg	3380	<100	84.6	70	130
C29 - C36 Fraction			100 mg/kg	2260	<100	112	70	130
EP080: BTEX								
EP080: BTEX - (QC Lot: 426453)				mg/kg	mg/kg	%	%	%
Benzene	ES0707566-001	Anonymous	0.2 mg/kg	2.5	<0.2	99.6	70	130
Toluene			0.5 mg/kg	2.5	<0.5	108	70	130
Ethylbenzene			0.5 mg/kg	2.5	<0.5	112	70	130
meta- & para-Xylene			0.5 mg/kg	2.5	<0.5	109	70	130
ortho-Xylene			0.5 mg/kg	2.5	<0.5	109	70	130

INTERPRETIVE QUALITY CONTROL REPORT

Client	: **AARGUS PTY LTD**	**Laboratory**	: Environmental Division Sydney	**Page**	:	**1 of 6**
Contact	: CASH SALE	**Contact**	: Victor Kedicioglu			
Address	: PO BOX 398 DRUMMOYNE NSW AUSTRALIA 2047	**Address**	: 277-289 Woodpark Road Smithfield NSW Australia 2164	**Work order**	:	**ES0707601**
				Amendment No.	:	
Project	: E1559	**Quote number**	: SY/021/05	**Date received**	:	7 Jun 2007
Order number	: - Not provided -			**Date issued**	:	14 Jun 2007
C-O-C number	: - Not provided -					
Site	: SMITH STREET, SUMMER HILL					
E-mail	: brenda.hong@alsenviro.com	**E-mail**	: Victor.Kedicioglu@alsenviro.com	**No. of samples**		
Telephone	: 1300137038	**Telephone**	: 61-2-8784 8555	**Received**	:	2
Facsimile	: 1300136038	**Facsimile**	: 61-2-8784 8500	**Analysed**	:	2

This Interpretive Quality Control Report was issued on 14 Jun 2007 for the ALS work order reference ES0707601 and supersedes any previous reports with this reference.
This report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Type Frequency Compliance
- Summary of all Quality Control Outliers
- Brief Method Summaries

Interpretive Quality Control Report - Analysis Holding Time

The following report summarises extraction / preparation and analysis times and compares with recommended holding times. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. Information is also provided re the sample container (preservative) from which the sample aliquot was taken. Elapsed time to analysis represents time from sampling where no extraction / digestion is involved or time from extraction / digestion where this is present. For composite samples, sampling date/time is taken as that of the oldest sample contributing to that composite. Sample date/time for laboratory produced leaches are taken from the completion date/time of the leaching process. Outliers for holding time are based on USEPA SW846, APHA, AS and NEPM (1999). Failed outliers, refer to the 'Summary of Outliers'.

Matrix Type: SOIL ***Analysis Holding Time and Preservation***

Method		**Date Sampled**	**Extraction / Preparation**			**Analysis**		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Pass?	Date analysed	Due for analysis	Pass?
EA055-103: Moisture Content								
Soil Glass Jar - Unpreserved								
SPLIT SS1,	SPLIT SS2	**31 May 2007**	----	----	----	**7 Jun 2007**	7 Jun 2007	Pass
EG005T: Total Metals by ICP-AES								
Soil Glass Jar - Unpreserved								
SPLIT SS1,	SPLIT SS2	**31 May 2007**	**8 Jun 2007**	27 Nov 2007	Pass	**8 Jun 2007**	27 Nov 2007	Pass
EG035T: Total Mercury by FIMS								
Soil Glass Jar - Unpreserved								
SPLIT SS1,	SPLIT SS2	**31 May 2007**	**8 Jun 2007**	28 Jun 2007	Pass	**12 Jun 2007**	28 Jun 2007	Pass
EK026G: Total Cyanide By Discrete Analyser								
Soil Glass Jar - Unpreserved								
SPLIT SS1,	SPLIT SS2	**31 May 2007**	**7 Jun 2007**	7 Jun 2007	Pass	**8 Jun 2007**	21 Jun 2007	Pass
EP066: Polychlorinated Biphenyls (PCB)								
Soil Glass Jar - Unpreserved								
SPLIT SS1,	SPLIT SS2	**31 May 2007**	**8 Jun 2007**	14 Jun 2007	Pass	**12 Jun 2007**	18 Jul 2007	Pass
EP068: Pesticides by GCMS								
Soil Glass Jar - Unpreserved								
SPLIT SS1,	SPLIT SS2	**31 May 2007**	**8 Jun 2007**	14 Jun 2007	Pass	**12 Jun 2007**	18 Jul 2007	Pass
EP071: TPH - Semivolatile Fraction								
Soil Glass Jar - Unpreserved								
SPLIT SS1,	SPLIT SS2	**31 May 2007**	**8 Jun 2007**	14 Jun 2007	Pass	**12 Jun 2007**	18 Jul 2007	Pass
EP075(SIM): PAH/Phenols (SIM)								
Soil Glass Jar - Unpreserved								
SPLIT SS1,	SPLIT SS2	**31 May 2007**	**8 Jun 2007**	14 Jun 2007	Pass	**12 Jun 2007**	18 Jul 2007	Pass
EP080: TPH Volatiles/BTEX								
Soil Glass Jar - Unpreserved								
SPLIT SS1,	SPLIT SS2	**31 May 2007**	**7 Jun 2007**	14 Jun 2007	Pass	**8 Jun 2007**	14 Jun 2007	Pass

Interpretive Quality Control Report - Frequency of Quality Control Samples

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which this work order was processed. Actual rate should be greater than or equal to the expected rate.

Matrix Type: SOIL

Frequency of Quality Control Samples

Quality Control Sample Type Method	Count		**Rate (%)**		Quality Control Specification
	QC	Regular	**Actual**	**Expected**	
Laboratory Duplicates (DUP)					
EA055-103: Moisture Content	2	12	**16.7**	**10.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EG005T: Total Metals by ICP-AES	1	4	**25.0**	**10.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EG035T: Total Mercury by FIMS	2	14	**14.3**	**10.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EK026G: Total Cyanide By Discrete Analyser	1	2	**50.0**	**10.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP066: Polychlorinated Biphenyls (PCB)	1	2	**50.0**	**10.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP068: Pesticides by GCMS	1	2	**50.0**	**10.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP071: TPH - Semivolatile Fraction	1	6	**16.7**	**10.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP075(SIM): PAH/Phenols (SIM)	1	3	**33.3**	**10.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP080: TPH Volatiles/BTEX	1	8	**12.5**	**10.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
Laboratory Control Samples (LCS)					
EG005T: Total Metals by ICP-AES	1	4	**25.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EG035T: Total Mercury by FIMS	1	14	**7.1**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EK026G: Total Cyanide By Discrete Analyser	1	2	**50.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP066: Polychlorinated Biphenyls (PCB)	1	2	**50.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP068: Pesticides by GCMS	1	2	**50.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP071: TPH - Semivolatile Fraction	1	6	**16.7**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP075(SIM): PAH/Phenols (SIM)	1	3	**33.3**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP080: TPH Volatiles/BTEX	1	8	**12.5**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
Method Blanks (MB)					
EG005T: Total Metals by ICP-AES	1	4	**25.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EG035T: Total Mercury by FIMS	1	14	**7.1**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EK026G: Total Cyanide By Discrete Analyser	1	2	**50.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP066: Polychlorinated Biphenyls (PCB)	1	2	**50.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP068: Pesticides by GCMS	1	2	**50.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP071: TPH - Semivolatile Fraction	1	6	**16.7**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP075(SIM): PAH/Phenols (SIM)	1	3	**33.3**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP080: TPH Volatiles/BTEX	1	8	**12.5**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
Matrix Spikes (MS)					
EG005T: Total Metals by ICP-AES	1	4	**25.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EG035T: Total Mercury by FIMS	1	14	**7.1**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EK026G: Total Cyanide By Discrete Analyser	1	2	**50.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP066: Polychlorinated Biphenyls (PCB)	1	2	**50.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP068: Pesticides by GCMS	1	2	**50.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP071: TPH - Semivolatile Fraction	1	6	**16.7**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP075(SIM): PAH/Phenols (SIM)	1	3	**33.3**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP080: TPH Volatiles/BTEX	1	8	**12.5**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement

Interpretive Quality Control Report - Summary of Outliers

Outliers : Quality Control Samples

The following report highlights outliers flagged on the 'Quality Control Report'. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). Flagged outliers on control limits for inorganics tests may be within the NEPM specified data quality objective of recoveries in the range of 70 to 130%. Where this occurs, no corrective action is taken. - Anonymous - Client Sample IDs refer to samples which are not specifically part of this work order but formed part of the QC process lot.

Non-surrogates

ALS QC Lot	Matrix Type	Laboratory Sample ID	Client Sample ID	Analyte	Data	Limits	Comment
Matrix Spikes (MS)							
EP068A: Organochlorine Pesticides (OC)	SOIL	ES0707601-002	SPLIT SS2	gamma-BHC	70.2 %	75.65-110.44 %	Recovery less than lower data quality objective
				Aldrin	58.0 %	77.54-107.0 %	Recovery less than lower data quality objective
				Dieldrin	66.1 %	76.37-109.7 %	Recovery less than lower data quality objective
				4,4'-DDT	64.4 %	67.12-118.10 %	Recovery less than lower data quality objective

- **For all matrices, no RPD recovery outliers occur for the duplicate analysis.**
- **For all matrices, no method blank result outliers occur.**
- **For all matrices, no laboratory spike recoveries breaches occur.**

Surrogates

ALS QC Lot	Matrix Type	Laboratory Sample ID	Client Sample ID	Analyte	Data	Limits	Comment
Surrogates							
EP080S: TPH(V)/BTEX Surrogates	SOIL	ES0707601-002	SPLIT SS2	Toluene-D8	77.8 %	81-117 %	Recovery less than lower data quality objective

Outliers : Analysis Holding Time

The following report highlights outliers within this 'Interpretive Quality Control Report - Analysis Holding Time'.

- **No holding time outliers occur.**

Outliers : Frequency of Quality Control Samples

The following report highlights outliers within this 'Interpretive Quality Control Report - Frequency of Quality Control Samples'.

- **No frequency outliers occur.**

Method Reference Summary

The analytical procedures used by ALS Environmental are based on established internationally-recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house procedure are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported herein. Reference methods from which ALSE methods are based are provided in parenthesis.

Matrix Type: SOIL ***Method Reference Summary***

Preparation Methods

EK026PR : NaOH leach for TCN in Soils - APHA 21st ed., 4500 CN- C & N. Samples are extracted by end-over-end tumbling with NaOH.

EN69 : Hot Block Digest for metals in soils sediments and sludges - USEPA 200.2 Mod. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (1999) Schedule B(3) (Method 202)

ORG16 : Methanolic Extraction of Soils for Purge and Trap - (USEPA SW 846 - 5030A) 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.

ORG17A : Tumbler Extraction of Solids (Option A - Concentrating) - In-house, Mechanical agitation (tumbler). 20g of sample, Na2SO4 and surrogate are extracted with 150mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.

ORG17B : Tumbler Extraction of Solids (Option B - Non-concentrating) - In-house, Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 20mL 1:1 DCM/Acetone by end over end tumble. The solvent is transferred directly to a GC vial for analysis.

Analytical Methods

EA055-103 : Moisture Content - A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (1999) Schedule B(3) (Method 102)

EG005T : Total Metals by ICP-AES - (APHA 21st ed., 3120; USEPA SW 846 - 6010) (ICPAES) Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (1999) Schedule B(3)

EG035T : Total Mercury by FIMS - AS 3550, APHA 21st ed., 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (1999) Schedule B(3)

EK026G : Total Cyanide By Discrete Analyser - APHA 21st 4500 CN - C & N. Caustic leach extracts of the sample are distilled with sulphuric acid, converting all CN species to HCN. The distillates are analyzed for CN by Seal. This method is compliant with NEPM (1999) Schedule B(3) (Method 403)

EP066 : Polychlorinated Biphenyls (PCB) - (USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Method 504)

EP068 : Pesticides by GCMS - (USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This technique is compliant with NEPM (1999) Schedule B(3) (Method 504,505)

EP071 : TPH - Semivolatile Fraction - (USEPA SW 846 - 8015A) Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C36. This method is compliant with NEPM (1999) Schedule B(3) (Method 506.1)

EP075(SIM) : PAH/Phenols (SIM) - (USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Method 502 and 507)

EP080 : TPH Volatiles/BTEX - (USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Method 501)

Matrix Type: SOIL

Method Reference Summary

Analytical Methods

LabMark
ENVIRONMENTAL LABORATORIES

CUSTOMER CENTRIC - ANALYTICAL CHEMISTS

ilac-MRA NATA Accreditation No. 13542

Accredited for compliance with ISO/IEC 17025. The results of tests, calibrations and/or measurements included in this document are traceable to Australian/national standards. NATA is a signatory to the APLAC mutual recognition arrangement for the mutual recognition of the equivalence of testing, calibration and inspection reports.

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Quarantine Approved Premises criteria 5.1 for quarantine containment level 1 (QCI) facilities. Class five criteria cover premises utilised for research, analysis and testing of biological material, soil, animal, plant and human products.

FINAL CERTIFICATE OF ANALYSIS - ENVIRONMENTAL DIVISION

Laboratory Report No: E036725
Client Name: Aargus Pty. Ltd
Client Reference: Summer Hill
Contact Name: Con Kariotoglou
Chain of Custody No: na
Sample Matrix: SOIL & WATER

Cover Page 1 of 4
plus Sample Results

Date Received: 14/03/2008
Date Reported: 26/03/2008

This Final Certificate of Analysis consists of sample results, DQI's, method descriptions, laboratory definitions, and internationally recognised NATA accreditation and endorsement. The DQO compliance relates specifically to QA/QC results as performed as part of the sample analysis, and may provide an indication of sample result quality. Transfer of report ownership from Labmark to the client shall only occur once full & final payment has been settled and verified. All report copies may be retracted where full payment has not occured within the agreed settlement period.

QUALITY ASSURANCE CRITERIA

Accuracy:	matrix spike:	1 in first 5-20, then 1 every 20 samples
	lcs, crm, method:	1 per analytical batch
	surrogate spike:	addition per target organic method
Precision:	laboratory duplicate:	1 in first 5-10, then 1 every 10 samples
	laboratory triplicate:	re-extracted & reported when duplicate RPD values exceed acceptance criteria
Holding Times:	soils, waters:	Refer to LabMark Preservation & THT table VOC's 14 days water / soil VAC's 7 days water or 14 days acidified VAC's 14 days soil SVOC's 7 days water, 14 days soil Pesticides 7 days water, 14 days soil Metals 6 months general elements Mercury 28 days
Confirmation:	target organic analysis:	GC/MS, or confirmatory column
Sensitivity:	EQL:	Typically 2-5 x Method Detection Limit (MDL)

QUALITY CONTROL
GLOBAL ACCEPTANCE CRITERIA (GAC)

Accuracy:	spike, lcs, crm surrogate:	general analytes 70% - 130% recovery phenol analytes 50% - 130% recovery organophosphorous pesticide analytes 60% - 130% recovery phenoxy acid herbicides, organotin 50% - 130% recovery
	anion/cation bal:	+/- 10% (0-3 meq/l), +/- 5% (>3 meq/l)
Precision:	method blank:	not detected >95% of the reported EQL
	duplicate lab RPD (metals):	0-30% (>10xEQL), 0-75% (5-10xEQL) 0-100% (<5xEQL)
	duplicate lab RPD:	0-50% (>10xEQL), 0-75% (5-10xEQL) 0-100% (<5xEQL)

QUALITY CONTROL
ANALYTE SPECIFIC ACCEPTANCE CRITERIA (ASAC)

Accuracy:	spike, lcs, crm surrogate:	analyte specific recovery data <3xsd of historical mean
Uncertainty:	spike, lcs:	measurement calculated from historical analyte specific control charts

RESULT ANNOTATION

Data Quality Objective	s:	matrix spike recovery	p:	pending	bcs:	batch specific lcs
Data Quality Indicator	d:	laboratory duplicate	lcs:	laboratory control sample	bmb:	batch specific mb
Estimated Quantitation Limit	t:	laboratory triplicate	crm:	certified reference material		
not applicable	r:	RPD relative % difference	mb:	method blank		

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This document is issued in accordance with NATA's accreditation requirements.

Laboratory Report: E036725

Cover Page 2 of 4

NEPC GUIDELINE COMPLIANCE - DQO

1. GENERAL

A. Results relate specifically to samples as received. Sample results are not corrected for matrix spike, lcs, or surrogate recovery data.

B. EQL's are matrix dependant and may be increased due to sample dilution or matrix interference.

C. Laboratory QA/QC samples are specific to this project.

D. Inter-laboratory proficiency results are available upon request. NATA accreditation details available at www.nata.asn.au.

E. VOC spikes & surrogates added to samples during extraction, SVOC spikes & surrogates added prior to extraction.

F. Recovery data outside GAC limits shall be investigated and compared to ASAC (historical mean +/- 3sd). If recovery data <20%, then the relevant results for that compound are considered not reliable.

G. Recovery data (ms, surrogate, crm, lcs) outside ASAC limits shall initiate an investigative action. Anomolous QC data is examined in conjunction with other QC samples and a final decision whether to accept or reject results is provided by the professional judgement of the senior analyst. The USEPA-CLP National Functional Guidelines are referred to for specific recommendations.

H. Extraction (preparation) date refers to the date that sample preparation was initiated. Note that certain methods not requiring sample preparation (eg. VOCs in water, etc) may report a common extraction and analysis date.

I. LabMark shall maintain an official copy of this Certificate of Analysis for all tracable reference purposes.

2. CHAIN OF CUSTODY (COC) & SAMPLE RECEIPT NOTICE (SRN) REQUIREMENTS

A. SRN issued to client upon sample receipt & login verification.

B. Preservation & sampling date details specified on COC and SRN, unless noted.

C. Sample Integrity & Validated Time of Sample Receipt (VTSR) Holding Times verified (preservation may extend holding time, refer to preservation chart).

3. NATA ACCREDITED METHODS

A. NATA accreditation held for each in-house method and sample matrix type reported, unless noted below (Refer to subcontracted test reports for NATA accreditation status).

B. NATA accredited in-house laboratory methods are referenced from NEPC, ASTM, modified USEPA / APHA documents. Corporate Accreditation No. 13542.

C. Subcontracted analyses: Refer to Sample Receipt Notice and additional DQO comments.

Foundation
Member

Laboratory Report: E036725

Cover Page 3 of 4

4. QA/QC FREQUENCY COMPLIANCE TABLE SPECIFIC TO THIS REPORT

Matrix: **SOIL**

Page:	Method:	Totals:	#d	%d-ratio	#t	#s	%s-ratio
1	BTEX by P&T	9	1	11%	0	1	11%
1	Volatile TPH by P&T (vTPH)	9	1	11%	0	1	11%
3	Petroleum Hydrocarbons (TPH)	9	1	11%	0	1	11%
5	Polyaromatic Hydrocarbons (PAH)	8	1	13%	0	1	13%
7	Phenols by GC/MS	1	0	0%	0	0	0%
8	Organochlorine Pesticides (OC)	3	0	0%	0	0	0%
9	Polychlorinated Biphenyls (PCB)	2	0	0%	0	0	0%
12	Acid extractable metals (M7)	17	2	12%	1	1	6%
15	Acid extractable mercury	17	2	12%	0	1	6%
17	Moisture	17	--	--	--	--	--

Matrix: **WATER**

Page:	Method:	Totals:	#d	%d-ratio	#t	#s	%s-ratio
10	Unfiltered metals (M7)	1	0	0%	0	0	0%
11	Unfiltered metals	1	0	0%	0	0	0%

GLOSSARY:

#d	number of discrete duplicate extractions/analyses performed.
%d-ratio	NEPC guideline for laboratory duplicates is 1 in 10 samples (min 10%).
#t	number of triplicate extractions/analyses performed.
#s	number of spiked samples analysed.
%s-ratio	USEPA guideline for laboratory matrix spikes is 1 in 20 samples (min 5%).

This document is issued in accordance with NATA's accreditation requirements.

Laboratory Report: E036725

Cover Page 4 of 4

5. ADDITIONAL COMMENTS SPECIFIC TO THIS REPORT

A. All tests were conducted by LabMark Environmental Sydney, NATA accreditation No. 13542, Corporate Site No. 13535, unless indicated below.
B. Metals (soil) nickle recovery in sample 146281s is 54%. corresponding LCS recovery is 103%.
C. Metals (soil) Lab # 146279d reported RPD range 10% - 100%, triplicate results issued.

Laboratory QA/QC data shall relate specifically to this report, and may provide an indication of site specific sample result quality. LabMark DOES NOT report NON-RELEVANT BATCH QA/QC data. Acceptance of this self assessment certificate does not preclude any requirement for a QA/QC review by a accredited contaminated site EPA auditor, when and wherever necessary. Laboratory QA/QC self assessment references available upon request.

LabMark ENVIRONMENTAL LABORATORIES

Laboratory Report No: E036725
Client Name: Aargus Pty. Ltd
Contact Name: Con Kariotoglou
Client Reference: Summer Hill E1559

Page: 1 of 18
plus cover page
Date: 26/03/08
This report supercedes reports issued on: N/A

Final
Certificate
of Analysis

Laboratory Identification		**146279**	**146280**	**146281**	**146282**	**146283**	**146286**	**146289**	**146293**	**146294**	**146279d**
Sample Identification		Dup A	BH	BH	BH	BH	BH	BH	BH	BH	QC
Depth (m)		--	28.10	29.10	29.20	30.10	31.15	35.05	5.10	6.10	--
Sampling Date recorded on COC		12/3/08	12/3/08	12/3/08	12/3/08	12/3/08	12/3/08	12/3/08	12/3/08	12/3/08	--
Laboratory Extraction (Preparation) Date		18/3/08	18/3/08	18/3/08	18/3/08	18/3/08	18/3/08	18/3/08	18/3/08	18/3/08	18/3/08
Laboratory Analysis Date		21/3/08	21/3/08	21/3/08	21/3/08	21/3/08	21/3/08	21/3/08	21/3/08	21/3/08	21/3/08
Method : E002.2 **BTEX by P&T**	**EQL**										
Benzene	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
meta- and para-Xylene	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
ortho-Xylene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Total Xylene	--	--	--	--	--	--	--	--	--	--	--
CDFB (Surr @ 10mg/kg)	--	*111%*	*121%*	*108%*	*119%*	*117%*	*115%*	*115%*	*118%*	*116%*	*114%*
Method : E003.2 **Volatile TPH by P&T (vTPH)**	**EQL**										
C6 - C9 Fraction	10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10

Results expressed in mg/kg dry weight unless otherwise specified

Comments:

E002.2: 8-10g soil extracted with 20ml methanol. Analysis by P&T/GC/PID/MSD.
E003.2: 8-10g soil extracted with 20ml methanol. Analysis by P&T/GC/FID.

Laboratory Report No: E036725
Client Name: Aargus Pty. Ltd
Contact Name: Con Kariotoglou
Client Reference: Summer Hill E1559

Date: 26/03/08

This report supercedes reports issued on: N/A

Final
Certificate
of Analysis

Laboratory Identification		**146279r**	**146281s**	**lcs**	**mb**						
Sample Identification		QC	QC	QC	QC						
Depth (m)		--	--	--	--						
Sampling Date recorded on COC		--	--	--	--						
Laboratory Extraction (Preparation) Date		--	18/3/08	18/3/08	18/3/08						
Laboratory Analysis Date		--	20/3/08	18/3/08	18/3/08						
Method : E002.2											
BTEX by P&T	**EQL**										
Benzene	0.2	--	92%	89%	<0.2						
Toluene	0.5	--	88%	89%	<0.5						
Ethylbenzene	0.5	--	83%	89%	<0.5						
meta- and para-Xylene	1	--	93%	92%	<1						
ortho-Xylene	0.5	--	87%	94%	<0.5						
Total Xylene	--	--	--	--	--						
CDFB (Surr @ 10mg/kg)	--	*3%*	*114%*	*95%*	*94%*						
Method : E003.2											
Volatile TPH by P&T (vTPH)	**EQL**										
C6 - C9 Fraction	10	--	84%	81%	<10						

Results expressed in mg/kg dry weight unless otherwise specified

Comments:

E002.2: 8-10g soil extracted with 20ml methanol. Analysis by P&T/GC/PID/MSD.
E003.2: 8-10g soil extracted with 20ml methanol. Analysis by P&T/GC/FID.

Laboratory Identification		**146279**	**146280**	**146281**	**146282**	**146283**	**146286**	**146289**	**146293**	**146294**	**146279d**
Sample Identification		Dup A	BH	BH	BH	BH	BH	BH	BH	BH	QC
Depth (m)		--	28.10	29.10	29.20	30.10	31.15	35.05	5.10	6.10	--
Sampling Date recorded on COC		12/3/08	12/3/08	12/3/08	12/3/08	12/3/08	12/3/08	12/3/08	12/3/08	12/3/08	--
Laboratory Extraction (Preparation) Date		18/3/08	18/3/08	18/3/08	18/3/08	18/3/08	18/3/08	18/3/08	18/3/08	18/3/08	18/3/08
Laboratory Analysis Date		18/3/08	18/3/08	18/3/08	18/3/08	18/3/08	18/3/08	18/3/08	18/3/08	18/3/08	18/3/08
Method : E006.2											
Petroleum Hydrocarbons (TPH)	**EQL**										
C10 - C14 Fraction	50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
C15 - C28 Fraction	100	110	<100	<100	<100	350	<100	<100	<100	<100	130
C29 - C36 Fraction	100	<100	<100	<100	<100	180	<100	<100	<100	<100	<100
Sum of TPH C10 - C36	--	110	--	--	--	530	--	--	--	--	130

Results expressed in mg/kg dry weight unless otherwise specified

Comments:

E006.2: 8-10g soil extracted with 20ml DCM/Acetone/Hexane (10:45:45). Analysis by GC/FID.

Laboratory Report No: E036725
Client Name: Aargus Pty. Ltd
Contact Name: Con Kariotoglou
Client Reference: Summer Hill E1559

Date: 26/03/08

This report supercedes reports issued on: N/A

Final
Certificate
of Analysis

Laboratory Identification		**146279r**	**146281s**	**lcs**	**mb**						
Sample Identification		QC	QC	QC	QC						
Depth (m)		--	--	--	--						
Sampling Date recorded on COC		--	--	--	--						
Laboratory Extraction (Preparation) Date		--	18/3/08	18/3/08	18/3/08						
Laboratory Analysis Date		--	18/3/08	18/3/08	18/3/08						
Method : E006.2											
Petroleum Hydrocarbons (TPH)	**EQL**										
C10 - C14 Fraction	50	--	--	--	<50						
C15 - C28 Fraction	100	17%	114%	94%	<100						
C29 - C36 Fraction	100	--	--	--	<100						
Sum of TPH C10 - C36	--	17%	--	--	--						

Results expressed in mg/kg dry weight unless otherwise specified

Comments:

E006.2: 8-10g soil extracted with 20ml DCM/Acetone/Hexane (10:45:45). Analysis by GC/FID.

Laboratory Identification		**146279**	**146280**	**146281**	**146282**	**146286**	**146287**	**146289**	**146294**	**146279d**	**146279r**
Sample Identification		Dup A	BH	BH	BH	BH	BH	BH	BH	QC	QC
Depth (m)		--	28.10	29.10	29.20	31.15	33.10	35.05	6.10	--	--
Sampling Date recorded on COC		12/3/08	12/3/08	12/3/08	12/3/08	12/3/08	12/3/08	12/3/08	12/3/08	--	--
Laboratory Extraction (Preparation) Date		18/3/08	18/3/08	18/3/08	18/3/08	18/3/08	18/3/08	18/3/08	18/3/08	18/3/08	--
Laboratory Analysis Date		20/3/08	20/3/08	20/3/08	19/3/08	20/3/08	20/3/08	20/3/08	20/3/08	20/3/08	--
Method : E007.2											
Polyaromatic Hydrocarbons (PAH)	**EQL**										
Naphthalene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	2.7	<0.5	<0.5	<0.5	--
Acenaphthylene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.0	<0.5	<0.5	<0.5	--
Acenaphthene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	6.6	<0.5	<0.5	<0.5	--
Fluorene	0.5	<0.5	<0.5	<0.5	0.5	<0.5	8.0	<0.5	<0.5	<0.5	--
Phenanthrene	0.5	1.9	<0.5	1.1	2.6	<0.5	60.4	0.9	<0.5	1.9	0%
Anthracene	0.5	0.6	<0.5	<0.5	0.8	<0.5	15.7	<0.5	<0.5	0.6	0%
Fluoranthene	0.5	4.4	<0.5	1.5	2.2	<0.5	66.6	1.9	<0.5	5.4	20%
Pyrene	0.5	4.4	<0.5	1.4	1.9	<0.5	58.4	1.9	<0.5	5.4	20%
Benz(a)anthracene	0.5	2.4	<0.5	0.6	0.8	<0.5	25.0	1.0	<0.5	3.2	29%
Chrysene	0.5	2.3	<0.5	0.5	0.8	<0.5	18.6	1	<0.5	2.8	20%
Benzo(b)&(k)fluoranthene	1	4	<1	1	1	<1	32	2	<1	5	22%
Benzo(a) pyrene	0.5	2.7	<0.5	0.7	0.8	<0.5	23.0	1.1	<0.5	3.6	29%
Indeno(1,2,3-c,d)pyrene	0.5	1.3	<0.5	<0.5	<0.5	<0.5	11.0	0.5	<0.5	1.7	27%
Dibenz(a,h)anthracene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	2.5	<0.5	<0.5	0.5	>0%
Benzo(g,h,i)perylene	0.5	1.6	<0.5	<0.5	<0.5	<0.5	12.5	0.6	<0.5	2.0	22%
Sum of reported PAHs	--	25.6	--	6.8	11.4	--	344.0	10.9	--	32.1	23%
2-FBP (Surr @ 5mg/kg)	--	*92%*	*101%*	*118%*	*116%*	*126%*	*107%*	*100%*	*117%*	*121%*	*27%*
TP-d14 (Surr @ 5mg/kg)	--	*91%*	*96%*	*111%*	*114%*	*126%*	*103%*	*103%*	*113%*	*112%*	*21%*

Results expressed in mg/kg dry weight unless otherwise specified

Comments:

E007.2: 8-10g soil extracted with 20ml DCM/Acetone/Hexane (10:45:45). Analysis by GC/MS.

Laboratory Identification		**146281s**	**lcs**	**mb**							
Sample Identification		QC	QC	QC							
Depth (m)		--	--	--							
Sampling Date recorded on COC		--	--	--							
Laboratory Extraction (Preparation) Date		18/3/08	18/3/08	18/3/08							
Laboratory Analysis Date		20/3/08	19/3/08	19/3/08							
Method : E007.2											
Polyaromatic Hydrocarbons (PAH)	**EQL**										
Naphthalene	0.5	109%	127%	<0.5							
Acenaphthylene	0.5	109%	128%	<0.5							
Acenaphthene	0.5	110%	122%	<0.5							
Fluorene	0.5	111%	127%	<0.5							
Phenanthrene	0.5	117%	124%	<0.5							
Anthracene	0.5	104%	124%	<0.5							
Fluoranthene	0.5	115%	127%	<0.5							
Pyrene	0.5	117%	120%	<0.5							
Benz(a)anthracene	0.5	108%	125%	<0.5							
Chrysene	0.5	102%	130%	<0.5							
Benzo(b)&(k)fluoranthene	1	116%	122%	<1							
Benzo(a) pyrene	0.5	120%	129%	<0.5							
Indeno(1,2,3-c,d)pyrene	0.5	103%	127%	<0.5							
Dibenz(a,h)anthracene	0.5	104%	119%	<0.5							
Benzo(g,h,i)perylene	0.5	102%	130%	<0.5							
Sum of reported PAHs	--	--	--	--							
2-FBP (Surr @ 5mg/kg)	--	*112%*	*104%*	*123%*							
TP-d14 (Surr @ 5mg/kg)	--	*111%*	*100%*	*115%*							

Results expressed in mg/kg dry weight unless otherwise specified

Comments:

E007.2: 8-10g soil extracted with 20ml DCM/Acetone/Hexane (10:45:45). Analysis by GC/MS.

Laboratory Report No: E036725
Client Name: Aargus Pty. Ltd
Contact Name: Con Kariotoglou
Client Reference: Summer Hill E1559

Date: 26/03/08
This report supercedes reports issued on: N/A

Final
Certificate
of Analysis

Laboratory Identification		**146282**	**lcs**	**mb**
Sample Identification		BH	QC	QC
Depth (m)		29.20	--	--
Sampling Date recorded on COC		12/3/08	--	--
Laboratory Extraction (Preparation) Date		18/3/08	18/3/08	18/3/08
Laboratory Analysis Date		19/3/08	19/3/08	19/3/08
Method : E008.2 **Phenols by GC/MS**	**EQL**			
Phenol	0.5	<0.5	106%	<0.5
2-chlorophenol	0.5	<0.5	127%	<0.5
2-methylphenol	0.5	<0.5	120%	<0.5
3-&4-methylphenol	1.0	<1.0	117%	<1.0
2-nitrophenol	0.5	<0.5	118%	<0.5
2,4-dimethylphenol	0.5	<0.5	107%	<0.5
2,4-dichlorophenol	0.5	<0.5	127%	<0.5
4-chloro-3-methylphenol	0.5	<0.5	81%	<0.5
2,4,6-trichlorophenol	0.5	<0.5	124%	<0.5
2,4,5-trichlorophenol	0.5	<0.5	130%	<0.5
Pentachlorophenol	1	<1	105%	<1
Sum of reported phenols	--	--	--	--
2-FP (Surr @ 5mg/kg)	--	*103%*	*108%*	*123%*
Phenol-d5 (Surr @ 5mg/kg)	--	*91%*	*112%*	*130%*
2,4,6-TBP (Surr @ 5mg/kg)	--	*81%*	*117%*	*129%*

Results expressed in mg/kg dry weight unless otherwise specified

Comments:

E008.2: 8-10g soil extracted with 20ml DCM/Acetone/Hexane (10:45:45). Analysis by GC/MS.

Laboratory Report No: E036725
Client Name: Aargus Pty. Ltd
Contact Name: Con Kariotoglou
Client Reference: Summer Hill E1559

Date: 26/03/08
This report supercedes reports issued on: N/A

Final
Certificate
of Analysis

Laboratory Identification		**146283**	**146286**	**146292**	**lcs**	**mb**					
Sample Identification		BH	BH	BH	QC	QC					
Depth (m)		30.10	31.15	4.10	--	--					
Sampling Date recorded on COC		12/3/08	12/3/08	12/3/08	--	--					
Laboratory Extraction (Preparation) Date		18/3/08	18/3/08	18/3/08	18/3/08	18/3/08					
Laboratory Analysis Date		19/3/08	19/3/08	19/3/08	19/3/08	19/3/08					
Method : E013.2 **Organochlorine Pesticides (OC)**	**EQL**										
a-BHC	0.05	<0.05	<0.05	<0.05	93%	<0.05					
Hexachlorobenzene	0.05	<0.05	<0.05	<0.05	104%	<0.05					
b-BHC	0.05	<0.05	<0.05	<0.05	108%	<0.05					
g-BHC (Lindane)	0.05	<0.05	<0.05	<0.05	105%	<0.05					
d-BHC	0.05	<0.05	<0.05	<0.05	104%	<0.05					
Heptachlor	0.05	<0.05	<0.05	<0.05	102%	<0.05					
Aldrin	0.05	<0.05	<0.05	<0.05	103%	<0.05					
Heptachlor epoxide	0.05	<0.05	<0.05	<0.05	105%	<0.05					
trans-chlordane	0.05	<0.05	<0.05	<0.05	104%	<0.05					
Endosulfan I	0.05	<0.05	<0.05	<0.05	97%	<0.05					
cis-chlordane	0.05	<0.05	<0.05	<0.05	96%	<0.05					
Dieldrin	0.05	<0.05	<0.05	<0.05	106%	<0.05					
4,4-DDE	0.05	<0.05	<0.05	<0.05	107%	<0.05					
Endrin	0.05	<0.05	<0.05	<0.05	102%	<0.05					
Endosulfan II	0.05	<0.05	<0.05	<0.05	102%	<0.05					
4,4-DDD	0.05	<0.05	<0.05	<0.05	103%	<0.05					
Endosulfan sulphate	0.05	<0.05	<0.05	<0.05	105%	<0.05					
4,4-DDT	0.2	<0.2	<0.2	<0.2	96%	<0.2					
Methoxychlor	0.2	<0.2	<0.2	<0.2	105%	<0.2					
DBC (Surr @ 0.2mg/kg)	--	*112%*	*98%*	*100%*	*100%*	*86%*					

Results expressed in mg/kg dry weight unless otherwise specified

Comments:

E013.2: 8-10g soil extracted with 20ml DCM/Acetone/Hexane (10:45:45). Analysis by GC/dual ECD.

Laboratory Identification		**146286**	**146293**	**lcs**	**mb**						
Sample Identification		BH	BH	QC	QC						
Depth (m)		31.15	5.10	--	--						
Sampling Date recorded on COC		12/3/08	12/3/08	--	--						
Laboratory Extraction (Preparation) Date		18/3/08	18/3/08	18/3/08	18/3/08						
Laboratory Analysis Date		19/3/08	19/3/08	19/3/08	19/3/08						
Method : E013.2 **Polychlorinated Biphenyls (PCB)**	**EQL**										
Arochlor 1016	0.5	<0.5	<0.5	--	<0.5						
Arochlor 1232	0.5	<0.5	<0.5	--	<0.5						
Arochlor 1242	0.5	<0.5	<0.5	--	<0.5						
Arochlor 1248	0.5	<0.5	<0.5	96%	<0.5						
Arochlor 1254	0.5	<0.5	<0.5	--	<0.5						
Arochlor 1260	0.5	<0.5	<0.5	--	<0.5						
Sum of reported PCBs	--	--	--	--	--						
DBC (Surr @ 0.2mg/kg)	--	*98%*	*106%*	*102%*	*86%*						

Results expressed in mg/kg dry weight unless otherwise specified

Comments:

E013.2: 8-10g soil extracted with 20ml DCM/Acetone/Hexane (10:45:45). Analysis by GC/dual ECD.

Laboratory Identification		**146296**	**lcs**	**mb**							
Sample Identification		Rinsate A	QC	QC							
Depth (m)		--	--	--							
Sampling Date recorded on COC		12/3/08	--	--							
Laboratory Extraction (Preparation) Date		17/3/08	17/3/08	17/3/08							
Laboratory Analysis Date		18/3/08	18/3/08	18/3/08							
Method : E022.1											
Unfiltered metals (M7)	**EQL**										
Arsenic	5	<5	88%	<5							
Cadmium	0.5	<0.5	91%	<0.5							
Chromium	5	<5	93%	<5							
Copper	5	<5	95%	<5							
Nickel	5	<5	92%	<5							
Lead	5	<5	92%	<5							
Zinc	5	<5	102%	<5							

Results expressed in ug/l unless otherwise specified

Comments:

E022.1: 25 ml digested in nitric/hydrochloric acid. Analysis by ICP-MS.

Laboratory Identification		**146296**	**lcs**	**mb**							
Sample Identification		Rinsate A	QC	QC							
Depth (m)		--	--	--							
Sampling Date recorded on COC		12/3/08	--	--							
Laboratory Extraction (Preparation) Date		17/3/08	17/3/08	17/3/08							
Laboratory Analysis Date		18/3/08	18/3/08	18/3/08							
Method : E026.1											
Unfiltered metals	**EQL**										
Mercury	0.1	<0.1	84%	<0.1							

Results expressed in ug/l unless otherwise specified

Comments:

E026.1: 25ml digested with nitric/hydrochloric acid. Analysis by CV-ICP-MS or FIMS.

Laboratory Identification		**146279**	**146280**	**146281**	**146282**	**146283**	**146284**	**146285**	**146286**	**146287**	**146288**
Sample Identification		Dup A	BH	BH	BH	BH	BH	BH	BH	BH	BH
Depth (m)		--	28.10	29.10	29.20	30.10	30.30	31.10	31.15	33.10	33.20
Sampling Date recorded on COC		12/3/08	12/3/08	12/3/08	12/3/08	12/3/08	12/3/08	12/3/08	12/3/08	12/3/08	12/3/08
Laboratory Extraction (Preparation) Date		18/3/08	18/3/08	18/3/08	18/3/08	18/3/08	18/3/08	18/3/08	18/3/08	18/3/08	18/3/08
Laboratory Analysis Date		19/3/08	19/3/08	19/3/08	19/3/08	19/3/08	19/3/08	19/3/08	19/3/08	19/3/08	19/3/08
Method : E022.2											
Acid extractable metals (M7)	**EQL**										
Arsenic	1	3	6	4	7	12	2	6	9	7	14
Cadmium	0.1	<0.1	<0.1	<0.1	<0.1	0.4	<0.1	<0.1	<0.1	0.3	<0.1
Chromium	1	5	15	17	21	17	10	28	38	14	21
Copper	2	22	<2	11	6	144	4	12	9	31	5
Nickel	1	3	<1	9	2	5	<1	6	2	15	2
Lead	2	32	7	30	13	329	7	38	21	100	18
Zinc	5	36	14	22	14	291	8	38	18	78	17

Results expressed in mg/kg dry weight unless otherwise specified

Comments:

E022.2: 0.5g digested in nitric/hydrochloric acid. Analysis by ICP-MS.

Laboratory Identification		**146289**	**146290**	**146291**	**146292**	**146293**	**146294**	**146295**	**146279d**	**146279r**	**146285d**
Sample Identification		BH	BH	BH	BH	BH	BH	BH	QC	QC	QC
Depth (m)		35.05	35.10	35.30	4.10	5.10	6.10	6.30	--	--	--
Sampling Date recorded on COC		12/3/08	12/3/08	12/3/08	12/3/08	12/3/08	12/3/08	12/3/08	--	--	--
Laboratory Extraction (Preparation) Date		18/3/08	18/3/08	18/3/08	18/3/08	18/3/08	18/3/08	18/3/08	18/3/08	--	18/3/08
Laboratory Analysis Date		19/3/08	19/3/08	19/3/08	19/3/08	19/3/08	19/3/08	19/3/08	19/3/08	--	19/3/08
Method : E022.2											
Acid extractable metals (M7)	**EQL**										
Arsenic	1	6	3	2	5	2	<1	7	2	40%	4
Cadmium	0.1	0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	--	<0.1
Chromium	1	16	20	10	19	21	9	30	3	50%	25
Copper	2	48	11	2	<2	5	2	12	20	10%	10
Nickel	1	4	2	<1	1	2	1	8	<1	>100%	5
Lead	2	469	97	3	8	5	8	30	16	67%	26
Zinc	5	421	83	<5	5	5	6	25	20	57%	28

Results expressed in mg/kg dry weight unless otherwise specified

Comments:

E022.2: 0.5g digested in nitric/hydrochloric acid. Analysis by ICP-MS.

Laboratory Identification		**146285r**	**146279t**	**146281s**	**crm**	**crm**	**lcs**	**lcs**	**mb**	**mb**	
Sample Identification		QC	QC	QC	QC	QC	QC	QC	QC	QC	
Depth (m)		--	--	--	--	--	--	--	--	--	
Sampling Date recorded on COC		--	--	--	--	--	--	--	--	--	
Laboratory Extraction (Preparation) Date		--	19/3/08	18/3/08	18/3/08	19/3/08	18/3/08	19/3/08	18/3/08	19/3/08	
Laboratory Analysis Date		--	20/3/08	19/3/08	19/3/08	19/3/08	18/3/08	19/3/08	18/3/08	19/3/08	
Method : E022.2											
Acid extractable metals (M7)	**EQL**										
Arsenic	1	40%	--	79%	95%	--	102%	--	<1	--	
Cadmium	0.1	--	--	95%	94%	--	102%	--	<0.1	--	
Chromium	1	11%	--	102%	103%	--	106%	--	<1	--	
Copper	2	18%	--	80%	94%	--	104%	--	<2	--	
Nickel	1	18%	--	54%	92%	--	103%	--	<1	--	
Lead	2	38%	44	78%	93%	92%	101%	102%	<2	<2	
Zinc	5	30%	43	92%	96%	96%	102%	87%	<5	<5	

Results expressed in mg/kg dry weight unless otherwise specified

Comments:

E022.2: 0.5g digested in nitric/hydrochloric acid. Analysis by ICP-MS.

Laboratory Identification		**146279**	**146280**	**146281**	**146282**	**146283**	**146284**	**146285**	**146286**	**146287**	**146288**
Sample Identification		Dup A	BH	BH	BH	BH	BH	BH	BH	BH	BH
Depth (m)		--	28.10	29.10	29.20	30.10	30.30	31.10	31.15	33.10	33.20
Sampling Date recorded on COC		12/3/08	12/3/08	12/3/08	12/3/08	12/3/08	12/3/08	12/3/08	12/3/08	12/3/08	12/3/08
Laboratory Extraction (Preparation) Date		18/3/08	18/3/08	18/3/08	18/3/08	18/3/08	18/3/08	18/3/08	18/3/08	18/3/08	18/3/08
Laboratory Analysis Date		18/3/08	18/3/08	18/3/08	18/3/08	18/3/08	18/3/08	18/3/08	18/3/08	18/3/08	18/3/08
Method : E026.2											
Acid extractable mercury	**EQL**										
Mercury	0.05	0.18	<0.05	0.08	<0.05	0.33	<0.05	0.12	0.08	0.64	<0.05

Results expressed in mg/kg dry weight unless otherwise specified

Comments:

E026.2: 0.5g digested with nitric/hydrochloric acid. Analysis by CV-ICP-MS or FIMS.

Laboratory Identification		**146289**	**146290**	**146291**	**146292**	**146293**	**146294**	**146295**	**146279d**	**146279r**	**146285d**
Sample Identification		BH	BH	BH	BH	BH	BH	BH	QC	QC	QC
Depth (m)		35.05	35.10	35.30	4.10	5.10	6.10	6.30	--	--	--
Sampling Date recorded on COC		12/3/08	12/3/08	12/3/08	12/3/08	12/3/08	12/3/08	12/3/08	--	--	--
Laboratory Extraction (Preparation) Date		18/3/08	18/3/08	18/3/08	18/3/08	18/3/08	18/3/08	18/3/08	18/3/08	--	18/3/08
Laboratory Analysis Date		18/3/08	18/3/08	18/3/08	18/3/08	18/3/08	18/3/08	18/3/08	18/3/08	--	18/3/08
Method : E026.2											
Acid extractable mercury	**EQL**										
Mercury	0.05	0.53	0.08	<0.05	0.05	<0.05	<0.05	0.05	0.16	12%	0.16

Results expressed in mg/kg dry weight unless otherwise specified

Comments:

E026.2: 0.5g digested with nitric/hydrochloric acid. Analysis by CV-ICP-MS or FIMS.

Laboratory Report No: E036725
Client Name: Aargus Pty. Ltd
Contact Name: Con Kariotoglou
Client Reference: Summer Hill E1559

Date: 26/03/08
This report supercedes reports issued on: N/A

Final
Certificate
of Analysis

Laboratory Identification		**146285r**	**146281s**	**crm**	**lcs**	**mb**					
Sample Identification		QC	QC	QC	QC	QC					
Depth (m)		--	--	--	--	--					
Sampling Date recorded on COC		--	--	--	--	--					
Laboratory Extraction (Preparation) Date		--	18/3/08	18/3/08	18/3/08	18/3/08					
Laboratory Analysis Date		--	18/3/08	18/3/08	18/3/08	18/3/08					
Method : E026.2 **Acid extractable mercury**	**EQL**										
Mercury	0.05	29%	93%	94%	86%	<0.05					

Results expressed in mg/kg dry weight unless otherwise specified

Comments:

E026.2: 0.5g digested with nitric/hydrochloric acid. Analysis by CV-ICP-MS or FIMS.

Laboratory Identification		**146279**	**146280**	**146281**	**146282**	**146283**	**146284**	**146285**	**146286**	**146287**	**146288**
Sample Identification		Dup A	BH	BH	BH	BH	BH	BH	BH	BH	BH
Depth (m)		--	28.10	29.10	29.20	30.10	30.30	31.10	31.15	33.10	33.20
Sampling Date recorded on COC		12/3/08	12/3/08	12/3/08	12/3/08	12/3/08	12/3/08	12/3/08	12/3/08	12/3/08	12/3/08
Laboratory Extraction (Preparation) Date		18/3/08	18/3/08	18/3/08	18/3/08	18/3/08	18/3/08	18/3/08	18/3/08	18/3/08	18/3/08
Laboratory Analysis Date		19/3/08	19/3/08	19/3/08	19/3/08	19/3/08	19/3/08	19/3/08	19/3/08	19/3/08	19/3/08
Method : E005.2 **Moisture**	**EQL**										
Moisture	--	16	16	14	15	11	14	16	8	12	10

Results expressed in % w/w unless otherwise specified

Comments:

E005.2: Moisture by gravimetric analysis. Results are in % w/w.

Laboratory Identification		**146289**	**146290**	**146291**	**146292**	**146293**	**146294**	**146295**	**146279d**	**146279r**	**146285d**
Sample Identification		BH	BH	BH	BH	BH	BH	BH	QC	QC	QC
Depth (m)		35.05	35.10	35.30	4.10	5.10	6.10	6.30	--	--	--
Sampling Date recorded on COC		12/3/08	12/3/08	12/3/08	12/3/08	12/3/08	12/3/08	12/3/08	--	--	--
Laboratory Extraction (Preparation) Date		18/3/08	18/3/08	18/3/08	18/3/08	18/3/08	18/3/08	18/3/08	18/3/08	--	18/3/08
Laboratory Analysis Date		19/3/08	19/3/08	19/3/08	19/3/08	19/3/08	19/3/08	19/3/08	19/3/08	--	19/3/08
Method : E005.2 **Moisture**	**EQL**										
Moisture	--	14	11	10	18	15	17	18	15	6%	7

Results expressed in % w/w unless otherwise specified

Comments:

E005.2: Moisture by gravimetric analysis. Results are in % w/w.

Laboratory Identification		**146285r**									
Sample Identification		QC									
Depth (m)		--									
Sampling Date recorded on COC		--									
Laboratory Extraction (Preparation) Date		--									
Laboratory Analysis Date		--									
Method : E005.2 **Moisture**	**EQL**										
Moisture	--	78%									

Results expressed in % w/w unless otherwise specified

Comments:

E005.2: Moisture by gravimetric analysis. Results are in % w/w.

Report Date : 17/03/2008
Report Time : 1:20:13PM

LabMark
ENVIRONMENTAL LABORATORIES

Quality, Service, Support

Sample **Receipt** Notice (SRN) for **E036725**

Client Details

Client Name:	Aargus Pty. Ltd
Client Phone:	02 9568 6159
Client Fax:	1300 136 038
Contact Name:	Con Kariotoglou
Contact Email:	admin@aargus.net
Client Address:	PO Box 398 Drummoyne NSW 1470
Project Name:	Summer Hill
Project Number:	E1559
CoC Serial Number:	- Not provided -
Purchase Order:	- Not provided -
Surcharge:	No surcharge applied (results by 6:30pm on due date)
Sample Matrix:	SOIL & WATER

Date Sampled (earliest date):	12/03/2008
Date Samples Received:	14/03/2008
Date Sample Receipt Notice issued:	17/03/2008
Date Preliminary Report Due:	26/03/2008

Laboratory Reference Information

Please have this information ready when contacting Labmark.

Laboratory Report:	**E036725**
Quotation Number:	- Not provided, standard prices apply
Laboratory Address:	Unit 1, 8 Leighton Pl. Asquith NSW 2077
Phone:	61 2 9476 6533
Fax:	61 2 9476 8219
Sample Receipt Contact:	Jakleen El Galada
Email:	jakleen.galada@labmark.com.au
Reporting Contact:	Jyothi Lal
Email:	jyothi.lal@labmark.com.au

NATA Accreditation:	13542
TGA GMP License:	185-336 (Sydney)
APVMA License:	6105 (Sydney)
AQIS Approval:	NO356 (Sydney)
AQIS Entry Permit:	200521534 (Sydney)

Invoice Number: 30943

Reporting Requirements: Electronic Data Download required:No

Sample Condition:
COC received with samples. Report number and lab ID's defined on COC.
Samples received in good order .
Samples received with cooling media: Ice bricks .
Samples received chilled.
Security seals not required. Direct Labmark's custody taken .
Sample container & chemical preservation suitable .

Comments: Extra sample Rinsate A was received and added to COC as per discussion with client.

Holding Times: Date received allows for sufficient time to meet Technical Holding Times.

Preservation: Chemical preservation of samples satisfactory for requested analytes.

Important Notes:
LabMark shall responsibly dispose of spent customer soil and water samples which includes the disintegration of the sample label. A sample disposal fee of $1.00 is applicable on all samples received by the laboratory regardless of whether they have undergone analytical testing. Sample disposal of environmental samples shall be 31 days (water) and 3 months (soil, HN03 preserved samples) after laboratory receipt, unless otherwise requested in writing by the client. Samples requested to be held in non-refrigerated storage shall incur $5.00/ sample/ 3 months. Additional refrigerated storage shall incur $30/ sample/ 3 months. Combination prices apply only if requested. Transfer of report ownership from LabMark to the client shall occur once full and final payment has been settled and verified. All report copies may be retracted where full payment does not occur within the agreed settlement period.

Analysis comments:

Subcontracted Analyses:

Thank you for choosing Labmark to analyse your project samples.
Additional information on www.labmark.com.au

ENVIRONMENTAL LABORATORIES

Quality, Service, Support

Report Date : 17/03/2008
Report Time : 1:20:13PM

Sample **Receipt** Notice (SRN) for E036725

The table below represents LabMark's understanding and interpretation of the customer supplied sample COC request (refer to SRN comments section on first page for external subcontracting method details). Please confirm that your COC request has been entered correctly. Due to THT and TAT requirements, testing shall commence immediately as per this table, unless the customer intervenes with a correction prior to testing.

GRID REVIEW TABLE				Requested Analysis																			
No.	**Date**	**Depth**	**Client Sample ID**	BTEX by P&T	Acid extractable mercury	Unfiltered metals	Acid extractable metals (M7)	Unfiltered metals (M7)	Moisture	Organochlorine Pesticides (OC)	Polyaromatic Hydrocarbons (PAH)	Polychlorinated Biphenyls (PCB)	Phenols by GC/MS	PREP Not Reported	PREP Not Reported	Petroleum Hydrocarbons (TPH)	Volatile TPH by P&T (vTPH)						
146279	12/03		Dup A	●	●		●		●		●			●		●	●						
146280	12/03	28.10	BH	●	●		●		●		●			●		●	●						
146281	12/03	29.10	BH	●	●		●		●		●			●		●	●						
146282	12/03	29.20	BH	●	●		●		●		●		●	●		●	●						
146283	12/03	30.10	BH	●	●		●		●	●				●		●	●						
146284	12/03	30.30	BH		●		●		●					●									
146285	12/03	31.10	BH		●		●		●					●									
146286	12/03	31.15	BH	●	●		●		●	●	●	●		●		●	●						
146287	12/03	33.10	BH		●		●		●		●			●									
146288	12/03	33.20	BH		●		●		●					●									
146289	12/03	35.05	BH	●	●		●		●		●			●		●	●						
146290	12/03	35.10	BH		●		●		●					●									
146291	12/03	35.30	BH		●		●		●					●									
146292	12/03	4.10	BH		●		●		●	●				●									
146293	12/03	5.10	BH	●	●		●		●			●		●		●	●						
146294	12/03	6.10	BH	●	●		●		●		●			●		●	●						
146295	12/03	6.30	BH		●		●		●					●									
146296	12/03		Rinsate A			●		●							●								
			Totals:	9	17	1	17	1	17	3	8	2	1	17	1	9	9						

'PREP Not Reported' refers to an internal laboratory instruction - client confirmation of this parameter is not required.

Thank you for choosing Labmark to analyse your project samples.
Additional information on www.labmark.com.au

Report Date : 17/03/2008
Report Time : 1:20:13PM

LabMark
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Sample **Receipt** Notice (SRN) for **E036725**

				Requested Analysis																			
No.	**Date**	**Depth**	**Client Sample ID**	M8 - M7-T_S	M8 - M7-T_W																		
146279	12/03		Dup A	●																			
146280	12/03	28.10	BH	●																			
146281	12/03	29.10	BH	●																			
146282	12/03	29.20	BH	●																			
146283	12/03	30.10	BH	●																			
146284	12/03	30.30	BH	●																			
146285	12/03	31.10	BH	●																			
146286	12/03	31.15	BH	●																			
146287	12/03	33.10	BH	●																			
146288	12/03	33.20	BH	●																			
146289	12/03	35.05	BH	●																			
146290	12/03	35.10	BH	●																			
146291	12/03	35.30	BH	●																			
146292	12/03	4.10	BH	●																			
146293	12/03	5.10	BH	●																			
146294	12/03	6.10	BH	●																			
146295	12/03	6.30	BH	●																			
146296	12/03		Rinsate A		●																		
			Totals:	17	1																		

Thank you for choosing Labmark to analyse your project samples.
Additional information on www.labmark.com.au

Aargus
AUSTRALIA

CHAIN OF CUSTODY

Project: Summer Hill Job Number E1559

Despatch To: Labmark
Address: Unit 1 8 Leighton Plc Asquith
Phone No: 9476 6533
Attention: David Burns
Sampled By: CK
Date & Time: 13/3/08

Report To: admin@aargus.net
Turnaround Time: Std.
Consigning Office: Sydney
Date Despatched: 14/3/08
Courier Service:
Consignment No:

	146279	146280	146281	146282	146283	146284	146285	146286	146287	146288	146289	146290	146291		
Sample ID	Dup	BH	BH	BH	BH	BH	BH	BH	BH	BH	BH	BH	BH		
	A	28.10	29.10	29.20	30.10	30.30	31.10	31.15	33.0	33.20	35.05	35.10	35.30		
WATER															
SOIL	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
SLUDGE															
SEDIMENT															
OTHER															
ICE/ICE BRICK	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
ACIDIFIED															
CHILLED															
NONE															
Sampling Date	12/3	12/3	12/3	12/3	12/3	12/3	12/3	12/3	12/3	12/3	12/3	12/3	12/3		
No of Containers	1	1	1	1	1	1	1	1	1	1	1	1	1		
Analyte Request															
METS8	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
TPH	✓	✓	✓	✓	✓			✓			✓				
BTEX	✓	✓	✓	✓	✓			✓			✓				
PAH	✓	✓	✓	✓				✓	✓		✓				
OCP					✓			✓							
Phenols				✓											
PCB								✓							

Comments: Job#E036725.

Relinquished By: Date: 14/3/08 Time: 11-50am
Received By: Date: 14/3/08 Time: 11-50.
Relinquished By: Date: Time:
Received By: Date: Time:

recd 8L 14/3/08 @ 5:15pm.

Aargus
AUSTRALIA

CHAIN OF CUSTODY

Project: Summer Hill. Job Number E1559

Despatch To: Labmark
Address: Unit 1, 8 Leighton Plc Asquith
Phone No: 9476 6533
Attention: David Burns
Sampled By: CK
Date & Time: 13/3/08.

Report To: admin@aargus.net
Turnaround Time: Std
Consigning Office: Sydney
Date Despatched: 14/3/08
Courier Service:
Consignment No:

	146292	146293	146294	146295	146296										
Sample ID	BH 4.10	BH 5.10	BH 6.10	BH 6.30	RinsateA										
WATER					✓										
SOIL	✓	✓	✓	✓											
SLUDGE															
SEDIMENT															
OTHER															
ICE/ICE BRICK	✓	✓	✓	✓											
ACIDIFIED															
CHILLED															
NONE															
Sampling Date	13/3	13/3	13/3	13/3											
No of Containers	1	1	1	1											
Analyte Request															
MET8	✓	✓	✓	✓	✓										
TPH		✓	✓												
BTEX		✓	✓												
PAH			✓												
OCP	✓														
PCB		✓													

Comments: Rinsate was added at clients req. Job# E036725

Relinquished By: Date: Time:
Received By: Date: Time:
Relinquished By: Date: Time:
Received By: Date: Time:

Accredited for compliance with ISO/IEC 17025. The results of tests, calibrations and/or measurements included in this document are traceable to Australian/national standards. NATA is a signatory to the APLAC mutual recognition arrangement for the mutual recognition of the equivalence of testing, calibration and inspection reports.

Quarantine Approved premises criteria 5.1 for quarantine containment level 1 (QCI) facilities. Class five criteria cover premises utilised for research, analysis,and/or testing of biological material, soil, animal, plant and human products.

FINAL CERTIFICATE OF ANALYSIS - ENVIRONMENTAL DIVISION

Laboratory Report No: E036822
Client Name: Aargus Pty. Ltd
Client Reference: Summer Hill
Contact Name: Con Kariotoglou
Chain of Custody No: na
Sample Matrix: SOIL

Cover Page 1 of 4
plus Sample Results

Date Received: 25/03/2008
Date Reported: 03/04/2008

This Final Certificate of Analysis consists of sample results, DQI's, method descriptions, laboratory definitions, and internationally recognised NATA accreditation and endorsement. The DQO compliance relates specifically to QA/QC results as performed as part of the sample analysis, and may provide an indication of sample result quality. Transfer of report ownership from Labmark to the client shall only occur once full & final payment has been settled and verified. All report copies may be retracted where full payment has not occured within the agreed settlement period.

QUALITY ASSURANCE CRITERIA

Accuracy:	matrix spike:	1 in first 5-20, then 1 every 20 samples
	lcs, crm, method:	1 per analytical batch
	surrogate spike:	addition per target organic method
Precision:	laboratory duplicate:	1 in first 5-10, then 1 every 10 samples
	laboratory triplicate:	re-extracted & reported when duplicate RPD values exceed acceptance criteria
Holding Times:	soils, waters:	Refer to LabMark Preservation & THT table VOC's 14 days water / soil VAC's 7 days water or 14 days acidified VAC's 14 days soil SVOC's 7 days water, 14 days soil Pesticides 7 days water, 14 days soil Metals 6 months general elements Mercury 28 days
Confirmation:	target organic analysis:	GC/MS, or confirmatory column
Sensitivity:	EQL:	Typically 2-5 x Method Detection Limit (MDL)

QUALITY CONTROL
GLOBAL ACCEPTANCE CRITERIA (GAC)

Accuracy:	spike, lcs, crm surrogate:	general analytes 70% - 130% recovery phenol analytes 50% - 130% recovery organophosphorous pesticide analytes 60% - 130% recovery phenoxy acid herbicides, organotins 50% - 130% recovery
	anion/cation bal:	+/- 10% (0-3 meq/l), +/- 5% (>3 meq/l)
Precision:	method blank:	not detected >95% of the reported EQL
	duplicate lab RPD (metals):	0-30% (>10xEQL), 0-75% (5-10xEQL) 0-100% (<5xEQL)
	duplicate lab RPD:	0-50% (>10xEQL), 0-75% (5-10xEQL) 0-100% (<5xEQL)

QUALITY CONTROL
ANALYTE SPECIFIC ACCEPTANCE CRITERIA (ASAC)

Accuracy:	spike, lcs, crm surrogate:	analyte specific recovery data <3xsd of historical mean
Uncertainty:	spike, lcs:	measurement calculated from historical analyte specific control charts

RESULT ANNOTATION

DQO:	Data Quality Objective	s:	matrix spike recovery	p:	pending
DQI:	Data Quality Indicator	d:	laboratory duplicate	lcs:	laboratory control sample
EQL:	Estimated Quantitation Limit	t:	laboratory triplicate	crm:	certified reference material
- - :	not applicable	r:	RPD relative % difference	mb:	method blank

David Burns
Quality Control (Report signatory)
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Geoff Weir
Authorising Chemist (NATA signatory)
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Simon Mills
Authorising Chemist (NATA signatory)
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This document is issued in accordance with NATA's accreditation requirements.

Laboratory Report: E036822

NEPC GUIDELINE COMPLIANCE - DQO

1. GENERAL

A. Results relate specifically to samples as received. Sample results are not corrected for matrix spike, lcs, or surrogate recovery data.

B. EQL's are matrix dependant and may be increased due to sample dilution or matrix interference.

C. Laboratory QA/QC samples are specific to this project.

D. Inter-laboratory proficiency results are available upon request. NATA accreditation details available at www.nata.asn.au.

E. VOC spikes & surrogates added to samples during extraction, SVOC spikes & surrogates added prior to extraction.

F. Recovery data outside GAC limits shall be investigated and compared to ASAC (historical mean +/- 3sd). If recovery data <20%, then the relevant results for that compound are considered not reliable.

G. Recovery data (ms, surrogate, crm, lcs) outside ASAC limits shall initiate an investigative action. Anomolous QC data is examined in conjunction with other QC samples and a final decision whether to accept or reject results is provided by the professional judgement of the senior analyst. The USEPA-CLP National Functional Guidelines are referred to for specific recommendations.

H. Extraction (preparation) date refers to the date that sample preparation was initiated. Note that certain methods not requiring sample preparation (eg. VOCs in water, etc) may report a common extraction and analysis date.

I. LabMark shall maintain an official copy of this Certificate of Analysis for all tracable reference purposes.

2. CHAIN OF CUSTODY (COC) & SAMPLE RECEIPT NOTICE (SRN) REQUIREMENTS

A. SRN issued to client upon sample receipt & login verification.

B. Preservation & sampling date details specified on COC and SRN, unless noted.

C. Sample Integrity & Validated Time of Sample Receipt (VTSR) Holding Times verified (preservation may extend holding time, refer to preservation chart).

3. NATA ACCREDITED METHODS

A. NATA accreditation held for each method and sample matrix type reported, unless noted below.

B. NATA accredited in-house laboratory methods are referenced from NEPC, ASTM, modified USEPA / APHA documents. Corporate Accreditation No. 13542.

C. Subcontracted analyses: Refer to Sample Receipt Notice and additional DQO comments.

Laboratory Report: E036822

4. QA/QC FREQUENCY COMPLIANCE TABLE SPECIFIC TO THIS REPORT

Matrix: **SOIL**

Page:	Method:	Totals:	#d	%d-ratio	#t	#s	%s-ratio
1	BTEX by P&T	4	0	0%	0	0	0%
1	Volatile TPH by P&T (vTPH)	4	0	0%	0	0	0%
2	Petroleum Hydrocarbons (TPH)	4	0	0%	0	0	0%
3	Polyaromatic Hydrocarbons (PAH)	4	0	0%	0	0	0%
4	Unfiltered metals (M7)	4	0	0%	0	0	0%
5	Unfiltered metals	4	0	0%	0	0	0%

GLOSSARY:

#d	number of discrete duplicate extractions/analyses performed.
%d-ratio	NEPC guideline for laboratory duplicates is 1 in 10 samples (min 10%).
#t	number of triplicate extractions/analyses performed.
#s	number of spiked samples analysed.
%s-ratio	USEPA guideline for laboratory matrix spikes is 1 in 20 samples (min 5%).

5. ADDITIONAL COMMENTS SPECIFIC TO THIS REPORT

A. All tests were conducted by LabMark Environmental Sydney, NATA accreditation No. 13542, Corporate Site No. 13535, unless indicated below.

Foundation
Member

Laboratory Report: E036822

Cover Page 4 of 4

Laboratory QA/QC data shall relate specifically to this report, and may provide an indication of site specific sample result quality. LabMark DOES NOT report NON-RELEVANT BATCH QA/QC data. Acceptance of this self assessment certificate does not preclude any requirement for a QA/QC review by a accredited contaminated site EPA auditor, when and wherever necessary. Laboratory QA/QC self assessment references available upon request.

Laboratory Report No: E036822
Client Name: Aargus Pty. Ltd
Contact Name: Con Kariotoglou
Client Reference: Summer Hill E1559

Page: 1 of 5
plus cover page
Date: 03/04/08
This report supercedes reports issued on: N/A

Final
Certificate
of Analysis

Laboratory Identification		**147301**	**147302**	**147303**	**147304**	**lcs**	**mb**				
Sample Identification		GW1	GW1A	GW2	GW3	QC	QC				
Depth (m)		--	--	--	--	--	--				
Sampling Date recorded on COC		20/3/08	20/3/08	20/3/08	20/3/08	--	--				
Laboratory Extraction (Preparation) Date		28/3/08	28/3/08	28/3/08	28/3/08	28/3/08	28/3/08				
Laboratory Analysis Date		29/3/08	29/3/08	2/4/08	2/4/08	28/3/08	28/3/08				
Method : E002.1											
BTEX by P&T	**EQL**										
Benzene	1	<1	<1	<1	<1	97%	<1				
Toluene	1	3	2	4	<1	97%	<1				
Ethylbenzene	1	<1	<1	<1	<1	95%	<1				
meta- & para-Xylene	2	<2	<2	4	<2	94%	<2				
ortho-Xylene	1	<1	<1	2	<1	92%	<1				
Total Xylene	--	--	--	6	--	--	--				
4-BFB (Surr @ 100ug/l)	--	*83%*	*79%*	*98%*	*91%*	*109%*	*104%*				
Method : E003.1											
Volatile TPH by P&T (vTPH)	**EQL**										
C6-C9	50	<50	<50	<50	<50	93%	<50				

Results expressed in ug/l unless otherwise specified

Comments:

E002.1: Direct injection into P&T/GC/PID/MSD.
E003.1: Direct injection into P&T/GC/FID.

LabMark
ENVIRONMENTAL LABORATORIES

Laboratory Report No: E036822
Client Name: Aargus Pty. Ltd
Contact Name: Con Kariotoglou
Client Reference: Summer Hill E1559

Date: 03/04/08
This report supercedes reports issued on: N/A

Final
Certificate
of Analysis

Laboratory Identification		**147301**	**147302**	**147303**	**147304**	**lcs**	**mb**				
Sample Identification		GW1	GW1A	GW2	GW3	QC	QC				
Depth (m)		--	--	--	--	--	--				
Sampling Date recorded on COC		20/3/08	20/3/08	20/3/08	20/3/08	--	--				
Laboratory Extraction (Preparation) Date		27/3/08	27/3/08	27/3/08	27/3/08	27/3/08	27/3/08				
Laboratory Analysis Date		28/3/08	28/3/08	28/3/08	28/3/08	28/3/08	28/3/08				
Method : E004.1											
Petroleum Hydrocarbons (TPH)	**EQL**										
C10-C14 Fraction	50	9180	9360	33000	160	--	<50				
C15-C28 Fraction	200	2100	2210	2720	<200	85%	<200				
C29-C36 Fraction	50	390	460	290	<50	--	<50				
Sum of TPH C10 - C36	--	11670	12030	36010	160	--	--				

Results expressed in ug/l unless otherwise specified

Comments:

E004.1: Triple extraction with DCM. Analysis by GC/FID.

NATA
No. 13542

LabMark
ENVIRONMENTAL LABORATORIES

Laboratory Report No: E036822
Client Name: Aargus Pty. Ltd
Contact Name: Con Kariotoglou
Client Reference: Summer Hill E1559

Page: 3 of 5
plus cover page
Date: 03/04/08
This report supercedes reports issued on: N/A

Final
Certificate
of Analysis

Laboratory Identification		**147301**	**147302**	**147303**	**147304**	**lcs**	**mb**				
Sample Identification		GW1	GW1A	GW2	GW3	QC	QC				
Depth (m)		--	--	--	--	--	--				
Sampling Date recorded on COC		20/3/08	20/3/08	20/3/08	20/3/08	--	--				
Laboratory Extraction (Preparation) Date		27/3/08	27/3/08	27/3/08	27/3/08	27/3/08	27/3/08				
Laboratory Analysis Date		29/3/08	29/3/08	29/3/08	29/3/08	28/3/08	28/3/08				
Method : E007.1											
Polyaromatic Hydrocarbons (PAH)	**EQL**										
Naphthalene	1	43	49	204	<1	91%	<1				
Acenaphthylene	1	<1	<1	<1	<1	93%	<1				
Acenaphthene	1	2	2	<1	<1	90%	<1				
Fluorene	1	3	3	<1	<1	94%	<1				
Phenanthrene	1	10	12	<1	<1	91%	<1				
Anthracene	1	2	3	<1	<1	92%	<1				
Fluoranthene	1	8	9	<1	<1	90%	<1				
Pyrene	1	8	9	<1	<1	93%	<1				
Benz(a)anthracene	1	2	2	<1	<1	95%	<1				
Chrysene	1	2	2	<1	<1	100%	<1				
Benzo(b)&(k)fluoranthene	2	<2	2	<2	<2	98%	<2				
Benzo(a) pyrene	1	1	1	<1	<1	100%	<1				
Indeno(1,2,3-c,d)pyrene	1	<1	<1	<1	<1	98%	<1				
Dibenz(a,h)anthracene	1	<1	<1	<1	<1	100%	<1				
Benzo(g,h,i)perylene	1	<1	<1	<1	<1	96%	<1				
Sum of reported PAHs	--	81	94	204	--	--	--				
2-FBP (Surr @ 250ug/l)	--	*118%*	*117%*	*113%*	*113%*	*104%*	*103%*				
TP-d14 (Surr @ 250ug/l)	--	*110%*	*108%*	*108%*	*111%*	*110%*	*120%*				

Results expressed in ug/l unless otherwise specified

Comments:

E007.1: Triple extraction with DCM. Analysis by GC/MS.

Laboratory Report No: E036822
Client Name: Aargus Pty. Ltd
Contact Name: Con Kariotoglou
Client Reference: Summer Hill E1559

Date: 03/04/08
This report supercedes reports issued on: N/A

Final
Certificate
of Analysis

Laboratory Identification		**147301**	**147302**	**147303**	**147304**	**lcs**	**mb**				
Sample Identification		GW1	GW1A	GW2	GW3	QC	QC				
Depth (m)		--	--	--	--	--	--				
Sampling Date recorded on COC		20/3/08	20/3/08	20/3/08	20/3/08	--	--				
Laboratory Extraction (Preparation) Date		27/3/08	27/3/08	27/3/08	27/3/08	27/3/08	27/3/08				
Laboratory Analysis Date		28/3/08	28/3/08	28/3/08	28/3/08	28/3/08	28/3/08				
Method : E022.1											
Unfiltered metals (M7)	**EQL**										
Arsenic	5	<5	<5	7	<5	105%	<5				
Cadmium	0.5	<0.5	0.5	<0.5	<0.5	103%	<0.5				
Chromium	5	12	13	16	<5	99%	<5				
Copper	5	65	68	74	14	97%	<5				
Nickel	5	21	22	43	11	97%	<5				
Lead	5	48	47	26	6	97%	<5				
Zinc	5	369	379	141	33	95%	<5				

Results expressed in ug/l unless otherwise specified

Comments:

E022.1: 25 ml digested in nitric/hydrochloric acid. Analysis by ICP-MS.

LabMark
ENVIRONMENTAL LABORATORIES

Laboratory Report No: E036822
Client Name: Aargus Pty. Ltd
Contact Name: Con Kariotoglou
Client Reference: Summer Hill E1559

Page: 5 of 5
plus cover page
Date: 03/04/08
This report supercedes reports issued on: N/A

Final
Certificate
of Analysis

Laboratory Identification		**147301**	**147302**	**147303**	**147304**	**lcs**	**mb**				
Sample Identification		GW1	GW1A	GW2	GW3	QC	QC				
Depth (m)		--	--	--	--	--	--				
Sampling Date recorded on COC		20/3/08	20/3/08	20/3/08	20/3/08	--	--				
Laboratory Extraction (Preparation) Date		27/3/08	27/3/08	27/3/08	27/3/08	27/3/08	27/3/08				
Laboratory Analysis Date		28/3/08	28/3/08	28/3/08	28/3/08	28/3/08	28/3/08				
Method : E026.1 **Unfiltered metals**	**EQL**										
Mercury	0.1	<0.1	<0.1	<0.1	<0.1	92%	<0.1				

Results expressed in ug/l unless otherwise specified

Comments:

E026.1: 25ml digested with nitric/hydrochloric acid. Analysis by CV-ICP-MS or FIMS.

LabMark
ENVIRONMENTAL LABORATORIES

Quality, Service, Support

Report Date : 26/03/2008
Report Time : 10:54:33AM

Sample **Receipt** Notice (SRN) for E036822

Client Details		Laboratory Reference Information	
Client Name:	Aargus Pty. Ltd	**Please have this information ready when contacting Labmark.**	
Client Phone:	02 9568 6159		
Client Fax:	1300 136 038	**Laboratory Report:**	**E036822**
Contact Name:	Con Kariotoglou	**Quotation Number:**	- Not provided, standard prices apply
Contact Email:	admin@aargus.net	**Laboratory Address:**	Unit 1, 8 Leighton Pl. Asquith NSW 2077
Client Address:	PO Box 398 Drummoyne NSW 1470		
Project Name:	Summer Hill	**Phone:**	61 2 9476 6533
Project Number:	E1559	**Fax:**	61 2 9476 8219
CoC Serial Number:	- Not provided -		
Purchase Order:	- Not provided -	**Sample Receipt Contact:**	Jakleen El Galada
Surcharge:	No surcharge applied (results by 6:30pm on due date)	**Email:**	jakleen.galada@labmark.com.au
		Reporting Contact:	Jyothi Lal
Sample Matrix:	SOIL	**Email:**	jyothi.lal@labmark.com.au
Date Sampled (earliest date):	20/03/2008	**NATA Accreditation:**	13542
Date Samples Received:	25/03/2008	**TGA GMP License:**	185-336 (Sydney)
Date Sample Receipt Notice issued:	26/03/2008	**APVMA License:**	6105 (Sydney)
Date Preliminary Report Due:	03/04/2008	**AQIS Approval:**	NO356 (Sydney)
		AQIS Entry Permit:	200521534 (Sydney)

Invoice Number: 31036

Reporting Requirements: Electronic Data Download required:No

Sample Condition:
COC received with samples. Report number and lab ID's defined on COC.
Samples received in good order .
Samples received with cooling media: Ice bricks .
Samples received chilled.
Security seals not required. Direct Labmark's custody taken .
Sample container & chemical preservation suitable .

Comments:

Holding Times: Date received allows for sufficient time to meet Technical Holding Times.

Preservation: Chemical preservation of samples satisfactory for requested analytes.

Important Notes:
LabMark shall responsibly dispose of spent customer soil and water samples which includes the disintegration of the sample label. A sample disposal fee of $1.00 is applicable on all samples received by the laboratory regardless of whether they have undergone analytical testing. Sample disposal of environmental samples shall be 31 days (water) and 3 months (soil, HN03 preserved samples) after laboratory receipt, unless otherwise requested in writing by the client. Samples requested to be held in non-refrigerated storage shall incur $5.00/ sample/ 3 months. Additional refrigerated storage shall incur $30/ sample/ 3 months. Combination prices apply only if requested. Transfer of report ownership from LabMark to the client shall occur once full and final payment has been settled and verified. All report copies may be retracted where full payment does not occur within the agreed settlement period.

Analysis comments:

Subcontracted Analyses:

Thank you for choosing Labmark to analyse your project samples.
Additional information on www.labmark.com.au

LabMark
ENVIRONMENTAL LABORATORIES

Quality, Service, Support

Report Date : 26/03/2008
Report Time : 10:54:33AM

Sample **Receipt** Notice (SRN) for **E036822**

The table below represents LabMark's understanding and interpretation of the customer supplied sample COC request (refer to SRN comments section on first page for external subcontracting method details). Please confirm that your COC request has been entered correctly. Due to THT and TAT requirements, testing shall commence immediately as per this table, unless the customer intervenes with a correction prior to testing.

GRID REVIEW TABLE

				Requested Analysis																			
No.	**Date**	**Depth**	**Client Sample ID**	BTEX by P&T	Unfiltered metals	Unfiltered metals (M7)	Polyaromatic Hydrocarbons (PAH)	PREP Not Reported	Petroleum Hydrocarbons (TPH)	Volatile TPH by P&T (vTPH)													
147301	20/03		GW1	●	●	●	●	●	●	●													
147302	20/03		GW1A	●	●	●	●	●	●	●													
147303	20/03		GW2	●	●	●	●	●	●	●													
147304	20/03		GW3	●	●	●	●	●	●	●													
			Totals:	4	4	4	4	4	4	4													

'PREP Not Reported' refers to an internal laboratory instruction - client confirmation of this parameter is not required.

Thank you for choosing Labmark to analyse your project samples.
Additional information on www.labmark.com.au

LabMark
ENVIRONMENTAL LABORATORIES

Quality, Service, Support

Report Date : 26/03/2008
Report Time : 10:54:33AM

Sample **Receipt** Notice (SRN) for **E036822**

				Requested Analysis																			
No.	**Date**	**Depth**	**Client Sample ID**	M8 - M7-T_W																			
147301	20/03		GW1	●																			
147302	20/03		GW1A	●																			
147303	20/03		GW2	●																			
147304	20/03		GW3	●																			
			Totals:	4																			

Thank you for choosing Labmark to analyse your project samples.
Additional information on www.labmark.com.au

Aargus
AUSTRALIA

CHAIN OF CUSTODY

Project: Summer Hill Job Number E1559

Despatch To: Labmark
Address: Unit 1 8 Leighton Plc
Phone No: 9476 6533 ( ) Asquith
Attention: David Burns
Sampled By: CK
Date & Time: 20-3-08

Report To: admin@aargus.net
Turnaround Time: Std ( )
Consigning Office: Sydney
Date Despatched:
Courier Service:
Consignment No:

LAB # 147301 147302 147303 147304

Sample ID	GW1	GW1A	GW2	GW3											
WATER	✓	✓	✓	✓											
SOIL															
SLUDGE															
SEDIMENT															
OTHER															
ICE/ICE BRICK	✓	✓	✓	✓											
ACIDIFIED															
CHILLED															
NONE															
Sampling Date	20/3	20/3	20/3	20/3											
No of Containers															
Analyte Request															
METS	✓	✓	✓	✓											
BTEX	✓	✓	✓	✓											
TPH	✓	✓	✓	✓											
PAH	✓	✓	✓	✓											

Comments: Job #E036822

Relinquished By: Date: Time:
Received By: Date: 25/3/08 Time: 11-15
Relinquished By: Date: Time:
Received By: Date: Time:

LabMark
ENVIRONMENTAL LABORATORIES

CUSTOMER CENTRIC - ANALYTICAL CHEMISTS

Accreditation No. 13542

Accredited for compliance with ISO/IEC 17025. The results of tests, calibrations and/or measurements included in this document are traceable to Australian/national standards. NATA is a signatory to the APLAC mutual recognition arrangement for the mutual recognition of the equivalence of testing, calibration and inspection reports.

AQIS
AUSTRALIAN QUARANTINE AND INSPECTION SERVICE

SYDNEY License No. N0356.

Quarantine Approved Premises criteria 5.1 for quarantine containment level 1 (QCI) facilities. Class five criteria cover premises utilised for research, analysis and testing of biological material, soil, animal, plant and human products.

FINAL CERTIFICATE OF ANALYSIS - ENVIRONMENTAL DIVISION

Laboratory Report No: E037619
Client Name: Aargus Pty. Ltd
Client Reference: Summer Hill
Contact Name: Con Kariotoglou
Chain of Custody No: na
Sample Matrix: WATER

Cover Page 1 of 3
plus Sample Results

Date Received: 15/05/2008
Date Reported: 23/05/2008

This Final Certificate of Analysis consists of sample results, DQI's, method descriptions, laboratory definitions, and internationally recognised NATA accreditation and endorsement. The DQO compliance relates specifically to QA/QC results as performed as part of the sample analysis, and may provide an indication of sample result quality. Transfer of report ownership from Labmark to the client shall only occur once full & final payment has been settled and verified. All report copies may be retracted where full payment has not occured within the agreed settlement period.

QUALITY ASSURANCE CRITERIA

Accuracy:	matrix spike:	1 in first 5-20, then 1 every 20 samples
	lcs, crm, method:	1 per analytical batch
	surrogate spike:	addition per target organic method
Precision:	laboratory duplicate:	1 in first 5-10, then 1 every 10 samples
	laboratory triplicate:	re-extracted & reported when duplicate RPD values exceed acceptance criteria
Holding Times:	soils, waters:	Refer to LabMark Preservation & THT table VOC's 14 days water / soil VAC's 7 days water or 14 days acidified VAC's 14 days soil SVOC's 7 days water, 14 days soil Pesticides 7 days water, 14 days soil Metals 6 months general elements Mercury 28 days
Confirmation:	target organic analysis:	GC/MS, or confirmatory column
Sensitivity:	EQL:	Typically 2-5 x Method Detection Limit (MDL)

QUALITY CONTROL GLOBAL ACCEPTANCE CRITERIA (GAC)

Accuracy:	spike, lcs, crm surrogate:	general analytes 70% - 130% recovery phenol analytes 50% - 130% recovery organophosphorous pesticide analytes 60% - 130% recovery phenoxy acid herbicides, organotin 50% - 130% recovery
	anion/cation bal:	+/- 10% (0-3 meq/l), +/- 5% (>3 meq/l)
Precision:	method blank:	not detected >95% of the reported EQL
	duplicate lab RPD (metals):	0-30% (>10xEQL), 0-75% (5-10xEQL) 0-100% (<5xEQL)
	duplicate lab RPD:	0-50% (>10xEQL), 0-75% (5-10xEQL) 0-100% (<5xEQL)

QUALITY CONTROL ANALYTE SPECIFIC ACCEPTANCE CRITERIA (ASAC)

Accuracy:	spike, lcs, crm surrogate:	analyte specific recovery data <3xsd of historical mean
Uncertainty:	spike, lcs:	measurement calculated from historical analyte specific control charts

RESULT ANNOTATION

Data Quality Objective	s:	matrix spike recovery	p:	pending	bcs:	batch specific lcs
Data Quality Indicator	d:	laboratory duplicate	lcs:	laboratory control sample	bmb:	batch specific mb
Estimated Quantitation Limit	t:	laboratory triplicate	crm:	certified reference material		
not applicable	r:	RPD relative % difference	mb:	method blank		

David Burns
Quality Control (Report signatory)
david.burns@labmark.com.au

Geoff Weir
Authorising Chemist (NATA signatory)
geoff.weir@labmark.com.au

Simon Mills
Authorising Chemist (NATA signatory)
simon.mills@labmark.com.au

This document is issued in accordance with NATA's accreditation requirements.

Laboratory Report: E037619

NEPC GUIDELINE COMPLIANCE - DQO

1. GENERAL

A. Results relate specifically to samples as received. Sample results are not corrected for matrix spike, lcs, or surrogate recovery data.

B. EQL's are matrix dependant and may be increased due to sample dilution or matrix interference.

C. Laboratory QA/QC samples are specific to this project.

D. Inter-laboratory proficiency results are available upon request. NATA accreditation details available at www.nata.asn.au.

E. VOC spikes & surrogates added to samples during extraction, SVOC spikes & surrogates added prior to extraction.

F. Recovery data outside GAC limits shall be investigated and compared to ASAC (historical mean +/- 3sd). If recovery data <20%, then the relevant results for that compound are considered not reliable.

G. Recovery data (ms, surrogate, crm, lcs) outside ASAC limits shall initiate an investigative action. Anomolous QC data is examined in conjunction with other QC samples and a final decision whether to accept or reject results is provided by the professional judgement of the senior analyst. The USEPA-CLP National Functional Guidelines are referred to for specific recommendations.

H. Extraction (preparation) date refers to the date that sample preparation was initiated. Note that certain methods not requiring sample preparation (eg. VOCs in water, etc) may report a common extraction and analysis date.

I. LabMark shall maintain an official copy of this Certificate of Analysis for all tracable reference purposes.

2. CHAIN OF CUSTODY (COC) & SAMPLE RECEIPT NOTICE (SRN) REQUIREMENTS

A. SRN issued to client upon sample receipt & login verification.

B. Preservation & sampling date details specified on COC and SRN, unless noted.

C. Sample Integrity & Validated Time of Sample Receipt (VTSR) Holding Times verified (preservation may extend holding time, refer to preservation chart).

3. NATA ACCREDITED METHODS

A. NATA accreditation held for each in-house method and sample matrix type reported, unless noted below (Refer to subcontracted test reports for NATA accreditation status).

B. NATA accredited in-house laboratory methods are referenced from NEPC, ASTM, modified USEPA / APHA documents. Corporate Accreditation No. 13542.

C. Subcontracted analyses: Refer to Sample Receipt Notice and additional DQO comments.

Laboratory Report: E037619

Cover Page 3 of 3

4. QA/QC FREQUENCY COMPLIANCE TABLE SPECIFIC TO THIS REPORT

Matrix: **WATER**

Page:	Method:	Totals:	#d	%d-ratio	#t	#s	%s-ratio
1	BTEX by P&T	4	0	0%	0	0	0%
1	Volatile TPH by P&T (vTPH)	4	0	0%	0	0	0%
2	Petroleum Hydrocarbons (TPH)	4	0	0%	0	0	0%
3	Polyaromatic Hydrocarbons (PAH)	4	0	0%	0	0	0%
4	Filtered metals (M7)	4	0	0%	0	0	0%
5	Filtered mercury	4	0	0%	0	0	0%

GLOSSARY:

#d	number of discrete duplicate extractions/analyses performed.
%d-ratio	NEPC guideline for laboratory duplicates is 1 in 10 samples (min 10%).
#t	number of triplicate extractions/analyses performed.
#s	number of spiked samples analysed.
%s-ratio	USEPA guideline for laboratory matrix spikes is 1 in 20 samples (min 5%).

5. ADDITIONAL COMMENTS SPECIFIC TO THIS REPORT

A. All tests were conducted by LabMark Environmental Sydney, NATA accreditation No. 13542, Corporate Site No. 13535, unless indicated below.

Laboratory QA/QC data shall relate specifically to this report, and may provide an indication of site specific sample result quality. LabMark DOES NOT report NON-RELEVANT BATCH QA/QC data. Acceptance of this self assessment certificate does not preclude any requirement for a QA/QC review by a accredited contaminated site EPA auditor, when and wherever necessary. Laboratory QA/QC self assessment references available upon request.

This document is issued in accordance with NATA's accreditation requirements.

LabMark
ENVIRONMENTAL LABORATORIES

Laboratory Report No: E037619
Client Name: Aargus Pty. Ltd
Contact Name: Con Kariotoglou
Client Reference: Summer Hill E1559

Page: 1 of 5
plus cover page
Date: 23/05/08
This report supercedes reports issued on: N/A

Final
Certificate
of Analysis

Laboratory Identification		**155552**	**155553**	**155554**	**155555**	**lcs**	**mb**				
Sample Identification		GW1	GW2	GW3	D1	QC	QC				
Depth (m)		--	--	--	--	--	--				
Sampling Date recorded on COC		14/5/08	14/5/08	14/5/08	14/5/08	--	--				
Laboratory Extraction (Preparation) Date		19/5/08	19/5/08	19/5/08	19/5/08	19/5/08	19/5/08				
Laboratory Analysis Date		20/5/08	20/5/08	20/5/08	20/5/08	19/5/08	19/5/08				
Method : E002.1											
BTEX by P&T	**EQL**										
Benzene	1	<1	<1	<1	<1	100%	<1				
Toluene	1	<1	<1	<1	<1	99%	<1				
Ethylbenzene	1	<1	<1	<1	<1	99%	<1				
meta- & para-Xylene	2	<2	<2	<2	<2	98%	<2				
ortho-Xylene	1	<1	<1	<1	<1	96%	<1				
Total Xylene	--	--	--	--	--	--	--				
4-BFB (Surr @ 100ug/l)	--	*85%*	*86%*	*87%*	*86%*	*94%*	*94%*				
Method : E003.1											
Volatile TPH by P&T (vTPH)	**EQL**										
C6-C9	50	<50	<50	<50	<50	97%	<50				

Results expressed in ug/l unless otherwise specified

Comments:

E002.1: Direct injection into P&T/GC/PID/MSD.
E003.1: Direct injection into P&T/GC/FID.

Laboratory Report No: E037619
Client Name: Aargus Pty. Ltd
Contact Name: Con Kariotoglou
Client Reference: Summer Hill E1559

Date: 23/05/08

This report supercedes reports issued on: N/A

Final
Certificate
of Analysis

Laboratory Identification		**155552**	**155553**	**155554**	**155555**	**lcs**	**mb**				
Sample Identification		GW1	GW2	GW3	D1	QC	QC				
Depth (m)		--	--	--	--	--	--				
Sampling Date recorded on COC		14/5/08	14/5/08	14/5/08	14/5/08	--	--				
Laboratory Extraction (Preparation) Date		20/5/08	20/5/08	20/5/08	20/5/08	20/5/08	20/5/08				
Laboratory Analysis Date		20/5/08	20/5/08	20/5/08	20/5/08	20/5/08	20/5/08				
Method : E004.1											
Petroleum Hydrocarbons (TPH)	**EQL**										
C10-C14 Fraction	50	300	<50	240	270	--	<50				
C15-C28 Fraction	200	360	<200	<200	<200	95%	<200				
C29-C36 Fraction	50	<50	<50	<50	<50	--	<50				
Sum of TPH C10 - C36	--	660	--	240	270	--	--				

Results expressed in ug/l unless otherwise specified

Comments:

E004.1: Triple extraction with DCM. Analysis by GC/FID.

Laboratory Identification		**155552**	**155553**	**155554**	**155555**	**lcs**	**mb**				
Sample Identification		GW1	GW2	GW3	D1	QC	QC				
Depth (m)		--	--	--	--	--	--				
Sampling Date recorded on COC		14/5/08	14/5/08	14/5/08	14/5/08	--	--				
Laboratory Extraction (Preparation) Date		20/5/08	20/5/08	20/5/08	20/5/08	20/5/08	20/5/08				
Laboratory Analysis Date		21/5/08	21/5/08	21/5/08	21/5/08	20/5/08	21/5/08				
Method : E007.1											
Polyaromatic Hydrocarbons (PAH)	**EQL**										
Naphthalene	1	18	<1	<1	<1	101%	<1				
Acenaphthylene	1	<1	<1	<1	<1	105%	<1				
Acenaphthene	1	2	<1	<1	<1	101%	<1				
Fluorene	1	2	<1	<1	<1	101%	<1				
Phenanthrene	1	9	<1	<1	<1	105%	<1				
Anthracene	1	2	<1	<1	<1	107%	<1				
Fluoranthene	1	4	<1	<1	<1	106%	<1				
Pyrene	1	4	<1	<1	<1	106%	<1				
Benz(a)anthracene	1	<1	<1	<1	<1	109%	<1				
Chrysene	1	<1	<1	<1	<1	101%	<1				
Benzo(b)&(k)fluoranthene	2	<2	<2	<2	<2	104%	<2				
Benzo(a) pyrene	1	<1	<1	<1	<1	100%	<1				
Indeno(1,2,3-c,d)pyrene	1	<1	<1	<1	<1	105%	<1				
Dibenz(a,h)anthracene	1	<1	<1	<1	<1	106%	<1				
Benzo(g,h,i)perylene	1	<1	<1	<1	<1	104%	<1				
Sum of reported PAHs	--	41	--	--	--	--	--				
2-FBP (Surr @ 250ug/l)	--	*103%*	*99%*	*102%*	*100%*	*100%*	*103%*				
TP-d14 (Surr @ 250ug/l)	--	*103%*	*103%*	*103%*	*104%*	*110%*	*103%*				

Results expressed in ug/l unless otherwise specified

Comments:

E007.1: Triple extraction with DCM. Analysis by GC/MS.

Laboratory Report No: E037619
Client Name: Aargus Pty. Ltd
Contact Name: Con Kariotoglou
Client Reference: Summer Hill E1559

Date: 23/05/08
This report supercedes reports issued on: N/A

Final
Certificate
of Analysis

Laboratory Identification		**155552**	**155553**	**155554**	**155555**	**lcs**	**mb**				
Sample Identification		GW1	GW2	GW3	D1	QC	QC				
Depth (m)		--	--	--	--	--	--				
Sampling Date recorded on COC		14/5/08	14/5/08	14/5/08	14/5/08	--	--				
Laboratory Extraction (Preparation) Date		20/5/08	20/5/08	20/5/08	20/5/08	20/5/08	20/5/08				
Laboratory Analysis Date		21/5/08	21/5/08	21/5/08	21/5/08	21/5/08	21/5/08				
Method : E022.1											
Filtered metals (M7)	**EQL**										
Arsenic	1	<1	<1	<1	<1	102%	<1				
Cadmium	0.1	<0.1	<0.1	<0.1	<0.1	98%	<0.1				
Chromium	1	*<5	*<5	*<5	*<5	98%	<1				
Copper	1	<1	2	<1	<1	98%	<1				
Nickel	1	15	8	10	10	99%	<1				
Lead	1	<1	<1	<1	<1	98%	<1				
Zinc	5	26	13	27	26	98%	<5				

Results expressed in ug/l unless otherwise specified

Comments: *EQL increased due to matrix interference.

E022.1: Filtered HNO3 preserved sample directly analysed by ICP-MS.

Laboratory Report No: E037619
Client Name: Aargus Pty. Ltd
Contact Name: Con Kariotoglou
Client Reference: Summer Hill E1559

Date: 23/05/08

This report supercedes reports issued on: N/A

Final
Certificate
of Analysis

Laboratory Identification		**155552**	**155553**	**155554**	**155555**	**lcs**	**mb**				
Sample Identification		GW1	GW2	GW3	D1	QC	QC				
Depth (m)		--	--	--	--	--	--				
Sampling Date recorded on COC		14/5/08	14/5/08	14/5/08	14/5/08	--	--				
Laboratory Extraction (Preparation) Date		20/5/08	20/5/08	20/5/08	20/5/08	20/5/08	20/5/08				
Laboratory Analysis Date		21/5/08	21/5/08	21/5/08	21/5/08	21/5/08	21/5/08				
Method : E026.1 **Filtered mercury**	**EQL**										
Mercury	0.1	<0.1	<0.1	<0.1	<0.1	79%	<0.1				

Results expressed in ug/l unless otherwise specified

Comments:

E026.1: Analysis by CV-ICP-MS or FIMS following BrCl pre-treatment.

LabMark
ENVIRONMENTAL LABORATORIES

Quality, Service, Support

Report Date : 16/05/2008
Report Time : 12:15:00PM

Sample **Receipt** Notice (SRN) for **E037619**

Client Details

Client Name: Aargus Pty. Ltd
Client Phone: 02 9568 6159
Client Fax: 1300 136 038
Contact Name: Con Kariotoglou
Contact Email: admin@aargus.net
Client Address: PO Box 398
Drummoyne NSW 1470

Project Name: Summer Hill
Project Number: E1559
CoC Serial Number: - Not provided -
Purchase Order: - Not provided -
Surcharge: No surcharge applied (results by 6:30pm on due date)
Sample Matrix: WATER

Date Sampled (earliest date): 14/05/2008
Date Samples Received: 15/05/2008
Date Sample Receipt Notice issued: 16/05/2008
Date Preliminary Report Due: 23/05/2008

Laboratory Reference Information

Please have this information ready when contacting Labmark.

Laboratory Report: **E037619**
Quotation Number: - Not provided, standard prices apply
Laboratory Address: Unit 1, 8 Leighton Pl.
Asquith NSW 2077

Phone: 61 2 9476 6533
Fax: 61 2 9476 8219

Sample Receipt Contact: Jakleen El Galada
Email: jakleen.galada@labmark.com.au
Reporting Contact: Jyothi Lal
Email: jyothi.lal@labmark.com.au

NATA Accreditation: 13542
TGA GMP License: 185-336 (Sydney)
APVMA License: 6105 (Sydney)
AQIS Approval: NO356 (Sydney)
AQIS Entry Permit: 200521534 (Sydney)

Reporting Requirements: Electronic Data Download required: No

Invoice Number: 31880

Sample Condition: COC received with samples. Report number and lab ID's defined on COC.
Samples received in good order .
Samples received with cooling media: Ice bricks .
Samples received chilled.
Security seals not required. Direct Labmark's custody taken .
Sample container & chemical preservation suitable .

Comments:

Holding Times: Date received allows for sufficient time to meet Technical Holding Times.

Preservation: Chemical preservation of samples satisfactory for requested analytes.

Important Notes:
LabMark shall responsibly dispose of spent customer soil and water samples which includes the disintegration of the sample label. A sample disposal fee of $1.00 is applicable on all samples received by the laboratory regardless of whether they have undergone analytical testing. Sample disposal of environmental samples shall be 31 days (water) and 3 months (soil, HN03 preserved samples) after laboratory receipt, unless otherwise requested in writing by the client. Samples requested to be held in non-refrigerated storage shall incur $5.00/ sample/ 3 months. Additional refrigerated storage shall incur $30/ sample/ 3 months. Combination prices apply only if requested. Transfer of report ownership from LabMark to the client shall occur once full and final payment has been settled and verified. All report copies may be retracted where full payment does not occur within the agreed settlement period.

Analysis comments:

Subcontracted Analyses:

Thank you for choosing Labmark to analyse your project samples.
Additional information on www.labmark.com.au

Report Date : 16/05/2008
Report Time : 12:15:00PM

LabMark
ENVIRONMENTAL LABORATORIES

Quality, Service, Support

Sample **Receipt** Notice (SRN) for **E037619**

The table below represents LabMark's understanding and interpretation of the customer supplied sample COC request (refer to SRN comments section on first page for external subcontracting method details). Please confirm that your COC request has been entered correctly. Due to THT and TAT requirements, testing shall commence immediately as per this table, unless the customer intervenes with a correction prior to testing.

GRID REVIEW TABLE				Requested Analysis																			
No.	**Date**	**Depth**	**Client Sample ID**	BTEX by P&T	Filtered mercury	Filtered metals (M7)	Polyaromatic Hydrocarbons (PAH)	PREP Not Reported	Petroleum Hydrocarbons (TPH)	Volatile TPH by P&T (vTPH)													
155552	14/05		GW1	●	●	●	●	●	●	●													
155553	14/05		GW2	●	●	●	●	●	●	●													
155554	14/05		GW3	●	●	●	●	●	●	●													
155555	14/05		D1	●	●	●	●	●	●	●													
			Totals:	4	4	4	4	4	4	4													

'PREP Not Reported' refers to an internal laboratory instruction - client confirmation of this parameter is not required.

Thank you for choosing Labmark to analyse your project samples.
Additional information on www.labmark.com.au

Report Date : 16/05/2008
Report Time : 12:15:00PM

LabMark
ENVIRONMENTAL LABORATORIES

Quality, Service, Support

Sample
Receipt
Notice (SRN) for **E037619**

				Requested Analysis																			
No.	**Date**	**Depth**	**Client Sample ID**	M8 - M7-F_W																			
155552	14/05		GW1	●																			
155553	14/05		GW2	●																			
155554	14/05		GW3	●																			
155555	14/05		D1	●																			
			Totals:	4																			

Thank you for choosing Labmark to analyse your project samples.
Additional information on www.labmark.com.au

Aargus
AUSTRALIA

CHAIN OF CUSTODY

Project: Summer Hill Job Number E1559

Despatch To: Labmark
Address: Unit 1 8 Leighton Plc
Phone No: 94766533 (Asquith)
Attention: David Burns
Sampled By: CK
Date & Time:

Report To: admin@aargus.net
Turnaround Time: Thurs (22 May)
Consigning Office: Sydney
Date Despatched:
Courier Service:
Consignment No:

	135552	135553	135554	135555
Sample ID	GW1	GW2	GW3	Di
WATER	✓	✓	✓	✓
SOIL				
SLUDGE				
SEDIMENT				
OTHER				
ICE/ICE BRICK	✓	✓	✓	✓
ACIDIFIED				
CHILLED				
NONE				
Sampling Date	14/5	14/5	14/5	14/5
No of Containers	5	5	5	5
Analyte Request				
Met 8	✓	✓	✓	✓
TPH	✓	✓	✓	✓
BTEX	✓	✓	✓	✓
PAH	✓	✓	✓	✓

Comments: recd 8l 15/5/0.8

E037619

Relinquished By: Date: 15/5/08 Time:
Received By: Date: 15/5/08 Time: 10:30
Relinquished By: Date: Time:
Received By: Date: Time:

25 March 2008

TEST REPORT

Aargus Pty Ltd
446 Parramatta Road
Petersham
NSW 2049

Your Reference:	E1559, Summer Hill (Aargus)
Report Number:	59506
Attention:	Mark Kelly

Dear Mark

The following samples were received from you on the date indicated.

Samples: Qty.	1 Soil
Date of Receipt of Samples:	14/3/08
Date of Receipt of Instructions:	14/3/08
Date Preliminary Report Emailed:	Not Issued

These samples were analysed in accordance with your written instructions.
A copy of the instructions is attached with the analytical report.

The results and associated quality control are contained in the following pages of this report. Unless otherwise stated, solid samples are expressed on a dry weight basis (moisture has been supplied for your information only), air and liquid samples as received.

Should you have any queries regarding this report please contact the undersigned.

Yours faithfully
SGS ENVIRONMENTAL SERVICES

Ly Kim Ha
Senior Organic Chemist

Edward ibrahim
Edward Ibrahim
Laboratory Services Manager

TRH in soil with..C6-C9 by P/T Our Reference: Your Reference Sample Type Date Sampled	UNITS ------------- ------------	59506-1 BH 6.10 Soil 13/03/2008
Date Extracted (TRH C6-C9 PT)		18/03/2008
Date Analysed (TRH C6-C9 PT)		19/03/2008
TRH C_6 - C_9 P&T	mg/kg	<20
Date Extracted (TRH C10-C36)		18/03/2008
Date Analysed (TRH C10-C36)		18/03/2008
TRH C_{10} - C_{14}	mg/kg	<20
TRH C_{15} - C_{28}	mg/kg	51
TRH C_{29} - C_{36}	mg/kg	<50

Metals in Soil by ICP-OES Our Reference: Your Reference Sample Type Date Sampled	UNITS ------------- ------------	59506-1 BH 6.10 Soil 13/03/2008
Date Extracted (Metals)		18/03/2008
Date Analysed (Metals)		18/03/2008
Arsenic	mg/kg	<3
Cadmium	mg/kg	<0.3
Chromium	mg/kg	19
Copper	mg/kg	3.3
Lead	mg/kg	11
Nickel	mg/kg	3.2
Zinc	mg/kg	5.8

Mercury Cold Vapor/Hg Analyser Our Reference: Your Reference Sample Type Date Sampled	UNITS ------------- ------------	59506-1 BH 6.10 Soil 13/03/2008
Date Analysed (Mercury)		19/03/2008
Date Extracted (Mercury)		19/03/2008
Mercury	mg/kg	<0.05

Moisture		
Our Reference:	UNITS	59506-1
Your Reference	-------------	BH 6.10
Sample Type	------------	Soil
Date Sampled		13/03/2008
Date Analysed (moisture)		18/03/2008
Moisture	%	17

Method ID	Methodology Summary
SEO-017	BTEX/TRH C6-C9 - Determination by Purge and Trap Gas Chromatography with Flame Ionisation Detection (FID) and Photo Ionisation Detection (PID). The surrogate spike used is aaa-trifluorotoluene.
SEO-020	TRH - Determination of Total Recoverable Hydrocarbons by gas chromatography following extraction with DCM/Acetone for solids and DCM for liquids.
SEM-010	Metals - Determination of various metals by ICP-OES following appropriate sample preparation or digestion process.
SEM-005	Mercury - Determination of Mercury by Cold Vapour Generation Atomic Absorption Spectroscopy.
AN002	Preparation of soils, sediments and sludges undergo analysis by either air drying, compositing, subsampling and 1:5 soil water extraction where required. Moisture content is determined by drying the sample at 105 ± 5°C.

QUALITY CONTROL TRH in soil with..C6-C9 by P/T	UNITS	LOR	METHOD	Blank	Duplicate Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Matrix Spike % Recovery Duplicate + %RPD
Date Extracted (TRH C6-C9 PT)				18/03/08	[NT]	[NT]	LCS	18/03/08%
Date Analysed (TRH C6-C9 PT)				19/03/08	[NT]	[NT]	LCS	19/03/08%
TRH C_6 - C_9 P&T	mg/kg	20	SEO-017	<20	[NT]	[NT]	LCS	101%
Date Extracted (TRH C10-C36)				18/03/08	[NT]	[NT]	LCS	18/03/08%
Date Analysed (TRH C10-C36)				18/03/08	[NT]	[NT]	LCS	18/03/08%
TRH C_{10} - C_{14}	mg/kg	20	SEO-020	<20	[NT]	[NT]	LCS	89%
TRH C_{15} - C_{28}	mg/kg	50	SEO-020	<50	[NT]	[NT]	LCS	86%
TRH C_{29} - C_{36}	mg/kg	50	SEO-020	<50	[NT]	[NT]	LCS	87%

QUALITY CONTROL Metals in Soil by ICP-OES	UNITS	LOR	METHOD	Blank	Duplicate Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Matrix Spike % Recovery Duplicate + %RPD
Date Extracted (Metals)				18/03/08	[NT]	[NT]	LCS	18/03/08%
Date Analysed (Metals)				18/03/08	[NT]	[NT]	LCS	18/03/08%
Arsenic	mg/kg	3	SEM-010	<3	[NT]	[NT]	LCS	95%
Cadmium	mg/kg	0.3	SEM-010	<0.3	[NT]	[NT]	LCS	95%
Chromium	mg/kg	0.3	SEM-010	<0.3	[NT]	[NT]	LCS	94%
Copper	mg/kg	0.5	SEM-010	<0.5	[NT]	[NT]	LCS	98%
Lead	mg/kg	1	SEM-010	<1	[NT]	[NT]	LCS	97%
Nickel	mg/kg	0.5	SEM-010	<0.5	[NT]	[NT]	LCS	98%
Zinc	mg/kg	0.5	SEM-010	<0.5	[NT]	[NT]	LCS	94%

QUALITY CONTROL Mercury Cold Vapor/Hg Analyser	UNITS	LOR	METHOD	Blank	Duplicate Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Matrix Spike % Recovery Duplicate + %RPD
Date Analysed (Mercury)				19/03/08	[NT]	[NT]	LCS	19/03/08%
Date Extracted (Mercury)				19/03/08	[NT]	[NT]	LCS	19/03/08%
Mercury	mg/kg	0.05	SEM-005	<0.05	[NT]	[NT]	LCS	93%

QUALITY CONTROL Moisture	UNITS	LOR	METHOD	Blank
Date Analysed (moisture)				18/03/2008
Moisture	%	1	AN002	<1

Result Codes

[INS]	:	Insufficient Sample for this test	[RPD]	:	Relative Percentage Difference
[NR]	:	Not Requested	*	:	Not part of NATA Accreditation
[NT]	:	Not tested	[N/A]	:	Not Applicable

Report Comments

Date Organics extraction commenced: 18/03/08
NATA Corporate Accreditation No. 2562, Site No 4354
Note: Test results are not corrected for recovery (excluding Dioxins/Furans* and PAH in XAD and PUF).
This document is issued, on the Client's behalf, by the Company under its General Conditions of Service available on request and accessible at http://www.sgs.com/terms_and_conditions.htm. The Client's attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein.

Any other holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents.

Quality Control Protocol

Method Blank: An analyte free matrix to which all reagents are added in the same volume or proportions as used in sample processing. The method blank should be carried through the complete sample preparation and analytical procedure. A method blank is prepared every 20 samples.
Duplicate: A separate portion of a sample being analysed that is treated the same as the other samples in the batch.
One duplicate is processed at least every 10 samples.
Surrogate Spike: Added to all samples requiring analysis for organics (where relevant) prior to extraction. Used to determine the extraction efficiency. They are organic compounds which are similar to the target analyte(s) in chemical composition and behaviour in the analytical process, but which are not normally found in environmental samples.
Internal Standard: Added to all samples requiring analysis for organics (where relevant) after the extraction process; the compounds serve to give a standard of retention time and response, which is invariant from run-to-run with the instruments.
Control Standards: Prepared from a source independent of the calibration standards. At least one control standard is included in each run to confirm calibration validity.
Additional QC Samples: A calibration standard and blank are run after every 20 samples of an instrumental analysis run to assess analytical drift.

Quality Acceptance Criteria

Duplicates: <5xLOR - no RPD criteria. >5xLOR 0-30% RPD is accepted.
Matrix Spikes and LCS: 70-130% recovery accepted for metals/inorganics; 60-140% for organics.
Surrogates: 60-130% recovery is accepted for BTEX 70-130% recovery is accepted for other organics.

APPENDIX H

AARGUS FIELDWORK PROTOCOLS

Aargus
AUSTRALIA

Fieldwork Protocols

February 2008

TABLE OF CONTENTS

1.0 OBJECTIVE AND SCOPE 3

2.0 SOIL SAMPLING 3

2.1 COLLECTION METHODS 3
  2.1.1 Possible collection methods 3
  2.1.2 Rotary Air Hammer 3
  2.1.3 Hand auger 4
  2.1.4 Solid or Hollow auger 4
  2.1.5 Test pits and trenches excavated with a backhoe or an excavator 4
  2.1.6 Backfilling 5
2.2 SOIL LOGGING 5
2.3 COLLECTING SOIL SAMPLES 5
2.4 LABELLING OF SOIL SAMPLES 5
2.5 EQUIPMENT DECONTAMINATION 6
2.6 SURVEYING OF SAMPLING LOCATIONS 7

3.0 GROUNDWATER SAMPLING 7

3.1 GROUNDWATER SAMPLING OBJECTIVES 7
3.2 GROUNDWATER WELL CONSTRUCTION 7
3.3 DEVELOPMENT OF MONITORING WELLS 9
3.4 PURGING OF MONITORING WELL 9
3.5 GROUNDWATER SAMPLING 10
3.6 LOW FLOW PURGING 11
3.7 FIELD MEASUREMENTS 12
3.8 LABELLING OF WATER SAMPLES 12
3.9 SAMPLING CONTAINERS 12
3.10 WELL SURVEYING 13

4.0 SURFACE WATERS AND STORMWATER SAMPLING 13

4.1 SURFACE WATERS 13
4.2 STORMWATER 13
4.3 FILTRATION DEVICES 14

5.0 PHOTO IONISATION DETECTOR (PID) 14

6.0 ACID SULFATE SOILS 15

6.1 DESKTOP CLASSIFICATION 15
6.2 SITE WALKOVER 16

6.3 VISUAL CLASSIFICATION 16
6.4 SAMPLE COLLECTION 16
6.5 FIELD TESTING 16
6.6 LABORATORY TESTING 17

7.0 NOISE MONITORING 17

8.0 DUST MONITORING 17

9.0 QUALITY ASSURANCE/QUALITY CONTROL (QA/QC) 18

9.1 INTRODUCTION 18
9.2 FIELD QAQC SAMPLES 18
9.2.1 General 18
9.2.2 Intra-laboratory duplicates 18
9.2.3 Inter-laboratory duplicates 19
9.2.4 Blanks 19
9.3 LABORATORY QUALITY ASSURANCE / QUALITY CONTROL 20
9.3.1 Laboratory duplicate samples 20
9.3.2 Matrix Spiked Samples 20
9.3.3 Laboratory Blank 21
9.3.4 Laboratory Control Samples 21
9.3.5 Surrogates 21

10.0 DATA QUALITY OBJECTIVES 22

10.1 GENERAL 22
10.2 FIELD DQOS 23
10.3 ASSESSMENT OF RPD VALUES FOR FIELD DUPLICATE SAMPLES 23
10.4 LABORATORY DATA QUALITY OBJECTIVES (DQO) 24
10.4.1 General 24
10.4.2 Laboratory analyses DQOs 24
10.4.3 Non-compliances 25

11.0 USE AND CALCULATION OF THE 95% UCL FOR SITE VALIDATION PURPOSE 25

12.0 COPYRIGHT 26

13.0 ABBREVIATIONS 27

14.0 REFERENCES 28

LIST OF TABLES

Table 1: RPD acceptance criteria 23

Table 2: Laboratory Data Quality Objectives (DQOs) 24

1.0 OBJECTIVE AND SCOPE

The objective of Aargus Pty Ltd (Aargus) Protocols is to ensure that the methodology followed during environmental works is adequate to provide data which is usable and representative of the conditions actually encountered at the site.

The scope of these protocols is to:

- Outline the methods and procedures for the field investigations during an environmental assessment or remediation and validation program; and
- Specify methods and procedures which ensure that soil and groundwater samples recovered are representative of the actual subsurface conditions at the site, as well as ensuring that the risk of introducing external contamination to samples and to the environment is minimised.

These protocols must be adhered to by Aargus personnel and by sub-contractors involved in field investigations. Any deviations from these protocols should be explained within the Environmental Report to which they are attached.

2.0 SOIL SAMPLING

2.1 Collection methods

Possible collection methods

Soil samples are generally collected by drilling or excavating the subsurface, using one of the following drilling / excavating technique:

- Rotary air hammer
- Hand auger
- Solid or hollow auger
- Backhoe or Excavator

Rotary Air Hammer

The air hammer technique requires the use of synthetic blend lubricants to prevent potential contamination of the borehole if a leak were to occur. In addition, micro-filters are installed into the drilling airline to avoid contamination by hydrocarbons present in the compressed air.

Samples of rock are generally not collected. Where rock samples are needed, specialised techniques are used.

Hand auger

A hand auger is generally used to investigate subsurface conditions of unconsolidated materials at shallow depths or in areas difficult to access with other equipment. Samples are recovered from the hand auger, taking care to avoid cross contamination, especially between samples from the same hole but at different depths. Sampling equipment is to be thoroughly cleaned between sampling events, in accordance with the procedures outlined in Section 2.5 Equipment decontamination.

Solid or Hollow auger

Solid and hollow auger drilling techniques are well suited to unconsolidated materials. The main advantage of the hollow auger technique is that the drill rods allow access of sampling equipment at specified depths within the annulus of the drill rods.

Samples of soil are recovered using a split spoon sampler at specific depth intervals. The split spoon sampler is driven into the soil by the drill rig whilst attached to the end of the drill rods. The retrieved sample is then split lengthways into two halves when duplicate samples are required. A few centimetres of soil from the top of the split spoon sampler is discarded. Samples for volatile analysis are collected first, without mixing.

Test pits and trenches excavated with a backhoe or an excavator

Test Pit and Trenches excavated with a backhoe/excavator are used to collect relatively shallow (i.e. less than 3.5m depth) soil samples on occasions where:

- Access multiple sample locations at a site are needed;
- A description of the subsurface soil profile to approximately 3.5 m depth is required (generally in unsaturated conditions);
- The investigated site is free from known underground services and access problems;
- The investigated site is free from impenetrable surface or near surface layers including concrete and asphalt pavements; and
- Undisturbed soil samples are required, usually at multiple depths.

Backfilling

On completion of drilling / test pitting, the investigated locations are backfilled with cuttings and compacted. Excess drill cuttings are disposed of appropriately. If the sampling location is located in an area used for the circulation of people or vehicles, the top of the sampling location should be sealed with mortar.

2.2 Soil logging

The lithological logging of soil samples and subsurface conditions is undertaken by environmental scientists / engineers. The soil characteristics are logged in accordance with the Australian Standard *AS1726-1993 Geotechnical Site Investigations.* This includes description of grain size, visible staining, odour and colour, and of the clues which may suggest that the soil may be contaminated. Descriptions of soils are made using the Northcote method.

2.3 Collecting soil samples

The soil sample is collected using a stainless steel trowel, or directly with the hand if the sampler wears disposable gloves. Soils are quickly transferred into 250g clean amber glass jars, which have been acid washed and solvent rinsed. The jars are sealed with a screw-on teflon lined plastic lid, labelled, and placed for storage in an ice filled chest.

2.4 Labelling of soil samples

Samples are labelled with the following information:

- Job number;
- Date of sample collection;
- Name of the environmental scientist / engineer who collected the sample; and
- Sample number: the letters used to label the samples are BH, C, SS, SP, TP and V which refer respectively to borehole samples, composite samples, surface samples, stockpile samples, test pit samples and validation samples. For borehole samples, BH3 1.0m is the sample taken from borehole 3 at 1.0m below ground level. For stockpile samples, SP1/1 is the first sample from stockpile 1. TP1 2.0m is the sample taken from testpit 1 at a depth of 2.0 metres below ground level. V3/F is the validation sample taken from location V3, the letters F N, S, E and W refer to the floor, north, south, east and west walls of an excavation; if some contamination is found in the validation sample, then chasing out of the contamination is required and in this case, the label of the sample is

changed by adding /1 or /2 according to the number of times the contamination has been chased out. B stands for blind.

2.5 Equipment decontamination

The drilling and sampling equipment are cleaned using an appropriate surfactant (e.g. phosphate-free detergent or Decon 90), then rinsed with tap water prior to final rinsing with distilled water.

The following procedures shall be followed for decontamination of drilling and sampling equipment:

- buckets or tubs used for decontamination shall be cleaned with tap water and detergent and rinsed with tap water before sampling commences;
- fill first bucket or tub with tap water, and phosphate free detergent;
- fill second bucket or tub with tap water;
- clean equipment thoroughly in detergent water, using a stiff brush; rinse equipment in tap water;
- dry equipment with disposable towels;
- rinse equipment by thoroughly spraying with tap water, then final rinse with distilled water;
- allow equipment to dry; and
- change water and detergent solution between sampling event.

Sampling decontaminated equipment should be kept in a clean area to prevent cross-contamination. Equipment that cannot be thoroughly decontaminated using the detergent wash and water rinse should be cleaned with steam or high pressure water or if a cleaner is not available, not used for further sampling (and labelled clearly "not decontaminated") or discarded. Equipment decontaminated using the high pressure steam cleaner will be treated as described above. Any equipment that cannot be thoroughly decontaminated shall be discarded and replaced.

A new pair of latex gloves is used to handle each sample. Contaminated materials such as disposable clothing should be disposed of in accordance with environmental best practice.

2.6 Surveying of sampling locations

Sampling locations are generally located by reference to existing ground features, e.g. fences, buildings.

If the survey for location and elevation is required, it should be done by a licensed surveyor, or alternatively by an Aargus environmental engineer / scientist if the level of precision required can be obtained by the use of Aargus field equipment. Aargus has GPS equipment and level meters.

If the location is given by a licensed surveyor, it is generally given to the nearest 0.1m and referenced to the Australian Map Grid (AMG) coordinates.

3.0 GROUNDWATER SAMPLING

3.1 Groundwater Sampling Objectives

The primary objective of any groundwater (quality) sampling is to produce groundwater samples that are representative of groundwater in the aquifer and will remain representative until analytical determination or measurements are made.

3.2 Groundwater well construction

Typically wells are installed to gain access to the groundwater to be sampled. Well construction details will depend on hydrogeological setting of the site, for example the depth to groundwater strata present. Relevant information regarding of the hydrogeological setting will have been obtained prior the development of any groundwater sampling program.

The preferred drilling methods will depend on the hydrogeological setting of the site and the objectives of the groundwater sampling program. For example, shallow wells in unconsolidated materials, such as sand, may be drilled using a hand auger. Drill rigs using solid of hollow flight augers may be used to drill deeper wells or through semi consolidated materials, such as stiff clay. Rotary air hammer drilling may be used were well is to be drilled through consolidated materials, such as rock. Soil samples may also be collected during drilling (see Section 2.0 SOIL SAMPLING).

Drilling methods and materials must not have an unacceptable impact on the groundwater to be sampled. For example, if groundwater from the wells is to be tested for organic analytes, petroleum based lubricants are not to be used and oil traps must be installed on compressed air lines. Drilling techniques should also minimise compaction or smearing of the boreholes wells and transport of material into different zones, in particular, when drilling through potentially contaminated material to access groundwater.

Drill cuttings accumulated over a hole are to be removed as drilling progresses so as to prevent fallback of cuttings into the hole. Samples may be collected at a range of depths in the borehole profile during drilling.

The depth of groundwater well depends of the purpose of the investigation on the soil profile and the regional geology of the area. If the borehole location is covered by concrete, coring of the superficial hard layer is undertaken first.

Petroleum based lubricants are not used on drilling and sampling equipment, instead, Teflon based greases are used where appropriate. An Aargus environmental scientist/engineer monitors and records drilling activities, procedures adopted, materials used, progress of the stages of well construction (including (i.e. screen location - standpipe lens, placement, of sand filters and well seals, and general completion details), as well as the lithology of the subsurface, visible staining, unusual odours and colours (if any).

The use of a rotary air hammer rig has many advantages for consolidated material (e.g. rock), including:

- Large diameter to allow precise placement of groundwater monitoring equipment;
- No injection of drilling fluids into the formation with resulting benefits in ensuring integrity of recovered samples, and therefore no need to dispose 0ff-site drilling fluids;
- Rapid penetration in consolidated material; and
- Provision of reliable indications of saturated conditions whilst drilling.

Drill cuttings accumulated over a hole are removed as drilling progresses so as to prevent fallback of cuttings into the hole. Samples are taken at a range of depths in the borehole profile.

Construction of the monitoring well may be carried out by the Aargus environmental scientist/engineer or the drilling contractor under the direct supervision of the Aargus environmental scientist/engineer. Typically on completion of drilling, slotted heavy duty PVC pipe (generally 50mm in diameter for the installation of monitoring well) is inserted into the drilled hole. The base of the pipe is capped prior to insertion in order to prevent natural soils entering the well from below. The drilled area surrounding the pipe screen is filled with coarse-grained sand. Bentonite or cement grout seal plugs may be placed above the screen depending on the hydrogeological setting of the site and sand cement mix. Excess drill cuttings are disposed of in accordance with environmental best practice.

The Aargus environmental scientist/engineer will monitor and record drilling activities, and materials encountered during drilling (including visible staining, unusual odours and colours (if any)). They will log the procedures adopted, materials used, and well construction (i.e. location of the screen, placement of sand packs and well seals and general completion details).

3.3 Development of monitoring wells

Development is the process of removing fine sand silt and clay from the aquifer around the well screen in order to maximise the hydraulic connection between the bore and the formation.

Development involves removal of fluids that may have been introduced during drilling operations as well as fines from the sand filter and screens. Well development generally involves actively agitating the water column in the well then pumping water out until, ideally, water pumped comes out visibly clean and of constant quality. Development can be undertaken immediately after installation of the groundwater well or after sufficient time has been allowed for bentonite / grout seals to consolidate.

Bores used for groundwater quality monitoring should be developed after drilling, then left for a period until bore chemistry can be demonstrated to have stabilised, any where between 24 hours and 7 days.

3.4 Purging of monitoring well

In most groundwater monitoring wells, there is a column of stagnant water above the screen that remains standing in the bore between sampling rounds. Stagnant water is generally not representative of formation water because it is in contact with bore construction materials for extended periods, is in direct contact with the atmosphere and is subject to different chemical equilibria.

Purging is the process of removing this water from the well prior to sampling. In newly installed wells, the disturbance cause by drilling may also affect water present in the well, and purging may be carried out concurrently with well development. Ideally wells should be purged at the lowest rate practicable until stable water chemistry is achieved.

Purging is to be performed less than 24 hours before sample collection, but usually it is performed just before sampling. The default procedure for purging a groundwater monitoring well is as follows:

- If required, measure the concentration of volatile organic vapours in the well standpipe headspace.
- Measure the depth to the standing water level in the well standpipe and the total depth of the well relative to a reference mark (generally the top of the groundwater pipe). The depth of any light non-aqueous phase liquids (LNAPL) floating on the standing water should be recorded if present using an interface probe or other suitable device.
- Calculate the volume of the groundwater in the well standpipe. The internal diameter of the well casing and the diameter of the drill hole are used to calculate the volume of water to be removed during development (nominally a minimum of three well volumes, including water present in the sand pack, should be abstracted during purging).
- Samples of water are collected generally following development/purging of each well volume. The samples are measured immediately in the field for water quality parameters, pH, electrical conductivity, redox potential and temperature. Water quality measurement probes are to be calibrated against stock standards on regular basis and decontaminated between wells.
- Pump/bail groundwater from the well until the water quality parameters have stabilised (i.e. within 10% of the previous reading) or the well is pumped/bailed dry. Collect all purged water into an appropriate volume measurement vessel. Purged water is disposed of appropriately.
- Record all appropriate development details on the well development and sampling sheet.
- Decontaminate all equipment used in the purging procedure.

3.5 Groundwater sampling

For each sampling event, starting water levels, purging times and volumes, water quality parameters and sample details are recorded on well development and sampling sheets.

At each groundwater monitoring well, a polyethylene sheet or Eski lid is placed beside the well head and firmly fixed into position. Sampling equipment is placed onto the sheet to avoid cross contamination between the ground surface and the groundwater in the well.

Groundwater samples are collected in a bailer (Stainless Steel or disposable polymer) fitted with a stainless steel emptying device. The bailer is decontaminated prior to use. All groundwater samples are retrieved at an appropriate rate in order for turbulence (which leads to cloudy samples) to be minimised.

When collecting a water sample the bailer is lowered gently into the well, until it is within the screened interval. The bailer is then steadily withdrawn, to minimise agitation of water in the well and disturbance of the surrounding sand filter material.

The procedure for using the bailer is:

- Slowly lower the bailer into the water and allow it to sink and fill with a minimum of disturbance;
- Empty the first bailer sample into a container in order to measure the volume of bailed water and to rinse the bailer with well water;
- Emptying the bailer through the bottom-emptying device (BED) collects the samples. The sample is discharged down the side of the sample bottle to minimise entry turbulence;
- Collect samples for volatile organics first, followed by semi-volatiles, other organics and then inorganics;
- The flow from the BED is adjusted so that a relatively low flow rate is maintained.

3.6 Low flow purging

Purging large volumes of water can be impractical, hazardous or may adversely affect the contaminant distribution in the sub-surface (e.g. through dilution). Low-flow purging involves minimal disturbance of the water column and aquifer ad is preferable to the removal of a number of bore volumes. This method removes only small volumes of water, typically at rates of 0.1 to 1.0L/min, at a discrete depth within the bore.

Low-flow purging consists essentially of the following steps:

- The pump inlet is carefully and slowly placed in the middle or slightly above the middle of the screened interval at the point where the contaminant concentration is required (dedicated pumps are ideal for low-flow sampling). Placement of the pump inlet too close to the bottom of the bore can cause increased entrainment of solids, which have collected in the bore over time.
- Purging begins, typically at a rate of 0.1 to 1.0L/min, although higher rates may be possible provident the rate of purging does not cause significant draw down in the bore.

- During purging, groundwater stabilisation parameters should be measured and recorded to determine when they stabilise.
- When parameters have stabilised, the sample may be collected, at a rate slower or equal to purge rate.

3.7 Field measurements

Field measurement of groundwater parameters provides a rapid means of assessing certain aspects of water quality. They are generally taken to:

- Ensure that formation water is being sampled
- Provide on-site measurements for water quality parameters that are sensitive to sampling and may change rapidly (e.g. temperature, pH, redox and dissolved oxygen (DO)).
- Compare with laboratory measurements of these parameters to assist in the interpretation of analytical results of other parameters (e.g. check for chemical changes due to holding time, preservation and transport).

Field measurements may be taken either in-situ or after groundwater has been extracted from a bore. Field measurements should be taken immediately before collecting each sample.

pH and dissolved oxygen meters need to be calibrated before every use, in accordance with the manufacturer’s instructions. If field meters are to be used over several hours, periodic readings of a reference solution must be made to ensure calibration is stable.

3.8 Labelling of water samples

The water samples are identified with the same information than soil samples. GW4/2 is the sample collected from well GW4, and 2 refers to the sample number from this well, i.e. second time the well is sampled.

3.9 Sampling containers

Water samples are generally collected in bottles and containers provided by the laboratory who will analyse the samples. These are generally plastic bottles for inorganic analysis, and amber glass bottles for organic analysis. Vials are used to collect samples to be analysed for volatile organics. Sampling containers have appropriate preservatives added.

The bottles are filled to overflowing so as to remove air bubbles as much as possible prior to firmly screwing on the container cap. When performing purge and trap analyses, the vials are filled to 100% of their capacity. For headspace analyses, the vials are filled to approximately 75% of their capacity.

3.10 Well surveying

If the survey for location and elevation of a groundwater well is required, it should be done by a licensed surveyor, or alternatively by an Aargus environmental engineer / scientist if the level of precision required can be obtained by the use of Aargus field equipment.

If the location is given by a licensed surveyor, it is generally given to the nearest 0.1m and referenced to the Australian Map Grid (AMG) coordinates.

If the elevation is given by a licensed surveyor, the top of the standpipe and the ground surface adjacent to the standpipe are generally given to the nearest 0.01m and may be referenced to the Australian Height Datum (AHD). Relative levels (RLs) can be used if general contours are required.

4.0 SURFACE WATERS AND STORMWATER SAMPLING

4.1 Surface waters

Surface water samples are collected by hand, using automatic samplers, batch samplers or continuous samplers which can be installed to take samples at discrete time intervals or continuously. For well mixed surface water samples (up to 1m depth) a sample bottle is immersed by hand covered by a glove below the surface. Samples are also taken with sample poles that have extension arms so that more representative samples can be taken. For areas where access is difficult, samples can be collected using a retractable sample extension pole (sample bottle on the end) or in a bucket and transferred to sample bottles immediately following collection. Other methods such as pumping systems, depth samplers, automatic samplers, and integrating systems are all relatively similar with water samples being supplied to a discharge point where samples can be collected in appropriate bottles.

4.2 Stormwater

The monitoring of stormwater quality is generally required prior to reject waters into stormwater drains. Field measurements are generally carried out using a Hanna Multiprobe prior to the discharge of the water to stormwater. The water parameters measured include pH, electrical conductivity (EC, in mS/cm) and Total Dissolved Solids (TDS).

If sampling is required, samples to be analysed for inorganic compounds are collected in plastic bottles, and samples to be analysed for organic compounds are collected in amber glass bottles. The bottles are filled to overflowing so as to remove air bubbles as much as possible prior to firmly screwing on the container cap. Sample containers may have preservatives added, in accordance with the laboratory recommendations.

Vials are used for volatile organic analysis. When performing purge and trap analysis, the vials should be filled to 100% of their capacity, whereas for headspace measurements, the vials should be filled to approximately 75% of their capacity..

4.3 Filtration devices

Water filtration devices may be required to filter surface water before it is discharged to the stormwater network, in order to remove suspended solids in water. One of the most simple and commonly used filtration device consists of between two to four retention sedimentation bays with a geotextile covering the inlet and outlet hoses.

Litter traps (wire or plastic grids or netting) may also be used to remove larger particles or debris. Other techniques to reduce the amount of suspended matter in water include wet basins, artificial wetlands, infiltration trenches and basins, sand filters and porous pavements. Some of these latter methods are also likely to reduce the bacterial levels in water.

The use of these filtration devices does not preclude carrying out monitoring of water quality following treatment and prior to discharge, particularly to the stormwater system.

5.0 PHOTO IONISATION DETECTOR (PID)

Photo Ionisation Detector (PID) measurements are used to provide indicative field measurements of the amount of ionisable vapours released from a soil or water sample into the head space above the sample.

The procedure for field screening of samples using the PID is as follows:

- Prior to testing commencing, the PID is calibrated using standard laboratory calibration gas. The battery of the PID should also be sufficiently charged for the duration of the testing;

- The background concentrations of total ionisable compounds in the ambient air in the vicinity of the work area are established prior to the commencement of site activities. Background measurements are normally taken approximately 5 to 10m upwind of the work area. The readings are observed before and after each measurement of a sample to ensure that the PID is operating correctly. The maximums, fluctuations and other relevant comments are recorded.

- A glass sample jar is filled with the soil sample to be tested. The jar should not be filled more than 3/4 full;
- The jar is sealed with aluminium foil or plastic wrap and the lid is screwed;
- At least 20 minutes after placing the sample into the sampling jar, check that the PID reading is constant and similar to the background. Insert the top of the PID through the foil or plastic wrap in order to measure the ionisable vapour concentrations in the airspace above the sample;
- Monitor and record the PID readings noting fluctuations and maximum readings;
- Monitor the readings after returning the PID to a location with background concentrations. Interchangeable, clean, in-line filters for the PID probe are available to allow rapid decontamination of the unit in the field if background readings measured by the instrument are significantly greater than the background air concentration initially established;
- If perforations are present in the aluminium foil prior to analysis reseal the jar and test after having waited again for at least 20minutes.

An alternative acceptable method is to place the soil to be tested in a disposable zip loc plastic bag and test the sample by punching a hole in the bag with the PID tube to sample the gas from the bag.

6.0 ACID SULFATE SOILS

6.1 Desktop Classification

An initial review of Acid Sulphate Soils (ASS) Planning Maps is undertaken to identify the likelihood and risk of ASS being present at the site. The following geomorphic conditions of the site are also checked as an indication of the presence of ASS: sediments of recent geological age (Holocene) ~ 6000 to 10 000 years old; soil horizons less than 5m AHD (Australian Height Datum); marine or estuarine sediments and tidal lakes; coastal wetlands or back swamp areas; waterlogged or scalded areas; inter-dune swales or coastal sand dunes; areas where the dominant vegetation is mangroves, reeds, rushes and other swamp tolerant and marine vegetation; areas identified in geological descriptions or in maps bearing sulfide minerals, coal deposits or former marine shales/sediments; and deeper older estuarine sediments >10m below the ground surface.

6.2 Site Walkover

The presence on site of hydrogen sulphide odours, acid scalds, flocculated iron, monosulfidic sludges, salt crusts, stressed vegetation, corrosion of concrete and/or steel structures and water logged soils are noted as cues for the presence of ASS.

6.3 Visual Classification

Visual indicators taken into account for the presence of ASS are the presence of jarosite (pale yellow colour) horizons or mottling, unripe muds (waterlogged, soft, blue grey or dark greenish grey in colour), silty sands and sands (mid to dark grey in colour) and the presence of shells.

6.4 Sample Collection

Samples are collected to at least one metre below the depth of the proposed excavation or estimated drop in the water table, or two metres below ground level, whichever is deepest. Samples are collected from every soil horizon or every 0.25m. Large shells, stones and fragments of wood, charcoal and other matter are noted, but removed from the sample. Small roots are not removed from the sample. If laboratory analysis is required, samples are sent for laboratory testing within 24 hours of sampling.

6.5 Field Testing

The field pH peroxide test (pH_{FOX}) is used to obtain an indication of the presence of oxidisable sulphur in the soil. The procedure for this test is as follows:

- A small sample of soil (<100g) is collected in a glass jar and split into two sub-samples. One sub-sample is made into a 1:5 (soil : deionised water) solution in order to measure field soil pH and electrical conductivity (EC) analysis. If the resulting pH is less than 4 ($pH_F<4$), the sample is identified as actual acid sulphate soil (AASS)

- The second sub-sample is made into a 1:5 (soil : Hydrogen Peroxide) solution to measure pH of oxidised soil. Sodium Hydroxide (NaOH)-adjusted analytical (30%) grade Hydrogen Peroxide (H_2O_2) is used as the soil oxidising agent. A mobile electronic pH/EC probe is used to measure soil pH.

- The presence of oxidisable sulphides, organic matter or manganese in the sample, will trigger a chemical reaction. The type of effervescence and any colour change is noted with the final pH measured to give an indication of the potential change in pH should the soil remain exposed to oxygen. If the resulting pH is less than 3 ($pH_{FOX}<3$) or if pH_{FOX} is at least one unit less than the $pH_{F,}$ this suggests that the soil tested is potential acid sulfate soil (PASS).

6.6 Laboratory Testing

When the field test suggests that the material tested contains ASS or PASS, this should be confirmed by laboratory analysis (POCAS/SPOCAS or TOS testing).

7.0 NOISE MONITORING

Measurements are taken at a range of times during the day in order to assess the trends in noise emission over time. Noise is measured using a hand-held Rion NA-29 Sound Level Meter with digital microphone. Some noise meters change and appropriate equioment which is calibrated is used for all monitoring. The reference level of the meter is checked before and after the measurements using a Rion NC-73 Sound Level Calibrator to ensure there is no significant drift. Noise measurements are made over a 15-minute interval using the “fast” response of the sound level meter. 5dB would be added if the noise is substantially tonal or impulsive in character. Measurements should be adapted to the type of noise being measured i.e. construction, occupation, club, etc.

8.0 DUST MONITORING

Sampling is conducted at locations of potential concern. The deposit gauge static sampler contains a glass funnel measuring approximately 150mm with the angle of the cones sides being 60 degrees, placed into a rubber stoppers in the mouth of a five-litre glass receptacle. The deposit gauge is placed in a stand so that the height of the funnel of the deposit gauge is between 1.8 and 2.2m above ground level. A quantity of 7.8g copper sulfate pentahydrate dissolved in water is placed in the glass receptacle in order to prevent algal growth.

Exposure periods vary depending on the purpose of the investigation but typically the period is 30 ±2 days. Samples are usually analysed for measured soils: total solids, insoluble solids, ash and combustible solids.

Dust can also be measured using a High Volume Air Sampler. Such sampler should be located at least 2 metre away from any structures so that an undisturbed sample can be collected. HVASs can be used indoors or outdoors.

9.0 QUALITY ASSURANCE/QUALITY CONTROL (QA/QC)

9.1 Introduction

Inaccuracies in sampling and analytical programs can result from many causes, including collection of unrepresentative samples, unanticipated interferences between elements during laboratory analyses, equipment malfunctions and operator error. Inappropriate sampling, preservation, handling, storage and analytical techniques can also reduce the precision and accuracy of results.

The Australian Standard AS4482.1-2005 *Guide to the Sampling and Investigation of Potentially Contaminated Soil, Part 1: Non-Volatile and Semi-Volatile Compounds* has documented procedures for quality assurance (QA) and quality control (QC) for sampling and analysis to ensure that the required degree of accuracy and precision is obtained. The Australian Standard also recommends the use of two laboratories for the implementation of a QA program for the analyses in addition to the QC procedures followed by the primary laboratory.

9.2 Field QAQC samples

General

Procedures for duplicate sampling should be identical to those used for routine sampling and duplicate samples will be despatched for analysis for the same parameters using the same methods as the routine samples. No homogenisation of samples which may induce the loss of volatile compounds (such as BTEX) should occur. Whenever possible, the selection of samples for duplicate analyses should be biased towards samples believed to contain the contaminant of concern.

Intra-laboratory duplicates

Intra-laboratory duplicate samples, also referred to as Blind duplicates, are used to assess the variation in analyte concentration between samples collected from the same sampling point and / or also the repeatability of the laboratory analyses. Samples are split in the field to form a primary sample and a QC duplicate (intra-laboratory replicate) sample. The intra-laboratory duplicates are taken from a larger than normal quantity of soil collected from the same sampling point, removed from the ground in a single action, and divided into two vessels. These samples are submitted to the laboratory as two individual samples without any indication to the laboratory that they have been duplicated.

Intra-laboratory duplicate samples should be collected at a rate of approximately 1 in 20 soil samples and analysed for the full suite of analytes. At least one intra-laboratory duplicate sample should be included in each batch of samples.

Inter-laboratory duplicates

Inter-laboratory duplicate samples, also referred to as Split duplicates, provide a check on the analytical proficiency of the laboratories. The samples are taken from a larger than normal quantity of soil collected from the same sampling point, removed from the ground in a single action, and divided into two vessels. One sample from each set is submitted to a different laboratory for analysis. The same analytes should be determined by both laboratories using the same analytical methods.

Inter-laboratory duplicates should be collected at a rate of approximately 1 in 20 soil samples and analysed for the full suite of analytes. At least one inter-laboratory duplicate sample should be included in each batch of samples.

Blanks

Rinsate Blanks

Rinsate blank samples provide information on the potential for cross-contamination of substances from the sampling equipment used. Rinsate blanks are collected where cross-contamination of samples is likely to impact on the validity of the sampling and assessment process (e.g. when the investigation level of a contaminant is close to the detection limit for this contaminant). They are prepared in the field using empty bottles and the distilled water used during the final rinse of sampling equipment. After completion of the decontamination process, fresh distilled water is poured over the sampling equipment and collected. The distilled water is exposed to the air for approximately the same time the sample would be exposed. The collected water is then transferred to an appropriate sample bottle and the proper preservative added, if required.

One rinsate blank par day and / or one per piece of sampling equipment are collected during the decontamination process, and analysed for the analytes of interest. At least one rinsate blank should be included in each batch of samples. One rinsate blank should be collected for every 50 samples collected and analysed for the full suite of analytes.

Trip Blanks / Spikes

Trip blanks / spikes are a check on the sample contamination originating or lost from sample transport, handling, and shipping. These are samples of soil or water prepared by the laboratory with a zero or known concentration of analytes.

Field Blanks

Field blanks are a check on sample contamination originating from sample transport, handling, shipping, site conditions or sample containers. These are similar to trip blanks except the water is transferred to sample containers on site.

9.3 Laboratory quality assurance / quality control

The laboratories undertake the analyses utilising their own internal procedures and their test methods (for which they are NATA, or equivalent, accredited) and in accordance with their own quality assurance system which forms part of their accreditation.

Laboratory duplicate samples

Laboratory duplicate samples measure precision. These samples are taken from one sample submitted for analytical testing in a batch. The rate of duplicate analysis will be according to the requirements of the laboratory's accreditation but should be at least one per batch. Precision is reported as standard deviation SD or Relative Percent Difference %RPD, being:

$$\%RPD = \frac{(D1 - D2)}{(D1 + D2)} \times 200$$

where: D1: sample concentration and D2: duplicate sample concentration

Replicate data for precision is expected to be less than 30% RPD at concentration levels greater than ten times the EQL, or less than 50% RPD at concentration levels less than ten times the EQL. Sample results with a RPD exceeding 100% require specific discussion. Note that certain methods may allow for threshold limits outside of these limits.

Matrix Spiked Samples

Matrix spiked samples are used to monitor the performance of the analytical methods used, and to assess whether the sample matrix has an effect of on the extraction and analytical techniques. A sample is spiked by adding an aliquot of known concentration of the target analyte(s) to the sample matrix prior to sample extraction and analysis. These samples should be analysed at a rate of approximately 5% of all analyses, or at least one per batch. Matrix spikes are reported as a percent recovery %R, being:

$$\%R = \frac{(SSR-SR)}{SA} \times 100$$

where: SSR: spiked sample result, SR: sample result (blank) and SA: spike added

Recovery data for accuracy is described by control limits specified by the laboratory (generally ranging between 70% and 130%) and referenced to US EPA SW-846 method guidelines values.

Laboratory Blank

Laboratory blanks are used to correct for possible contamination resulting from the preparation or processing of the samples. These are usually an organic or aqueous solution that is as free as possible of analyte and contains all the reagents in the same volume as used in the processing of the samples. Laboratory blanks must be carried through the complete sample preparation procedure and contain the same reagent concentrations in the final solution as in the sample solution used for analysis. Laboratory blanks should be analysed at a rate of once per process batch, and typically at a rate of 5% of all analyses.

Laboratory Control Samples

Laboratory Control Samples, also referred to as Quality Control Check Samples, are used to assess the repeatability and long term accuracy of the laboratory analysis. These are externally prepared and supplied reference material containing representative analytes under investigation. Recovery check portions should be fortified at concentrations that are easily quantified but within the range of concentrations expected for real samples. Laboratory Control samples should be analysed at a rate of one per process batch, and typically at a rate of 5% of analyses. Laboratory control samples are reported as a percent recovery %R, being:

$$\%R = \frac{(SSR-SR)}{SA} \times 100$$

where: SSR: spiked sample result, SR: sample result (blank) and SA: spike added

Recovery data for accuracy is described by control limits specified by the laboratory and referenced to US EPA SW-846 method guidelines values. Ideally, all calculated recovery values should be within the acceptable limits. However, in the event that control limit outliers are reported, professional judgement is used to assess the extent to which such results may affect the overall usability of data.

Surrogates

Surrogates are used to provide a means of checking, for every analysis, that no gross errors have occurred at any stage of the procedure leading to significant analyte losses. Surrogate are quality control monitoring spikes, which are added to all fields and QAQC samples at the beginning of the sample extraction process in the laboratory. Surrogates are closely related to the sample analytes being measured (particularly with regard to extraction, recovery through cleanup procedures and response to chromatography) and are not normally found in the natural environment.

Surrogate spikes will not interfere with quantification of any analytes of interest and may be separately and independently quantified by virtue of, for example, chromatographic separation or production of different mass ions in a GC/MS system. Surrogates are measured as Percent Recovery %R expressed as:

$$\%R = \frac{(SSR)}{SA} \times 100$$

where: SSR: spiked sample result and SA: spike added

Recovery data for accuracy is described by control limits specified by the laboratory and referenced to US EPA SW-846 method guidelines values.

10.0 DATA QUALITY OBJECTIVES

10.1 General

Data Quality Objectives (DQOs) are defined to ensure that the data is sufficiently accurate and precise to be used for the purpose of the environmental works. DQOs are defined for a number of areas including:

- sampling methods;
- decontamination procedures;
- sample storage (including nature of the containers) and preservation;
- laboratory analysis, including PQL, recoveries (surrogates, spikes), duplicates;
- preparation of CoC forms;
- document and data completeness; and
- data comparability.

The NSW DEC Contaminated Sites Guidelines for the NSW Site Auditor Scheme (2nd Ed) 2006 also provide a seven step process for Data Quality Objectives (DQOs). These are as follows:

- State the problem

- Identify the decisions
- Identify inputs to the decision
- Define the study boundaries
- Develop a decision rule
- Specify limits on decision errors
- Optimise the design for obtaining data

DQOs must be adopted for all assessments and remediation programmes. The DQO process must be commenced before any investigative works begin on a project.

10.2 Field DQOs

The DQOs for sampling methods, decontamination procedures, sample storage (including nature of the containers) and preservation, preparation of CoC forms, and document and data completeness are the Aargus protocols which have been described in the previous sections of this document.

10.3 Assessment of RPD values for field duplicate samples

The criteria used to assess RPD values for field duplicate samples is based on discussion reported in AS4482.1 1997, a summary of which is presented below:

Table 1: RPD acceptance criteria

Sample type	Typical acceptable RPD
Intra-laboratory duplicate (blind duplicate)	30-50°% (*)
Inter-laboratory duplicate (split duplicate)	30-50% (*)

It is noted that other factors such as sampling technique, sample variability, absolute concentration relative to criteria and laboratory performance should also be considered when evaluating RPD values.

The Australian Standard also states that the variation can be expected to be higher for organic analytes than for inorganics, and for low concentrations of analytes (lower than five times the detection limit). Based on Aargus Pty Ltd experience, RPD up to 70% are considered to be acceptable for organic species. RPD of 100% or more are generally considered to demonstrate poor correlation and should be discussed.

10.4 Laboratory Data Quality Objectives (DQO)

General

Labmark is the Aargus-preferred laboratory for the analysis of primary samples. Labmark is accredited by the National Association of Testing Authorities (NATA).

The laboratory generally used by Aargus for analysing inter-duplicate samples is SGS.

Analytical methods including detection limits are provided on each laboratory report and are checked as part of the data review process.

Laboratory QA/QC

Specific to Labmark, standard QA/QC data includes LCS, MB, CRM (CRM metals only), Laboratory Duplicate (1 in first 5-10 samples, then every tenth sample) and Spike sample (1 in first 5-20 samples, then every 20th sample), and surrogate recovery's (target organics). All QA/QC is reviewed by a senior chemist prior to customer release and includes a DQO comment on final report. Additional QA/QC maybe performed on batches less than 10 samples; however additional charges shall apply at the appropriate analytical rate/sample.

Laboratory analyses DQOs

The following table summarises Labmark laboratory analyses DQOs.

Table 2: Labmark Data Quality Objectives (DQOs)

Laboratory QA/QC Testing	Laboratory QA/QC Acceptance Criteria
Method Blanks	For all inorganic analytes the Method Blanks must be less than the LOR. For organics Method Blanks must contain levels less than or equal to LOR.
Surrogate Spikes	At least two of three routine level soil sample Surrogate Spike recoveries are to be within 70-130% where control charts have not been developed and within the estimated control limited for charted surrogates. Matrix effects may void this as an acceptance criteria. Any recoveries outside these limits will have comment. Water sample Surrogates Spike recoveries are to within 40-130%. The presence of emulsions, surfactants and particulates may void this as an acceptance criteria. Any recoveries outside these limits will have comment.
Matrix Spikes	Sample Matrix Spike duplicate recovery RPD to be <30%. In the event that the matrix spike has been applied to samples whose matrix or contamination is problematic to the method then these acceptance criteria apply to the Control Matrix Spike.

Laboratory QA/QC Testing	**Laboratory QA/QC Acceptance Criteria**
Laboratory Control Samples	Control standards must be 80-120% of the accepted value. Control standard recoveries are to be within established control limits or as a default 60-140% unless compound specific limits apply.
Laboratory Duplicate Samples	For Inorganics laboratory duplicates RPD to be <15%. For Organics Laboratory duplicates must have a RPD <30%.
Calibration of Chromatography Equipment	The calibration check standards must be within +/-15%. The calibration check blanks must be less than the LOR.

Non-compliances

Exceedances of QAQC results outside the DQO should be thoroughly investigated and discussed with the laboratories concerned, and the outcomes of these investigations should be recorded in the project files.

11.0 USE AND CALCULATION OF THE 95% UCL FOR SITE VALIDATION PURPOSE

Validation of a site at the completion of remediation works should comply with the recommendations of the applicable guidelines. For a site to be considered uncontaminated or successfully remediated, the typical minimum requirement is that the 95% upper confidence limit (UCL) of the arithmetic average concentration of the contaminant(s) is less than an acceptable limit, eg the threshold value of an health-based investigation level.

The calculation of the 95% UCL of the arithmetic average concentration method requires that the probable average concentration and standard deviation of the contaminant be known. This method is most applicable for validation sampling, where the mean concentration and the standard deviation can be estimated from sampling results. The 95% UCL is calculated as follows:

$$\mathbf{95\%\ UCL = mean + t_{\propto,n-1}\ \frac{\mathit{STDEV}}{\sqrt{n}}}$$

where

mean	arithmetic average of all sample measurements
$t_{\propto,n-1}$	A test statistic (Student's t at an $\propto$ level of significance and n-1 degrees of freedom)

$\propto$	The probability (in that case chosen to be 0.05) that the 'true' average concentration of the sampling area might exceed the UCL average determined by the above equation
STDEV	Standard deviation of the sample measurements
n	number of samples measurements

12.0 COPYRIGHT

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13.0 ABBREVIATIONS

ANZECC	Australian and New Zealand Environment and Conservation Council
ASS	Acid Sulfate Soil
BGL	Below Ground Level
BTEX	Benzene, Toluene, Ethyl benzene and Xylene
CoC	Chain of Custody
DEC	Department of Conservation (formerly EPA)
DIPNR	Department of Infrastructure Planning and Natural Resources
DQO	Data Quality Objective
EIL	Ecological Investigation Level
EPA	Environment Protection Authority
ESA	Environmental Site Assessment
HIL	Health-Based Soil Investigation Level
LGA	Local Government Area
NEHF	National Environmental Health Forum
NEPC	National Environmental Protection Council
NEPM	National Environmental Protection Measure
NHMRC	National Health and Medical Research Council
NSL	No Set Limit
OCP/OPP	Organochlorine Pesticides /Organophosphate Pesticides
PAH	Polycyclic Aromatic Hydrocarbon
PASS	Potential Acid Sulfate Soil
PCB	Polychlorinated Biphenyl
PID	Photo Ionisation Detector
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance, Quality Control
RAC	Remediation Acceptance Criteria
RAP	Remediation Action Plan
RPD	Relative Percentage Difference
SAC	Site Assessment Criteria
SVC	Site Validation Criteria
SWL	Standing Water Level
TCLP	Toxicity Characteristics Leaching Procedure
TESA	Targeted Environmental Site Assessment
TPH	Total Petroleum Hydrocarbons
UCL	Upper Confidence Limit
VHC	Volatile Halogenated Compounds
VOC	Volatile Organic Compounds

14.0 REFERENCES

- ANZECC (1992) – *Australian and New Zealand Guidelines for the Assessment and Management of Contaminated Sites.*
- ANZECC (1996) – *Drinking Water Guidelines.*
- ANZECC (2000) – *Guidelines for Fresh and Marine Waters.*
- Land and Biodiversity committee (2003) – *Minimum Construction requirements for water bores in Australia.*
- National Environment Protection Council (NEPC) (1999) – *National Environmental Protection (Assessment of Site Contamination) Measure.*
- Netherlands Ministry of Spatial Planning, Housing and the Environment (1994 rev. 2000) – *Environmental Quality Objectives in the Netherlands.*
- New South Wales Environment Protection Authority (1994) – *Guidelines for Assessing Service Station Sites.*
- New South Wales Environment Protection Authority (1995) – *Sampling Design Guidelines.*
- New South Wales Environment Protection Authority (1997) – *Guidelines for Consultants Reporting on Contaminated Sites.*
- New South Wales Environment Protection Authority (1998) – *Guidelines for the NSW Site Auditor Scheme.*
- New South Wales Department of Environment & Conservation (2006) – *Guidelines for the NSW Site Auditor Scheme (2nd Ed).*
- New South Wales Environment Protection Authority (1999) – *Guidelines on Significant Risk of Harm from contaminated land and the duty to report.*
- New South Wales Environment Protection Authority (1999) – *Environmental Guidelines: Assessment, Classification & Management of Liquid & Non-liquid Wastes.*
- New South Wales Environment Protection Authority (2005) – *Guidelines for assessing former orchards and market gardens.*
- QLD Department of Environment (DoE) (1998) – *Draft Guidelines for the Assessment & Management of Contaminated Land in Queensland.*
- QLD EPA – Waste Management Branch, Contaminated Land Section – *Details about investigation thresholds and sampling – sent to Aargus on 14 Nov 2000.*
- Standards Australia AS1726-1993 (1993) – *Geotechnical Site Investigations.*
- Standards Australia AS4482.1-1997 (1997) – *Guide to the Sampling and Investigation of Potentially Contaminated Soil, Part 1: Non-Volatile and Semi-Volatile Compounds.*
- Standards Australia AS5667.11-1998 (1998) – *Water Quality Sampling: Guidance on the Sampling of Groundwaters.*
- Victorian EPA (2000) – *Groundwater Sampling Guidelines*

APPENDIX I

RESUMES OF CLIENT TEAM

MARK KELLY

DATE OF BIRTH	25th October 1975
EDUCATIONAL QUALIFICATIONS	BAppSc (Geology) (Hons) University of New South Wales, Sydney, Australia Majoring in Soil and Groundwater Resources and Remediation
ADDITIONAL COURSES	Groundwater Hydrology Hydrogeochemistry Analysis and Interpretation of Hydrogeochemical Data Physical Aspects of Contaminated Groundwater Interpretation of Aeromagnetics Structural Interpretation and Analysis
PROFESSIONAL MEMBERSHIP	Geological Society of Australia (GSA)
PROFESSIONAL LICENCES	Senior First Aid Certificate (2006) X-ray Fluorescence (XRF) Metal Detector Operation License (EPA License No 24430) Energy Australia Passport (Service No. 7728)
PROFESSIONAL TRAINING	Asbestos Removal Course (TAFE NSW) XRF Training Course Energy Australia inductions, electrical safety rules, environmental training, safety training, first aid training, CPR training, low voltage release and rescue training and courses, substation entry & safely working near live power cables in EA network courses
FIELDS OF SPECIAL COMPETENCY	**Contaminated Land Assessment and Site Remediation –** management, technical advice, planning, data evaluation, coordinating and supervision of environmental/contaminated site assessments including preliminary and detailed assessments, contaminated site remediation and validation with particular reference to soil, water and groundwater. Acid sulphate soils, salinity and hazardous materials assessments.

EXPERIENCE:

2007 – Present	Senior Environmental Geologist – Aargus Pty Ltd
2006 - 2007	Senior Environmental Geologist – Geotechnique Pty Ltd
1999 – 2006	Environmental Geologist – Geotechnique Pty Ltd

PRACTICAL EXPERIENCE (Office)

- Project management, scheduling laboratory chemical analysis, data evaluation and reporting on environmental/contaminated site investigations including preliminary, detailed assessments, remediation and validation
- Preparation of waste classification, including biosolids from sewage treatment plants
- Salinity Assessments
- Preparation of proposals
- Occupational Health & Safety Issues
- Environmental Management Plans
- Coordinating and corresponding with Principal/Senior Environmental Engineers, Environmental Engineers, field staff, management, clients and contractors
- Liaising and negotiating with relevant government departments, statutory authorities
- Basic Turbocad skills

PRACTICAL EXPERIENCE (Field)

- Site inspections
- Soil and water sampling
- Installation of groundwater monitoring wells
- Assessing the contamination status of land/water
- Site remediation and validation
- Site management including remediation, asbestos removal
- PID calibration and use
- Hazardous material assessment
- Salinity indicators
- Service station works including underground storage tank removal
- Gas monitoring

SITES

Investigations have been carried out on a number of sites across the Sydney Metropolitan area, the greater Sydney area, rural NSW and interstate. The types of sites assessed include:

- Rural residential properties including active and former agricultural (market gardens, orchards, nursery, poultry) lands, farming lands, vacant lands etc
- Residential Properties including residential, townhouse and units
- Commercial / Industrial including activities such as tanneries, printing, tyre storage and manufacture, paint storage and manufacture, metal works, foundries, wheat processing and storage, scrap metal yards, metal recyclers etc

- Service Station Sites including small scale operations to larger sites operated by BP, Caltex etc.
- Schools including pre-development, re-development, refurbishing, hazardous materials assessment.
- Childcare Facilities
- Energy Australia facilities including active sites and decommissioning of sites.
- Sewage Treatment Plants including the assessment of biosolids, installation works and initialization of site management plans and inspections.

PROJECT EXPERTISE

Air Quality Monitoring – Levels of volatile gases were monitored to determine Occupational Health and Safety (OH&S) compliance within an enclosed work environment.

Acid Sulphate Soil Assessment – Development areas within potential Acid Sulphate Soil regions were assessed to determine the presence, absence or extent of Acid Sulphate Soils. Duties included site surveys, soil sampling, chemical testing of soils, preparation of borehole logs, liaising with clients and regulatory authorities and report generation.

Asbestos Monitoring – Dust emissions from the demolition of a building and excavation of soil with known asbestos contamination were monitored in order to measure effects on the neighbouring properties. Duties included the use of technical equipment, liaising with site personnel, analysis of data and report generation.

Asbestos Removal – Work involved monitoring the removal and delineating the extent of contamination of bonded asbestos waste from an excavation site.

Buried Chicken Carcass Removal – Work involved monitoring the removal and delineating the extent of buried of chicken carcasses within an existing poultry farm.

Classification of Excavation Material, NSW – Involvement in classifying excavated material from development sites for removal to an appropriate landfill or assessing suitability for use within a proposed development. Duties included liaising with site personnel / contractors, soil sampling and descriptions, QA/QC and report generation.

Dilapidation Assessment –The assessment entailed a site visit and a written and photographic documentation of all structural cracks on walls, ceilings, pavements, grates and road surfaces in the vicinity of the site. The purpose is to establish the pre-existing condition of the buildings so that any claim made for defects that occur during or after construction can be validated. Duties included liaising with site personnel / contractors, site inspection and report generation.

Due Diligence Reports – Carried out in relation to property acquisition and due diligence. Duties varied from report reviews, comments, costing, desktop studies, sampling and assessment, and reporting.

Dust Monitoring – Dust emissions from construction sites were collected over a period of time in order to assess the specific amount of particulate matter escaping the construction area onto neighbouring properties.

Effluent Disposal – Work was undertaken to assess the suitability of soil material for the construction of an effluent treatment and disposal system. Duties included soil sampling, preparation of borehole logs, calculation of permeability and flow rates and report generation.

Environmental Management Plans – Preparation of how the earthworks program are to be undertaken during the development works, the environmental procedures to be followed during operation and includes an Occupation Health & Safety (OH&S) plan.

Ground Water Well Monitoring – Work involved instructing contractors on where to drill monitoring wells, construction and interpretation of survey data of the wells, measurements of groundwater levels, measurement of the rate of groundwater infiltration, sampling of groundwater, QA/QC, determining groundwater flow direction and report generation

Hazardous Materials Assessment – Structures proposed for demolition were surveyed for hazardous material such as asbestos, lead and other substances known to be harmful to human health and the environment. Duties included liaising with contractors and regulatory authorities, identification of hazardous materials, sampling of potential hazardous materials and report generation.

Lead Assessment – Buildings were surveyed for lead paint, dust and soils and assessed to determine if they were harmful to human health and the environment. Duties included liaising with government, regulatory authorities, identification of lead based materials, sampling of these materials and report generation.

Phase 1 Environmental Site Assessments (desktop) – Duties included historical searches, analysing aerial photographs, liaising with authorities (WorkCover, Council's, EPA etc), identification of potential contaminants and report generation.

Phase 2 Environmental Site Assessments – Duties included desktop study, liaising with clients, contractors and regulatory authorities, identification of potential contaminants, sampling and analysis design, soil and groundwater sampling, preparation of borehole logs, decontamination, QA/QC and report generation.

Remedial Action Plans – Options for the remediation of known contaminated sites were prepared in order to determine the most efficient methods of remediation. Duties included reviewing of previous environmental assessments, data analysis, design and costing of potential remedial options.

Remediation Validation – The collection of data to assess the efficacy of remediation works in decontaminating sites. Duties included liaising with clients, contractors and regulatory authorities, field sampling, QA/QC, data analysis and report generation.

Salinity Assessments – Duties included historical searches, analysing aerial photographs, liaising with authorities, identification of potential contaminants, sampling and analysis design, soil sampling, preparation of borehole logs, decontamination, QA/QC and report generation.

Sampling and Testing Plans – Preparation of sampling location, sampling density and testing program for ESA's and RemVal's that are sent to the Site Auditor for approval.

Site Audit Responses – replying to comments made by NSW Site Auditors on selected jobs to meet final requirements for a full clearance of a site after remedial works have taken place.

Site Based Management Plans – includes detailed management practices, and procedures for all identified environmental issues for every environmentally relevant activity (ERA) within the site. The plans provide the environmental procedures to be followed during operation and are to safeguard the way in which waste is managed.

Soil Vapour Survey – Soil vapours originating from beneath an apartment block development containing known contamination were monitored to assess the affects on human health. Duties included operation of technical equipment, sampling of soil vapours, QA/QC, analysis of data and report generation.

Targeted Environmental Site Assessments – Duties included historical searches, analysing aerial photographs, liaising with authorities, identification of potential contaminants, sampling and analysis design, soil and groundwater sampling, preparation of borehole logs, decontamination, QA/QC and report generation.

Underground Storage Tank Removal – Removal of underground storage tanks in order to satisfy regulatory requirements for the redevelopment of sites. Duties included historical searches, liaising with contractors and regulatory authorities, sampling and analysis design, soil and groundwater sampling, decontamination, QA/QC, data analysis and report generation.

MAJOR PROJECTS

- Auburn Hospital - Various soil classifications and leachate management for an EPA inert and solid licensed landfill.

- Australian Defence Industries site, St Marys – Former defence force lands. An extensive sampling program was managed and the results of soil analysis were reviewed with respect to human heath risk and potential ecological impact. Reports endorsed by accredited site auditor.

- Auburn Catholic Club - Sampling and soil classification of soils, followed by onsite management of the disposal of the soils to licensed landfills.

- Barter & Sons - Former poultry farm, scheduled for industrial / commercial development. Responsible for cost estimating, project management and co-ordination of site investigation works. Included a review of available site history, and contamination assessment of soils, targeting heavy metals, pesticides and asbestos. Remediation recommended landfill disposal (industrial and solid waste category).

- Brown Consulting (NSW) Group - Newbury Estate, Stanhope Gardens - Former market garden and grazing site developed for low density residential purposes. Responsible for cost estimating, project management and co-ordination of site investigation works, remediation and validation. Included review of site history information, contamination assessment of soils waters and sediment. Remediation recommendations included Landfill disposal and land farming. Reported on site investigations, remediation options (Remediation Action Plan), and validation. Reports endorsed by accredited site auditor.

- Columban Mission Institute, North Turramurra - Duties included desktop study, liaising with clients, contractors and regulatory authorities, identification of potential contaminants, sampling and analysis design, soil and groundwater sampling, preparation of borehole logs, decontamination, QA/QC and report generation.

- Cronulla Sewage Treatment Plant – Classification of biosolids for disposal off site to other land uses or to landfills.

- Deicorp Pty Ltd – Coulson Street, Erskineville – Former clothing factory and workshops with a UST to be redeveloped into a number of multi-storey residential apartment blocks. The collection of data to assess the efficacy of remediation works in decontaminating the site. Duties included liaising with clients, contractors and regulatory authorities, field sampling, QA/QC, data analysis and report generation. Reports endorsed by accredited site auditor.

- Department of Commerce – Assessment of a number of Department of Housing sites for potential hazardous materials within active housing commission units.

- Department of Housing – Lilyfield - Development of a residential area. Duties included desktop study, liaising with clients, contractors and regulatory authorities, identification of potential contaminants, sampling and analysis design, soil and groundwater sampling, preparation of borehole logs, decontamination, QA/QC and report generation.

- Department of Lands – Redfern - Development of a major residential area. Duties included desktop study, liaising with clients, contractors and regulatory authorities, identification of potential contaminants, sampling and analysis design, soil and groundwater sampling, preparation of borehole logs, decontamination, QA/QC and report generation.

- Duffy Kennedy Constructions – Cronulla – A former service station site. Sampling and soil classification of soils, followed by onsite management of the disposal of the soils to licensed landfills.

- EG Property Group / Funds Management –Port Adelaide, SA, Summer Hill and Five Dock, NSW –Active transport company, wheat production plant and silos, former bowling greens, former railway lines, land filling activities, land reclamation. Reports for due diligence and full environmental site assessments, duties included desktop study, liaising with clients, contractors and regulatory authorities, identification of potential contaminants, sampling and analysis design, soil and groundwater sampling, preparation of borehole logs, decontamination, QA/QC and report generation.

- Energy Australia Substations - Various soil classifications and leachate management for an EPA inert and solid licensed landfill.

- Event Project Management - Bundaleer Street, Belrose – An active nursery to be redeveloped as part of extension works to the Covenant Christian School. A Phase 1 and Phase 2 contaminated land investigation with recommendations for remediation techniques and costs.

- Exceland Property Group (NSW) Pty Ltd – The Castellorizian Club at Kingsford. Duties included historical searches, analysing aerial photographs, liaising with authorities (WorkCover, Council's, EPA etc), identification of potential contaminants and report generation.

- Glasson Family Group – Wolli Creek – A large development site comprising a number of industrial properties including factories, warehouses, car yards etc. Conducting sampling and reporting on ASS/PASS and potential management techniques during future development.

- Glenbrook Sewer Installation - Environmental Representative for sewer installation contracts in Glenbrook. Responsible for the preparation of Environmental Management Plans (EMP) and work method statements. Monitored the works undertaken by the contractor, ensuring adequate environmental safeguards are in place and maintained. Prepared inspection reports and EMP status reports for Sydney Water.

- Granville Boys High School – assessment of soils and supervision of remedial works within an existing playing field. Remedial works included removal of soils contaminated with asbestos to an EPA licensed landfill.

- Group Development Services – Carrying out full assessments, from Stage 1 to Stage 4, on numerous rural residential sites in north western Sydney.

- International Speedway, Granville – Assessment of an existing spectator mound for asbestos and other soils analytes and recommendations for capping on-site.

- IWD Pty Ltd - Lyons Road, Drummoyne – A former service station with numerous UST's. The assessment included tank and line tests, gross pollution review, soil sampling, groundwater sampling, historical review and final data interpretation. Remediation of contaminated soils after the tanks were removed, soil classification and final validating of site surfaces. Reports endorsed by accredited site auditor.

- JK Williams Contracting Pty Ltd - Various soil classifications and leachate management for an EPA inert and solid licensed landfill.

- John Morony Correctional Complex, Berkshire Park – assessment of soils and preparation of remedial costs prior to extension works to the existing prison.

- Landcom - Archbold Road, Eastern Creek and McIver Avenue, Middleton Grange – Former farming lands purchased by Landcom for residential subdivision, school developments, parklands and town centre (shopping facilities etc). Responsible for cost estimating, project management and co-ordination of site investigation works. Preparation of a preliminary RAP and recommendations in remediation techniques and costs.

- Liverpool City Council – Former park lands. Duties included historical searches, analysing aerial photographs, liaising with authorities (WorkCover, Council's, EPA etc), identification of potential contaminants and report generation.

- Mann Group - Various soil classifications and leachate management for an EPA inert and solid licensed landfill.

- Manson Group – Kogarah – Former glass factory with an UST. Preparation of a Remedial Action Plan (RAP), followed by remediation and validation of the site including project management, liaising with contractors and clients, sampling, soil classification and assessment, and final report generation.

- Narwee Boys High School – Preparation of a hazardous materials (HAZMAT) assessment. Analysis involved identifying asbestos materials from lagging, roofing guttering, floor tiles, electricity backing boards, mercury switches, mercury/cadmium lamps, synthetic mineral fibres, lead paint etc.

- Parramatta City Council - Sampling and soil classification of soils, followed by onsite management of the disposal of the soils to licensed landfills.

- Paynter Dixon Constructions Pty Ltd – Homebush – Teachers Credit Union site. Duties included historical searches, analysing aerial photographs, liaising with authorities (WorkCover, Council's, EPA etc), identification of potential contaminants and report generation.

- Penrith City Council - Claremont Meadows Stage 2 – South Western Precinct – Masterplan. Full environmental and salinity assessments were carried out to address the Claremont Meadows Stage 2 DCP - Performance Standards for which is currently under consideration by the Council for the Stage 1 Subdivision Plan of the properties provides for creation of residential allotments, dedication of a Public

Reserve, construction and dedication of new roads and creation of residue lots for future development.

- Proust & Gardner Consulting - Carrying out full assessments, from Stage 1 to Stage 4, on numerous rural residential and residential sites in both the local Sydney and Central Coast regions. Sites included vacant lands, farming lands, market gardens, poultry farms, residential properties and schools.

- Reefway Waste Services – Alexandria and Auburn – Active waste receivers and recyclers. Management of soil quality by analysing soils for reuse. Discussion with DECC on providing a 'gateway' mechanism for removing bona fide resource recovery from the waste regulatory framework.

- Richard Crookes Constructions Pty Ltd – Various soil classifications and leachate management for an EPA inert and solid licensed landfill.

- Robert Moore & Asscoiates - Carrying out full assessments, from Stage 1 to Stage 4, on numerous rural residential and residential sites across Sydney. Sites included vacant lands, farming lands, market gardens and residential properties.

- Royal Botanical Gardens, Sydney – Former works depot. Managing removal of UST's and associated pipelines, sampling and soil classification of soils to an EPA inert and solid waste licensed landfill.

- Sam the Paving Man - Sampling and soil classification of soils, followed by onsite management of the disposal of the soils to licensed landfills.

- Stocklands Mall, Merrylands - Former carpark area. Sampling and soil classification of soils, followed by onsite management of the disposal of the soils to licensed landfills.

- SPAD Pty Ltd – Former chemical factory. Report for full environmental site assessment, duties included desktop study, liaising with clients, contractors and regulatory authorities, identification of potential contaminants, sampling and analysis design, soil sampling, preparation of borehole logs, decontamination, QA/QC and report generation. Preparation of a RAP, managing remedial works and issuing final validation report.

- Sydney Airport Corporation – Soil classification and leachate management for an EPA solid licensed landfill.

- Telstra Depot, Rooty Hill - Report for full environmental site assessment, duties included desktop study, liaising with clients, contractors and regulatory authorities, identification of potential contaminants, sampling and analysis design, soil sampling, preparation of borehole logs, decontamination, QA/QC and report generation. Preparation of a RAP, managing remedial works and issuing final validation report.

- THG Resource – Kingston, QLD –Active scraps metal and car recycler. Duties included detailing management practices, outlining procedures for all identified environmental issues and providing a plan during operation to safeguard the way in which waste is managed.

- University of Sydney - Various soil classifications and leachate management for an EPA inert and solid licensed landfill.

NICKOLAOS KARIOTOGLOU

DATE OF BIRTH..................... 3rd February 1967

EDUCATIONAL QUALIFICATIONS
BAppSc (Environmental Science & Extractive Metallurgy majors), University of Technology
Strategic International Marketing Cert (Scholar) Stanford University USA
Commercialisation Skills Certificate, AGSM
Project Manager Certificate, AGSM

AFFILIATIONS
CPM, Fellow, Australian Marketing Institute
Member Environmental Institute of Australia
Member, Royal Australian Chemical Institute (on and off)
Member, International Association Water Quality (on and off)
Member, Australian Water Wastewater Association (on and off)

FIELDS OF SPECIAL COMPETENCE
Environmental Science & Technology, Project Management, Policy/Strategy Development, Patents, Marketing, Industry/Market Analysis, EMS, Chemistry, Environmental Auditing, Technology Transfer, Commercialisation

EXPERIENCE.............................. Total number of projects conducted and reviewed is estimated at over 2,500

EXPERIENCE:

1994 – Present:	President/Managing Director, Aargus Pty Ltd, Aargus Chemicals, Aargus Refill Centre
2000 - Present:	Director, ACCA
2000 – 2005	Director, Hellenic Australian Chamber of Commerce
2000 – 2001:	Director, RPA
1995 – Present:	Accredited Network Broker, AusIndustry - Australian Federal Government
1993 – Present:	Chairman/Executive Director, Australian Marketing Institute
1996 – 1998:	Principal Environmental Scientist and Director, Environmental Management Australia Pty Ltd (contractor)
1995 – 1996:	Director, SARDI - Department of Primary Industries SA
1994 – 1995:	Lecturer for Marketing, Sales, & Management, TAFE NSW
1993 – 1999:	Board Member for Illawarra Environmental & Sustainable Development Committee
1992 – 1994:	Environmental Scientist & National Manager Corporate Strategy & Marketing, Coffey Partners International P/L
1988 – 1992:	NSW Business Manager, CSIRO Division of Chemicals & Polymers
1986 – 1988:	Laboratory Scientist then Manager, Lever & Kitchens

MAJOR PROJECTS

- European Union EYDAP Project. Developing a regulatory framework to be used by all European countries for their respective water and wastewater industries. A pilot scale project is being put into Athens (EYDAP) and passed through parliament to commence. Project Budget $5 million Euro

- DMA, China permaculture Project. Formulating and project managing a team to tackle worldwide dry land degradation using permaculture and natural farming techniques. Project Budget $800 million.

- Rhodes Peninsular Assessment & Remediation of Dioxin & Scheduled Waste – This project is focused on one of the most contaminated areas in Australia (union Carbide site in Rhodes). The contaminants existing on the site range from dioxins, scheduled pesticide waste, HCB (hexachlorobenzene), PAHs, TPHs and some minor occurrences of heavy metals. The works included preparation of a Statement of Environmental Effects, EMP, RAP, OH&S Plan and Validation Plan for the remedial works to be undertaken at the site. A complex Remedial Action Plan was developed for the site which incorporated specifications for multi-layer containment cells with groundwater controls, leachate barriers, liner protocols, plus work method statements for works to be undertaken in all aspects of project work. The remedial works were based upon further delineation of contaminants within soil strata during excavation and stockpiling works thereafter having appropriate controls (EMP) for dust, noise, waters, groundwater, vapours, etc. The project data was placed in courts after DIPNR inhibition of consent and all documents held up to 3 independent EPA auditor reviews including a court appointed expert. The success has led to the commencement of works and further stages are proposed for second stage works. Project Budget $40 million.

- Boeing Aeroplane Corporation, Memorandum of Understanding. Commercial carriage and coordination of 8 individual projects. Implementation of foreign exchange contracts. Project Budget: $25 million.

- BHP, Memorandum of Understanding. Negotiations to extend research contracts. Discussions leading to BHP using CSIRO as research laboratory. Project synergy identification. Project Budget: $12 million.

- Macquarie Bank/AMRAD anti viral funding. Instigating a syndicated R&D fund for funding of leading edge research into new anti viral and related chemicals for use as low toxicity clinical drugs. Identification of most suitable collaborative team. Costing of technology and transfer of technology. Project Budget: $21m.

- DuPont/CSIRO joint venture (Dunlena). Commercial carriage of activity testing for new bio active synthesised chemicals used as environmental safe herbicides, insecticides and fungicides. Project Budget: $1.5 m/year.

- DuPont Australia/USA business plan. Market analysis in Australia and South East Asia of specialised resins and their applications. Work involved patents, agreements and royalties for commercial transfer. Project Budget: $5m.

- Pacific Power, external R&D funding. Negotiation for a high temperature plasma arc waste destruction system. Project Budget: $1.1 million.

ENVIRONMENTAL PROJECTS

- Exide Technologies Groundwater Assessment – A detailed assessment of groundwater migration of a former landfill area that has previously been subject to leachate breakout. Investigations include reviewing migration flow pathways, attenuation patterns, modeling of movement, and comparisons to current guidelines. Contaminants include organic and heavy metals.

- CSIRO, research priorities into environmental technology. Development of a framework and methodology for CSIRO's environmental and waste management research strategies. Identify and prioritise key elements of research and budget accordingly. Appropriation funds were distributed as per recommendations. Project budget: $16 million.

- Qantas Cater Air Detailed Groundwater Assessment – Development of a monitoring programme for Qantas Airlines for a site conducting commercial activities adjacent to a river system. The assessment includes reviewing background groundwater quality, comparing this to on-site groundwater quality and thereafter seeking to correlate the potential impact into the river system (inclusive of nutrient loading).

- Blacktown Council Asbestos Study – Aargus is the preferred supplier to council for conducting Asbestos assessments of abandoned stockpiles and dumped rubbish within the entire municipality. Assessments then are taken through Environment Australia to gain grant funding for reimbursement.

- Multiplex Ultimo – The environmental assessment of a large development site within Sydney City. Works involved assessing soils for ASS/PASS and undertaking ongoing monitoring during transportation.

- Sydney Water Trade Waste Sampling for over 150 companies – Aargus has set up and is undertaking at least one third of all Sydney's Trade Waste sampling. A dedicated team travels to all industrial/commercial sites (including McDonalds, Coca-Cola, etc) to undertake sampling on behalf of Sydney Water.

- Lygon Group Environmental Services for Construction over landfill – Works for the site involve developing a Environmental Management Plan for the construction of industrial complexes over a former landfill. The scope of works involved developing leachate extraction wells, developing vapour monitoring locations and vent pipes (to restrict landfill gas build-up) and to provide collection points for gas and water.

- Dial a Dump Landfill soil classifications – Various soil classifications and leachate management for a EPA inert and solid waste licensed landfill.

- Nundah Landfill – A former American WWII bunker that had been a former council landfill crossing the site needed to be remediated to a stage to make the site acceptable for the proposed low density residential development. Works involved preparing a Remedial Action Plan then conducting an excavation and disposal strategy, thereafter validating residual soils prior to reinstatement to original levels.

- Telstra Depot Hurlstone Park – Preparation of a detailed Remediation Action Plan for a former Telstra Depot (formerly owner by State Rail) where large PAH and TPH impacted soils were present. The works then progressed to implementation of the remedial programme which entailed a bioremediation of 90% of the site. This task was complex as the site land restricted creation of complete lifts for landfarming. Sectioned work was undertaken during a validation programme and the entire programme took 12 months to complete. A petroleum hydrocarbon groundwater plume was also part of the remedial programme which is currently being attenuated after a pump out of PSH was undertaken. Work was undertaken along with the EPA to ensure public health was not compromised from the migrating plume within the shallow aquifer.

- Australand Arncliffe – Development of a major medium density residential area which required to have PAH impacted soils remediated from site. Works involved following the RAP and preparation of a final Validation Report to verify the remedial success.

- Multiplex Arncliffe - Development of a major medium density residential area which required to have PAH impacted soils remediated from site. Works involved following the RAP and preparation of a final Validation Report to verify the remedial success. Works also involved Vibration monitoring and preparation of a Dilapidation Study to ensure that the rock cutting and breaking did not impact the surrounding area.

- Piper Property group, Ultimo – Preparation of a Hazardous material (HAMAT) assessment for an old heritage property in Sydney. Analysis involved identifying asbestos materials from lagging, roofing, guttering, floor tiles, electricity backing boards, mercury switches, mercury/cadmium lamps plus identifying synthetic mineral fibres.

- Emu Park Statement of Environmental Effects – Conduct of a full scale Environmental Effects Statement for a 1,000ha property near Rockhampton. Works involved conduct of a Flora/Fauna assessment (day & night – spotlighting, identification, scats, etc), heritage, traffic study, noise study, targeted assessment for a cattle yard and tipping area, water & groundwater study plus collation of all other data to be incorporated for the proposed development.

- Tin Can Bay Statement of Environmental Effects – Works are underway in preparing a full scale Environmental Effects Statement for a 1,500ha property north of Brisbane. Works will involve conduct of a Flora/Fauna assessment (day & night – spotlighting, identification, scats, etc), heritage, traffic study, noise study, targeted assessment, water & groundwater study plus collation of all other data to be incorporated for the proposed development.

- Kur in gai Council Groundwater and Leachate Assessment of impact into estuary and creek system – Preparation and implementation of a water quality assessment to identify the potential impact of 2 landfills adjoining a river system within a national Park. The uncontrolled landfills do not have adequate leachate controls so a detailed assessment of water quality is currently being undertaken (2 year project) up and downstream to provide baseline works for future proposed remedial options. Works also include an ecological study for the river.

- Mortlake Remediation of site adjoining gasworks site – An industrial site in the Mortlake Area has been remediated due to the impact from ash and coke from a former gasworks site that adjoined the site. Works involved remediating industrial and solid waste classified soils and then validating to low density residential guidelines.

- Ampol Service Station Remediation & Validation Carlton – This site is a Section 35 site (EPA controlled) where Aargus are conducting works on behalf of the EPA to delineate and remediate contamination under a Voluntary Agreement with the site owner. The works involve assessing the Service Station, adjoining commercial property and residential property and preparing a remedial Action Plan. Findings found that a petroleum hydrocarbon impacted groundwater plume had migrated to the adjoining property and to the rear of the residential block. The assessment involved detail soil and groundwater sampling (9 groundwater wells and >50 soil borehole locations).

- J&M Waste Sludge Assessment – Works involved the sampling and characterization of tank sludge that was illegally being sprayed onto sites. The assessment provided evidence for EPA prosecution against the client when classification showed high contaminant levels being present within food grade waste.

- St George Bank Camden – Due diligence assessment for St George Bank. Aargus is the preferred consultant for the bank and conducts many due diligence assessment. Works follow ESA guidelines but allow for legal security requirements as set up between Aargus and the Banks.

- Eaglehawk Tailings Impacted site – The assessment for this site was undertaken due to the potential impact from mining operations for a proposed development. Aargus found widespread tailing impact and the ultimate remediation of the area confirmed that the site was thereafter suitable for residential settlement.

- ABB Bay Street Botany – Large scale remediation programme for a complex industrial site. Works on the site entailed bioremediation, excavation and disposal of contaminants and groundwater remediation via vapour extraction, carbon filtering and a pump and treat strategy. The site is now being developed for residential occupation.

- Hoover Meadowbank – Large scale assessment of a former industrial site. Detailed characterization of near surface and subsurface soils was undertaken with various USTs present and decommissioned on the site.

- Westinghouse Concord - Large scale remediation of a former industrial site. Detailed characterization of near surface and subsurface soils was undertaken to delineate impacted soils. Contaminants included slag, PAHs and TPHs. The site was remediated over a 2 month period finally completing works after 11,000 tonnes of material was treated and removed from site.

- Qantas Air Services Emergency Response – Aargus conducts annual sampling of groundwater at Sydney Airport for the Emergency Response crew. The works involve assessing the potential impact of firefighting equipment (spraying of foaming agents) on the surface of the site where rainwater via percolation migrates materials into underlying shallow aquifers.

- BP Smithfield, Greysteynes, Mays Hill – Various site assessments for Service Stations around Australia. The assessment include tank & line tests, gross pollution review, soil sampling, groundwater sampling, historical review and final data interpretation.

- Tweed Heads Assessment – Assessment of a former car yard which showed evidence of poor housekeeping practices impacting the environment. Works were enforced on the seller to clean up contaminants left as a legacy of their lack of concern. Remediation included stabilisation of contaminants prior to transportation down to Newcastle to a licensed EPA landfill.

- A Current Affair (Melbourne & Sydney) Fish and CCA Treated Timber – Aargus is the preferred consultant used by a Current Affair and channel 9. Some works undertaken to date include reviewing pesticide residues within canned tomatoes, reviewing the leaching of CCA treated timber into the environment, and mercury levels within fish. Results of analytical work undertaken by Aargus has led to the banning of Treated Timber products in childrens playgrounds within Australia by the end of this year after results showed that significant leaching and impact occurs from these products. Analysis also showed that significant bioaccumulation of mercury occurs in Swordfish and Flake (shark) in fish caught and sold within QLD, NSW & VIC). Results have provided information that the Department of Health are now targeting for shops and fish markets. The standard fish and chip shop now holds concern for flake (used as the fish in fish and chips). Results from this work has led Aargus to join forces with Sydney University in a joint R&D project to seek methods of real time sampling of mercury (plus other heavy metals) in fish and waters. This research project is still current.

- Strathfield Council Depot (Argentine Ant) Scheduled Waste Remediation & Validation – This council sub-leased its premise to an Argentine Ant extermination company. The prevailing contaminants left behind were pesticides at a scheduled waste level. Detailed remedial works were required including appropriate destruction to Western Australia of substances. Full licensing of transportation and disposal was required for cross-border transfer. A detailed validation programme was thereafter conducted to verify that no remaining contaminants existed on the site.

- Telstra Stadium – Ongoing classification of soils into the site as part of turf laying. The assessment classified over 100,000 tonnes of soils brought onto the site.

- Environmental Management System (EMS), Korea - conduct an environmental audit and provide EMS strategies and implementation of the EMS strategies for the largest paper manufacturer in Korea (4th in the world), Hansol.

- Environmental Management System training in Korea for a host of organisations. The course ran for three days and involved preparation of training manuals and a workshop format with allocation of certificates at the completion.

- Cockatoo Island Environmental Audit, NSW - assessment of soil and ground water contamination of the Department of Defence’s Cockatoo Island in Sydney Harbour. Involved selection of sampling locations, checking for buried surfaces, data management of results from laboratories, establishing a QA/QC program and direction of field sampling crews.

- Sydney Ports Corporation - EMS development and implementation for over 150 tenants on Sydney Ports Corporation properties throughout Sydney.

- Textile industry EMS development for South Korea.

- Sydney Olympics 2000 - Auditing and development of environmental management plans and health and safety plans for the Homebush Bay Sydney Olympics Site.

- Taegu City Wastewater Treatment Plant - Audit and development of improvement plans for a major city wastewater treatment facility in South Korea.

- Techtron - Auditing of an electronics company in Athens, Greece.

- Biotech Egypt - Development and design of potable water treatment facility for a Red Sea project in Egypt.

- Brompton Gas Works, Adelaide - ground water contamination studies. Field screening of volatile organic hydrocarbons using portable gas chromatography and preparation of control samples for QA/QC program.

- Kirk's Tanker Services - contamination study of a petrol station site at Canberra involving a soil vapour survey for hydrocarbon contamination using a portable GC.

- Rockdale Feedlot Management, Yanco NSW - laboratory data management of monthly monitoring of surface and ground water samples. Involved with compliance with EPA requirements related to environmental control for expansion of the feedlot and abattoir.

- West Menai Liquid Toxic Waste Dump, Low Radiation Dump and Municipal Landfill - soil vapour survey and soil and ground water contamination study.

- Contaminated Site Assessment, Yagoona NSW - assessment of contamination by heavy metals and OC's at former council chemical stores. Design of remedial management plan comprising excavation and landfill disposal of contaminated soils and validation testing for Bankstown City Council.

- Environmental Site Assessment, Kooragang Island NSW - assessment of contamination at SRA locomotive refuelling facility on Kooragang Island. Involved soil gas survey, ground water monitoring and soil sampling and analysis for Clyde Engineering.

- Asbestos Assessment, Cumberland Hospital NSW - assessment of asbestos contamination in near surface soils at one of Sydney's oldest Hospitals for Dept of Health, NSW.

- Contaminated Site Assessment, Fairfield NSW - environmental effects assessment of contamination for heavy metals, aromatics and halogenated hydrocarbons at a drum reconditioning facility for E and T drum surgeons.

- Battery Breaking Facility, Preston NSW - assessment of areal and vertical extent of contamination in soils and ground water at the site of a former battery breaking yard. Design of remedial measures (solidification/stabilisation and pH correction) for Don Fox Planning.

- Remediation of Former Chemical Plant St Mary's NSW - on site supervision of cleanup activities and validation procedures for former pool chemical plant. Soil heavily contaminated by caustic soda and acids for Greenway and banks.

- Environmental Audit and EPA waste water compliance audit for Brambles, Wollongong - assessment of potential environmental pollution with recommendations towards cleanup. Preparation of a waste water treatment program including truck wash design, stormwater runnoff reticulation and design of a treatment plant. This project included total water management on site and negotiations and discussions with EPA and the Water Board.

- Environmental Site Assessment of a former Mobil petrol station site in Albury VIC which included assessment of contamination at Mobil site involving a soil gas survey, soil sampling and analysis.

- Waste water & COD rectification for BHP Wollongong. Included consulting, sampling, analysis and installation of a treatment process

- Caltex Oil Refinery - Ground water monitoring around the area of a proposed lube oil blending plant involved collection of samples using a hand held positive displacement pump and subsequent analysis of results.

- Environmental Site Assessment of Nolands Smash Repairers, NSW - assessment included ground water sampling, soil vapour survey and soil sampling and analysis.

- Expert Testimony for Sly & Weigal regarding cross border contamination - work involved conducting an environmental assessment of soil and ground water on one property to prove contamination had migrated from an adjoining property.

- Environmental Audit for Westpac for an industrial facility with various underground storage tanks. Work involved drilling and sampling underground soil for contamination.

- Environmental contamination assessment for one of Australia's largest banks. The company, under receivership, needed a bill of clean health for the site in order to sell at a better price.

- Environmental audit for Westpac of a chemical plant consisting of vast above and underground storage areas. Work included auditing, testing, analysing and reporting of samples from soil vapour surveys and soil and ground water testing.

- Remediation of tank sludge from Shell Oil Refinery. The process included sampling, testing and fixation of the product in order that land farming be conducted.

- Chemical testing research and development for Australia's largest chemical manufacturer, ICI. Work involved producing environmental friendly chemicals from existing, known hazardous chemicals.

- Product development and research into value added chemicals for Eastman Kodak using novel continuos microwave reactionary processes. Work involved distinguishing physical and chemical benefits of using accelerated heating as a reactionary process.

- International training for EMS and Environmental auditing including conferences and seminars for companies, industry associations and government bodies.

- Developing a SHE manual for AWS. Work involved developing an environmental, safety and health manual for the world's largest water filtration plant in Prospect.

- Environmental audit and review for Denehurst - Woodlawn mine. Work involved a complete audit on operational and environmental conformance to meet regulatory compliance, for one of Australia's largest base metals mine.

- Various EMS seminars worldwide and for varying industries such as Hotels, Mining, Medical and Textile.

- Kuk Je Dyeing & Weaving company - Development and Implementation of an integrated QMS, EMS, Environmental performance, Life Cycle Analysis system.

- -Alan Moffet - Environmental Audit (Phase II) for the racing car driver's property

- -St. George Bank - Various environmental audits (Phase I & II)

- -Advance Bank - Various environmental audits (Phase I & II)

- -Commonwealth Bank - Asbestos study

- -FBT Operations (VIC) Pty Limited - Environmental audits (Phase I, II & III) on proprties both in Victoria and Sydney

- -The University of Sydney Union - Environmental audit of the three Union buildings Wentworth, Manning and Holme

- RM Constructions - Environmental Site Assessment, Remediation and Validation of a heavily contaminated commercial property in a residential area. This project was a high profile project where a 10m wide x 3m deep coal tar pit was discovered buried on site in a sensitive residential area. This project involved heavy liason with council, EPA, Department of Health, Media, Minister for the Environment and residents.

- Sydney CBD - Large Multi-Storey development for the Developer Sattelite group, project managers Caverstock and builders Abigroup. This 8 storey development involved numerous environmental assessments, excavation and disposal down to 3 metres of contaminated material, and final validation of soils.

- Pheonix Developments. Project included site assessment and validation of a industrial warehouse to residential medium-high density dwellings.

- Large multi-storey residential development at 1-35 Pine Street, Chippendale for Citiscape under the project managers Waracon. Work involved a site assessment, removing 5,000 tonnes of contamination and final validation of work.

- Aarkbay Pty Ltd – Various projects in Sydney involving environmental assessment, remediation and validation for redevelopments.

- Environmental Audit and recommendation for a sale in Maddox Street, Alexandria for a large textile manufacturer.

- 1 Margaret Street, Redfern. Work involved an ESA and site validation for SL constructions.

- Corner of Cornwallis Street & Boundary Street, Redfern. Work involved preparing a environmental site assessment and validation report.

- A large commercial development of 25,000 sqm in 35 Bourke Road Alexandria for RM Constructions (Downton & Dyer).

- The new Swadlings hardwarehouse development on Botany Road Alexandria. Work was for Advance Bank and involved removal of various underground tanks and asbestos roofing as part of the development and mortgage arrangements.

PROJECT MANAGEMENT

- Commercialisation of a Readily Biodegradable Chemical Oxygen Demand (RBCOD) sensor with field trials. Application of various patents to protect the intellectual property.

- Preliminary commercial assessment for a multi-divisional, multi-million dollar Sound Acoustic Wave - Enzyme Linked Immuno Sorbent Assay (SAW-ELISA) bio sensor and targeting of appropriate collaborators.

- BTR/CSIRO & ICI/CSIRO joint research agreements for establishment of collaborative research efforts.

- Discussion report on the industrial chemical process of surfactants. The report was used to develop increased understanding of the wetting of solids by fluids and the role of surfactants in industrially important wetting processes.

- Hazardous Chemical Report on Cumene and its impact on the environment and in manufacturing and handling processes.

- ADI/CSIRO joint research agreements for the establishment of collaborative research efforts.

- Boeing external funding project for research into polymer matrices for advanced composites in high speed civil transport aircraft.

- Government Industry Research Development (GIRD) grant for bio active surfaces.

- Kodak Australia external funding for processes to manufacture fine chemicals in Australia. This project involved a detailed market analysis.

- Samuel Taylor research funds for development of surface cleaners for specific surface types.

- Austep licensee of SIROFLOC process to treat water and waste water.

- BHP research project on foam flotation of effluents containing oil and grease.

- BHP research project on anaerobic fermentation of industrial effluents.
- Sydney Water Board adoption of SIROFLOC to sewage treatment. This project has been scaled up from bench to 4ML/day at the Malabar sewage treatment works.

- Patent application PJ0872/88, PJ5057/89 for the method and apparatus for continuous chemical reactions using microwave technology as a medium.

- Patent application PK0974/90 for the continuous RBCOD measurement in an instrument designed for effluent monitoring.

- Commercialisation of a CSIRO developed continuous microwave reactor and the development of new and improved versions. The company IMA was chosen and has commenced manufacture.

- Chemical processing project. To develop chemical processes for Australian manufacture based on process optimisation and staged scale-up of chemical innovations.

- Anti viral project. Form alliances with virology testing to investigate modes of action and processes of synthesis and follow-up their development in firms.

- Human health products project. To generate novel pharmaceutical chemicals in support of an Australian based pharmaceutical industry supplying world markets.

- Specialty Polymers Project. Investigate new methods of polymer synthesis and apply them in the production of polymers for special applications.

- Polymeric Bio materials Project. To develop polymeric materials for medical, veterinary and dental applications by means of polymer synthesis, polymer blending and surface or bulk modification of polymers.

- Coagulation Processes Project. To develop coagulation processes based on the use of magnetite or other coagulants for applications in the treatment of potable water and domestic and industrial waste waters

- Aargus, development & worldwide product launch for Greenpower - a world beneficial fuel enhancement device. Work involved R&D, commercialisation, marketing, sales & office setup in Asia, Europe, America, Canada, & Australia.

BUSINESS DEVELOPMENT & MARKETING

- Australian and global industry study on the Pharmaceutical industry seeking a funding partner for CSIRO's anti viral research. A task force was developed to bring together CSIRO's combined research on pharmaceutical’s and offer a combined package to industry.

- National industry study on the Environmental and Waste Management industry. This project involved developing a framework and methodology for research priorities within CSIRO - to be used also for other industries, identify and prioritise research within CSIRO, identifying niche opportunities for CSIRO and examine synergy within CSIRO's own research.

- Marketing, Sales and Business Development Services for Nolands Auto Repair Centres (3 Centres). Work involved being the marketing department for the group with advertising, sponsorship, design, planning, and sales as an outcome. Turnaround of 20% fleet 80% casual to 80% fleet 20% casual.

- The marketing of a Concrete Additive for Plugge Constructions. This involved setting up a marketing strategy, creating appropriate brochures and documentation, testing and sales. Target markets included architects, Structural Engineers, Consultants and concrete companies.

- Marketing of a paint product for Duralex Paints. Work involved setting up a marketing mix and preparing artwork, then direct marketing activities to the consumable market.

- Commercialisation, Marketing, Sales and Distribution worldwide of an environmental friendly fuel enhancement device for Greenpower Pty Ltd. Work involved setting up license agreements and distribution networks, direct sales, government lobbying and fitting and servicing of the product.

- Industry characterisation of the aerospace industry in Australia and the vendor alliances formed.

- Industry characterisation on the Fine and Specialty Chemical industry in order to target niche areas of research and potential commercial collaborators.

- Industry characterisation on the Aluminium industry for the purpose of identifying key manufacturing prospects for large aluminium casting projects.

- Industry characterisation on the Scientific Instrument, Medical Devices and Diagnostic industry for the commercialisation of the SAW-ELISA bio sensor and to seek potential collaborators for other key project sensor areas.

- Porter analysis on the petroleum industry looking at interactions in the industry and international competitiveness.

- Market analysis in the South East Asian region for an outlet for engineered resins and chain transfer agents. This project involved DuPont and Chemplex and overseas meetings involved the detailed description and negotiation of the product to prospective manufacturers and buyers.

- A business plan on the derivatives and outlet possibilities for coal tar naphtha, a by-product from Koppers Australia.

- Company profiles on Boeing, Pacific Power, Hoechst, Kodak, J&J and DuPont. These were basically briefs on the company which were circulated to all senior CSIRO personnel to increase collaboration areas.

- ICI Australia corporate profile for the purpose of placing a Memorandum of Understanding (MOU) for joint research.

- Australian Defence Industries (ADI) corporate profile for the purpose of placing a Memorandum of Understanding (MOU) for joint research.

- BTR Australia corporate profile for the purpose of placing a Memorandum of Understanding (MOU) for joint research.

- Establishment of a training program for commercialisation of CSIRO technology. This was implemented throughout CSIRO research scientists & senior staff.

- Developing a CSIRO manual on seeking a commercial partner. Commercial managers and business managers were focused as recipients.

- Developing a CSIRO manual on Winning and managing Key Accounts and Developing an internal manual on marketing strategies for R&D. This manual developed into a training program whereby senior staff throughout CSIRO were encouraged to attend.

- Sponsorship hunting and planning for Auscar/Nascar motorcar racing.

- Strategy formulation, function and event organisation, sponsorship acquirement and office management for the Australian Marketing Institute.

- Development of a Business Plan for the National Centre for Appropriate Technology (Futureworld). Tasks involved strategy formulation, SWOT analysis, market research, market analysis, forecasting, budgeting, building and training for corporate culture and implementation.

- Lecturing on a part time level for North Sydney College of TAFE. Subjects included Sales Skills, Sales Management, Marketing Management and Business.

- Orange Council promotional work for the region promoting the town as a tourist attraction for NSW and QLD residents.

- Newcastle Regional Art Gallery sponsorship plan. The plan involved developing a sponsorship framework for attaining extra funding by the Gallery over a five year forecast. Work involved seeking a presentation package desirable for sponsors to be involved with, seeking appropriate potential sponsor groups and segmenting user groups of the gallery for individual targeting.

- Newcastle Regional Art Gallery sponsorship implementation. Stage II of the development of a sponsorship plan was to develop a presentation package and approach potential sponsors on behalf of the Gallery.

- SARDI Quality Management Plan. The work involved developing a tailored Quality Management Program involving aspects of World Competitive Service, TQM, Quality Assurance, Quality Control for a South Australian Government Department.

- Networking for the AusIndustry program. As an accredited network broker for the Federal Government, responsibilities include seeking potential networks or alliances, formulating feasibility studies, business plans and execution of the implementation stage.

- Global Brand and Image Launch for Point Break Australia Pty Ltd. Work involved sponsorship, direct marketing, public relations, distribution, advertising, and market penetration.

- Project Management and Marketing of a project focused on the recycling, reuse and formulation of by-products from CCA (Copper Chrome, Arsenic) treated timbers. This project entailed applying for grants, marketing, formulating strategic direction and developing new and novel products for a worldwide market including the fighting against staphlacocca, Golden Staph, Chicken Flu, and Mad Cows disease.

- Marketing, sponsorship development and commercialisation of a unique chopping board developed for one handed or disabled persons. Work involved market research, formulation of a business plan and preparing strategic direction and commercialisation options.

- The marketing and sponsorship gaining for the Greek Community of Australia for the 100th celebrations. The production involved the finding of sponsorship and advertisement for the organisation as well as marketing assistance and promotion.

- The joint development and marketing of a fish emulsion from fish waste. The product was developed as a value-added by-product for Heinz Greenseas in Eden. Chemical manufacturing is supporting his project. The fish emulsion is currently being marketed as a fertiliser.

- The preparation and conducting of Sales and Marketing courses for businesses and associations needing support and direction for these subjects. These courses were advanced levels and included items such as neuro linguistic programming, body language, as well as traditional sales and marketing techniques.

- Start up and set up of the Australian Centre for Corporate Advancement (ACCA). Work involved pricing strategies, business planning, feasibility studies and the launch of specific events and conferences.

APPENDIX J

REGULATORY CRITERIA

Table 5-A - Soil Investigation Levels (mg/kg)

Substances	Health Investigation Levels (HILs)						Ecological Investigation Levels (EILs)		Background
	A[1]	B[2]	C[3]	D	E	F	REIL[4]	Interim Urban[5]	Ranges[6]
METALS/METALLOIDS									
Arsenic (total)	100			400	200	500	Limited Australian data at this time	20	1 - 50
Barium								300	100 - 3000
Beryllium	20			80	40	100			
Cadmium	20			80	40	100		3	1
Chromium (III)	12%			48%	24%	60%		400	
Chromium (VI)	100			400	200	500		1	
Chromium (Total)*7									5 - 1000
Cobalt	100			400	200	500			1 - 40
Copper	1000			4000	2000	5000		100	2 - 100
Lead	300			1200	600	1500		600	2 · 200
Manganese	1500			6000	3000	7500		500	850
Methyl mercury	10			40	20	50			
Mercury (inorganic)	15			60	30	75		1	0.03
Nickel	600			2400	600	3000		60	5 - 500
Vanadium								50	20 - 500
Zinc	7000			28000	14000	35000		200	10 - 300
ORGANICS									
Aldrin + Dieldrin	10			40	20	50			
Chlordane	50			200	100	250			
DDT + DDD + DDE	200			800	400	1000			
Heptachlor	10			40	20	50			
Polycyclic aromatic hydrocarbons (PAHs)	20			80	40	100			
Benzo(a)pyrene	1			4	2	5			
Phenol	8500			34000	17000	42500			
PCBs (Total)	10			40	20	50			
Petroleum Hydrocarbon Components (constituents): • >C16 - C35 Aromatics[8]	90			360	180	450			
• >C16 - C35 Aliphatics	5600			22400	11200	28000			
• >C35 Aliphatics	56000			224000	112000	280000			
OTHER									
Boron	3000			12000	6000	15000			
Cyanides (Complexed)	500			2000	1000	2500			
Cyanides (free)	250			1000	500	1250			
Phosphorus								2000	
Sulfur								600	
Sulfate[9]								2000	

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[1] Human exposure settings based on land use have been established for HILs (see Taylor and Langley 1998). These are:

- A. 'Standard' residential with garden/accessible soil (home-grown produce contributing less than 10% of vegetable and fruit intake; no poultry): this category includes children's day-care centres, kindergartens, preschools and primary schools.
- B. Residential with substantial vegetable garden (contributing 10% or more of vegetable and fruit intake) and/or poultry providing any egg or poultry meat dietary intake.
- C. Residential with substantial vegetable garden (contributing 10% or more of vegetable and fruit intake); poultry excluded.
- D. Residential with minimal opportunities for soil access: includes dwellings with fully and permanently paved yard space such as high-rise apartments and flats.
- E. Parks, recreational open space and playing fields: includes secondary schools.
- F. Commercial/Industrial: includes premises such as shops and offices as well as factories and industrial sites.

(For details on derivation of HILs for human exposure settings based on land use see Schedule B(7A).

[2] Site and contaminant specific: on site sampling is the preferred approach for estimating poultry and plant uptake. Exposure estimates may then be compared to the relevant ADIs, PTWIs and GDs.

[3] Site and contaminant specific: on site sampling is the preferred approach for estimating plant uptake. Exposure estimates may then be compared to the relevant ADIs, PTWIs and GDs.

[4] These will be developed for regional areas by jurisdictions as required.

[5] Interim EILs for the urban setting are based on considerations of phytotoxicity, ANZECC B levels, and soil survey data from urban residential properties in four Australian capital cities.

[6] Background ranges, where HILs or EILs are set, are taken from the Field Geologist's Manual, compiled by D A Berkman, Third Edition 1989. Publisher - The Australasian Institute of Mining & Metallurgy. This publication contains information on a more extensive list of soil elements than is included in this Table. Another source of information is Contaminated Sites Monograph No. 4: Trace Element Concentrations in Soils from Rural & Urban Areas of Australia, 1995. South Australian Health Commission.

[7] Valence state not distinguished - expected as Cr (III).

[8] The carbon number is an 'equivalent carbon number' based on a method that standardises according to boiling point. It is a method used by some analytical laboratories to report carbon numbers for chemicals evaluated on a boiling point GC column.

[9] For protection of built structures.

Table 3 Threshold concentrations for sensitive land use — soils

Analytes	Threshold concentrations[a] (mg/kg dry wt)	Sources
TPH[b, c]: C6–C9	65	see note[d]
TPH[c]: C10–C40 (C10–C14, C15–C28, C29–C40)	1,000	see note[e]
Benzene	1[f]	ANZECC /NHMRC 1992
Toluene	1.4[g] / 130[h]	Netherlands 1994
Ethyl benzene	3.1[i] / 50[j]	Netherlands 1994
Total Xylenes	14[k] / 25[j]	Netherlands 1994
Phenol	—[l]	—[l]
Total Lead	300	ANZECC /NHMRC 1992
Benzo(a)pyrene	1	ANZECC /NHMRC 1992
Total PAHs[m]	20	ANZECC /NHMRC 1992

NB. Scientifically justified alternative threshold concentrations may be acceptable. Thresholds may be reviewed as new scientific information becomes available.

Explanatory notes for Table 3

a Refer to relevant source documents for details.

Definitions of terms used in discussion of Netherlands criteria (Denneman 1993) are:

- The **maximum permissible concentration** (MPC) is the 'concentration of a toxic substance that fully protects 95% of the species in an ecosystem'.
- The **intervention level** represents 'a level where action is needed because impermissible risks may occur. It depends on other than chemical characteristics if action should take place immediately or not'. In the case of ecological risk, the intervention level 'fully protects 50% of the species in an ecosystem'.

Further information regarding MPCs and intervention levels may be found in Denneman & van den Berg 1993.

The Netherlands sourced values in Table 2 refer to soil with 10% natural organic matter content. These threshold concentrations must be adjusted for the particular natural organic matter content of the specific site. The natural organic matter content in soil may be determined using the Walkley and Black Method, AS 1289.D1.1–1977, *Determination of the Organic Matter Content of a Soil (Standard Method)*.

The threshold concentrations for ethyl benzene and xylenes to protect terrestrial organisms have been derived from aquatic toxicological data using equilibrium partitioning. Investigations have shown (Van Gestal & Ma 1993) that in the case of earthworms, toxicity is related to the pore water contaminant concentration. The LC_{50} pore water concentrations for several compounds have been favourably compared with LC_{50} aquatic toxicological data for fish.

Explanatory notes for Table 3 (cont.)

The derivations of criteria adopted as threshold concentrations have not explicitly taken account of chemical mixtures. The potential impact of mixtures of chemicals should be assessed on a site-specific basis.

The potential for the generation of odours may mean that lower thresholds than those listed in Table 2 are required for volatile compounds.

b Total petroleum hydrocarbons

c Approximate range of petroleum hydrocarbon fractions: petrol C6–C9, kerosene C10–C18, diesel C12–C18 and lubricating oils above C18.

d The TPH C6–C9 threshold concentration, i.e. 65 mg/kg, applies to soil containing 10% natural organic matter. This concentration has been calculated assuming the following:

- that there has been a fresh spill of petrol
- that the aromatic content of the petrol is 30%
- that the resultant BTEX soils concentrations are at their lower thresholds.

TPH C6–C9 concentrations above the relevant threshold may indicate that BTEX concentrations are above their thresholds. This threshold concentration should be interpreted as only an approximate potential indicator of contamination.

e The TPH C10–C40 threshold concentration is based on a consideration both of the Netherlands Intervention Level for the TPH C10–C40 range and on commonly reported analytical detection limits. The Netherlands intervention value is 5,000 mg/kg dry weight.

f A lower benzene threshold concentration may be needed to protect groundwater.

g The toluene threshold concentration is the Netherlands MPC to protect terrestrial organisms in soil. This value was obtained by applying a US EPA assessment factor to terrestrial chronic No Observed Effect Concentration (NOEC) data. The MPC is an 'indicative' value (Van de Plassche *et al.* 1993; Van de Plassche & Bockting 1993).

h Human health and ecologically based protection level for toluene. The threshold concentration presented here is the Netherlands intervention value for the protection of terrestrial organisms. Other considerations such as odours and the protection of groundwater may require a lower remediation criterion.

i The ethyl benzene threshold concentration is the Netherlands MPC for the protection of terrestrial organisms in soil. No terrestrial ecotoxicological data could be found for use in the Netherlands criteria derivation. Therefore, equilibrium partitioning has been applied to the MPC for water to obtain estimates of the MPC for soil. The MPC for water has been derived from aquatic ecotoxicological data (Van de Plassche *et al.* 1993; Van de Plassche & Bockting 1993).

j Human health based protection level for ethyl benzene or total xylenes as shown. The threshold concentration presented here is the Netherlands intervention value. Other considerations such as odours and the protection of groundwater may require a lower remediation criterion

k The xylene threshold concentration is the Netherlands MPC for the protection of terrestrial organisms in soil. No terrestrial ecotoxicological data could be found for use in the Netherlands criteria derivation. Therefore, equilibrium partitioning has been applied to the MPC for water to obtain an estimate of the MPC for soil. The MPC for water has been derived from aquatic ecotoxicological data. The concentration shown applies to total xylenes and is based on the arithmetic average of the individual xylene MPCs (Van de Plassche *et al.* 1993; Van de Plassche & Bockting 1993).

l Phenol contamination is not expected to be significant at service station sites. Phenol has been included in the analyte list because it is a potential constituent of waste oil. The potential impact of phenol should be evaluated on a site-specific basis. Phenol may have a significant impact on waters.

m Polycyclic aromatic hydrocarbons

Contaminated aquifers and contaminated aquicludes should, as far as practicable, be remediated to the condition they were in before they became contaminated.

If groundwater is to be used for drinking water, analyte concentrations should not exceed the relevant drinking water guidelines: *Guidelines for Drinking Water Quality in Australia* (NHMRC/AWRC 1987), and *Draft Australian Drinking Water Guidelines* (NHMRC/ARMCANZ 1994). The draft NHMRC/ARMCANZ (1994) guidelines have been released for public comment, so some proposed guideline values may change upon review.

Groundwater that enters aquatic ecosystems (freshwater or marine) should not cause concentrations in the receiving ecosystem to exceed the relevant water quality guideline recommendations. See *Australian Water Quality Guidelines for Fresh and Marine Waters* (ANZECC 1992).

If the analyte concentrations in groundwater exceed the relevant thresholds, the groundwater should be remediated to or below the threshold concentrations. **If the threshold concentrations provided are not applicable, then the EPA should be consulted to determine the remediation goals.** The site assessor should keep a record of the reasons for selecting particular threshold concentrations. If other groundwater uses (e.g. industrial or agricultural) are affected, then other guideline recommendations should be considered (see ANZECC 1992).

The threshold concentrations may not apply in the following circumstances:

- when an appropriate human health risk assessment or ecological risk assessment demonstrates that lower or higher concentrations may be applicable
- when an appropriate risk-benefit analysis demonstrates that lower or higher concentrations may be acceptable.

2.5.2 How threshold concentrations have been selected

Threshold concentrations have, wherever possible, been selected from Australian sources, including ANZECC, NHMRC and ARMCANZ. In cases where the information was not available locally, Netherlands sources have been used (see Bibliography).

Threshold concentrations for soils are presented in Table 3. The concentrations have been taken from ANZECC/NHMRC (1992), and the Netherlands Ministry of Housing, Environment etc. (1994).

Threshold concentrations for waters are presented in Table 4. The

Table 4 Threshold concentrations — waters

Analytes	Threshold concentrations (µg/L)[a]				
	Protection of drinking water		Protection of aquatic ecosystems[b]		
	Health-based	Sources	Fresh	Marine	Source
TPH: C6–C9	—[c]	—[c]	—[e]	—[e]	—[e]
TPH: C10–C36	—[d]	—[d]	—[e]	—[e]	—[e]
Benzene	10[f]	NHMRC/AWRC	300	300	ANZECC
Toluene	800[g]	NHMRC/ARMCANZ	300	—[c]	ANZECC
Ethyl benzene	300[g]	NHMRC/ARMCANZ	140	—[c]	ANZECC
Xylene	600[g]	NHMRC/ARMCANZ	380[h]	380[h]	Netherlands 1994
Phenols	2	ANZECC	50	50	ANZECC
Benzo(a)pyrene	0.01	NHMRC/AWRC	—[c]	—[c]	—[c]
PAHs	—[c]	—[c]	3	3	ANZECC
Lead	10	NHMRC/ARMCANZ	1–5[i]	5	ANZECC

NB. Scientifically justified alternative threshold concentrations may be acceptable. Thresholds may be reviewed as new scientific information becomes available.

Explanatory notes for Table 4

a Refer to the relevant source documents for details. The unit µg/L = micrograms per litre.

b Groundwater entering aquatic ecosystems should not cause concentrations to exceed the relevant threshold concentrations.

c Information needed to select threshold concentrations is incomplete.

d Information needed to select threshold concentrations is incomplete. Alkanes in this range have low solubility and are unlikely to be of concern in water. All separate phase products must be removed.

e Information needed to select threshold concentrations is incomplete. The NSW Clean Waters Act 1970 and Clean Waters Regulations 1972 prohibit the pollution of waters by unlicensed contaminated discharges and require licensed discharges to be visually free of oil and grease. Experience has demonstrated that the latter criterion is equivalent to an oil and grease concentration of approximately 10 mg/L.

f NHMRC/ARMCANZ 1994 proposed 1 µg/L as the new benzene guideline concentration. This has not yet been adopted.

g NHMRC/ARMCANZ 1994 proposed concentrations are similar to WHO 1993 drinking-water quality guideline concentrations.

h Netherlands 1994 Maximum Permissible Concentration for total xylenes.

i Dependent on water hardness.

Table 5-B

Groundwater Investigation Levels

SETTING[10]	Aquatic Ecosystems[11]		Drinking Water	Agricultural[9]	
	Marine Waters µg/L	Fresh Waters µg/L	Health[10]/ Aesthetic[11] mg/L	Irrigation (mg/L)	Livestock (mg/L)
METALS/METALLOIDS					
Aluminium		<5 (if pH <6.5) <100(if pH >6.5)	(0.2)	5.0	5.0
Antimony		30	0.003		
Arsenic (total)	50.0	50	0.007	0.1	0.5
Barium			0.7		
Beryllium		4		0.1	0.1
Boron			0.3	0.5-6.0	5.0
Cadmium	2.0	0.2-2.0	0.002	0.01	0.01
Chromium (Total)	50.0	10		1.0	
Chromium (VI)			0.05	0.1	1.0
Cobalt				0.05	1.0
Copper	5.0	2.0-5.0	2.0 (1.0)	0.2	0.5
Iron		1000	(0.3)	1.0	
Lead	5.0	1.0-5.0	0.01	0.2	0.1
Lithium				2.5	
Manganese			0.5 (0.1)	2.0	
Mercury (total)	0.1	0.1	0.001	0.002	0.002
Molybdenum			0.05	0.01	0.01
Nickel	15.0	15.0-150.0	0.02	0.02	1.0
Selenium	70.0	5.0	0.01	0.02	0.02
Silver	1.0	0.1	0.1		
Thallium	20.0	4.0			
Tin (tributyltin)	0.002	0.008			
Vanadium				0.1	0.1
Zinc	50.0	5.0-50.0	(3.0)	2.0	20.0
ORGANICS					
1,2-dichloroethane			0.003		
Benzo(a)pyrene			0.00001		
Carbon tetrachloride			0.003		
Chlorobenzene			0.3 (0.01)		
Dichloromethane (methylene chloride)			0.004		
Ethylbenzene			0.3 (0.003)		
Ethylenediamine tetracetic acid (EDTA)			0.25		
Hexachlorobutadiene	0.3	0.1	0.0007		

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[10] Levels for recreational and industrial uses have not been set. For guidance on Recreational levels, see NHMRC/ARMCANZ, 1996. For recreational uses, toxic substances should, in general, not exceed the concentrations given for drinking water. For guidance on Industrial levels, see ANZECC, 1992. Industrial settings include: generic processes, hydro-electric power generation, textiles, chemical and allied industries, food and beverage, iron and steel, tanning and leather, pulp and paper, petroleum.

[11] Taken from Australian Water Quality Guidelines for Fresh and Marine Waters (AWQG) (ANZECC 1992)

SETTING[10]	Aquatic Ecosystems[11]		Drinking Water	Agricultural[9]	
	Marine Waters µg/L	Fresh Waters µg/L	Health[10]/ Aesthetic[11] mg/L	Irrigation (mg/L)	Livestock (mg/L)
ORGANICS (cont.)					
Monocyclic aromatic compounds					
Benzene	300.0	300.0	0.001		
Chlorinated benzenes		0.007-15.0[12]			
Chlorinated phenols	0.2-8.0	0.05-18.0[13]	0.04-1.5		
Phenol	50.0	50.0			
Toluene		300.0	0.8 (0.025)		
Xylene			0.6 (0.02)		
Pesticides	Footnote[14]	Footnote[15]	Footnote[16]		See guidelines for raw water for drinking water supply (AWQG, ANZECC 1992)
Aldrin	10.0 ng/L	10.0 ng/L	0.0003		
Chlordane	4.0 ng/L	4.0 ng/L	0.001		
DDT	1.0 ng/L	1.0 ng/L	0.02		
Dieldrin	2.0 ng/L	2.0 ng/L	0.0003		
Heptachlor	10.0 ng/L	10.0 ng/L	0.0003		
Phthalate esters					
di-n-butylphthalate		4.0			
di(2-ethylhexyl)phthalate		0.6			
other phthalate esters		0.2			
Polyaromatic hydrocarbons					
Polychlorinated biphenyls	0.004	0.001			
Polycyclic aromatic hydrocarbons	3.0	3.0			
Styrene (vinylbenzene)			0.03 (0.004)		
Tetrachloroethene			0.05		
Trichlorobenzenes (total)			0.03 (0.005)		
Vinyl chloride			0.0003		
OTHER					
Calcium					1,000.0
Chloride			(250.0)	30.0 700.0[17]	
Cyanide	5	0.005	0.08		
Fluoride			1.5	1.0	2.0
Nitrate-N			50.0		30.0
Nitrite-N			3.0		10.0
AESTHETIC PARAMETERS					
Colour and clarity	< 10% change in euphotic depth	< 10% change in euphotic depth			

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[12] See table 2.8, p.2-49 AWQG (ANZECC 1992) for further information
[13] see table 2.9, p2-50 AWQG (ANZECC 1992) for further information
[14] see table 2.10 also, p.2-55 (ANZECC 1992) for further information
[15] see table 2.10 also, p.2-55 (ANZECC 1992) for further information
[16] see table on p32 (Guidelines for Pesticides), p32 (NHMRC/ARMCANZ 1996)
[17] Maximum chloride concentration should be set according to the sensitivity of the crop. For further information. (See Tables 5.1, 5.2, 5.3, 5.4, ANZECC 1992)

APPENDIX K

PREVIOUS REPORTS

Previous report

Prepared by
Goodman Fielder
Ltd

3rd April 2002

Only hard copy
available