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DETAILED SITE INVESTIGATION (DSI)

185 Fifth Avenue, Austral NSW

**Prepared for
GM Architects**

February 2018





DOCUMENT CONTROL REGISTER

Document Information	
Job Number	E1292-2
Document Number	1
Report Title	Detailed Site Investigation (DSI)
Site Address	185 Fifth Avenue, Austral NSW
Prepared for	GM Architects

Document Review			
Revision Number	Date Issued	Description	Issued By
0	14/02/18	Initial Issue	Ben Buckley

Distribution Register		
Distribution Method	Custodian	Issued to
Electronic	B. Buckley	Benviron Group Office
Electronic	M. Khouri	

Authorisation and Release			
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Authorised		Benjamin Buckley- Director B.Env Sc., BSc (Forensics)	14/02/18

ABBREVIATIONS

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

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EXECUTIVE SUMMARY

Benviron Group was appointed by GM Architects to undertake a Detailed Site Investigation (DSI) for the property situated at 185 Fifth Avenue, Austral NSW (“the site”).

Refer to **Figure 1** - Site Locality and **Figure 2** – Site Features, Borehole Locations & Exceedance Plan.

The site is currently occupied by a rural residential property and is proposed to be redeveloped into four multi-level residential apartment buildings including two level basements, landscaping, road widening & new road.

Soils sampled across the Site were assessed against the Site Acceptance Criteria (SAC) provided by the National Environment Protection (Assessment of Site Contamination) Measure (NEPM 2013) Table 1A - Residential B.

The investigation revealed the following areas of environmental concern:

- The asbestos detected within BH1 is located in the fill layer to a depth of 0.3m BGL.
- The asbestos detected within BH4 is located in the fill layer to a depth of 0.1m BGL.
- The copper and zinc concentration within BH9 is located in the fill layer to a depth of 0.1m BGL.

- The groundwater monitoring undertaken by Benviron Group has indicated no concerns with Heavy Metals, TRH, BTEXN, PAH, & VOC in relation to the adopted guidelines.

Based on the results of the investigation, the abovementioned locations BH1, BH4 & BH9 require minor remediation in order to render the site suitable for the proposed development.

- It is considered that the site would be deemed suitable for the proposed development subject to the implementation of a Remediation Action Plan (RAP) to manage the abovementioned environmental concerns and data gaps.
- Any soil requiring removal from the site, as part of future site works, should be classified in accordance with the “Waste Classification Guidelines, Part 1: Classifying Waste” NSW EPA (2014).

If during any potential site works, significant odours and / or evidence of gross contamination (including asbestos) not previously detected are encountered, or any other significant unexpected occurrence, site works should cease in that area, at least temporarily, and the environmental consultant should be notified immediately to set up a response to this unexpected occurrence.

1.0 INTRODUCTION

Benviron Group was appointed by GM Architects to undertake a Detailed Site Investigation (DSI) for the property situated at 185 Fifth Avenue, Austral NSW (“the site”).

Refer to **Figure 1** - Site Location and **Figure 2** - Site Features, Borehole Locations & Exceedance Plan.

The site is currently occupied by a rural residential property and is proposed to be redeveloped into four multi-level residential apartment buildings including two level basements, landscaping, road widening & new road.

Soils sampled across the Site were assessed against the Site Acceptance Criteria (SAC) provided by the National Environment Protection (Assessment of Site Contamination) Measure (NEPM 2013) Table 1A - Residential B.

2.0 OBJECTIVE

The NSW Office of Environment and Heritage (OEH) indicate that a Detailed Site Environmental Investigation should provide comprehensive information on:

- Any issues raised in preliminary investigations;
- The type, extent and level of contamination;
- Contaminant dispersal in the air, surface water, soil and dust;

- The potential effects of contaminants on public health and the environment;
- Where applicable, off-site impacts on soil, sediment and biota; and
- The adequacy and completeness of all information available to be used in making decisions on remediation.

The project objectives of this Detailed Site Investigation (DSI) are to satisfy the stated OEH Detailed Site Investigation requirements in accordance with *NSW OEH Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites, 2011*. Specifically this investigation will consider the potential for suspected historical activities to have caused contamination at the Site and determine land use suitability for the proposed land use.

The proposed investigation program and the Detailed Site Investigation are designed to assess the presence of any unacceptable on site or off site risk to human health or the environment. The report will draw conclusions regarding the land use suitability of the Site for the proposed land use or provide recommendations to enable such conclusions and determine the need for a further assessment.

3.0 SCOPE OF WORKS

The scope of works for this Detailed Site Investigation (DSI) included:

- Collecting site information, review of historical information and past site practices, (site surveys, site records on waste management practices, NSW Land Titles Office records of ownership, aerial photographs obtained from the NSW Department of Lands, WorkCover NSW records and site interviews);
- A site inspection to identify areas of environmental concern, on-site waste disposal practices and location of sewers, drains, holding tanks, Underground Storage Tanks, Aboveground Storage Tanks and pits, spills and ground discolouration etc.;
- A targeted soil boring/sampling investigative study – formulating and conducting a sampling plan and borehole investigation; the soil samples are taken and submitted for analysis on particular contaminants;
- Groundwater monitoring, well installation and sampling program based on site access;
- Laboratory analysis and results from sample analysis – findings and comparison to regulatory guidelines;
- Quality Assurance/Quality Control (QA/QC) – all QA/QC procedures were undertaken in accordance with the Benviron Group Quality Assurance/Quality Control manual;
- Interpretation of results and findings; and
- Recommendations and final conclusions drawn from interpretation of the results.

4.0 SITE IDENTIFICATION AND SITE HISTORY REVIEW

4.1 Site identification

The site is identified as follows:

Table 1: Site Identification Review

Site Identifier	Site Details	
Site Location	185 Fifth Avenue, Austral NSW 2765	
Lot/DP	Lot 1115 in DP2475	
Site Coordinates #	NE corner: Latitude: -33.945508, Longitude: 150.805922 NW corner: Latitude: -33.945381, Longitude: 150.805072 SE corner: Latitude: -33.946836, Longitude: 150.805651 SW corner: Latitude: -33.946716, Longitude: 150.804796	
Parish	Cabramatta	
County	Cumberland	
Nearest Survey Marker	PM178460 131m West	
Site Area ##	12,120.425 m ²	
Local Government Area (LGA)	Liverpool	
Zoning##	R2 – Low Density Residential	
Surrounding Land Uses	<i>North</i>	Rural Residential & Agricultural
	<i>South</i>	Fifth Avenue and rural residential
	<i>East</i>	Rural residential
	<i>West</i>	Rural Residential & Commercial / Agricultural

Notes:

Refer to NSW LPI “Six Maps” <https://maps.six.nsw.gov.au/>

<https://www.planningportal.nsw.gov.au/find-a-property>

4.2 Review of Historical Maps

A review of the maps originally produced by Higinbotham & Robinson from 1885-1890 was undertaken. No relevant map was found.

4.3 Underground Services

Dial Before You Dig' plans were requested and reviewed for the Site. Plans were provided by Endeavour Energy, Jemena Gas West, Sydney Water & Telstra NSW. The plans did not indicate the presence of any major underground services or utility easements at the Site.

Refer to **Appendix A** – DBYD Plans

4.4 Review of aerial photographs

A number of aerial photographs obtained from the NSW Department of Lands and/or the Land and Property Information Spatial Information Exchange website "Six maps" were reviewed as part of this DSI. Copies of the aerial photographs are kept in the offices of Benviron Group and are available for examination upon request. The results of this review are presented in the following table:

Table 2 Review of Aerial Photographs

Year	Site	Surrounding areas
1955	Cleared land	The site appeared to be cleared vacant land and part of an agricultural (farming / market gardening) property.
1970	Rural residential and agricultural	The site appeared to be developed into a new rural residential property with free standing sheds and with agricultural/ farming activities evident.
1994	Rural residential	The site had been further developed with extensions to the house, two large sheds / garages & swimming pool. No agricultural activities appeared evident.
2005	Rural residential	The swimming pool appeared to have been filled in and an additional shed appeared visible.
Current	As per inspection	The site is as inspected (section 7.1)

The aerial photographs indicate the site had been cleared vacant land and part of a larger agricultural property in 1955. From 1955 to 1970 the site was developed into a new rural residential property with freestanding sheds and with agricultural/ farming activities evident. From 1970 to the current date the site has remained a rural residential with no evidence of agricultural activities.

The surrounding land had been a mixture of vacant uncleared bushland, rural residential, agricultural and vacant cleared land in the 1955 aerial photograph. The land surrounding the site has remained a mixture of rural residential, residential and agricultural to the current date.

Refer to **Appendix B** – Historical Aerial Photographs.

4.5 Title search

A review of historical documents held by Direct Info (approved LPI NSW Information broker) was undertaken to characterise the previous land use and occupiers of the site.

Table 3 Historical land title data

Lot 1115 in DP2475 (185 Fifth Avenue, Austral NSW)		
Year	Proprietor	Company/Personal Occupation
1998-Current	Michael Murphy Patricia Duke	
1996	Stephanie Uren	
1987	Stephanie Uren Christine Lucey	
1959	Erwin Lade	Market Gardener
1958	Gertrude Mulhall	
1956	Radinoj Stoilkovich	Agent
1952	Martin Mulhall	
1947	Cecil Oliver CarMichael	Farmer
1925	James Freeland Leacock	Land Valuer

In summary, the land titles have indicated the following:

- The property at 185 Fifth Avenue has been owned by private individuals from 1925 to 1998. From 1998 to the current date the property has been continued to be owned by private individuals.
- The land titles have revealed the following concerns in relation to potential land use;

- Farmer and Market Gardener were listed as personal occupations in 1947 and 1959 respectively.

Refer to **Appendix C** – Land Title Information.

4.6 Anecdotal Evidence

No Anecdotal Evidence was available at the time of the investigation.

4.7 NSW EPA Records

The NSW EPA publishes records of contaminated sites under Section 58 of the Contaminated Land Management (CLM) Act 1997. The notices relate to investigation and/or remediation of site contamination considered to pose a significant risk of harm under the definition in the CLM Act.

A search of the database revealed that the subject site is not listed and there were no listed properties within the suburb of Austral.

It should be noted that the NSW EPA record of Notices for Contaminated Land does not provide a record of all contaminated land in NSW.

Refer to **Appendix D** – NSW EPA Records.

4.8 NSW EPA POEO Register

A search of the POEO Register revealed that the site was not listed.

Refer to **Appendix D** – NSW EPA Records.

4.9 Council Records

The Liverpool Council database was accessed in order to disclose file records relating to the site and the search revealed the following:

- In 1956, consent to development was approved for the erection of cottage and garage.
- In 1960, a building permit was approved for the erection of a fibro dwelling addition.
- In 1962, consent to development was approved for the erection of additions to the existing dwelling (lounge room, kitchen and adjoining room).
- In 1964, consent to development was approved for the erection of a carport for a motor vehicle.
- In 1964, a building permit was approved for the erection of a brick and fibro carport and tool shed addition.
- In 1979, a development application was approved for the erection of a garage / workshop for home industry use including design work and building small models / prototypes or samples of castings.
- In 1979, a building permit was approved for a detached garage.
- In 1981, a building permit was approved for brick addition.
- In 1982, a building permit was approved for a fibro dwelling addition.
- In 1992, a building permit was approved for the proposed garage and stables.

- In 1992, development consent was provided for the erection of a garage & stables.
- In 1993, a building application was approved for the proposed class 10a awning.
- In 1998, a building certificate was issued for a class 1a dwelling & class 10 patio, awning, aviary, sheds and stables.

Refer to **Appendix E** – Council Records.

4.10 Previous Reports

One previous environmental report was identified at the time of writing this report and is listed below:

- Benviron Group (2017), “Preliminary Site Investigation”, 185 Fifth Avenue, Austral NSW, Ref: E1292, dated August 2017.

Benviron Group 2017 PSI

Benviron Group was appointed by GM Architects to undertake a Preliminary Site Investigation (PSI) for the property situated at 185 Fifth Avenue, Austral NSW. A number of potential areas of environmental concerns were identified at the site, particularly:

- Historical uses including agricultural (farming / market gardening);
- Where pesticides were potentially utilised;
- Carpark areas / driveways where leaks and spills from cars may have occurred;
- degrading building features

The following data gaps were also identified:

- The proposed development plans include landscape areas which are recommended for intrusive investigation to determine site suitability in relation to the proposed development.
- The groundwater quality at the site has not been investigated.
- The SafeWork NSW records & Section 149 certificates have not been searched, received and/or reviewed as part of this investigation.

A summary of the investigation components including the previous site history (farming / market gardening & home industry use for the garage), underground services plans & site inspection; indicates the potential for significant soil and/or groundwater impact was considered medium. In applying the NEPM 2013 Schedule B2 "Guideline on Site Characterisation"; there is sufficient evidence, uncertainty and/ or suspicion of contamination, therefore further investigation was recommended.

Based on the results of this investigation it was considered that the risks to human health and the environment associated with soil and groundwater contamination at the site are medium in the context of the proposed use of the site. The site **can be made suitable** for the proposed development, subject to the following recommendations:

- Preparation of a Detailed Site Investigation (Phase 2 Environmental Site assessment) by a suitably qualified Environmental Consultant.
- Any soil requiring removal from the site, as part of future site works, should be classified in accordance with the "Waste Classification Guidelines, Part 1: Classifying Waste" NSW EPA (2014).
- An Asbestos Clearance Certificate is recommended to be completed once all existing buildings are structures have been demolished.
- All further works may be undertaken during construction certificate stage.

4.11 Summary of site history

The site history is summarised below:

- The land title information indicated the property at 185 Fifth Avenue has been owned by private individuals from 1925 to 1998. From 1998 to the current date the property has been continued to be owned by private individuals.
- The land titles have revealed the following concerns in relation to potential land use;
 - Farmer and Market Gardener were listed as personal occupations in 1947 and 1959 respectively.
- The aerial photographs indicate the site had been cleared vacant land and part of a larger agricultural property in 1955. From 1955 to 1970 the site was developed into a new rural residential property with freestanding sheds and agricultural/ farming activities evident. From 1970 to the current date the site has remained a rural residential with no evidence of agricultural activities.
- The surrounding land had been a mixture of vacant uncleared bushland, rural residential, agricultural and vacant cleared land in the 1955 aerial photograph. The land surrounding the site has remained a mixture of rural residential, residential and agricultural to the current date.
- NSW EPA Records reveal that the subject site is not listed.
- The SafeWork NSW records & Section 149 certificates have not been searched, received and/or reviewed as part of this investigation.
- The Council records have flagged some potential concern in relation to land use and/or contamination including the development of multiple buildings onsite and the use of the garage / workshop for home industry use.

4.12 Integrity Assessment

The information found in the historical sources has been found to be in general concurrence. It is therefore considered that accuracy of this data is acceptable for this investigation.

5.0 REVIEW OF ENVIRONMENTAL INFORMATION

Table 4: Site Condition and Surrounding Environment Review

Site Information	Descriptions
<p>Sensitive Receivers</p>	<p>The nearest sensitive human receptors are the current and future users of the site, construction workers during the site redevelopment and the general public.</p> <p>The nearest watercourse is a tributary of Kemps Creek located 83m north west of the site.</p>
<p>Soil Landscape</p> <p><i>Review of NSW Soil and Land Information website ESPADE.</i></p>	<p>The Soil Landscape Map viewed on NSW ESPADE indicates that the site is located within the Blacktown landscape area. These soils are considered moderately reactive highly plastic subsoil, low soil fertility with poor soil drainage.</p>
<p>Topography</p> <p>Review of NSW Soil and Land Information website ESPADE.</p>	<p>The topography viewed on NSW ESPADE indicated the following for the Blacktown Landscape:</p> <p>Gently undulating rises on Wianamatta Shale with local relief 10-30 m and slopes generally <5% but up to 10%. Crests and ridges are broad (200-600 m) and rounded with convex upper slopes grading into concave lower slopes. Rock outcrop is absent.</p> <p>Based on the site inspection it was determined that the site was sloping to the north west at approximately 2-4°.</p>

Site Information	Descriptions					
Geological Profile	The Geological Map of Penrith (Geological Series Sheet 9030, Scale 1:100,000, Edition 1, 1991), published by the Department of Minerals and Energy indicates the residual soils within the site to be underlain by Triassic Age Shale of the Wianamatta Group, comprising shale, carbonaceous claystone, claystone, laminite, fine to medium grained lithic sandstone, rare coal and tuff.					
Salinity Potential Review of DIPNR Salinity Potential in Western Sydney 2002 Risk Map Refer to Appendix F – Salinity Risk Map.	A review of the Salinity Potential in Western Sydney 2002 Map (DIPNR March 2003) was undertaken for the site. The map indicated the site is located in an area listed with moderate salinity potential.					
Presence of Acid Sulphate Soils <i>Review of NSW Department of Land & Water Conservation (DLWC) Acid Sulphate Soil Risk Maps (Edition Two, December 1997, Scale 1:250,000).</i>	A review of the Liverpool map indicated the site has “No Known Occurrence” of acid sulphate soil material expected within the soil profile.					
Localised Hydrogeology Review of DPI (Office of Water) Database. Appendix G – DPI (Office of Water) Database Records.	Number	Location from Site	Depth (m BGL)	SWL (m BGL)	Use	Water Bearing Zones
	GW107007	2.7km NE	267.00	4	Test Bore	Shale
	GW112662	2.7km SE	-	-	Monitoring	-
	GW072372	6.0km W	228.0	-	Stock / Domestic	Sandstone

Site Information	Descriptions
Nearest Surface Water Body	The nearest watercourse is a tributary of Kemps Creek located 83m north west of the site.
Local Meteorology (Bureau of Meteorology BOM website) Appendix H – BOM Data.	The monthly rainfall of the local surrounding area is represented by the data collected from the BOM rainfall gauge located in Rossmore (South Creek), which is located approximately 3.5km from Austral. The records indicate that the lowest & highest monthly rainfall recorded from 2007 to 2017 in May (date of fieldwork) was 7mm & 105mm.
Nearest Active Service Station (Google Maps Search)	2.5km south of the site.

6.0 REVIEW OF CONSTRUCTION AND SERVICE INFORMATION

6.1 Proposed Development

The site is currently occupied by a rural residential property and is proposed to be redeveloped into four multi-level residential apartment buildings including two level basements, landscaping, road widening & new road.

The proposed development is four 5-storey residential buildings (Buildings A, B, C and D) with two levels of basement carpark. The two level basement carpark is joined between buildings A & B and between buildings C & D at basement 1 level. Buildings A & D are located on the higher eastern part of the site where the proposed vehicular entrance from the future road to the basement carpark are situated. The lower basement 2 carpark level (basement 2) is at approximately RL+66.4m AHD for Buildings A & D and at approximately RL +65.6 m AHD for Buildings B & C. The proposed basement wall has a minimum set-back of 6.0m from the northern and southern boundary, and a minimum set-back of 4.7m from the eastern and the western site boundary. The proposed basement floor levels are confirmed to contain car spaces & lift pits.

Refer to **Appendix I** - Proposed Development Plans & Survey

7.0 SITE VISIT

7.1 General

The site was visited on the 6th February 2018 by Benviron Group Environmental Scientists to inspect the site for any potential sources of contamination.

The following items were considered as part of the site visit:

- Description of the building structures;
- Site surroundings;
- Present and past industrial processes and operations at the site;
- Surface water, groundwater, stormwater and sewer;
- Present and past storage of chemicals and wastes associated with site use and their on-site location;
- Waste management practices and management of hazardous materials;
- Presence of Underground Storage Tanks or Above Ground Storage Tanks;
- Odour; and
- Occupational health and safety.

7.2 Site observations

At the time of the site visit the following observations were made as per the following table:

Table 5: Site Inspection Review

Factors Considered	Description of Sites
Buildings & Structures on Site	The property at 185 Fifth Avenue is rectangular in shape and is occupied by a fibro cement residence with tile roof. The property consisted of a large carport area, animal shelter (stock holding area), garage with attached pergola, sheds, grassed areas, stockpile of soil & building waste, gardens, trees & unsealed driveways.
Percentage Hard-standing surface	15%
Concrete Condition	Average and cracks were visible
Chemical Storage	One drum of sealant was stored at the rear of the animal shelter & stables / carport area. Refer to Appendix J – Site Photographs
Above and Underground Storage Tanks	USTs and ASTs were not identified within the property.
Trade Waste Pits	No trade waste agreements or pits were identified for the building.
Nearby Electrical Transformers	No electrical transformers were identified within the site
Asbestos	Fibro cement sheeting was identified within the building structures, site surface near BH23 and in boreholes BH1 & BH4.
Site Vegetation	Appeared healthy.
Soil Staining and Odours	No odours were identified within the property. No significant soil staining was noted during the inspection.

Stormwater and Sewer	Stormwater and sewage were connected to the local utilities.
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Refer to **Figure 2** - Site Features, Borehole Locations & Exceedance Plan and **Appendix J** – Site Photographs.

8.0 CONCEPTUAL SITE MODEL (CSM)

Based on the above information, site history and site walkover, the areas of potential concern and associated contaminants for the site CSM were identified. These are summarised in the following table.

Table 6: Areas and Contaminants of Concern

Known and potential contamination source	Associated Contaminants
<i>Historical Site Uses (including farming / agricultural)</i>	Heavy Metals, TRH, BTEX, PAH, OCP, PCB
<i>Imported Fill</i>	Heavy Metals, TRH, BTEX, PAH, OCP, PCB
<i>Car parking Areas</i>	TRH, BTEX, PAH
<i>Building degradation/ Demolition</i>	Heavy Metals and Asbestos

Table 7: Potentially Contaminated Media

Known and potential contamination source	Associated Contaminants
<i>Fill Material</i>	There is the potential for contamination to be present in the upper fill material.
<i>Groundwater</i>	There is the potential for the leaching of contaminants into groundwater onsite and also migration of the contaminants.

Potential for Migration

Contaminants generally migrate from site via a combination of windblown dusts, rainwater infiltration, groundwater migration and surface water runoff. The potential for contaminants to migrate is a combination of:

- The nature of the contaminants (solid/liquid and mobility characteristics);
- The extent of the contaminants (isolated or widespread);
- The location of the contaminants (surface soils or at depth); and
- The site topography, geology, hydrology and hydrogeology.

The potential contaminants identified as part of the site history review, site inspection and previous report are present in solid (e.g. impacted fill, asbestos) & liquid (e.g. dissolved in water) forms.

Aerial photography has indicated that there were some unsealed ground surfaces and therefore, there is the potential for migration of contaminants via wind-blown dust.

Rainfall infiltration at the site is expected to occur in unsealed areas. There is therefore the potential that soil contamination could result in impacts to shallow groundwater.

Potential Exposure Pathways

Potential exposure pathways include:

- Dermal;
- Ingestion; and
- Inhalation.

Due to the presence of exposed potentially impacted soil/fill on ground surfaces, dermal and inhalation exposure is considered a potential exposure pathway.

The potential for ingestion of soil is considered as a potential exposure pathway. Although groundwater is not used at the site, there is the potential, for ingestion of contaminants via groundwater removed from monitoring wells.

Receptors

Potential receptors of environmental impact present within the site which will be required to be addressed with respect to the suitability of the site for the proposed use include:

- Excavation/construction/maintenance workers conducting activities at the site, who may potentially be exposed to COPCs through direct contact with impacted soils, Vapour Intrusion and/or groundwater present within excavations and/or inhalation of dusts/fibres associated with impacted soils;
- Future occupants/users of the site may potentially be exposed to COPCs through direct contact with impacted soils and/or ingestion of impacted soils and/or inhalation of dusts/fibres associated with impacted soils and/or exposure to vapour; and/or
- Offsite sensitive receptors of groundwater;
- Flora species to be established on vegetated areas of the site; and
- Tributary of Kemps Creek

Preferential Pathways

For the purpose of this assessment, preferential pathways have been identified as natural and/or man-made pathways that result in the preferential migration of COPCs as either liquids or gases.

Man-made preferential pathways are present throughout the site, generally associated with fill materials and services present beneath existing ground surface. Fill materials and service lines are anticipated to have a higher permeability than the underlying natural soil and/or bedrock.

9.0 REVIEW OF DATA QUALITY OBJECTIVES

The DQOs were also prepared using Appendix IV of the Site Auditor Guidelines. These require 7 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

9.1 State the Problem

The site requires to be confirmed suitable for the proposed development. The site is proposed to be redeveloped and has had some areas of potential concern, those being impacts from historical uses (farming / agricultural), imported fill of unknown origin, degradation of the building materials and leakages from vehicles on site.

Technically defensible evidence needs to be provided so that the identified Site does not present an unacceptable risk to human health or the environment and is suitable for the intended land use.

9.2 Identify the Decisions

The decisions to be made on the contamination and the new environmental data required includes considering relevant site contamination criteria for each medium (fill, soil and sediment). A proposed use of the 95% UCL on the mean concentrations for all soil chemicals of potential concern must be less than the site criteria identified for the relevant land use suitability.

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 the proposed land use being residential with minimal soil access
- 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

9.3 Identify Inputs to Decision

This step requires the identification of the environmental variables/characteristics that need measuring, identification of which media (fill, soil etc.) need to be collected, identification of the site criteria for each medium of concern and appropriate analytical testing. Inputs include:

- Existing site information
- Site history

- Regional geology, topography and hydrogeology
- Potential contaminants
- Proposed Land Use
- Site assessment criteria
- Results as measured against criteria

9.4 Define the Study Boundaries

Specific spatial and temporal aspects must be provided to identify the boundaries of the investigation and to identify any restrictions that may hinder the assessment process. The site is located at 185 Fifth Avenue, Austral NSW and is currently registered as Lot 1115 in DP2475. The site is approximately 12,120.425m² in area.

Refer to **Figure 1** - Site Locality and **Figure 2** – Site Features, Borehole Locations & Exceedance Plan.

9.5 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 suitable for the proposed use 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
- Results are from NATA accredited laboratories
- Detection limits are below assessment criteria
- Results can be shown to be of minimal concern

9.6 Specify Limits on Decision Errors

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

- 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 2013 Guidelines.

9.7 Optimise the Design for Obtaining Data

A resource-effective sampling and analysis design was undertaken for data collection that satisfies the DQO's. The sampling and analytical plan is designed to avoid Type 1 and Type 2 errors and includes defining minimum sample numbers required to detect contamination as determined with procedures provided in the NSW EPA 1995 Sampling Design Guidelines and AS 4482.1 - 2005 and appropriate quality control procedures.

Furthermore, 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 incorporate traceable documentation of procedures used in the sampling and analytical program and in data verification procedures.

10.0 INTRUSIVE SOIL INVESTIGATION

The intrusive soil investigation took place on the 6th February 2018 and was designed to meet the Data Quality Objectives.

10.1 Soil Assessment

Samples were recovered from twenty three (23) borehole locations across the site and were labelled BH1 to BH23. These locations were selected to detect any contamination that may have originated from past and present activities, and due to potential excavation and future development in these areas.

Table 8: Sampling Information - Soil

Analyte / Analyte Group		SAMPLING DATE	DUPLICATE & SPLIT	HEAVY METALS	TRH	BTEX	PAH	OCP	PCB	TRH C6-C10 & BTEXN	PH / CEC / %CLAY	Asbestos ID	Asbestos %w/w
Sample	Depth (m)												
BH1	0-0.2	06.02.2018		✓	✓	✓	✓	✓	✓				✓
BH1	0.4-0.5	06.02.2018		✓	✓	✓	✓	✓	✓				
BH1	0.1	06.02.2018										✓	
BH2	0.1-0.2	06.02.2018	D1/SS1	✓	✓	✓	✓	✓	✓		✓		
BH2	0.4-0.5	06.02.2018		✓	✓	✓	✓	✓	✓		✓		
BH3	0-0.2	06.02.2018		✓	✓	✓	✓	✓	✓				✓
BH3	0.3-0.4	06.02.2018		✓	✓	✓	✓	✓	✓				
BH4	0-0.1	06.02.2018		✓	✓	✓	✓	✓	✓				✓
BH4	0-0.1	06.02.2018										✓	
BH5	0.1-0.2	06.02.2018		✓	✓	✓	✓	✓	✓				
BH6	0-0.1	06.02.2018		✓	✓	✓	✓	✓	✓				
BH7	0.2-0.3	06.02.2018		✓	✓	✓	✓	✓	✓				
BH8	0.1-0.2	06.02.2018		✓	✓	✓	✓	✓	✓				
BH9	0-0.1	06.02.2018		✓	✓	✓	✓	✓	✓				
BH10	0-0.1	06.02.2018		✓	✓	✓	✓	✓	✓				
BH11	0-0.1	06.02.2018		✓	✓	✓	✓	✓	✓				✓
BH11	0.3-0.4	06.02.2018		✓	✓	✓	✓	✓	✓				
BH12	0-0.2	06.02.2018	D2/SS2	✓	✓	✓	✓	✓	✓				
BH13	0.2-0.3	06.02.2018		✓	✓	✓	✓	✓	✓				
BH14	0-0.2	06.02.2018		✓	✓	✓	✓	✓	✓				
BH15	0.1-0.2	06.02.2018		✓	✓	✓	✓	✓	✓		✓		
BH15	0.3-0.4	06.02.2018		✓	✓	✓	✓	✓	✓		✓		
BH16	0-0.1	06.02.2018		✓	✓	✓	✓	✓	✓				
BH17	0-0.1	06.02.2018		✓	✓	✓	✓	✓	✓				
BH17	0.2-0.3	06.02.2018		✓	✓	✓	✓	✓	✓				
BH18	0-0.2	06.02.2018		✓	✓	✓	✓	✓	✓				
BH19	0-0.2	06.02.2018		✓	✓	✓	✓	✓	✓				
BH20	0.1-0.3	06.02.2018		✓	✓	✓	✓	✓	✓				
BH21	0-0.1	06.02.2018		✓	✓	✓	✓	✓	✓				
BH22	0-0.1	06.02.2018		✓	✓	✓	✓	✓	✓				
BH23	0-0.2	06.02.2018		✓	✓	✓	✓	✓	✓				✓
BH23	0.3-0.4	06.02.2018		✓	✓	✓	✓	✓	✓				
TB1	-	-								✓			
TS1	-	-								✓			

The locations of the boreholes and samples are shown in **Figure 2** and details of the boreholes are presented in **Appendix K – Borehole Logs**.

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

- Fill: Clayey Silt & Silty Clay ; and
- Natural: Silty Clay;

10.2 Sampling Density and Rationale

The NSW EPA “Sampling Design Guidelines” (September 1995) requires a minimum sampling density of twenty three (23) sampling points for a site area of 12,120.425m².

Twenty three boreholes labelled (BH1 to BH23) were drilled by adopting a judgemental pattern across the site and to provide general site coverage with consideration given to accessibility and limitations in relation to underground services & access.

10.3 Sampling Methodology

In summary:

- Soil samples were collected using a hand auger, DCP and U50 to collect undisturbed samples.
- Samples were transferred directly into appropriately labelled clean laboratory supplied containers;
- Samples were transferred into chilled eskies for sample preservation;
- A Chain of Custody was completed and forwarded to the laboratory. Sampling analysis was based on field observations and were in accordance to the schedule outlined in Section 12.
- Soil samples were submitted to their respective laboratories as specified in Section 12.4.

Sampling of asbestos was undertaken as follows:

- Soil samples were submitted to their respective laboratories as specified in Section 12.4.
- A minimum 10L sample from each sample location was recovered;
- Each sample (minimum of 10 L) was screened through a 7mm sieve and the material retained on the sieve examined for any bonded ACM and / or suspect material and forwarded to the laboratory for analysis if any suspected ACM is encountered;
- If visible FA material is present or suspected, the soil should be wetted to minimise the release of fibres;
- Identified bonded ACM and FA should be weighed for each sample; and
- One wetted 500ml sample from each sampling location was submitted for laboratory analysis for AF.

11.0 GROUNDWATER INVESTIGATION

11.1 Groundwater Assessment

Samples were recovered from one (1) existing groundwater well within the site. The schedule of analysis is provide below:

Table 9: Sampling Information – Groundwater

SAMPLE ID	SAMPLING DATE	HEAVY METALS	TRH	BTEX	PAH	VOC	TRH C6-C10 & BTEXN
Benviron Group DSI							
GW1	06.02.2018	X	X	X	X	X	
GWD1	06.02.2018	X	X	X	X	X	
GW-SS1	06.02.2018	X	X	X	X	X	
TS1	-						X
TB1	-						X

The location of the groundwater well is shown in **Figure 2 –Site Features, Borehole Locations & Exceedance Plan** and details of the boreholes are presented in **Appendix K – Borehole Logs**. The existing well was installed by Benviron Group during the geotechnical investigation for the site.

Refer to **Appendix L – Calibration Certificates & Appendix M – Field Record Forms**.

11.2 Groundwater Methodology

The groundwater monitoring well was constructed on the 18th to 19th May 2018 by adopting the following methodology:

- 50mm diameter, Class 18PVC threaded and flush joined casing and 0.45 machine-slotted screens were used;
- Coarse, washed sand and gravel was placed in the annulus surrounding the piping to a height of the screen;
- Bentonite pellets were placed in the annulus to form an impermeable plug near the top of the well to prevent surface runoff from entering directly into the well;
- Bentonite pellets were placed in the annulus to form an impermeable plug near the top of the bedrock;
- A PVC cap was placed on the casing;
- 100mm diameter stainless steel flushed covers were used for all well finishes and concreted onto the ground surface.

Table 10: Summary of Well Construction Details

Well ID	Total Depth	Screening (m)	Surface Level (RL)	Water Bearing	Comment
GW1	9.0	3.5-9.0	71.2	Shale	Existing

Notes:

RLs was taken from the closest point on the survey plan provided in Appendix I.

The following works were carried out upon completion of the well installations:

- The well was developed by removing at least three well volumes until groundwater parameters reached equilibrium and no further turbidity improvements were observed.

Drilling and installation of the monitoring well was carried out on the 18th May 2017, using a combination of solid stem augering & NMLC coring, under supervision of Benviron Group.

11.3 Groundwater Sample Collection

Groundwater sampling was undertaken on the 6th February 2018. Prior to sampling, the resting water level was recorded within the well while checking for the presence of phase separated hydrocarbon.

Sampling was completed using a low flow peristaltic pump – a low flow/minimum drawdown sampling technique used to minimise any disturbance to the aquifer.

Field measured parameters were collected using a certified and calibrated In-situ SmarTroll water quality meter. Samples were collected when field measured parameters (pH, electrical conductivity, redox potential, dissolved oxygen and temperature) had stabilised. The samples were placed into appropriate laboratory supplied bottles and preserved on ice. The peri pump and other sampling equipment were decontaminated before and after use to avoid possible cross contamination. All samples collected were preserved on ice and couriered directly to the laboratory under COC documentation.

11.4 Groundwater Observations

Table 11: Groundwater Elevations & Observations

Well ID	Well Depth	Surface Level RL	Groundwater Depth Measured (m BGL)	Groundwater Level (RL)	PSH Depth
BH1/ GW1	9.0	71.2	1.4	69.8	None

Notes:

RLs taken from the closest point on the survey plan provided in Appendix I.

The field measured parameters (pH), electrical conductivity (EC), redox potential, dissolved oxygen (DO) and temperature recorded during purging, were allowed to stabilise prior sampling. Final stabilised groundwater field parameters are summarised in below.

Table 12: Groundwater Field Results

Well ID	Date	pH	Electrical Conductivity (EC us/cm)	Redox Potential (ORP mV)	Dissolved Oxygen (mg/L)	Temperature (*C)
BH1/GW1	06.02.18	6.69	24464.3	30.5	6.42	23.33

The results of the field parameters measured are summarised as follows:

- pH readings indicated the groundwater is general neutral;
- The EC readings indicated generally brackish to seawater water. However Austral is not located near the ocean and salinity issues may be a contributor in freshwater present in the underlying aquifer; and
- Redox readings indicated increasing conditions.

12.0 QUALITY ASSURANCE / QUALITY CONTROL

12.1 General QA/QC

The frequency required for each field quality assurance / quality control (QA/QC) sample is presented in the table below.

Table 13: QA/QCs Frequencies

	Intra Lab	Inter Lab	Rinsate	Spikes	Blanks
Sampling Frequency	1 in 20	1 in 20	1/day	1/day	1/day

During the contamination assessment the integrity of data collected is considered vital. With the assessment of the site, a number of measures were taken to ensure the quality of the data. These are as follows:

12.2 Sample Containers

Soil samples collected during the investigation were placed immediately into laboratory prepared glass jars with Teflon lid inserts. Standard identification labels were adhered to each individual container and labelled according to depth, date, sampling team and media collected.

12.3 Decontamination

All equipment used in the sampling program was decontaminated prior to use and between samples to prevent cross contamination. Decontamination of equipment involved the following procedures:

- Cleaning equipment in potable water to remove gross contamination;
- Cleaning in a solution of Decon 90;
- Rinsing in clean demineralised water then wiping with clean lint free cloths;

Benviron Group also adopted a sampling gradient of lowest to highest potential contamination to minimise the impact of cross contamination. This gradient was determined from the historical review and the on-site inspection that was carried out prior to sampling.

Although Benviron Group maintains consistent sampling procedures, a rinsate sample is obtained to ensure false positive samples are not generated and that decontamination procedures are effective in preventing cross contamination. The Rinsate water is collected after being in contact generally with the trowel used for sampling. Analytical results that target the contaminants of concern are compared to a blank sample, which is taken directly from the rinsate water container supplied by the laboratory.

A rinsate sample was not collected as the samples were taken either directly from the push tube / split spoon sampler or U50 tube and therefore the chance for cross-contamination was minimal.

12.4 Sample Tracking, Identification and Holding Times

All samples were forwarded to Envirolab and ALS Environmental under recognised chain of custodies with clear identification outlining the date, location, sampler and sample ID. All samples were recorded by the laboratory as meeting their respective holding times. The sample tracking system is considered adequate for the purposes of sample collection.

12.5 Sample Transport

All samples were packed into an esky with ice from the time of collection. A trip blank and trip spike are collected where appropriate. These were transported under chain of custody from the site to Envirolab Pty Ltd and ALS Environmental, both NATA registered laboratories. During the project, the laboratory reported that all the samples arrived intact and were analysed within holding times for the respective analytes.

Samples were kept below 4°C at all times, soil samples submitted for asbestos analysis are not required to be kept below 4°C.

12.6 Trip Spike

Trip Spike samples were obtained from the laboratory prior to conducting field sampling where volatile substances are suspected. Benviron Group QA/QC procedures for the collection of environmental samples involves the collection of trip blanks, trip spikes and duplicate samples both intra and inter laboratory.

12.7 Trip Blank

A trip blank accompanied the sampling for the sampling process and is not separated from the sample collection and transportation process. The purpose of the trip blank is to identify whether cross-contamination is occurring during the sample collection and transport process.

12.8 Field Duplicate Samples

The tables below list the duplicate soil samples collected with their corresponding primary samples.

Table 14: Soil Field Duplicate Samples

Primary Sample	Sample Depth (m BGL)	Intra Duplicate	Inter Duplicate	Date Sampled
BH2	0.1-0.2	D1	SS1	06.02.18
BH12	0-0.2	D2	SS2	06.02.18

Table 15: Groundwater Field Duplicate Samples

Primary Sample	Screen Zone (m bgl)	Intra Duplicate	Inter Duplicate	Date Sampled
GW1	3.5-9.0	GWD1	GWSS1	06.02.18

Field duplicate samples for soil were prepared in the field through the following process:

- A larger than normal quantity of soil is recovered from the sample location selected for duplication.
- Two Portions of the sub-sample are immediately transferred, one for an intra-laboratory duplicate and another as a sample.
- Samples are placed into a labelled, laboratory supplied 250ml glass jar and sealed with an airtight, Teflon screw top lid. The fully filled jars are labelled as the sample and duplicate and immediately placed in a chilled esky.

Soil Intra-Laboratory duplicate samples were sent to Envirolab Pty Ltd while Inter-Laboratory duplicate samples were sent to ALS Environmental.

A summary of the test results with the Relative Percentage Difference (RPD) is presented in the following tables.

The comparisons between the duplicates and original samples indicate acceptable RPDs when they comply with criteria which are commonly set at:

- less than 30% for inorganics and 50% for organics
- greater than five (5) times the laboratory limit of recording (LOR)
- greater than 50% of the relevant health investigation level (HIL) concentration.

The tables, below, give details of intra laboratory and inter laboratory duplicates.

Table 16: Intra-lab Soil Sample D1 RPDs

ANALYTE	BH2 0.1-0.2 mg/kg	ENVIROLAB D1 mg/kg	RELATIVE PERCENTAGE DIFFERENCE %
HEAVY METALS			
Arsenic	6	6	0
Cadmium	<0.4	<0.4	-
Chromium	20	17	16
Copper	15	15	0
Lead	21	21	0
Mercury	<0.1	<0.1	-
Nickel	9	7	25
Zinc	41	37	10
TRH			
C10-C14	<50	<50	-
C15-C28	<100	<100	-
C29-C36	120	120	0
BTEX			
Benzene	<0.2	<0.2	-
Toulene	<0.5	<0.5	-
Ethylbenzene	<1	<1	-
Xylenes - Total	<1	<1	-
POLYCYCLIC HYDROCARBONS (PAH)			
Benzo(a)pyrene	<0.05	<0.05	-
Total PAH	<0.05	<0.05	-
ORGANOCHLORINE PESTICIDES			
Heptachlor	<0.1	<0.1	-
Aldrin	<0.1	<0.1	-
Dieldrin	<0.1	<0.1	-
DDD	<0.1	<0.1	-
DDE	<0.1	<0.1	-
DDT	<0.1	<0.1	-
Chlordane (trans & cis)	<0.1	<0.1	-
POLYCHLORINATED BIPHENYLS			
Total PCB	<0.1	<0.1	-

Table 17: Intra-lab Soil Sample D2 RPDs

ANALYTE	BH12 0-0.2 mg/kg	ENVIROLAB D2 mg/kg	RELATIVE PERCENTAGE DIFFERENCE %
HEAVY METALS			
Arsenic	6	5	18
Cadmium	<0.4	<0.4	-
Chromium	17	16	6
Copper	28	31	10
Lead	41	37	10
Mercury	<0.1	<0.1	-
Nickel	6	7	15
Zinc	180	220	20
TRH			
C10-C14	<50	<50	-
C15-C28	<100	<100	-
C29-C36	150	170	13
BTEX			
Benzene	<0.2	<0.2	-
Toulene	<0.5	<0.5	-
Ethylbenzene	<1	<1	-
Xylenes - Total	<1	<1	-
POLYCYCLIC HYDROCARBONS (PAH)			
Benzo(a)pyrene	<0.05	<0.05	-
Total PAH	<0.05	<0.05	-
ORGANOCHLORINE PESTICIDES			
Heptachlor	<0.1	<0.1	-
Aldrin	<0.1	<0.1	-
Dieldrin	1	1	0
DDD	<0.1	<0.1	-
DDE	<0.1	<0.1	-
DDT	<0.1	<0.1	-
Chlordane (trans & cis)	<0.1	<0.1	-
POLYCHLORINATED BIPHENYLS			
Total PCB	<0.1	<0.1	-

Table 18: Intra-lab Groundwater Sample GWD1 RPDs

ANALYTE	Envirolab GW1 ug/l	DUPLICATE GWD1 ug/l	RELATIVE PERCENTAGE DIFFERENCE %
HEAVY METALS			
Arsenic	1	1	0
Cadmium	<0.1	<0.1	-
Chromium	<1	<1	-
Copper	<1	<1	0
Lead	<1	<1	-
Mercury	<0.05	<0.05	-
Nickel	2	2	0
Zinc	4	3	29
TRH			
C6-C10 (F1)	<10	<10	-
C10-C16 (F2)	<50	<50	-
C16-C34	<100	<100	-
C34-C40	<100	<100	-
BTEX			
Benzene	<1	<1	-
Toulene	<1	<1	-
Ethylbenzene	<1	<1	-
Xylenes - Total	<3	<3	-
POLYCYCLIC HYDROCARBONS (PAH)			
Benzo(a)pyrene	<0.1	<0.1	-
Naphthalene	<0.2	<0.2	-
VOC			
Vinyl Chloride	<10	<10	-
PCE	<1	<1	-
TCE	<1	<1	0

The comparisons between the intra-laboratory duplicates and corresponding original samples for soil and groundwater indicated generally acceptable RPD overall.

Table 19: Inter-lab Soil Sample SS1 RPDs

ANALYTE	BH2 0.1-0.2 mg/kg	ALS SS1 mg/kg	RELATIVE PERCENTAGE DIFFERENCE %
HEAVY METALS			
Arsenic	6	7	15
Cadmium	<0.4	<1	-
Chromium	20	20	0
Copper	15	14	7
Lead	21	23	9
Mercury	<0.1	<0.1	-
Nickel	9	8	12
Zinc	41	40	2
TRH			
C10-C14	<50	<50	-
C15-C28	<100	<100	-
C29-C36	120	<100	-
BTEX			
Benzene	<0.2	<0.2	-
Toulene	<0.5	<0.5	-
Ethylbenzene	<1	<0.5	-
Xylenes - Total	<1	<0.5	-
POLYCYCLIC HYDROCARBONS (PAH)			
Benzo(a)pyrene	<0.05	<0.5	-
Total PAH	<0.05	<0.5	-
ORGANOCHLORINE PESTICIDES			
Heptachlor	<0.1	<0.05	-
Aldrin	<0.1	<0.05	-
Dieldrin	<0.1	<0.05	-
DDD	<0.1	<0.05	-
DDE	<0.1	<0.05	-
DDT	<0.1	<0.2	-
Chlordane (trans & cis)	<0.1	<0.05	-
POLYCHLORINATED BIPHENYLS			
Total PCB	<0.1	<0.1	-

Table 20: Inter-lab Soil Sample SS2 RPDs

ANALYTE	BH12 0-0.2 mg/kg	ALS SS1 mg/kg	RELATIVE PERCENTAGE DIFFERENCE %
HEAVY METALS			
Arsenic	6	<5	-
Cadmium	<0.4	<1	-
Chromium	17	11	43
Copper	28	26	7
Lead	41	34	19
Mercury	<0.1	<0.1	-
Nickel	6	4	40
Zinc	180	210	15
TRH			
C10-C14	<50	<50	-
C15-C28	<100	<100	-
C29-C36	150	<100	-
BTEX			
Benzene	<0.2	<0.2	-
Toulene	<0.5	<0.5	-
Ethylbenzene	<1	<0.5	-
Xylenes - Total	<1	<0.5	-
POLYCYCLIC HYDROCARBONS (PAH)			
Benzo(a)pyrene	<0.05	<0.5	-
Total PAH	<0.05	<0.5	-
ORGANOCHLORINE PESTICIDES			
Heptachlor	<0.1	<0.05	-
Aldrin	<0.1	<0.05	-
Dieldrin	1	0.75	29
DDD	<0.1	<0.05	-
DDE	<0.1	<0.05	-
DDT	<0.1	<0.2	-
Chlordane (trans & cis)	<0.1	0.07	-
POLYCHLORINATED BIPHENYLS			
Total PCB	<0.1	<0.1	-

Table 21: Inter-lab Groundwater Sample GWSS1 RPDs

ANALYTE	Envirolab GW1 ug/l	ALS GWSS1 ug/l	RELATIVE PERCENTAGE DIFFERENCE %
HEAVY METALS			
Arsenic	1	1	0
Cadmium	<0.1	<0.1	-
Chromium	<1	<1	-
Copper	<1	<1	-
Lead	<1	<1	-
Mercury	<0.05	<0.1	-
Nickel	2	2	0
Zinc	4	<5	-
TRH			
C6-C10 (F1)	<10	<20	-
C10-C16 (F2)	<50	<100	-
C16-C34	<100	<100	-
C34-C40	<100	<100	-
BTEX			
Benzene	<1	<1	-
Toulene	<1	<2	-
Ethylbenzene	<1	<2	-
Xylenes - Total	<3	<2	-
POLYCYCLIC HYDROCARBONS (PAH)			
Benzo(a)pyrene	<0.1	<0.1	-
Naphthalene	<0.2	<0.1	-
VOC			
Vinyl Chloride	<10	<0.3	-
PCE	<1	<0.05	-
TCE	<1	<0.05	-

The comparisons between the inter-laboratory duplicates and corresponding original samples for soil and groundwater indicated generally acceptable RPD overall.

Field duplicates provide an indication of the whole investigation process, including the sampling process, sample preparation and analysis. The accuracy of the data is considered to be adequate due to the effect on confidence intervals with low concentrations in the samples and their duplicates.

12.9 Trip Spike and Trip Blank Results

Trip Spike samples were obtained from the laboratory prior to conducting field sampling where volatile substances are suspected. Trip spike and trip blank samples were collected to assess the effect of sample handling on volatile concentrations in the samples collected and the results are listed in the tables below:

Table 22: Trip Spike

ANALYTE	TS1 Trip Spike % Soil (mg/kg) 06.02.2018	ANALYTE	TS1 Trip Spike % water (ug/L) 06.02.2018
BTEX		BTEX	
Benzene	118%	Benzene	85%
Toluene	125%	Toluene	90%
Ethyl Benzene	130%	Ethyl Benzene	100%
O-Xylenes	130%	O-Xylenes	110%
M & P Xylenes	131%	M & P Xylenes	105%

Results discussed in Section 12.11

Table 23: Trip Blank

ANALYTE	Trip Blank Soil (TB1) mg/kg 06.02.2018	Practical Quantitation Limits (PQL)	ANALYTE	Trip Blank Water (TB1) ug/L 03.11.2017	Practical Quantitation Limits (PQL)
TRH			TRH		
C6-C9	<25	25	C6-C9	<10	10
C6-C10	<25	25	C6-C10	<10	10
BTEX			BTEX		
Naphthalene	<1	1	Naphthalene	-	-
Benzene	<0.2	0.20	Benzene	<1	1.0
Toluene	<0.5	0.50	Toluene	<1	1.0
Ethyl Benzene	<1	1.00	Ethyl Benzene	<1	1.0
Total Xylenes	<1	1.00	Total Xylenes	<3	3.0

Results discussed in Section 12.11

12.10 Laboratory QA/QC

The integrity of analytical data provides the second step in the QA/QC process for total data compliance. The data validation techniques adopted by Benviron Group are based upon techniques published by the US EPA and in line with methods and guidelines adopted by the NSW EPA and outlined in the NEPM, 2013.

Descriptions are provided of the specific mechanisms used in the assessment of accuracy, precision and useability of analytical data within the project.

Refer to **Appendix N**- NATA Accredited Laboratory Certificates.

12.11 QA/QC Results

The QA/QC results for soil collected at the site are summarised in the table below:

Table 24: QA/QC Results Summary

Data Quality Indicator	Results	DQI Met
Completeness		
<i>Soil & Groundwater</i>		
Data from critical samples is considered valid	Data is considered valid	Yes
Satisfactory frequency / result for QC samples	The majority QC results are considered adequate for the purpose of the investigation. The frequency of the QC samples were not sufficient in laboratory certificate 1804143 for laboratory duplicate water samples analysed for mercury. This was considered a minor non-conformance.	Partial
Field documentation completed	Field records are complete	Yes
Boreholes logs & COCs completed and holding times complied with	Logs, COCs and holding times have been completed and complied with	Yes
Comparability		
<i>Soil & Groundwater</i>		
Standard operating procedures used	Yes	Yes
Consistent field conditions, sampling staff and laboratory analysis	Sampling was conducted by one Benviron Group scientist operating under the SOPs. The laboratories remained consistent throughout the investigation	Yes
Same analytical methods used	All analytical methods used between laboratories were based on the USEPA/APHA methods	Yes

Data Quality Indicator	Results	DQI Met
Limit of reporting appropriate and consistent	The LORs were the same within each laboratory but differed between the primary and secondary laboratories. The LORs were considered appropriate based on the results.	Yes
Representativeness		
<i>Soil & Groundwater</i>		
Sampling appropriate for media and analytes	All sampling was conducted in accordance with Benviron Group SOPs.	Yes
Samples adequately preserved	All of the samples collected were received by laboratories at the correct temperature. Where relevant, samples were stored in acid-preserved containers supplied by laboratories.	Yes
Precision		
<i>Soil & Groundwater</i>		
SOPs appropriate and complied with in relation to field duplicates	The recovery of field duplicates were conducted in accordance with Benviron Group SOPs to allow for the assessment of field precision.	Yes
RPDs of the field duplicates within control limits	The RPDs of the field duplicates were within control limits for all samples..	Yes
RPDs of the laboratory duplicates within control limits	The RPDs of the laboratory duplicates were within the control limits.	Yes

Data Quality Indicator	Results	DQI Met
Accuracy		
<i>Soil & Groundwater</i>		
SOPs appropriate and complied with in relation to field blanks	Yes	Yes
Rinsate Blanks, trip blanks & laboratory blanks free of contaminants	Laboratory blanks & trip blanks were free of contaminants.	Yes
Surrogate spikes within control limits	Yes	Yes
Laboratory control spikes within control limits	Yes	Yes
Matrix Spike recoveries within control limits	Matrix Spike recoveries were within control limits for all samples.	Yes
Trip spike recoveries within control limits	Yes	Yes

12.12 QA/QC Evaluation / Conclusion

In summary, the findings of the QA/QC evaluation indicated the following:

- Data Completeness – The following non-conformance was identified with regards to data comparability:
 - The majority QC results are considered adequate for the purpose of the investigation. The frequency of the QC samples were not sufficient in laboratory certificate 1804143 for laboratory duplicate water samples analysed for mercury. This was considered a minor non-conformance.
- Data Representativeness – The data set is considered representative.
- Data Precision – The data set is considered precise.

- Data Accuracy – The data set is considered accurate.

It is therefore considered that the data is sufficiently reliable and that the results can be used for the purpose of this project.

13.0 SITE ASSESSMENT CRITERIA

13.1 SOILS

13.1.1 Health Investigation Levels (HILs)

To assess the contamination status of soils at a site, the NSW EPA refers to the document entitled National Environmental Protection (Assessment of Site Contamination) Measure (NEPM) (Amendment 2013).


The site is currently occupied by a rural residential property and is proposed to be redeveloped into four multi-level residential apartment buildings including two level basements, landscaping, road widening & new road.

The site will be assessed against the NEPM exposure scenario 'Residential B' Health Investigation Levels of the above mentioned guidelines and specifically refers to the following:

HIL 'B' Residential with minimal opportunities for soil access: includes dwellings with fully and permanently paved yard space such as high-rise buildings and apartments.

The soil regulatory guidelines are presented in the table below.

Table 25: Health Investigation Levels (HIL) Criteria for Soil Contaminants

	Residential B	Reference
Heavy Metals		
Arsenic	500	NEPM 2013 - Table 1(A)1 HILs
Beryllium	90	NEPM 2013 - Table 1(A)1 HILs
Boron	40000	NEPM 2013 - Table 1(A)1 HILs
Cadmium	150	NEPM 2013 - Table 1(A)1 HILs
Chromium (VI)	500	NEPM 2013 - Table 1(A)1 HILs
Cobalt	600	NEPM 2013 - Table 1(A)1 HILs
Copper	30000	NEPM 2013 - Table 1(A)1 HILs
Lead	1200	NEPM 2013 - Table 1(A)1 HILs
Manganese	14000	NEPM 2013 - Table 1(A)1 HILs
Mercury (Inorganic)	120	NEPM 2013 - Table 1(A)1 HILs
Methyl Mercury	30	NEPM 2013 - Table 1(A)1 HILs
Nickel	1200	NEPM 2013 - Table 1(A)1 HILs
Selenium	1400	NEPM 2013 - Table 1(A)1 HILs
Zinc	60000	NEPM 2013 - Table 1(A)1 HILs
Cyanide (Free)	300	NEPM 2013 - Table 1(A)1 HILs
Polycyclic Aromatic Hydrocarbons (PAHs)		
Carcinogenic PAHs (as Bap TEQ)	4	NEPM 2013 - Table 1(A)1 HILs
Total PAHs	400	NEPM 2013 - Table 1(A)1 HILs
Organochlorine Pesticides		
DDT + DDE + DDD	600	NEPM 2013 - Table 1(A)1 HILs
Aldrin + Dieldrin	10	NEPM 2013 - Table 1(A)1 HILs
Chlordane	90	NEPM 2013 - Table 1(A)1 HILs
Endosulfan	400	NEPM 2013 - Table 1(A)1 HILs
Heptachlor	10	NEPM 2013 - Table 1(A)1 HILs
HCB	15	NEPM 2013 - Table 1(A)1 HILs
Phenols		
Phenols	45000	NEPM 2013 - Table 1(A)1 HILs
Pentachlorophenol	130	NEPM 2013 - Table 1(A)1 HILs
Cresols	4700	NEPM 2013 - Table 1(A)1 HILs
Polychlorinated Biphenyls (PCBs)		
PCBs	1200	NEPM 2013 - Table 1(A)1 HILs
Other Pesticides		
Atrazine	470	NEPM 2013 - Table 1(A)1 HILs
Chlorpyrifos	340	NEPM 2013 - Table 1(A)1 HILs
Bifenthrin	840	NEPM 2013 - Table 1(A)1 HILs
Herbicides		
2,4,5-T	900	NEPM 2013 - Table 1(A)1 HILs
2,4-D	1600	NEPM 2013 - Table 1(A)1 HILs
MCPA	900	NEPM 2013 - Table 1(A)1 HILs
MCPB	900	NEPM 2013 - Table 1(A)1 HILs
Mecoprop	900	NEPM 2013 - Table 1(A)1 HILs
Picloram	6600	NEPM 2013 - Table 1(A)1 HILs
Other Organics		
PDBE (Br1-Br9)	2	NEPM 2013 - Table 1(A)1 HILs

Note - All values are in mg/kg

13.2 Health Screening Levels (HSLs)


The HSLs are applicable to generic land uses such as residential, commercial/industrial or recreational/public open space and different soil types between the ground surface and soils >4 metres below ground level. The HILs have been applied to assess human health risks via the inhalation and direct contact pathways of exposure.

It should be noted that HSL D can be used in lieu of HSL B for buildings that comprise car parks or commercial properties on the ground floor.

For assessing TRH and BTEX contamination at sites used for sensitive land use, such as residential, the NEPM refers to the Health Screening Levels (HSLs) "HSL A and HSLB".

For selection of the health screening criteria an assessment of the in-situ soil profile should be undertaken. The soil profile consisted of predominantly Silt & Clay.

Table 26: Health Screening Levels (HSL) Criteria

	HSL A & HSL B	HSL A & HSL B	HSL A & HSL B	HSL A & HSL B	Soil Saturation Concentration (Csat)	Reference
	0m to <1m	1m to <2m	2m to <4m	4m+		
CLAY						
Toluene	480	NL	NL	NL	630	NEPM 2013 - Table 1(A) 3 HSLs
Ethylbenzene	NL	NL	NL	NL	68	NEPM 2013 - Table 1(A) 3 HSLs
Xylenes	110	310	NL	NL	330	NEPM 2013 - Table 1(A) 3 HSLs
Naphthalene	5	NL	NL	NL	10	NEPM 2013 - Table 1(A) 3 HSLs
Benzene	0.7	1	2	3	430	NEPM 2013 - Table 1(A) 3 HSLs
F1	50	90	150	290	850	NEPM 2013 - Table 1(A) 3 HSLs
F2	280	NL	NL	NL	560	NEPM 2013 - Table 1(A) 3 HSLs
SAND						
Toluene	160	220	310	540	560	NEPM 2013 - Table 1(A) 3 HSLs
Ethylbenzene	55	NL	NL	NL	64	NEPM 2013 - Table 1(A) 3 HSLs
Xylenes	40	60	95	170	300	NEPM 2013 - Table 1(A) 3 HSLs
Naphthalene	3	NL	NL	NL	9	NEPM 2013 - Table 1(A) 3 HSLs
Benzene	0.5	0.5	0.5	0.5	360	NEPM 2013 - Table 1(A) 3 HSLs
F1	45	70	110	200	950	NEPM 2013 - Table 1(A) 3 HSLs
F2	110	240	440	NL	560	NEPM 2013 - Table 1(A) 3 HSLs
SILT						
Toluene	390	NL	NL	NL	640	NEPM 2013 - Table 1(A) 3 HSLs
Ethylbenzene	NL	NL	NL	NL	69	NEPM 2013 - Table 1(A) 3 HSLs
Xylenes	95	210	NL	NL	350	NEPM 2013 - Table 1(A) 3 HSLs
Naphthalene	4	NL	NL	NL	10	NEPM 2013 - Table 1(A) 3 HSLs
Benzene	0.6	0.7	1	2	440	NEPM 2013 - Table 1(A) 3 HSLs
F1	40	65	100	100	910	NEPM 2013 - Table 1(A) 3 HSLs
F2	230	NL	NL	NL	570	NEPM 2013 - Table 1(A) 3 HSLs

Note - All values are in mg/kg

13.3 (EILs) and (ESLs)

Ecological Investigation Levels (EILs) -

The NEPM 2013 states that "Ecological investigation levels (EILs) for the protection of terrestrial ecosystems have been derived for common contaminants in soil based on a species sensitivity distribution (SSD) model developed for Australian conditions. EILs have been derived for As, Cu, CrIII, DDT, naphthalene, Ni, Pb and Zn

Insufficient data was available to derive ACLs for arsenic (As), DDT, lead (Pb) and naphthalene. As a result, the derived EILs are generic to all soils and are presented as total soil contaminant concentrations in Tables 1B (4) and 1B (5) within the NEPM 2013.

For the purposes of EIL derivation, a contaminant incorporated in soil for at least two years is considered to be aged for the purpose of EIL derivation. The majority of contaminated sites are likely to be affected by aged contamination. Fresh contamination is usually associated with current industrial activity and chemical spills".

The following process describes the method for calculation of site specific EILs.

A. EILs for Ni, Cr III, Cu, Zn and Pb aged contamination (>2 years)

Steps 1–4 below describe the process for deriving site-specific EILs for the above elements using Tables 1B (1) – 1B (4), which can be found at the end of the NEPM 2013.

1. Measure or analyse the soil properties relevant to the potential contaminant of concern (pH, CEC, organic carbon, clay content). Sufficient samples need to be taken for these determinations to obtain representative values for each soil type in which the contaminant occurs.
2. Establish the sample ACL for the appropriate land use and with consideration of the soil-specific pH, clay content or CEC. The ACL for Cu may be determined by pH or CEC and the lower of the determined values should be selected for EIL calculation. Note that the ACL for Pb is taken directly from Table 1(B) 4.
3. Calculate the contaminant ABC in soil for the particular contaminant and location from a suitable reference site measurement or other appropriate method.

4. Calculate the EIL by summing the ACL and ABC:

$$\text{EIL} = \text{ABC} + \text{ACL}$$

B. EILs for As, DDT and naphthalene


EILs for aged contamination for DDT and naphthalene are not available and the adopted EIL is based on fresh contamination taken directly from Table 1B (5). The EILs for As, DDT and naphthalene are generic i.e. they are not dependent on soil type and are taken directly from Table 1B (5). Only EILs for fresh contamination are available for As, DDT and naphthalene due to the absence of suitable data for aged contaminants.

Ecological Screening Levels (ESLs) -

Ecological screening levels (ESLs) are presented based on a review of Canadian guidance for petroleum hydrocarbons in soil and application of the Australian methodology (Schedule B5b) to derive Tier 1 ESLs for BTEX, benzo(a)pyrene and F1 and F2 (Warne 2010a, 2010b)

The Canadian Council of the Ministers of the Environment (CCME) has adopted risk-based TPH standards for human health and ecological aspects for various land uses in the *Canada-wide standard for petroleum hydrocarbons (PHC) in soil* (CCME 2008) (CWS PHC). The standards established soil values including ecologically based criteria for sites affected by TPH contamination for coarse- and fine-grained soil types.

Table 27: Ecological Investigation Levels (EIL) and Ecological Screening Levels (ESL)
Criteria

	Contaminant Age/Soil Texture	National parks and areas of high conservation value	Urban residential and open public spaces	Commercial and industrial	Reference
Ecological Investigation Levels (EILs)					
Heavy Metals					
Arsenic	Fresh	20	50	80	NEPM 2013 - Table 1(B) 1-5 EILs NEPM 2013 - Table 1(B) 1-5 EILs
	Aged	40	100	160	
Chromium (III)	Fresh	Site Specific Calculation Required			NEPM 2013 - Table 1(B) 1-5 EILs NEPM 2013 - Table 1(B) 1-5 EILs
	Aged				
Copper	Fresh	Site Specific Calculation Required			NEPM 2013 - Table 1(B) 1-5 EILs NEPM 2013 - Table 1(B) 1-5 EILs
	Aged				
Lead	Fresh	110	270	440	NEPM 2013 - Table 1(B) 1-5 EILs NEPM 2013 - Table 1(B) 1-5 EILs
	Aged	470	1100	1800	
Nickel	Fresh	Site Specific Calculation Required			NEPM 2013 - Table 1(B) 1-5 EILs NEPM 2013 - Table 1(B) 1-5 EILs
	Aged				
Zinc	Fresh	Site Specific Calculation Required			NEPM 2013 - Table 1(B) 1-5 EILs NEPM 2013 - Table 1(B) 1-5 EILs
	Aged				
Polycyclic Aromatic Hydrocarbons (PAHs)					
Naphthalene	Fresh	10	170	370	NEPM 2013 - Table 1(B) 1-5 EILs NEPM 2013 - Table 1(B) 1-5 EILs
	Aged	10	170	370	
Organochlorine Pesticides					
DDT	Fresh	3	180	640	NEPM 2013 - Table 1(B) 1-5 EILs NEPM 2013 - Table 1(B) 1-5 EILs
	Aged	3	180	640	
Ecological Screening Levels (ESLs) and Management Limits					
F1 (C ₆ -C ₁₀)	Coarse	125*	180*	215*	NEPM 2013 - Table 1(B) 6-7 EILs NEPM 2013 - Table 1(B) 6-7 EILs
	Fine				
F1 (C ₆ -C ₁₀) (Management Limits)	Coarse	-	700	700	NEPM 2013 - Table 1(B) 6-7 EILs NEPM 2013 - Table 1(B) 6-7 EILs
	Fine		800	800	
F2 (>C ₁₀ -C ₁₆)	Coarse	25*	120*	170*	NEPM 2013 - Table 1(B) 6-7 EILs NEPM 2013 - Table 1(B) 6-7 EILs
	Fine				
F2 (>C ₁₀ -C ₁₆) (Management Limits)	Coarse	-	1000	1000	NEPM 2013 - Table 1(B) 6-7 EILs NEPM 2013 - Table 1(B) 6-7 EILs
	Fine		1000	1000	
F3 (>C ₁₆ -C ₃₄)	Coarse	-	300	1700	NEPM 2013 - Table 1(B) 6-7 EILs NEPM 2013 - Table 1(B) 6-7 EILs
	Fine		1300	2500	
F3 (>C ₁₆ -C ₃₄) (Management Limits)	Coarse	-	2500	3500	NEPM 2013 - Table 1(B) 6-7 EILs NEPM 2013 - Table 1(B) 6-7 EILs
	Fine		3500	5000	
F4 (>C ₃₄ -C ₄₀)	Coarse	-	2800	3300	NEPM 2013 - Table 1(B) 6-7 EILs NEPM 2013 - Table 1(B) 6-7 EILs
	Fine		5600	6600	
F4 (>C ₃₄ -C ₄₀) (Management Limits)	Coarse	-	10000	10000	NEPM 2013 - Table 1(B) 6-7 EILs NEPM 2013 - Table 1(B) 6-7 EILs
	Fine		10000	10000	
Benzene	Coarse	10	50	75	NEPM 2013 - Table 1(B) 6-7 EILs NEPM 2013 - Table 1(B) 6-7 EILs
	Fine	10	65	95	
Toluene	Coarse	10	85	135	NEPM 2013 - Table 1(B) 6-7 EILs NEPM 2013 - Table 1(B) 6-7 EILs
	Fine	65	105	135	
Ethylbenzene	Coarse	1.5	70	165	NEPM 2013 - Table 1(B) 6-7 EILs NEPM 2013 - Table 1(B) 6-7 EILs
	Fine	40	125	185	
Xylenes	Coarse	10	105	180	NEPM 2013 - Table 1(B) 6-7 EILs NEPM 2013 - Table 1(B) 6-7 EILs
	Fine	1.6	45	95	
Benzo(a)pyrene	Coarse	0.7	0.7	0.7	NEPM 2013 - Table 1(B) 6-7 EILs NEPM 2013 - Table 1(B) 6-7 EILs
	Fine	0.7	0.7	0.7	

Notes

- Urban residential/public open space is broadly equivalent to the HIL-A, HIL-B and HIL-C land use scenarios in Table 1A(1) Footnote 1 and as described in Schedule B7.
- Aged values are applicable to arsenic contamination present in soil for at least two years. For fresh contamination refer to Schedule B5c.
- Insufficient data was available to calculate aged values for DDT and naphthalene, consequently the values for fresh contamination should be used.
- Insufficient data was available to calculate ACLs for As, DDT and naphthalene. The EIL should be taken directly from Table 1B(5).
- ESLs are of low reliability except where indicated by * which indicates that the ESL is of moderate reliability.
- '-' indicates that insufficient data was available to derive a value.
- To obtain F1, subtract the sum of BTEX concentrations from C6-C10 fraction and subtract naphthalene from >C10-C16 to obtain F2.
- Management limits are applied after consideration of relevant ESLs and HSLs
- Separate management limits for BTEX and naphthalene are not available hence these should not be subtracted from the relevant fractions to obtain F1 and F2.

13.4 Asbestos

Health screening for asbestos in soil, which are based on scenario-specific likely exposure levels, are adopted from the WA DoH guidelines and are referred in Table 7 in Schedule B1. The following health screening levels for asbestos can be seen below:

Table 28: Health Screening Levels for Asbestos

	Health Screening Levels (w/w)			
Form of Asbestos	Residential A	Residential B	Recreational C	Commercial/Industrial D
Bonded ACM	0.01%	0.04%	0.02%	0.05%
FA and AF (Friable Asbestos)	0.001%			
All forms of asbestos	No visible asbestos for surface soil			

13.5 Aesthetic Considerations

Schedule B1 in NEPC (2013) requires the consideration of aesthetic issues arising from soils and groundwater within the site. The following assessment criteria were adopted when considering aesthetics:

- no persistently malodorous soils or extracted groundwater;
- no persistent hydrocarbon sheen on surface water;
- no staining or discolouration in soils, taking into consideration the natural state of the soil; and
- no large or frequently occurring anthropogenic materials present (to the extent practicable).

13.6 Groundwater

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*' (Amendment 2013) 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

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:

- Discharge to water bodies sustaining aquatic ecosystems particularly Fresh Water.
- Extraction of groundwater by local users.

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 ***fresh water trigger*** values are applicable for investigating chemical concentrations in groundwater at the site, as the receiving body. The nearest watercourse is a tributary of Kemps Creek located 83m northwest of the site. 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.

14.0 RESULTS

SOIL

The laboratory certificates are presented in **Appendix N** – NATA Accredited Laboratory Certificates.

A summary of the results together with the assessment criteria adopted are provided in **Appendix O** – Summary Tables. A summary of the statistical information utilised in the analysis is provided in **Appendix P** – Statistical Information.

14.1 HEAVY METALS

14.1.1 Heath Investigation Levels

As indicated in Table O1 the majority of heavy metals were below the respective LOR and/or the Health Investigation Level (HIL) for a residential development, that being the HIL 'B' with the exception of the following:

- A lead concentration of 1,500mg/kg in the sample BH9 (0-0.1m) exceeded the criteria of 1,200mg/kg.

The lead data has been assessed statistically against the relevant assessment criteria. As shown in Table O1, the 95% UCL of the mean concentrations of lead from the fill material, was below the assessment HIL 'B' criteria for lead; the standard deviations was 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 lead contamination is not likely to be an issue within the site.

14.1.2 Ecological Investigation Levels

The EILs for Copper, Zinc, Lead, Nickel and Chromium III were derived by adding the Ambient Background Concentration (ABC) to the Added Contaminant Limits (ACL), as per the following formula:

$$\text{EIL} = \text{ABC} + \text{ACL}$$

The ABC for the site has been determined by recovering a sample from an appropriate reference point, that being:

- BH2 (0.1-0.2m)
- BH2 (0.4-0.5m)
- BH15 (0.1-0.2m)
- BH15 (0.3-0.4m)

The soil samples collected from BH2 & BH15 were analysed for pH, CEC & %CLAY to provide the background parameters for the soil on the site.

As shown in Table O1 the majority of the locations were below the site derived EILs with the exception of the following:

- A copper, zinc, nickel & lead concentration of 1,800mg/kg, 1,900mg/kg, 94mg/kg & 1,500mg/kg in the sample BH9 (0-0.1m) exceeded the EIL criteria of 110mg/kg, 250mg/kg, 40mg/kg & 1,100mg/g respectively.
- A nickel concentration of 52mg/kg in the sample BH17 (0-0.1m) exceeded the EIL criteria of 40mg/kg.

The lead & nickel data has been assessed statistically against the relevant assessment criteria. As shown in Table O1, the 95% UCL of the mean concentrations of lead & nickel from the fill material, was below the assessment EIL criteria for lead & nickel; the standard deviations was less than 50% of the assessment criteria and no single concentration exceeded the assessment criteria by more than 250%.

However, BH9 is considered a hotspot based on the exceedance by more than 250% of the EIL criteria for copper and zinc concentrations.

14.2 TRH, BTEX, NAPHTHALENE &/OR BENZO (A) PYRENE

14.2.1 Heath Screening Levels & Management Limits

As indicated in Table O1, the F1 (C₆-C₁₀), F2 (>C₁₀-C₁₆), benzene, toluene, ethyl benzene, xylenes and naphthalene concentrations were below the HSL 'A' & HSL 'B' for a Clay & Silt soil profile with a source depth of "0m to <1m" .

As shown in Table O1, the F1 (C₆-C₁₀), F2 (>C₁₀-C₁₆), F3 (C₁₆-C₃₄), F4 (C₃₄-C₄₀), concentrations were below the Management Limits for a FINE grained soil texture in a "residential parkland and public open space".

14.2.2 Ecological Screening Levels

As indicated in Table O1, the F1 (C₆-C₁₀), F2 (>C₁₀-C₁₆), F3 (C₁₆-C₃₄), F4 (C₃₄-C₄₀), benzene, toluene, ethyl benzene, xylenes and benzo(a)pyrene concentrations were below the ESL for a FINE grained soil texture in an “urban residential and public open space”.

14.3 PAH, OCP & PCB

14.3.1 Health Investigation Levels

As indicated in Table O1, the concentrations of the benzo(a)pyrene (as TEQ), Total PAH, OCP & PCB were below the Health Investigation Level (HIL) for a residential development, that being the HIL ‘B’ and/or the limit of reporting (LOR).

14.3.2 EILs & ESLs

As indicated in Table O1, the concentrations of arsenic, naphthalene and DDT were below the EILs & ESLs for urban residential and public open space.

14.4 Asbestos

As shown in Table O1, two ACM fragments from BH1 (0.1m) & BH4 (0-0.1m) were confirmed to contain asbestos (chrysotile & amosite).

As shown in Table O1, the soil samples tested for asbestos were below the %w/w asbestos for FA & AF adjusted assessment criteria & below the %w/w asbestos ACM – Residential use, childcare centres, preschools etc.

Although the ACM is considered low risk as no fibrous asbestos or asbestos fines were detected, the boreholes at BH1 & BH4 are located in the landscape areas and therefore minor remediation works is considered appropriate.

GROUNDWATER

The laboratory certificates are presented in **Appendix N** – NATA Accredited Laboratory Certificates.

A summary of the results together with the assessment criteria adopted are provided in **Appendix O** – Summary Tables.

14.5 HEAVY METALS

As indicated in Table O2, all metals concentrations were either below the laboratory limits of reporting (LOR) or their respective assessment criteria.

14.6 TRH & BTEXN

As shown In Table O2, the BTEXN concentrations were either less than the laboratory limit of reporting (LOR) and/or below the assessment criteria.

As indicated in Table O2, the TRH F1 (C₆-C₁₀), F2 (>C₁₀-C₁₆), benzene, toluene, ethyl benzene, xylenes and naphthalene concentrations were below the HSL 'A' & HSL 'B' for a Clay profile with a source depth of "2m to <4m".

14.7 PAH

As indicated in Table O2, the PAH concentrations were either less than the laboratory limit of reporting (LOR) and/or below the assessment criteria.

14.8 VOCs in Groundwater

As indicated in Table O3, the VOC concentrations were either less than the laboratory limit of reporting (LOR) and/or below the adopted assessment criteria.

Refer to **Appendix N** – NATA Accredited Laboratory Certificates.

15.0 DISCUSSION

15.1 SOILS

Based on the results of the investigation, the abovementioned locations BH1, BH4 & BH9 require remediation in order to render the site suitable for the proposed development.

Information pertaining to the above mentioned locations is included below:

- The asbestos detected within BH1 is located in the fill layer to a depth of 0.3m BGL.
- The asbestos detected within BH4 is located in the fill layer to a depth of 0.1m BGL.
- The copper and zinc concentration within BH9 is located in the fill layer to a depth of 0.1m BGL.

Reference should be made to Figure 1 & 2 for a copy of the site plans.

15.2 GROUNDWATER QUALITY

The groundwater monitoring undertaken by Benviron Group has indicated no concerns with Heavy Metals, TRH, BTEXN, PAH, & VOC in relation to the adopted guidelines.

15.3 DATA GAPS

The following data gaps were identified:

- The SafeWork NSW records & Section 149 certificates have not been searched, received and/or reviewed as part of this investigation.

15.4 DUTY TO REPORT

Under Section 60 of the Contaminated Land Management Act 1997, the owner of the land is required to notify contamination in circumstances as indicated in the NSW EPA (2015) *Guidelines on Duty to Report Contamination under the Contaminated Land Management Act 1997*.

Sites that are significantly impacted by soil, groundwater and ground gases are likely to require notification to the NSW EPA under section 60 of the CLM Act. A decision process for use by site owners or responsible persons considering reporting contamination under section 60 is provided in Appendix 1 (Figure 1) of the aforementioned guidelines.

16.0 CONCLUSION AND RECOMMENDATION

The investigation revealed the following areas of environmental concern:

- The asbestos detected within BH1 is located in the fill layer to a depth of 0.3m BGL.
- The asbestos detected within BH4 is located in the fill layer to a depth of 0.1m BGL.
- The copper and zinc concentration within BH9 is located in the fill layer to a depth of 0.1m BGL.
- The groundwater monitoring undertaken by Benviron Group has indicated no concerns with Heavy Metals, TRH, BTEXN, PAH, & VOC in relation to the adopted guidelines.

Based on the results of the investigation, the abovementioned locations BH1, BH4 & BH9 require minor remediation works in order to render the site suitable for the proposed development.

- It is considered that the site would be deemed suitable for the proposed development subject to the implementation of a Remediation Action Plan (RAP) to manage the abovementioned environmental concerns and data gaps.
- Any soil requiring removal from the site, as part of future site works, should be classified in accordance with the “Waste Classification Guidelines, Part 1: Classifying Waste” NSW EPA (2014).

If during any potential site works, significant odours and / or evidence of gross contamination (including asbestos) not previously detected are encountered, or any other significant unexpected occurrence, site works should cease in that area, at least temporarily, and the environmental consultant should be notified immediately to set up a response to this unexpected occurrence.

Thank you for the opportunity of undertaking this work. We would be pleased to provide further information on any aspects of this report.

17.0 LIMITATIONS

To the best of our knowledge information contained in this report is accurate at the date of issue, however, 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.

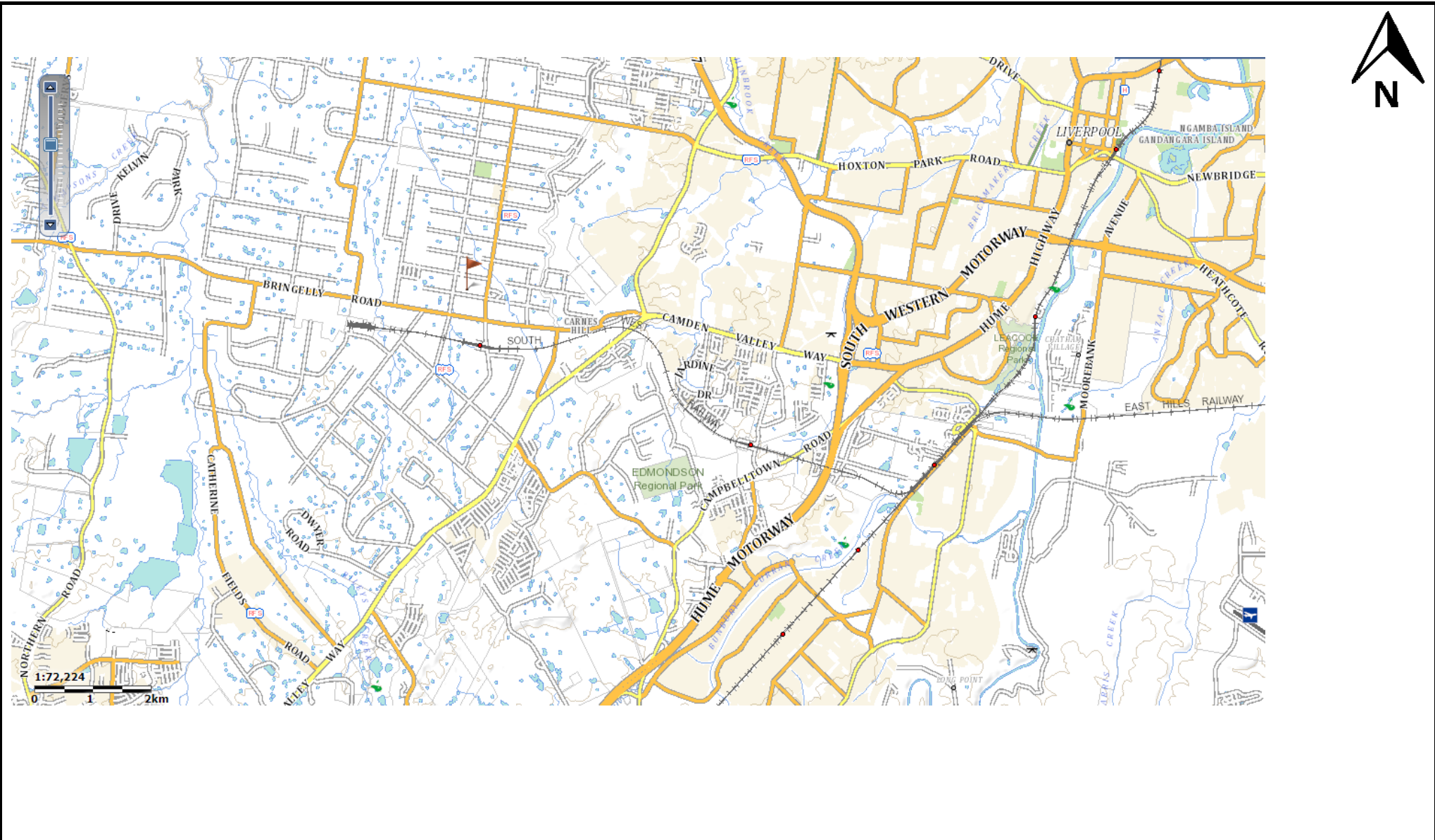
Opinions expressed herein are judgements and are based on our understanding and interpretation of current regulatory standards and should not be construed as legal opinions.

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*.
- Benviron Group (2017), “Preliminary Site Investigation”, 185 Fifth Avenue, Austral NSW, Ref: E1292, dated August 2017.
- Department of Urban Affairs and Planning – EPA (1998) “*Managing Land Contamination – Planning Guidelines – SEPP 55 – Remediation of Land*”.
- National Environmental Protection Council (NEPC) (1999) – *National Environmental Protection (Assessment of Site Contamination) Measure. Amendment 2013*
- National Health and Medical Research Council (NHMRC) & National Resource Management Ministerial Council (NRMCC) “National Water Quality Management Strategy, Australian Drinking Water Guidelines” (2011)
- NSW EPA (2014) “*Technical Note: Investigation of Service Station Sites*”.
- NSW EPA (2009) “*Guidelines on Significant Risk of Harm from contaminated land and the duty to report*”.
- NSW OEH “Guidelines for Consultants Reporting on Contaminated Sites” (2011). NSW Environment Protection Authority, Sydney.
- NSW DEC, “Guidelines for the Assessment and Management of Groundwater Contamination” (March 2007).
- NSW DEC “Guidelines for the NSW Site Auditor Scheme” (2006, 2nd edition). NSW Environment Protection Authority, Sydney.
- NSW EPA (2014) – “Waste Classification Guidelines, Part 1: Classifying Waste”;
- NSW EPA “Guidelines for Consultants Reporting on Contaminated Sites” (2011). NSW Environment Protection Authority, Sydney.

- NSW EPA (2014) “Guidelines on the Duty to Report Contamination under the Contaminated Land Management Act 1997”;
- NSW EPA “Sampling Design Guidelines” (1995). NSW Environment Protection Authority, Sydney.
- US EPA “Regional Screening Level (RSL) Summary Tables” (2016). United States Environment Protection Authority.

FIGURE 1 SITE LOCALITY





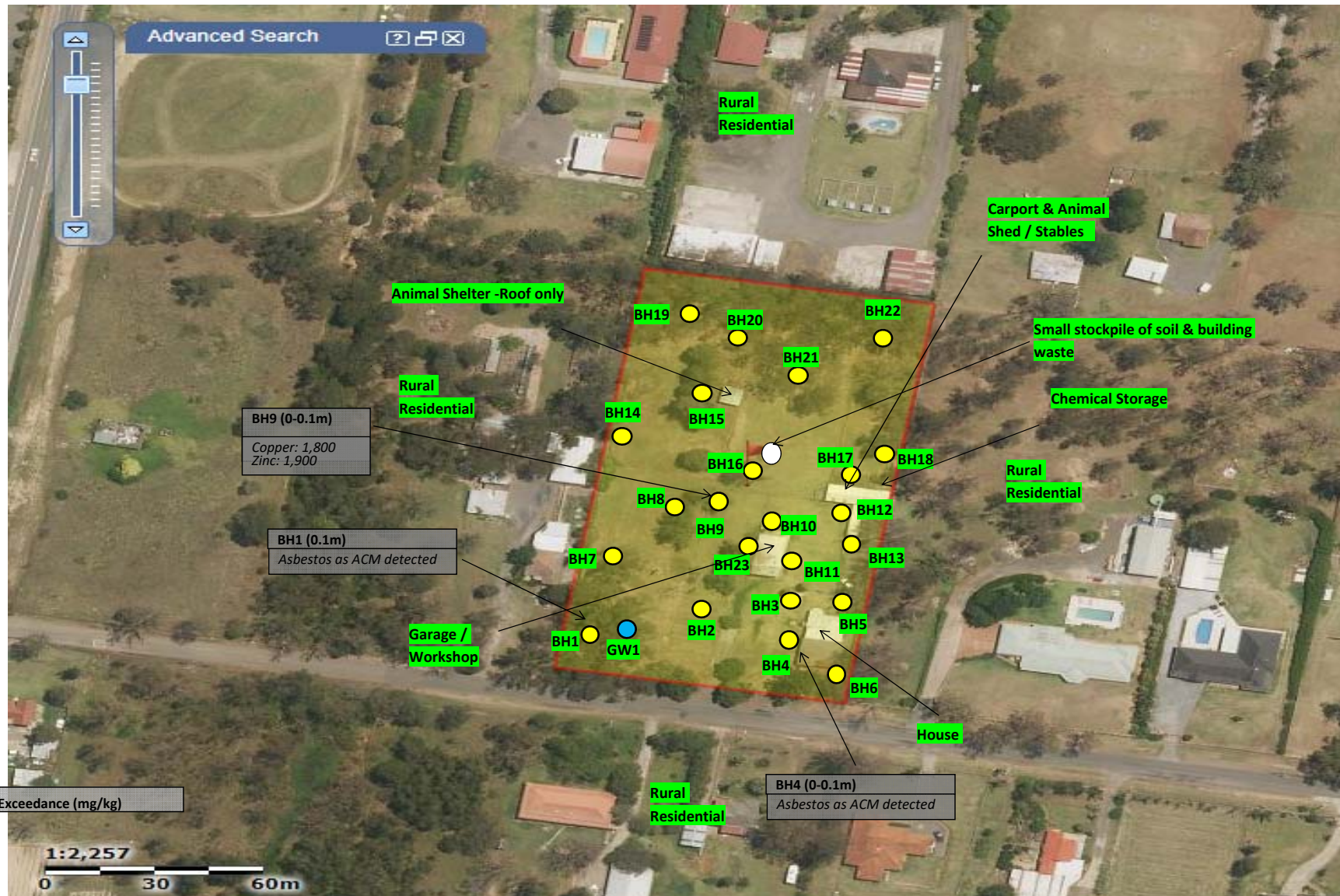
Key Site Location 	 simple sustainable solutions	DRAWN RL	SITE LOCALITY
		FIGURE 1	Ref: NSW LPI Six Maps
		Job # E1292-2	185 Fifth Avenue, Austral

FIGURE 2: SITE FEATURES, BOREHOLE LOCATIONS & EXCEEDANCE PLAN

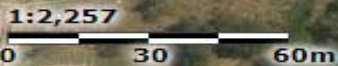


BH9 (0-0.1m)
Copper: 1,800
Zinc: 1,900

BH1 (0.1m)
Asbestos as ACM detected

BH4 (0-0.1m)
Asbestos as ACM detected

Soil Exceedance (mg/kg)



Key

Site Location
Groundwater Locations
Soil Locations



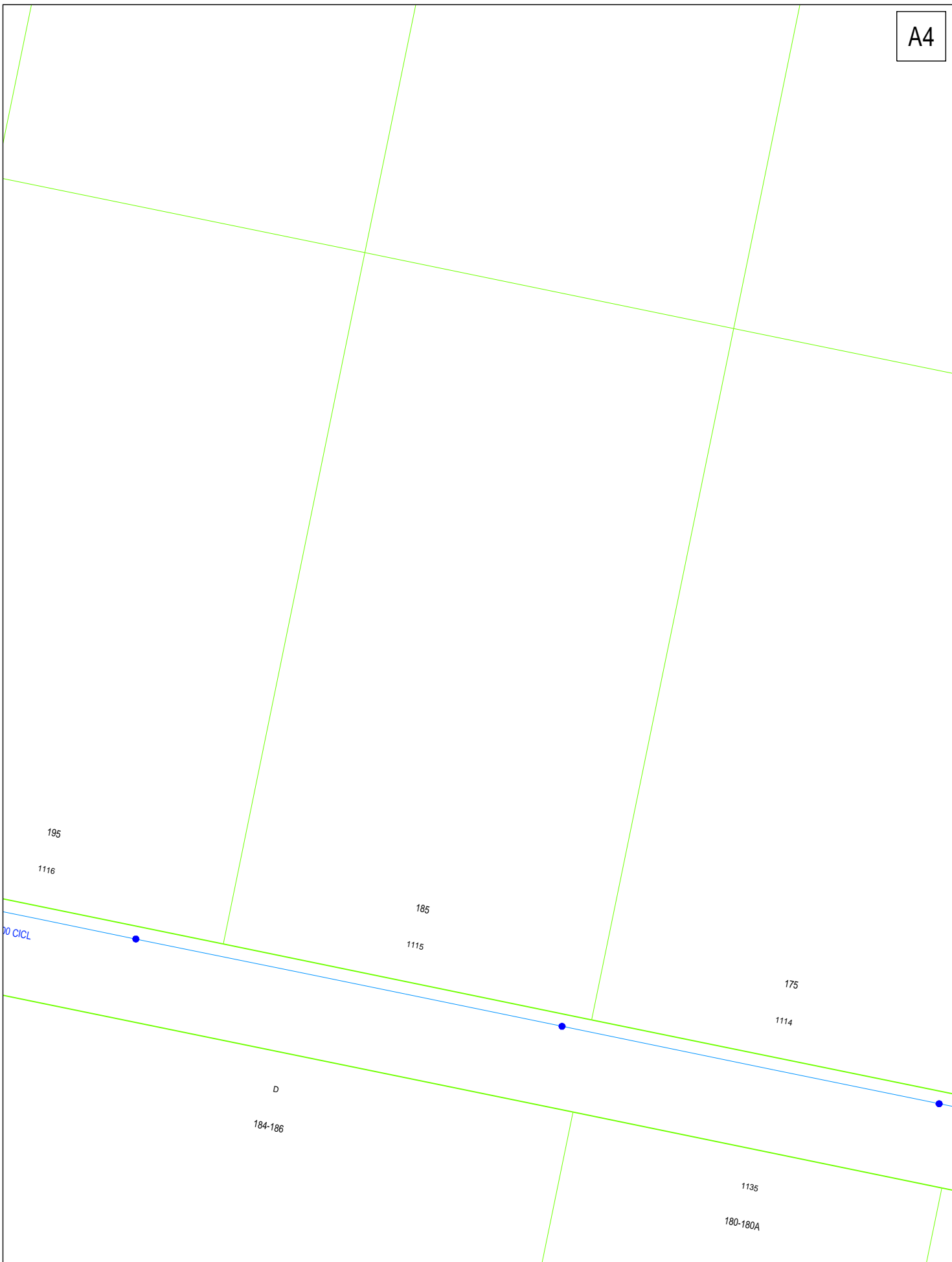
DRAWN
RL
FIGURE
2
Job #
E1292-2

Site Features, Borehole Locations & Exceedance Plan

Ref: NSW LPI Six Maps

185 Fifth Avenue, Austral NSW

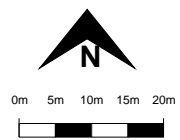
APPENDIX A: DBYD PLANS



DBYD Address:
185 Fifth Avenue
Austral NSW 2179
DBYD Job No: 12313007
DBYD Sequence No: 61106431

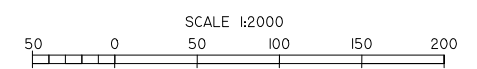
Copyright Reserved Sydney Water 2017
No warranty is given that the information shown is complete or accurate.
SYDNEY WATER CORPORATION
Scale: 1:1000

Date of Production: 12/05/2017
Plan 1 of 1





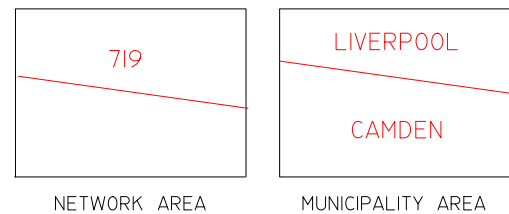
BRINGELLY 6B



THIS MAP UPDATED ON 17/05/2016
 THIS PLAN IS DIAGRAMATIC ONLY. DISTANCES
 SCALED FROM THIS PLAN MAY NOT BE ACCURATE.

BR3C	BR3D	LIC
BR6A	BR6B	L4A
BR6C	BR6D	L4C

ADJOINING MAPS

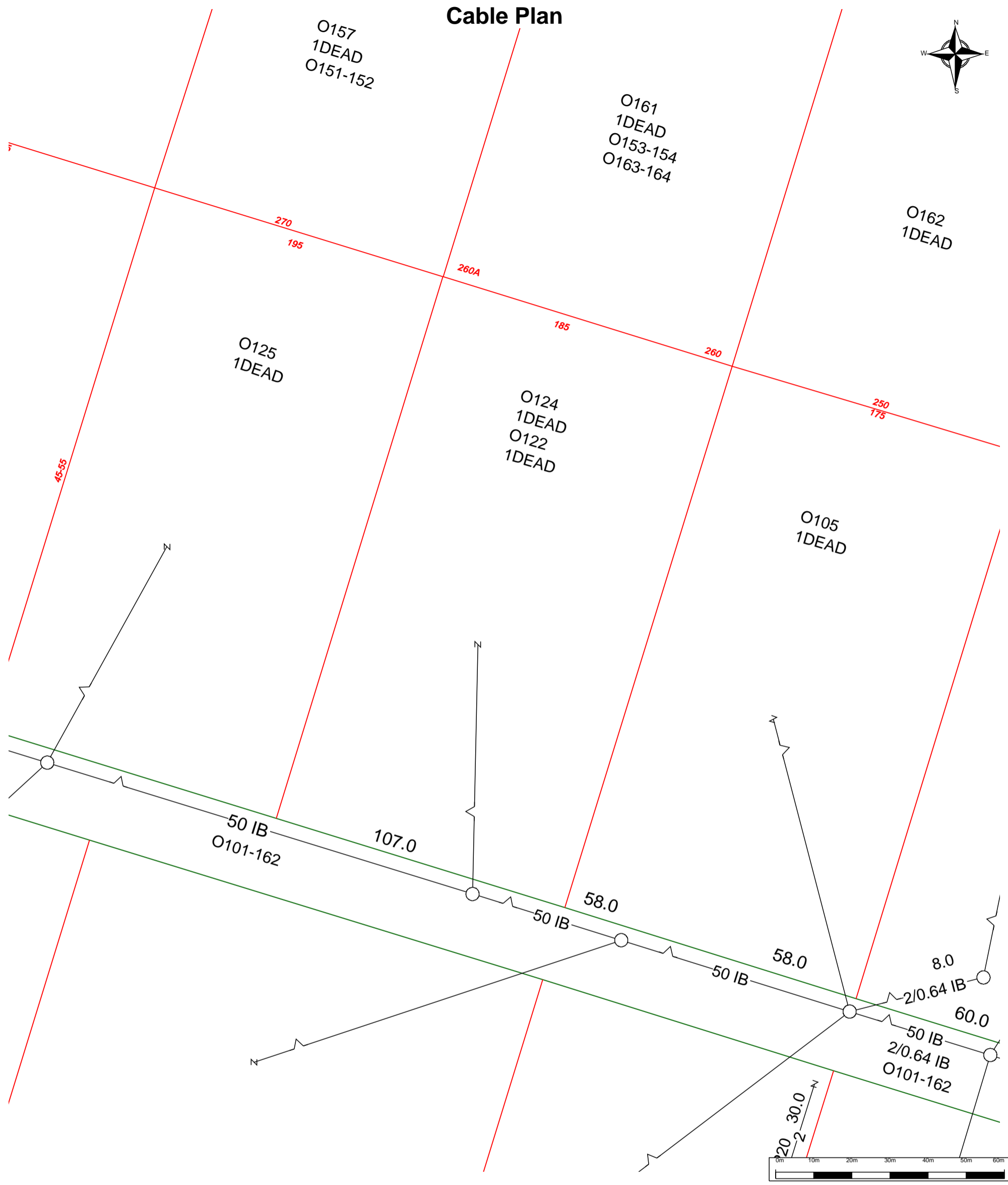


Jemena

KEY

- | MAX ALLOWABLE OPERATING PRESSURE | |
|----------------------------------|--|
| | TRUNK PIPELINE 7000 kPa |
| | PRIMARY MAIN 3500 kPa |
| | SECONDARY MAIN 1050 kPa |
| | NETWORK MAIN 400 kPa |
| | NETWORK MAIN 300 kPa |
| | NETWORK MAIN 210 kPa |
| | NETWORK MAIN 100 kPa |
| | NETWORK MAIN 30 kPa |
| | NETWORK MAIN 7 kPa |
| | NETWORK MAIN 2 kPa |
| | PROPOSED MAINS |
| | STEEL MAIN PROJECT NUMBER |
| | PRESSURE MONITORING STATION |
| | VALVE |
| | SYSTEM PRESSURE REGULATOR |
| | SIPHON |
| | NETWORK NODE |
| | NETWORK VALVE NODE |
| | VALVE NUMBER |
| | 6 INCH CAST IRON MAIN |
| | 150MM STEEL MAIN |
| | 110MM POLYETHYLENE/NYLON MAIN |
| | 50MM NYLON INSERTED INTO 6NB MAIN CAST IRON MAIN |
| | DISTANCE IN METRES OF MAIN FROM BOUNDARY LINE |
| | YEAR LAID |
| | MUNICIPALITY BOUNDARY |
| | NETWORK BOUNDARY |
| | HOUSE NUMBER |

Cable Plan



For all Telstra DBYD plan enquiries -
 email - Telstra.Plans@team.telstra.com
 For urgent onsite contact only - ph 1800 653 935 (bus hrs)

Sequence Number: 61106428

Please read Duty of Care prior to any excavating

TELSTRA CORPORATION LIMITED A.C.N. 051 775 556

Generated On 12/05/2017 11:18:12

WARNING - Due to the nature of Telstra underground plant and the age of some cables and records, it is impossible to ascertain the precise location of all Telstra plant from Telstra's plans. The accuracy and/or completeness of the information supplied can not be guaranteed as property boundaries, depths and other natural landscape features may change over time, and accordingly the plans are indicative only. Telstra does not warrant or hold out that its plans are accurate and accepts no responsibility for any inaccuracy shown on the plans.

It is your responsibility to locate Telstra's underground plant by careful hand pot-holing prior to any excavation in the vicinity and to exercise due care during that excavation.

Please read and understand the information supplied in the duty of care statement attached with the Telstra plans. TELSTRA WILL SEEK COMPENSATION FOR LOSS CAUSED BY DAMAGE TO ITS PLANT.

Telstra plans and information supplied are valid for 60 days from the date of issue. If this timeframe has elapsed, please reapply for plans.

WARNING

- **All electrical apparatus shall be regarded as live until proved de-energised.** Contact with live electrical apparatus will cause severe injury or death.
- In accordance with the *Electricity Supply Act 1995*, you are obliged to report any damage to Endeavour Energy Assets immediately by calling **131 003**.
- The customer must obtain a new set of plans from Endeavour Energy if work has not been started or completed within twenty (20) working days of the original plan issue date.
- The customer must contact Endeavour Energy if any of the plans provided have blank pages, as some underground asset information may be incomplete.
- Endeavour Energy underground earth grids may exist and their location **may not** be shown on plans. Persons excavating are expected to exercise all due care, especially in the vicinity of padmount substations, pole mounted substations, pole mounted switches, transmission poles and towers.
- Endeavour Energy plans **do not** show any underground customer service mains or information relating to service mains within private property.
- Asbestos or asbestos-containing material may be present on or near Endeavour Energy's underground assets.
- Organo-Chloride Pesticides (OCP) may be present in some sub-transmission trenches.
- All plans must be printed and made available at the worksite where excavation is to be undertaken. Plans must be reviewed and understood by the crew on site prior to commencing excavation.

INFORMATION PROVIDED BY ENDEAVOUR ENERGY

- Any plans provided pursuant to this service are intended to show the approximate location of underground assets relative to road boundaries, property fences and other structures at the time of installation.
- Depth of underground assets may vary significantly from information provided on plans as a result of changes to road, footpath or surface levels subsequent to installation.
- Such plans have been prepared solely for use by Endeavour Energy staff for design, construction and maintenance purposes.
- All enquiry details and results are kept in a register.

DISCLAIMER

Whilst Endeavour Energy has taken all reasonable steps to ensure that the information contained in the plans is as accurate as possible it will accept no liability for inaccuracies in the information shown on such plans.

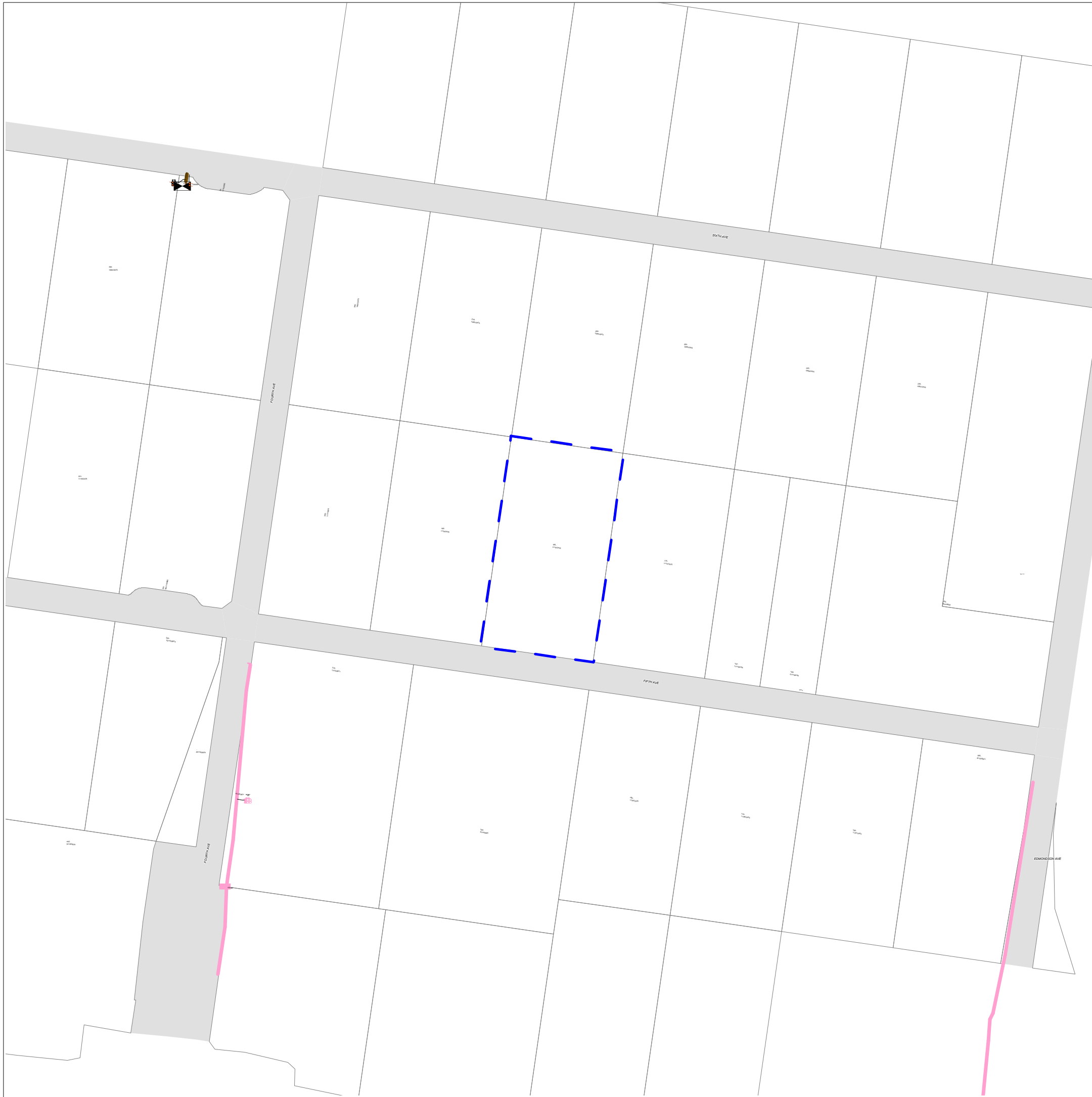
LEGEND

- OR ■ Street light column
- ▭ Padmount substation
- OR ■ Overground pillar (O.G.Box)
- ▭ Underground pit
- Duct run
- Cable run
- ⊙ Typical duct section
- ▲ Asbestos warning



NOT TO SCALE

DBYD Sequence No.:	61106426
Issued Date:	12/05/2017



APPENDIX B: HISTORICAL AERIAL PHOTOGRAPHS

Historical Aerial Photographs

E1292-2 Austral

185 Fifth Avenue, Austral NSW

1955:



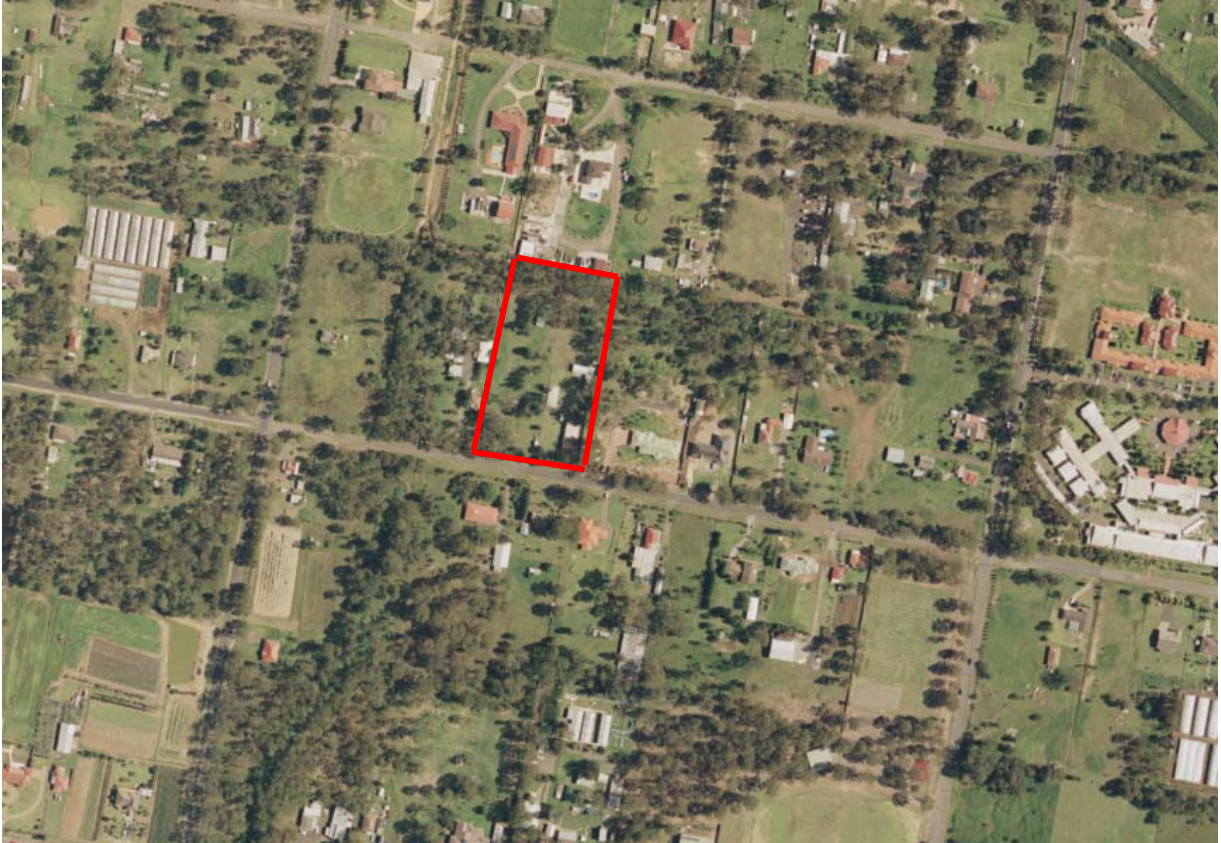
1970:



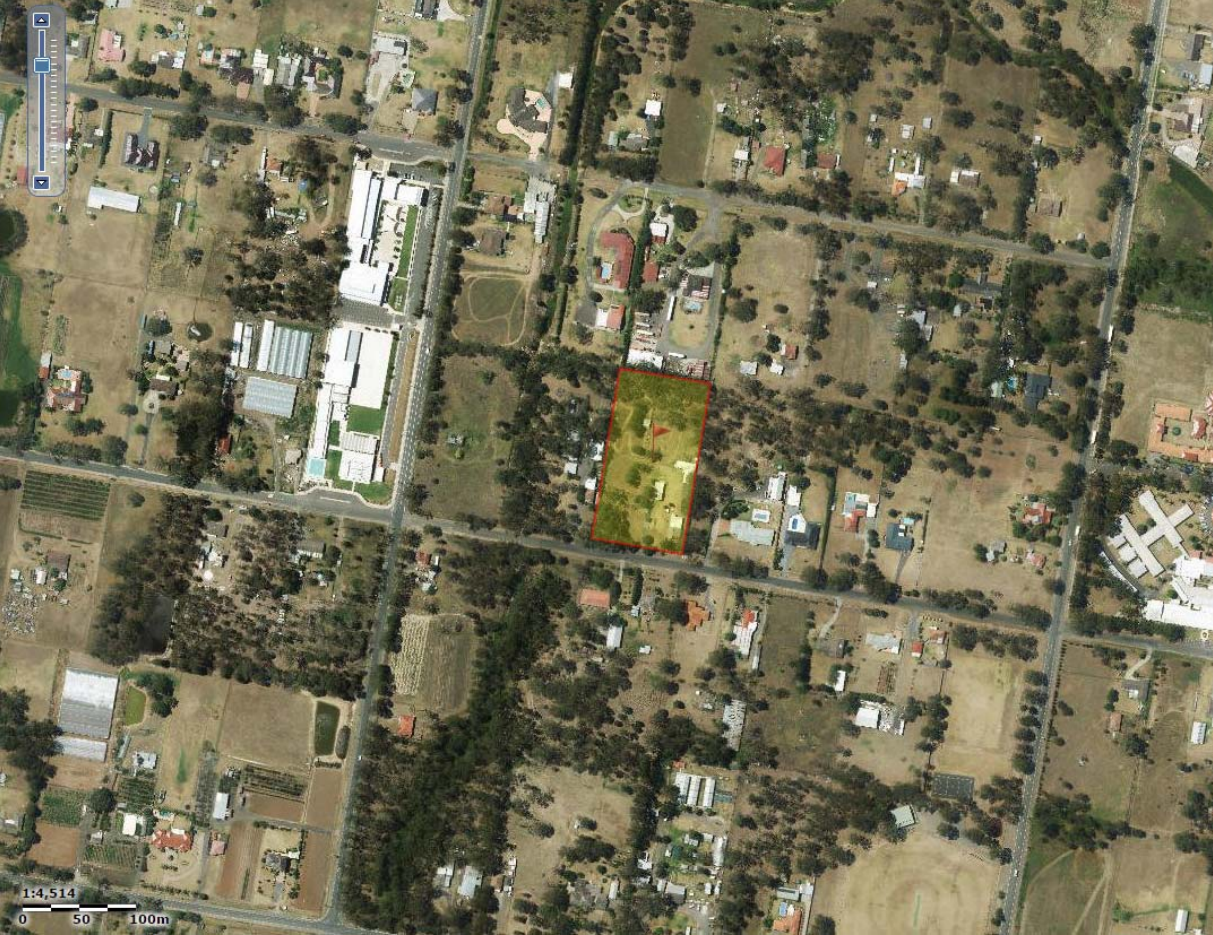
1994:



2005:



Current (Six Maps):



APPENDIX C: LAND TITLE INFORMATION

Title Search
12/05/2017 11:15 AM

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - TITLE SEARCH

FOLIO: 1115/2475

SEARCH DATE	TIME	EDITION NO	DATE
-----	---	-----	---
12/5/2017	11:15 AM	3	2/10/1998

LAND

LOT 1115 IN DEPOSITED PLAN 2475
LOCAL GOVERNMENT AREA LIVERPOOL
PARISH OF CABRAMATTA COUNTY OF CUMBERLAND
TITLE DIAGRAM DP2475

FIRST SCHEDULE

MICHAEL BRIAN MURPHY
PATRICIA ANN DUKE
AS JOINT TENANTS (T 5309176)

SECOND SCHEDULE (2 NOTIFICATIONS)

- 1 RESERVATIONS AND CONDITIONS IN THE CROWN GRANT(S)
- 2 5309177 MORTGAGE TO RHG MORTGAGE CORPORATION LIMITED

NOTATIONS

NOTE: THE CERTIFICATE OF TITLE FOR THIS FOLIO OF THE REGISTER DOES NOT INCLUDE SECURITY FEATURES INCLUDED ON COMPUTERISED CERTIFICATES OF TITLE ISSUED FROM 4TH JANUARY, 2004. IT IS RECOMMENDED THAT STRINGENT PROCESSES ARE ADOPTED IN VERIFYING THE IDENTITY OF THE PERSON(S) CLAIMING A RIGHT TO DEAL WITH THE LAND COMPRISED IN THIS FOLIO.

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

Historical Search

12/05/2017 11:17 AM

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - HISTORICAL SEARCH

SEARCH DATE

12/5/2017 11:17AM

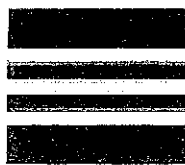
FOLIO: 1115/2475

First Title(s): SEE PRIOR TITLE(S)

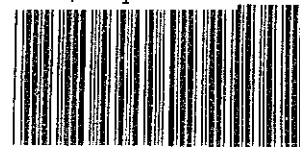
Prior Title(s): VOL 13894 FOL 181

Recorded	Number	Type of Instrument	C.T. Issue
21/8/1988		TITLE AUTOMATION PROJECT	LOT RECORDED
		FOLIO NOT CREATED	
28/11/1988		CONVERTED TO COMPUTER FOLIO	FOLIO CREATED
		CT NOT ISSUED	
15/10/1990	Z277571	DISCHARGE OF MORTGAGE	EDITION 1
22/10/1996	2553587	TRANSFER	
22/10/1996	2553588	MORTGAGE	EDITION 2
2/10/1998	5309175	DISCHARGE OF MORTGAGE	
2/10/1998	5309176	TRANSFER	
2/10/1998	5309177	MORTGAGE	EDITION 3

*** END OF SEARCH ***



CERTIFICATE OF TITLE



NEW SOUTH WALES

REAL PROPERTY ACT, 1900

Vol. **13894** Fol. **181**

Appln No 5620

Prior Title Vol. 7908 Fol. 1



EDITION ISSUED

12 7 1979

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

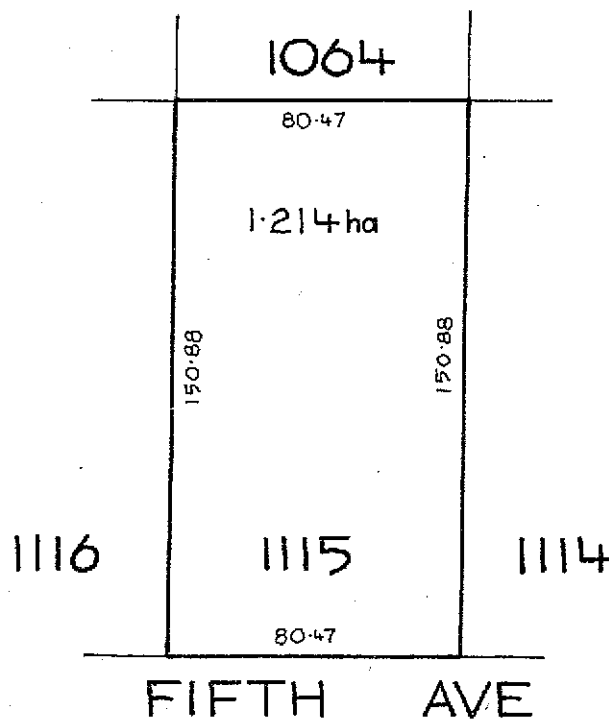
[Signature]

Registrar General.



PLAN SHOWING LOCATION OF LAND

LENGTHS ARE IN METRES



FIFTH AVE

R65028 *M.D.*
ATT.

REDUCTION RATIO 1:2000

ESTATE AND LAND REFERRED TO

S Estate in Fee Simple in Lot 1115 in Deposited Plan 2475 in the City of Liverpool Parish of Cabramatta and County of Cumberland being part of Portion 33 granted to Thomas Carne on 31-8-1819.

FIRST SCHEDULE

ERWIN LADE of *[Signature]*, Pensioner.

SECOND SCHEDULE

GRY

1. Reservations and conditions, if any, contained in the Crown Grant above referred to.

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

WARNING: THIS DOCUMENT MUST NOT BE REMOVED FROM THE REGISTRAR GENERAL'S OFFICE.

13894 Fol. 181

(Page 1) Vol.

FIRST SCHEDULE (continued)

REGISTERED PROPRIETOR	INSTRUMENT		REGISTERED	Signature of Registrar General
	NATURE	NUMBER		
Stanley Peter Clarke of Austral, Metallurgist and Edith Marie Clarke his wife, as joint tenants. Stephanie Uren and Christine Lucey as joint tenants by Transfer W929675. Registered 19-6-1987	Transfer	R160327	17-7-1979	

Handwritten notes:
 W929674 (M)
 -75.7
 -76 m/k
 R 160327
 W 211683 m/k

SECOND SCHEDULE (continued)

INSTRUMENT	PARTICULARS	REGISTERED	Signature of Registrar General	CANCELLATION
W211883 Mortgage to Commonwealth Bank of Australia. Registered 4-3-1986 W929676 Mortgage to Qantas Staff Credit Union Limited. Registered 19-6-1987				Discharged W929674

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

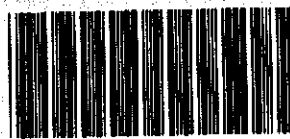
97-01T



\$29

TRANSFER

Real Property Act, 1900



2553587 Y

Office of State Revenue use only

\$2.00

250996 1809 04 002001773/02

N.S.W. STAMP DUTY

(A) LAND TRANSFERRED

Show no more than 20 References to Title.
If appropriate, specify the share transferred.

FOLIO IDENTIFIER 1115/2475

(B) LODGED BY

L.T.O. Box

Name, Address or DX and Telephone

398P

T.G. Hartmann + Associates.

REFERENCE (max. 15 characters): Q-Uren .

STEPHANIE UREN & CHRISTINE LUCEY

(C) TRANSFEROR

\$142,500.00 ***

(D) acknowledges receipt of the consideration of
and as regards the land specified above transfers to the Transferee an estate in fee simple

(E) subject to the following ENCUMBRANCES 1. 2. 3.

(F) TRANSFEE

T TS <small>(s713 LGA)</small> TW <small>(Sheriff)</small>	STEPHANIE UREN TENANCY:
---	--

(G)

(H) We certify this dealing correct for the purposes of the Real Property Act, 1900. DATED 18/10/96
Signed in my presence by the Transferor who is personally known to me.

Johnson
 Signature of Witness
GREGG JOHNSON
 Name of Witness (BLOCK LETTERS)
 14 Hill St. CAMDEN
 Address of Witness

Stephanie Uren
 Signature of Transferor
 13/10/96

Signed in my presence by the Transferee who is personally known to me.

Johnson
 Signature of Witness
GREGG JOHNSON
 Name of Witness (BLOCK LETTERS)
 14 Hill St. CAMDEN
 Address of Witness

Stephanie Uren
 Signature of Transferee

INSTRUCTIONS FOR FILLING OUT THIS FORM ARE AVAILABLE FROM THE LAND TITLES OFFICE

CHECKED BY (office use only)

13/10

AG 5

202

New South Wales

[CERTIFICATE OF TITLE.]

Primary Appn No. 5620
Reference to Last Title
Vol. 3730 Fol. 70



REGISTER BOOK.
VOL. 7908 FOL. 1
Issued on _____ Transfer No. H345758

CANCELLED

68949 6.59 K 2006-1 V. C. N. E. Right, Government Printer

ERWIN LADE, of Hoxton Park, Market Gardener, is now the proprietor of an Estate in Fee Simple,
subject nevertheless to the reservations and conditions, if any, contained in the Grant hereinafter referred to, and also subject to such encumbrances
liens, and interests as are notified hereon, in That piece of land
in the Municipality of Liverpool Parish of Cabramatta and County of Cumberland
shown in the plan hereon and therein edged red being Lots 1115 and 1116 in Deposited Plan No. 2475 and being part of Portion 33
granted to Thomas Carne on 31st August 1819.

In witness whereof I have hereunto signed my name and affixed my Seal, this Nineteenth day of May, 1960.

Signed in the presence of *J. Mountain*

Jawatson
Registrar-General



M
~~No. J683634 MORTGAGE dated 1st April 1964
to Australia and New Zealand Saving
Bank Limited
Entered 22nd June 1964
R65028
Discharged
12-3-1974
Jawatson
REGISTRAR GENERAL~~

H345758

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

Area: 6.6c.
Scale: 8 chains to one inch

NOTIFICATION REFERRED TO

No. H345759 MORTGAGE dated 19th June 1959
to The Commercial Bank of
Australia Limited
Entered 21st June 1960
Jawatson
REGISTRAR GENERAL

MORTGAGE No. H345759 has been discharged.
See J683633 Entered 22nd June 1964
Jawatson
REGISTRAR GENERAL

This Deed is cancelled and Certificate of Title issued
Vol. 13894 Fol. 181-182 dated 10-7-1979
Bennett
REGISTRAR GENERAL

H345759 MR

*R65028 AM/R
30 m C-
R160327 Lot 1115
D.B. 2475*

Appn. No. 5620
Reference to last Certificate
Vol. 1101 Fol. 115

New South Wales.

58035 1-45
[CERTIFICATE OF TITLE.]



REGISTER BOOK.
VOL. 3730 FOL. 70

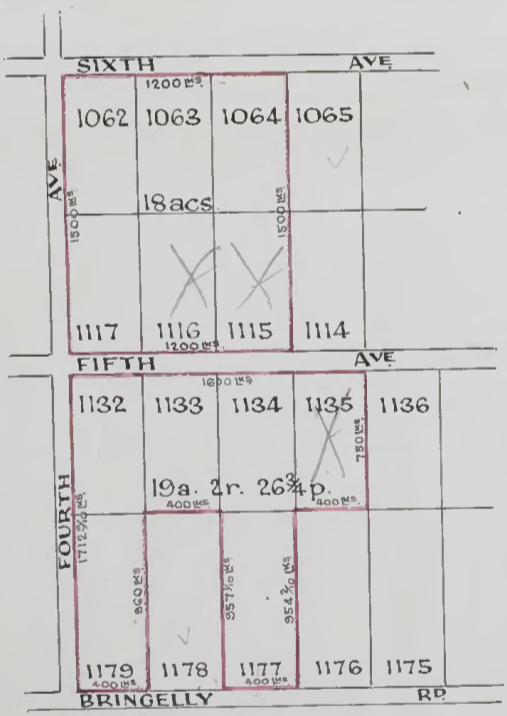
CANCELLED W

JAMES FREELAND LEACOCK of Liverpool, Land Valuer, Transferee under Instrument of Transfer No. B.209928 from Assets Realisation Company Limited Mortgagee exercising power of Sale is now the proprietor of an Estate in Fee Simple, _____ subject nevertheless to the reservations and conditions, if any, contained in the Grant hereinafter referred to, and also subject to such encumbrances, liens and interests, as are notified hereon, in those pieces of land situated at Hoxton Park _____ in the Shire of Nepean _____ Parish of Cabramatta _____, and County of Cumberland _____ containing Thirty seven acres two roods twenty six and three quarters perches _____, or thereabouts, as shown in the Plan hereon and therein edged red, being lots 1062, 1063, 1064, 1115, 1116, 1117, 1132, 1133, 1134, 1135, 1177 and 1179 _____ in a Plan deposited in the Land Titles Office, Sydney, No. 2475 and being parts of 700 acres (Portion 33 of Parish) delineated in the Public Map of the said Parish in the Department of Lands originally granted to Thomas Carne by Crown Grant dated the thirty first day of August One thousand eight hundred and nineteen. _____

In witness whereof, I have hereunto signed my name and affixed my Seal, this twentieth day of May 1925

Signed in the presence of R. Murray }

J. Wells
REGISTRAR GENERAL.



Scale: 8Ch^{ns} to one inch

Notification referred to

No. B 307799 MORTGAGE dated 12th January 1926 from the said James Freeland Leacock to Bank of New South Wales
Produced and entered 16th January 1926 and entered 1st February 1926 at 12 o'clock in the noon.
J. Wells
REGISTRAR GENERAL.

No. D677220 DISCHARGE of within mortgage B307799 dated 10th March 1947 as regards the land comprised in this Certificate of Title. Produced 6th June 1947 and entered 6th June 1947 at 16 mts pt 1 o'clock in the after noon.
J. Wells
REGISTRAR GENERAL.

No. D677221 TRANSFER dated 17th March 1947 from the said James Freeland Leacock to Cecil Oliver Carmichael of Austral near Liverpool, Farmer of the land within described Produced and entered 6th June 1947 at 16 mts pt 1 o'clock in the after noon.
J. Wells
REGISTRAR GENERAL.

No. F 23266 MORTGAGE dated 6th June 1949 from the said Cecil Oliver Carmichael to Commonwealth Bank of Australia
Produced and entered 8th June 1949 at 22 mts pt 10 o'clock in the fore noon.
J. Wells
REGISTRAR GENERAL.

No. E657597 DISCHARGE of within mortgage No. F23266 dated 25th February 1952 Produced and entered 1st May 1952 at 12 mts pt 3 o'clock in the after noon.
J. Wells
REGISTRAR GENERAL.

B109928

B307799 R

M26/6/40
M28/6/40

over

No. F657598 TRANSFER dated 27th April 1952
from the said Cecil Oliver Carmichael to
Master Mulhall of Leppington
Produced and entered 20 May 1952
at 1.15 p.m. 3 o'clock in the afternoon.
J. Wells
REGISTRAR GENERAL.

No. H238417 MORTGAGE dated 11 March 1959
from the said Radivoj Stojkovich (otherwise
Radivoj Stojkovic) to The Commercial
Bank of Australia Limited.
Entered 17 November 1959.
Jawatson
REGISTRAR GENERAL.

Radivoj Stojkovic & Gertrude May Mulhall
of Austral Widow
is
now the registered proprietor of the land within described.
See Section 94 Application No. G 877001
Entered 30th April 1958.
J. Wells
REGISTRAR GENERAL.

No. H345758 TRANSFER dated 30th October 1959
to Erwin Lode of Lots 1115 and 1116, D.P.
2475
of the land within described.
Discharged from Mortgage No. H238417
Entered 18th May 1960.
As to land in this transfer
this deed is cancelled
and new certificate issued
Vol. 7908 Fol. 1
Jawatson
REGISTRAR GENERAL.

Radivoj Stojkovich of Leppington
Agent
is
now the registered proprietor of the land within described.
See TRANSFER No. G877002 dated 27th September 1956.
Entered 30th April 1958.
J. Wells
REGISTRAR GENERAL.

MORTGAGE No. H238417 has been discharged.
As regards Lot 115 D.P. 2475
See H475752 Entered 17th June 1960.
Jawatson
REGISTRAR GENERAL.

No. G877003 MORTGAGE dated 27th September 1956
from the said Radivoj Stojkovich to
Gertrude May Mulhall of
Austral Widow
Entered 30th April 1958.
J. Wells
REGISTRAR GENERAL.

No. H475753 TRANSFER dated 29th March 1960
to Johannes Hendrikus Nijpel and Anna
Nijpel as joint tenants of Lot 115, D.P. 2475
of the land within described.
Entered 17th June 1960.
As to land in this transfer
this deed is cancelled
and new certificate issued
Vol. 7928 Fol. 99
Jawatson
REGISTRAR GENERAL.

No. G924352 Caveat Produced 27th March 1958
Entered 30th April 1958 as regards Lots 1115 and 1116, D.P. 2475
J. Wells
Registrar General

CAVEAT No. G924352 has been withdrawn.
See H345754 Entered 17th November 1959.
Jawatson
REGISTRAR GENERAL.

No. H553364 TRANSFER dated 19th May 1960
to Edwin Baltrame and Reniger
Barton as joint tenants in common
of Lot 3 in plan annexed to
H356732 Re-numbered as H753806
of the land within described.
Discharged from Mortgage No. H238417
Entered 28th March 1961.
As to land in this transfer
this deed is cancelled
and new certificate issued
Vol. 8113 Fol. 41
Jawatson
REGISTRAR GENERAL.

MORTGAGE No. G877003 has been discharged.
See H238415 Entered 17th November 1959.
Jawatson
REGISTRAR GENERAL.

No. H753896 Transfer dated 15th August 1959.
to Louis Duttlinger Oikem of Lot 3 in plan annexed
to H753896 of the land within described.
Entered 20th March 1961.
As to land in this transfer
this deed is cancelled
and new certificate issued
Vol. 8193 Fol. 42
Jawatson
REGISTRAR GENERAL.

As to Radivoj
this Deed is cancelled and new Certificate of Title issued
Vol. 8314 Fol. 23, 24, 25
vide Mss. PPS H75371
Jawatson
Registrar General.

H 884261. Chx x sold
H 888996 Telus, lot A N/C on O
D.P. 201393
H 745557 lot A
H 753171 lot B
H 769346 no of lot A

M 117X
A. G. 877001
D/M 2345
M - 4776

H 345758
- 759711
H 356732 lot 115
H 360574 M/C
H 475752
P/O
H 553364
H 753896
H 753896
H 753896

APPENDIX D NSW EPA RECORDS



[Home](#) > [Environment protection licences](#) > [POEO Public Register](#) > [Search for licences, applications and notices](#)

Search results

Your search for: **General Search** with the following criteria

Suburb - AUSTRAL

returned 1 results

[Export to excel](#)

1 of 1 Pages

[Search Again](#)

Number	Name	Location	Type	Status	Issued date
1789	SCALABRINI VILLAGE LTD	65 EDMONDSON AVE, AUSTRAL, NSW 2171	POEO licence	Surrendered	25 Sep 2000

12 May 2017

Connect

Feedback

Web support
Public consultation

Contact

Contact us
Offices
Report pollution

Government

NSW Government
jobs.nsw



[Home](#) [Contaminated land](#) [Record of notices](#)

Search results

Your search for: Suburb: AUSTRAL

did not find any records in our database.

If a site does not appear on the record it may still be affected by contamination. For example:

- Contamination may be present but the site has not been regulated by the EPA under the Contaminated Land Management Act 1997 or the Environmentally Hazardous Chemicals Act 1985.
- The EPA may be regulating contamination at the site through a licence or notice under the Protection of the Environment Operations Act 1997 (POEO Act).
- Contamination at the site may be being managed under the [planning process](#).

More information about particular sites may be available from:

- The [POEO public register](#)
- The appropriate planning authority: for example, on a planning certificate issued by the local council under [section 149 of the Environmental Planning and Assessment Act](#).

See [What's in the record and What's not in the record](#).

If you want to know whether a specific site has been the subject of notices issued by the EPA under the CLM Act, we suggest that you search by Local Government Area only and carefully review the sites that are listed.

This public record provides information about sites regulated by the EPA under the Contaminated Land Management Act 1997, including sites currently and previously regulated under the Environmentally Hazardous Chemicals Act 1985. Your inquiry using the above search criteria has not matched any record of current or former regulation. You should consider searching again using different criteria. The fact that a site does not appear on the record does not necessarily mean that it is not affected by contamination. The site may have been notified to the EPA but not yet assessed, or contamination may be present but the site is not yet being regulated by the EPA. Further information about particular sites may be available from the appropriate planning authority, for example, on a planning certificate issued by the local council under section 149 of the Environmental Planning and Assessment Act. In addition the EPA may be regulating contamination at the site through a licence under the Protection of the Environment Operations Act 1997. You may wish to search the POEO public register. [POEO public register](#)

[Search Again](#)

[Refine Search](#)

Search TIP

To search for a specific site, search by LGA (local government area) and carefully review all sites listed.

... [more search tips](#)

Connect

Feedback

We Put

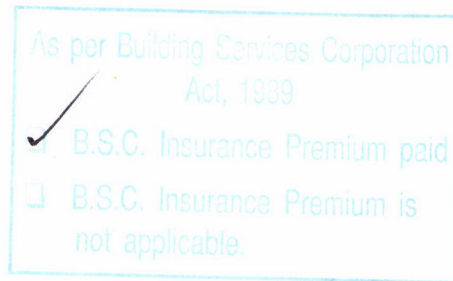
12 May 2017

APPENDIX E COUNCIL RECORDS

B 1425.1440
Mr B Cohen:cb
821-9389

19 October 1993

Patioland P/L
Cnr Hume Highway & Grove Street
LIVERPOOL 2170



**LOCAL GOVERNMENT ACT, 1993 AND BUILDING CODE OF AUSTRALIA (BCA) & BCA
(ADMINISTRATIVE PROVISIONS) ORDINANCE 1991**

**NOTICE TO APPLICANT OF DETERMINATION OF
A BUILDING APPLICATION**

Being the applicant in respect of Building Application No. 2135/93 and pursuant to Section 99 of the Act, Notice is hereby given of the determination by the Approval Authority of the Building Application No. 2135/93 relating to:

PROPERTY: LOT 1115, DP 2475, NO. 185 FIFTH AVENUE, AUSTRAL
OWNER: MS C LUCEY, 185, FIFTH AVENUE, AUSTRAL
BUILDER: PATIOLAND P/L, CNR HUME HIGHWAY & GROVE ST, LIVERPOOL

The Building Application has been determined on 19 October 1993 by granting of approval which operates from 19 October 1993 subject to conditions specified in this Notice.

DESCRIPTION: PROPOSED CLASS 10a AWNING

CONDITIONS:

THIS IS TO CERTIFY that the attached stamped plans and specification have been approved by Council on the date hereon, subject to the following conditions.

GENERAL

1. Compliance with the Local Government Act, 1993 and Regulations thereunder.
2. 48 hours notice in writing to be given to Council. Inspections are required at the following stages of construction:-
 - (a) All trenches and steel reinforcement prior to pouring of concrete;
 - (b) Stormwater drainage lines prior to backfilling;
 - (c) Completion of all works.
3. Stamped approved building plans must be submitted to The Water Board prior to commencement of work. Failure to do so will render the owner liable to a penalty and may result in the demolition of the work. A Regional Office of the Board is now located cnr. Bigge & Moore Streets, Liverpool, Telephone 821 0555.
4. No trees are to be lopped or removed without prior Council approval.
5. Electrical installations must be in accordance with the requirements of Prospect Electricity. All enquiries relating to electrical installations should be directed to that Authority.

SITING, SURVEY REPORTS, FLOODING

6. The awning is to be sited in accordance with approved site plan.
7. The land may be subject to flooding and the building may be inundated by floodwaters from time to time and Council does not accept any responsibility for any damage sustained as a result of flooding.

FOOTINGS, SLABS, STRUCTURAL DETAILS

8. Footings to be taken to solid and uniform bearing and a minimum of 450 mm deep.

DRAINAGE

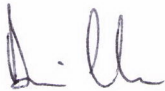
9. Roofwater to be connected to existing house stormwater drainage system.

MISCELLANEOUS

10. The awning is not to be enclosed without prior written approval being obtained from Council.

NOTES:

- A** All buildings to be sited well clear of any easements affecting the allotment. The applicant should ascertain if any easements do exist and if so obtain full details of such prior to construction commencing.
- B** A review of this approval may be requested by the applicant within twenty eight (28) days of the determination subject to an appropriate fee..
- C** If you are aggrieved by any of the aforementioned conditions of approval you are advised of your right of appeal to the Land and Environment Court of NSW. However, any items may be clarified by contacting you District Health and Building Surveyor at Council's Offices.
- D** Construction/civil work is not permitted on the site between the hours of 6 pm to 7 am Monday to Saturday with no work permitted on Sundays, unless otherwise approved by the Planning & Development Department.
- E** ANY FAILURE TO COMPLY WITH THE CONDITIONS OF APPROVAL MAY RESULT IN LEGAL ACTION BEING INSTIGATED AND THE PRECLUSION OF A 317AE BUILDING CERTIFICATE AT THE COMPLETION OF WORKS.
- F** The conditions are imposed taking into account the Local Government Act, 1993 and Regulations thereunder, relevant standards and site conditions.
- G** To ascertain the extent to which the approval is liable to lapse refer to Section 103 of the Act.



Bernie Cohen

SENIOR ENVIRONMENTAL HEALTH & BUILDING SURVEYOR



LIVERPOOL CITY COUNCIL

COPY

1 Hoxton Park Road, Liverpool, N.S.W. 2170 Telephone: (02) 821 9222

'PROUD OF OUR PAST, CONFIDENT IN OUR FUTURE'

Your reference:

Our reference: P 1425.1440

Enquiries: Miss T Shephard: ac
821-9306

20 October 1992

TO: Mesdames S Uren & C Lucey
185 Fifth Avenue
AUSTRAL 2171

E3.

FILE No: P1425.1440
LOCATION CODE: 4062
SUBJECT No: 726
FOLIO No: 200
DOCUMENT TYPE: 02
FOLLOW-UP CODE:

✓

ENVIRONMENTAL PLANNING AND ASSESSMENT ACT, 1979.

NOTICE TO APPLICANT OF DETERMINATION OF A DEVELOPMENT APPLICATION.

Being the applicant in respect of Development Application No. 839/92 and pursuant to Section 92 of the Act, Notice is hereby given of the determination by the Consent Authority of the Development Application No. 839/92 relating to:

PROPERTY: LOT 1115, D.P. 2475, NO. 185 FIFTH AVENUE, AUSTRAL

The Development Application has been determined by granting of consent subject to conditions specified in this Notice.

DESCRIPTION OF DEVELOPMENT: GARAGE AND STABLES.

CONDITIONS:

THE DEVELOPMENT

The following conditions have been imposed to achieve the objectives of the relevant planning instruments and policies.

1. Development shall be carried out generally in accordance with Development Application received 2nd October, 1992 and accompanying plans prepared by RW Sheds Pty Ltd, except where modified by the undermentioned conditions.
2. The proposed buildings are not to be used for human habitation, industrial or commercial purposes.

Advice:

The land is subject to flooding and further details (as to the accuracy of which Council gives no warranty) may be obtained from Council or the Department of Public Works. Council expressly absolves itself from responsibility for any damage or injury sustained as a result of or in any way connected with flooding of the subject land.

.../2

Notes:

- (1) To ascertain the date upon which the Consent becomes effective refer to Section 93 of the Act.
- (2) To ascertain the extent to which the Consent is liable to lapse refer to Section 99 of the Act.
- (3) Section 97 of the Act confers on an applicant who is dissatisfied with the determination of a Consent Authority a right of appeal to the Land and Environment Court exercisable within twelve (12) months after receipt of this Notice.
- (4) The conditions are imposed taking into account the matters for consideration in determining a Development Application under Section 90(1) of the Environmental Planning and Assessment Act, 1979.

JMU

Judy McKittrick
SENIOR DEVELOPMENT PLANNER

Approved/Refused as Above Under
Delegation of Authority.

20/10/1992

Sgnd

Posn

J. McKittrick
S.O.P

20/10



P.M. THE CITY OF LIVERPOOL

PLEASE QUOTE
REFERENCE NO.....

YOUR REFERENCE NO.....

FOR ENQUIRIES EXTENSION NO.....

COUNCIL OFFICE,
MOORE STREET,
LIVERPOOL, N.S.W.

CONSENT NO: LCG: 835/64.

CONSENT TO DEVELOPMENT UNDER
CUMBERLAND COUNTY PLANNING SCHEME.

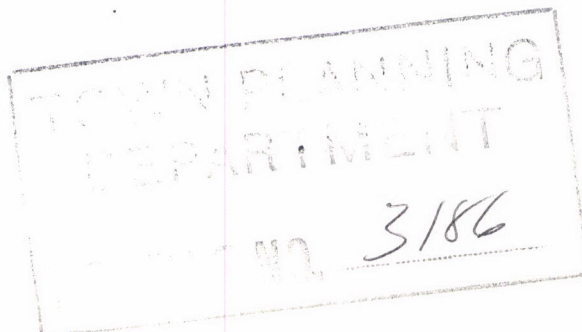
Date: 2nd October, 1964.

To Mr. Edwin Lade,
Fifth Avenue,
A U S T R A L.

The Council of the City of Liverpool as the Responsible Authority under the Local Government Act hereby grants permission to carry out development on Lots 1115-1116 Deposited Plan No. 2275 House No. _____ Section No. _____ Resubdivision of _____ in Fifth Avenue situated within a Rural Area for the purpose of the erection of a airport for motor vehicle.

Conditions if any applicable to this application for consent:-

All buildings to be sited a minimum of 66 feet from the street boundary of the land.



R. T. FINDLEY
TOWN CLERK.
Per:

NOTE:

This consent is not approval to erect a building or to a subdivision. Plans for such purposes must be submitted in the usual manner.



P.M. THE CITY OF LIVERPOOL

PLEASE QUOTE
REFERENCE NO.....

YOUR REFERENCE NO.....

FOR ENQUIRIES EXTENSION NO.....

COUNCIL OFFICE,
MOORE STREET,
LIVERPOOL, N.S.W.

CONSENT NO: LCG: 835/64.

CONSENT TO DEVELOPMENT UNDER
CUMBERLAND COUNTY PLANNING SCHEME.

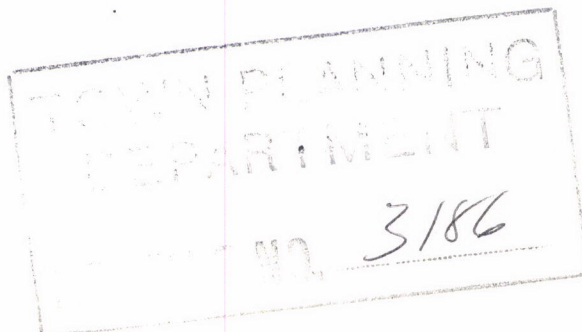
Date: 2nd October, 1964.

To Mr. Edwin Lade,
Fifth Avenue,
A U S T R A L.

The Council of the City of Liverpool as the Responsible Authority under the Local Government Act hereby grants permission to carry out development on Lots 1115-1116 Deposited Plan No. 2275 House No. _____ Section No. _____ Resubdivision of _____ in Fifth Avenue situated within a Rural Area for the purpose of the erection of a airport for motor vehicle.

Conditions if any applicable to this application for consent:-

All buildings to be sited a minimum of 66 feet from the street boundary of the land.



R. T. FINDLEY
TOWN CLERK.

Per:

NOTE:

This consent is not approval to erect a building or to a subdivision. Plans for such purposes must be submitted in the usual manner.



ALL COMMUNICATIONS TO BE ADDRESSED TO
THE TOWN CLERK

TELEPHONES: GENERAL OFFICE 72-7281, 72-7282, 72-7926
LIBRARY 72-7453
MEMORIAL OLYMPIC POOL 72-8795

THE CITY OF LIVERPOOL

PLEASE QUOTE

REFERENCE NO.

YOUR REFERENCE NO.

COUNCIL OFFICE
MOORE STREET,
LIVERPOOL, N.S.W.

CONSENT NO: LCC: 508/62

CONSENT TO DEVELOPMENT UNDER
CUMBERLAND COUNTY PLANNING SCHEME.

Date: 10th September, 1962

To Mr. E. Lade,
5th Avenue,
AUSTRAL

The Council of the City of Liverpool as the Responsible Authority under the Local Government Act hereby grants permission to carry out development of Lot 1115-1116 Deposited Plan No. _____ House No. _____ Section No. _____ Resubdivision of _____ in 5th Avenue situated within a Rural Area for the purpose of the erection of additions to existing dwelling (lounge room, kitchen and dining room.)

Conditions if any applicable to this application for consent:-

T.P. FILE NO. 3186

H.J. GILL
TOWN CLERK

per:

NOTE:

This consent is not approval to erect a building or to a subdivision. Plans for such purposes must be submitted in the usual manner.

23 October 1992

B1425.1440
Mr Leslie:dl
821-9337

**BUILDING PERMIT NO. 2058/92
LOCAL GOVERNMENT ACT, 1919 PART XI & ORDINANCE 70**

**PROPOSED CLASS X GARAGE AND STABLE
TO BE ERECTED AT LOT 1115 D.P. 2475 NO 185 FIFTH AVENUE, AUSTRAL
SUBMITTED BY: MISS S UREN & MISS C LUCEY 185 FIFTH AVENUE, AUSTRAL
OWNER: AS ABOVE
BUILDER: R W SHEDS PTY TD 100 PACIFIC HIGHWAY ROSEVILLE**

THIS IS TO CERTIFY that the attached stamped plans and specification have been approved by Council on the date hereon, subject to the following special conditions numbered 1 - 11 inclusive.

1. Compliance with the Local Government Act, 1919, and Ordinances thereunder.
2. 48 hours notice in writing to be given to Council. Inspections are required at the following stages of construction:-
 - (a) All trenches and steel reinforcement prior to pouring of concrete;
 - (b) Framework when complete prior to the fixing of wall sheeting;
 - (c) Flashings in wet areas i.e. bathrooms;
 - (d) Stormwater drainage lines prior to backfilling;
 - (e) Completion of all works.
3. Stamped approved building plans must be submitted to The Water Board prior to commencement of work. Failure to do so will render the owner liable to a penalty and may result in the demolition of the work. A Regional Office of the Board is now located cnr. Bigge & Moore Streets, Liverpool, Telephone 821 0555.
4. No trees are to be lopped or removed without prior Council approval. However approval is not required to remove trees inside the perimeter of the proposed building. Consultation with Council's Tree Preservation Officer is suggested if other trees on the site are near the proposed building.
5. Electrical installations must be in accordance with the requirements of Prospect Electricity. All enquiries relating to electrical installations should be directed to that Authority.
6. The garage and stable are to be sited in accordance with approved site plan.
7. Roof cladding to be fixed and supported in accordance with the manufacturer's recommendations.
8. Roof gutters and downpipes to be installed.
9. Subject to conditions of Development Consent No. 839/92 dated 20th October 1992
10. Roofwater to be disposed of to Council's satisfaction so as not to cause nuisance to adjacent lot boundaries.
11. **NOTE:** If you are aggrieved by any of the aforementioned conditions of approval you are advised of your right of appeal to the Land & Environment Court of NSW. However, any items may be clarified by contacting your District Building and Health Surveyor at Council's Offices.

NOTE: All buildings to be sited well clear of any easements affecting the allotment. The applicant should ascertain if any easements do exist and if so obtain full details of such prior to construction commencing.

NOTE: Telecom recommends prewiring for telephone services during construction. Contact Telecom for further details.

NOTE: This approval shall be void if the building work to which it refers is not substantially commenced within 12 months after the date of the approval.

NOTE: Construction/civil work is not permitted on the site between the hours of 6 pm to 7 am Monday to Saturday with no work permitted on Sundays, unless otherwise approved by the Building and Health Department.

An applicant for Building Approval under Part XI of the Local Government Act, 1919, as amended, has the right of appeal pursuant to Section 317L of the said Act to The Land and Environment Court of NSW.


Craig Leslie
SENIOR ENVIRONMENTAL HEALTH & BUILDING SURVEYOR

BUILDING PERMIT

DH

Local Government Act, 1919

No 928/64

THIS IS TO CERTIFY that the Plans and Specifications numbered 928/64

submitted by **A. Lade**

of **1115-1116 Fifth Avenue, Austral.**

~~NEW BUILDINGS~~
of ADDITIONS
~~ALTERATIONS~~

and comprising **of a brick and fibro carport and tool shed addition.**

to be erected on Lot **1115-1116** Section

Fifth Avenue Street

have been approved by Council.

SPECIAL CONDITIONS:

- (a) Compliance with the Local Government Act, 1919, and Ordinances thereunder.
- (b) That the building shall be erected on a building line of NOT LESS THAN TWENTY-FIVE (25) FEET back from the street alignment except in (i) commercial districts (ii) rural, non-urban and green belt areas — 66 feet (iii) rural, non-urban and green belt areas — 100 feet where land fronts a county road.
- (c) That 48 hours notice in writing be given to Council for inspection of trenches before foundations are laid, foundations before trenches are filled, drains before they are covered in and framework when complete. Buildings are not to be used or occupied until approval granted by Council.
- (d) **4½" brick wall to have 9" x 4½" engaged piers at a maximum of 6ft. centres.**
- (e) **Provide roof guttering and downpipes and dispose of roof water to Council requirements.**
- (f) **Provide fascia and architraves and complete building to a neat appearance.**

Name of Owner **E. Lade.**

Name of Builder **Mr. Lucich.**

This approval shall not extend to and shall not affect the rights of the Council in respect of any matter appearing in or arising out of such Plans and Specifications which is not in conformity with the Local Government Act, 1919 and the Ordinances thereunder.

Dated *16th October* 19*64*

[Signature]
.....
Town Clerk

B1425.1440
Mr Gary Chalmers
9821 9341

23 September 1998

Breens Solicitors & Conveyancers
DX 5024
LIVERPOOL

BUILDING CERTIFICATE NO. 218/99

**issued under the
Environmental Planning & Assessment Act 1979
Section 149D**

The Council of the City of Liverpool certifies that, in relation to the building or part identified below:

- (a) there is no matter discernible by the exercise of reasonable care and skill that would entitle the council, under the *Environmental Planning and Assessment Act 1979* or the *Local Government Act 1993*:
- (i) to order the building to be demolished, altered, added to or rebuilt, or
 - (ii) to take proceedings for an order or injunction requiring the building to be demolished, altered, added to or rebuilt, or
 - (iii) to take proceedings in relation to any encroachment by the building onto land vested in or under the control of the council, or
- (b) there is such a matter but, in the circumstances, the council does not propose to make any such order or take any such proceedings.

* see notes on page 2

IDENTIFICATION OF BUILDING

LOCATION

Street: Fifth Avenue
Side of Street: Northern
House No: 185
Nearest cross street: Fourth Avenue

PARTICULARS

Classification of building: Class 1a Dwelling & Class 10 Patio,
awning, aviary, sheds & stables

Whole/part: Whole

Owner: Uren

Date of inspection of building: 22/09/98

DESCRIPTION OF LAND

Lot No: 1115
Deposited Plan No. 2475
Suburb: Austral
Parish: St Luke

SCHEDULE

The following written information was used by the Council in deciding to issue this Certificate:

1. Survey Report No. 25836 dated 24 August, 1998 by Lean, Lackenby & Hayward Pty Ltd

Dated this twenty-third day of September, 1998.

Gary Chalmers
SENIOR ENVIRONMENT HEALTH & BUILDING SURVEYOR

Fee : \$50.00

Receipt No : 460717

Date: 31/08/98

Notes*

This certificate operates to prevent the Council:

- (a) from making an order (or taking proceedings for the making of an order or injunction) under the *Environmental Planning and Assessment Act 1979* or the *Local Government Act 1993* requiring the building to be repaired, demolished, altered, added to or rebuilt, and
- (b) from taking proceedings in relation to any encroachment by the building onto land vested in or under the control of the council,

in relation to matters existing or occurring before the date of issue of this certificate.

This certificate operates to prevent the council, for a period of 7 years from the date of issue of this certificate:

- (a) from making an order (or taking proceedings for the making of an order or injunction) under the *Environmental Planning and Assessment Act 1979* or the *Local Government Act 1993* requiring the building to be repaired, demolished, altered, added to or rebuilt, and
- (b) from taking proceedings in relation to any encroachment by the building onto land vested in or under the control of the Council, in relation to matters arising only from the deterioration of the building as a result solely of fair wear and tear.

However, this certificate does not operate to prevent the council:

- (a) from making order No 6 in the Table to section 121B of the *Environmental Planning and Assessment Act 1979*, or
- (b) from taking proceedings against any person under section 125 of the *Environmental Planning and Assessment Act 1979* with respect to that person's failure:
 - (i) to obtain a development consent with respect to the erection or use of the building, or
 - (ii) to comply with the conditions of a development consent.

B1425.1440
Mr Gary Chalmers
9821 9341

23 September 1998

Breens Solicitors & Conveyancers
DX 5024
LIVERPOOL

BUILDING CERTIFICATE NO. 218/99

**issued under the
Environmental Planning & Assessment Act 1979
Section 149D**

The Council of the City of Liverpool certifies that, in relation to the building or part identified below:

- (a) there is no matter discernible by the exercise of reasonable care and skill that would entitle the council, under the *Environmental Planning and Assessment Act 1979* or the *Local Government Act 1993*:
- (i) to order the building to be demolished, altered, added to or rebuilt, or
 - (ii) to take proceedings for an order or injunction requiring the building to be demolished, altered, added to or rebuilt, or
 - (iii) to take proceedings in relation to any encroachment by the building onto land vested in or under the control of the council, or
- (b) there is such a matter but, in the circumstances, the council does not propose to make any such order or take any such proceedings.

* see notes on page 2

IDENTIFICATION OF BUILDING

LOCATION

Street: Fifth Avenue
Side of Street: Northern
House No: 185
Nearest cross street: Fourth Avenue

PARTICULARS

Classification of building: Class 1a Dwelling & Class 10 Patio,
awning, aviary, sheds & stables

Whole/part: Whole

Owner: Uren

Date of inspection of building: 22/09/98

DESCRIPTION OF LAND

Lot No: 1115
Deposited Plan No. 2475
Suburb: Austral
Parish: St Luke

SCHEDULE

The following written information was used by the Council in deciding to issue this Certificate:

1. Survey Report No. 25836 dated 24 August, 1998 by Lean, Lackenby & Hayward Pty Ltd

Dated this twenty-third day of September, 1998.

Gary Chalmers
SENIOR ENVIRONMENT HEALTH & BUILDING SURVEYOR

Fee : \$50.00

Receipt No : 460717

Date: 31/08/98

Notes*

This certificate operates to prevent the Council:

- (a) from making an order (or taking proceedings for the making of an order or injunction) under the *Environmental Planning and Assessment Act 1979* or the *Local Government Act 1993* requiring the building to be repaired, demolished, altered, added to or rebuilt, and
- (b) from taking proceedings in relation to any encroachment by the building onto land vested in or under the control of the council,

in relation to matters existing or occurring before the date of issue of this certificate.

This certificate operates to prevent the council, for a period of 7 years from the date of issue of this certificate:

- (a) from making an order (or taking proceedings for the making of an order or injunction) under the *Environmental Planning and Assessment Act 1979* or the *Local Government Act 1993* requiring the building to be repaired, demolished, altered, added to or rebuilt, and
- (b) from taking proceedings in relation to any encroachment by the building onto land vested in or under the control of the Council, in relation to matters arising only from the deterioration of the building as a result solely of fair wear and tear.

However, this certificate does not operate to prevent the council:

- (a) from making order No 6 in the Table to section 121B of the *Environmental Planning and Assessment Act 1979*, or
- (b) from taking proceedings against any person under section 125 of the *Environmental Planning and Assessment Act 1979* with respect to that person's failure:
 - (i) to obtain a development consent with respect to the erection or use of the building, or
 - (ii) to comply with the conditions of a development consent.



LCC PROPERTY
FILE NUMBER
T.P. 300-35

LIVERPOOL CITY COUNCIL

D X 5030 LIVERPOOL

BOX 64 P O LIVERPOOL N S W 2170

YOUR REFERENCE NO.

TELEPHONE: 602-0511

33 MOORE STREET.
LIVERPOOL N.S.W.

COUNCIL REFERENCE NO. **3186**

EXT. **83** BM:AMS

9th April, 1979

CONSENT NO. LCC: **381/79**

CONSENT TO DEVELOPMENT

To The Manager,
Lindsay Birchall Pty. Ltd.,
Lot 2 Rockford Road,
TAHMOOR. N.S.W. 2573

The Council of the City of Liverpool as the Responsible Authority under the Local Government Act hereby grants permission to carry out the undermentioned development

on Lot 1115 Deposited Plan Number 2475
House No. _____ Section No. _____ Resubdivision of _____
in Fifth Avenue, Austral

situated within the following Zone: Suspended Non Urban 1(b) - IDO 74
applies.

DEVELOPMENT:- erection of a garage workshop 6.0m x 7.5m, comprising a workshop 6.0m x 4.5m and adjoining garage 6.0m x 3.0m.

Conditions, if any, applicable to this application for Consent:-

(PLEASE SEE ATTACHED LIST)

**TOWN PLANNING
DEPARTMENT**
T.P. FILE NO. 381/79

~~XXXXXXXXXXXX~~ (J.G. FAHEY)
~~XXXXXXXXXXXX~~ DEPUTY TOWN CLERK
TOWN CLERK

Per: 

NOTE: This consent is not approval to erect a building or to a subdivision. Plans for such purposes must be submitted in the usual manner.

LCC PROPERTY
FILE NUMBER
T.P. 300-35

**CONDITIONS APPLICABLE TO DEVELOPMENTAL CONSENT NO. LCC 381/79 ISSUED ON
9TH APRIL, 1979**

Property - Lot 1115, D.P. 2475, Fifth Avenue, Austral

- (1) Development to take place in accordance with development application dated 22nd December, 1978, except as modified by the following conditions.
- (2) Compliance with the definition of a Home Industry under the Liverpool Planning Scheme Ordinance, as follows -
"Home Industry" means industry carried on in a building, not being a dwelling house or dwelling in a residential flat building, under the following circumstances:
 - (a) the building does not occupy a floor space exceeding 300sq.ft. and is erected within the curtilage of the dwelling house or residential flat building occupied by the person carrying on the industry or on adjoining land owned by such person;
 - (b) the industry does not interfere with amenity of the locality by reason of the emission of noise, vibration, smell, fumes, smoke, vapour, steam, soot, ash, dust, waste water, waste products, grit, oil or otherwise.
 - (c) the industry does not involve exposure to view from any adjacent premises or from any public place of any unsightly matter.
 - (d) the industry does not require the provision of any essential service main of a greater capacity than that available in the locality.
- (3) All buildings to be sited minimum 20.12m from street boundary of the land.
- (4) The proposed garage is not to be used in conjunction with the home industry use.
- (5) The workshop/garage is to be screened from view from all adjoining property, boundaries by the planting of dense tree/shrub planting to the satisfaction of Council's Town Planning Department.
- (6) No advertising signs to be erected, painted or displayed without Council approval.
- (7) No trees to be removed from property without Council consent.
- (8) Compliance with Council's Health and Building Department requirements:
 - (a) A Building Application together with plans and specifications in duplicate be submitted to Council and approval obtained prior to any construction works commencing.
 - (b) No noise nuisance or any other nuisance to be created.
 - (c) The requirements of all relevant authorities are to be observed.

J.G. FAHEY
DEPUTY TOWN CLERK

Per: 



LCC PROPERTY
FILE NUMBER
T.P. 300-35

LIVERPOOL CITY COUNCIL

D X 5030 LIVERPOOL

BOX 64 P O LIVERPOOL N S W 2170

YOUR REFERENCE NO ...

TELEPHONE: 602-0511

33 MOORE STREET.
LIVERPOOL N.S.W.

COUNCIL REFERENCE NO **3186**

EXT. **83** BM:AMS

9th April, 1979

CONSENT NO. LCC: **381/79**

CONSENT TO DEVELOPMENT

To The Manager,
Lindsay Birchall Pty. Ltd.,
Lot 2 Rockford Road,
TAHMOOR. N.S.W. 2573

The Council of the City of Liverpool as the Responsible Authority under the Local Government Act hereby grants permission to carry out the undermentioned development

on Lot 1115 Deposited Plan Number 2475
House No. _____ Section No. _____ Resubdivision of _____
in Fifth Avenue, Austral

situated within the following Zone: Suspended Non Urban 1(b) - IDO 74
applies.

DEVELOPMENT:- erection of a garage workshop 6.0m x 7.5m, comprising a workshop 6.0m x 4.5m and adjoining garage 6.0m x 3.0m.

Conditions, if any, applicable to this application for Consent:-

(PLEASE SEE ATTACHED LIST)

**TOWN PLANNING
DEPARTMENT**
T.P. FILE NO. 381/79

~~XXXXXXXXXXXX~~ (J.G. FAHEY)
~~XXXXXXXXXXXX~~ DEPUTY TOWN CLERK
TOWN CLERK

Per: 

NOTE: This consent is not approval to erect a building or to a subdivision. Plans for such purposes must be submitted in the usual manner.

LCC PROPERTY
FILE NUMBER
T.P. 300-35

**CONDITIONS APPLICABLE TO DEVELOPMENTAL CONSENT NO. LCC 381/79 ISSUED ON
9TH APRIL, 1979**

Property - Lot 1115, D.P. 2475, Fifth Avenue, Austral

- (1) Development to take place in accordance with development application dated 22nd December, 1978, except as modified by the following conditions.
- (2) Compliance with the definition of a Home Industry under the Liverpool Planning Scheme Ordinance, as follows -

"Home Industry" means industry carried on in a building, not being a dwelling house or dwelling in a residential flat building, under the following circumstances:

 - (a) the building does not occupy a floor space exceeding 300sq.ft. and is erected within the curtilage of the dwelling house or residential flat building occupied by the person carrying on the industry or on adjoining land owned by such person;
 - (b) the industry does not interfere with amenity of the locality by reason of the emission of noise, vibration, smell, fumes, smoke, vapour, steam, soot, ash, dust, waste water, waste products, grit, oil or otherwise.
 - (c) the industry does not involve exposure to view from any adjacent premises or from any public place of any unsightly matter.
 - (d) the industry does not require the provision of any essential service main of a greater capacity than that available in the locality.
- (3) All buildings to be sited minimum 20.12m from street boundary of the land.
- (4) The proposed garage is not to be used in conjunction with the home industry use.
- (5) The workshop/garage is to be screened from view from all adjoining property, boundaries by the planting of dense tree/shrub planting to the satisfaction of Council's Town Planning Department.
- (6) No advertising signs to be erected, painted or displayed without Council approval.
- (7) No trees to be removed from property without Council consent.
- (8) Compliance with Council's Health and Building Department requirements:
 - (a) A Building Application together with plans and specifications in duplicate be submitted to Council and approval obtained prior to any construction works commencing.
 - (b) No noise nuisance or any other nuisance to be created.
 - (c) The requirements of all relevant authorities are to be observed.

J.G. FAHEY
DEPUTY TOWN CLERK

Per: 



PH. **THE CITY OF LIVERPOOL**

COPY ONLY

COUNCIL OFFICE,
MOORE STREET,
LIVERPOOL, N.S.W.

PLEASE QUOTE
REFERENCE NO.

YOUR REFERENCE NO.

FOR ENQUIRIES EXTENSION NO.

CONSENT NO: LMC. 247/56

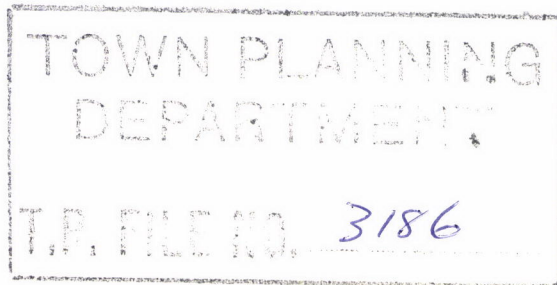
CONSENT TO DEVELOPMENT UNDER
CUMBERLAND COUNTY PLANNING SCHEME.

Date: 5th November, 1956

To Mr. E. Lade,
Railway Camp,
CHULLORA

The Council of the City of Liverpool as the Responsible Authority under the Local Government Act hereby grants permission to carry out development on Lot 1115 - 1116 Deposited Plan No. 2475 House No. _____ Section No. _____ Resubdivision of _____ in Fifth Avenue situated within a Rural Area for the purpose of erection of cottage and garage, on combined area of two lots.

Conditions if any applicable to this application for consent:-



R. T. FINDLEY
TOWN CLERK.
per:

NOTE:

This consent is not approval to erect a building or to a subdivision. Plans for such purposes must be submitted in the usual manner.

BUILDING PERMIT

Local Government Act, 1919

No. 694/60

THIS IS TO CERTIFY that the Plans and Specifications numbered
submitted by **Mr. E. Laid** of **5th Ave., AUSTRAL.**

NEW BUILDINGS
of ADDITIONS
ALTERATIONS

and comprising **the erection of a fibro dwelling.**
to be erected on Lot **s 1115-6** Section **--** of **5th Avenue,** Street

have been approved by Council.

SPECIAL CONDITIONS:

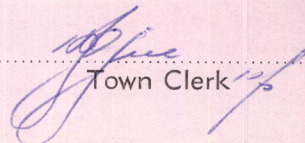
- (a) Compliance with the Local Government Act, 1919, and Ordinances thereunder.
- (b) That the building shall be erected on a building line of NOT LESS THAN TWENTY-FIVE (25) FEET back from the street alignment unless special exemption has been obtained from the Council.
- (c) That 48 hours notice in writing be given to Council for inspection of trenches before foundations are laid, foundations before trenches are filled, drains before they are covered in and framework when complete. Buildings are not to be used or occupied until approval granted by Council.
- (d) ~~Septic tank subject to separate approval.~~
- (e) **Window area to each room to be at least equal to 1/10th room floor area.**

Name of Owner **E. Laid.**

Name of Builder **N. Lucich**

This approval shall not extend to and shall not affect the rights of the Council in respect of any matter appearing in or arising out of such Plans and Specifications which is not in conformity with the Local Government Act, 1919 and the Ordinances thereunder.

Dated **8. 12 1960**


Town Clerk

BUILDING PERMIT

Local Government Act, 1919

No. 694/60

THIS IS TO CERTIFY that the Plans and Specifications numbered
submitted by **Mr. E. Laid** of **5th Ave., AUSTRAL.**

NEW BUILDINGS
of ADDITIONS
ALTERATIONS

and comprising **the erection of a fibro dwelling.**
to be erected on Lot **s 1115-6** Section **--** of **5th Avenue,** Street

have been approved by Council.

SPECIAL CONDITIONS:

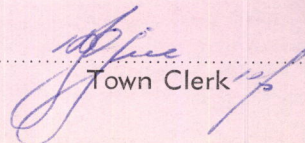
- (a) Compliance with the Local Government Act, 1919, and Ordinances thereunder.
- (b) That the building shall be erected on a building line of NOT LESS THAN TWENTY-FIVE (25) FEET back from the street alignment unless special exemption has been obtained from the Council.
- (c) That 48 hours notice in writing be given to Council for inspection of trenches before foundations are laid, foundations before trenches are filled, drains before they are covered in and framework when complete. Buildings are not to be used or occupied until approval granted by Council.
- (d) ~~Septic tank subject to separate approval.~~
- (e) **Window area to each room to be at least equal to 1/10th room floor area.**

Name of Owner **E. Laid.**

Name of Builder **N. Lucich**

This approval shall not extend to and shall not affect the rights of the Council in respect of any matter appearing in or arising out of such Plans and Specifications which is not in conformity with the Local Government Act, 1919 and the Ordinances thereunder.

Dated **8. 12 1960**


Town Clerk

LIVERPOOL CITY COUNCIL

BUILDING PERMIT

Local Government Act, 1919

No. 482/79

THIS IS TO CERTIFY that the Plans and Specifications numbered 482/79

submitted by **LINDSAY BIRCHALL PTY. LTD.** of **LOT 2 ROCKFORD ROAD, TAHMOOR**
of **NEW BUILDINGS**
ADDITIONS
ALTERATIONS.

and comprising **DETACHED GARAGE**

to be erected on Lot **1115** Section **FIFTH AVENUE** Street **AUSTRAL**

have been approved by Council.

SPECIAL CONDITIONS:

- (a) Compliance with the Local Government Act, 1919, and Ordinances thereunder.
- (b) That the building shall be erected on a building line of NOT LESS THAN TWENTY-FIVE (25) FEET back from the street alignment except in (i) commercial districts (ii) rural, non-urban and green belt areas — 66 feet (iii) rural, non-urban and green belt areas — 100 feet where land fronts a county road.
- (c) That 48 hours notice in writing be given to Council for inspection of trenches before foundations are laid, foundations before trenches are filled, drains before they are covered in and framework when complete. Buildings are not to be used or occupied until approval granted by Council.
- (d) Garage to stand wholly within the boundaries of the site as per approved site plan.
- (e) Garage to be sited a minimum 7 metres from existing disposal area.
- (f) Roof gutters and downpipes to be installed.
- (g) Roofwater to be disposed of to Council's satisfaction without nuisance and well clear of adjacent lot boundaries.
- (h) Garage to be structurally sound and completed to a neat appearance.
- (i) Subject to conditions of Development Consent No.381/79 dated 9th April, 1979.
- (j) Garage not to be used for human habitation, industrial or commercial purposes.

E&OE

In accordance with provisions of the Local Government Act, 1919, as amended, you are advised that you have a right of appeal to the Local Government Appeals Tribunal against this decision of the Council.

Name of Owner **SP. & EM. CLARKE, LOT 1115 FIFTH AVENUE, AUSTRAL**

Name of Builder **LINDSAY BIRCHALL PTY. LTD., LOT 2 ROCKFORD ROAD, TAHMOOR**

This approval shall not extend to and shall not affect the rights of the Council in respect of any matter appearing in or arising out of such Plans and Specifications which is not in conformity with the Local Government Act, 1919, and the Ordinances thereunder.

Dated **3RD MAY,** 1979

.....
Town Clerk.

(OFFICE COPY)

LIVERPOOL CITY COUNCIL

ASSESSMENT No.: 5600--11

BUILDING PERMIT

Local Government Act, 1919

No. 1380/81

THIS IS TO CERTIFY that the Plans and Specifications numbered 1380/81

submitted by S.P. CLARKE of LOT 1115 FIFTH AVE., AUSTRAL
-NEW BUILDINGS
of ADDITIONS
ALTERATIONS-

and comprising BRICK ADDITIONS

to be erected on Lot 1115 Section FIFTH AVENUE Street AUSTRAL

have been approved by Council.

SPECIAL CONDITIONS:

- (a) Compliance with the Local Government Act, 1919, and Ordinances thereunder.
- (b) The building shall be erected on a building line of NOT LESS THAN 7.5 METRES back from the street alignment except in (i) commercial districts (ii) rural and non-urban — 20 metres (iii) rural and non-urban — 30 metres where land fronts a county road.
- (c) 48 hours notice in writing to be given to Council for inspection of trenches before foundations are laid, foundations before trenches are filled, drains before they are covered in and framework when complete. Buildings are not to be used or occupied until approval granted by Council.
- (d) Building to be sited in accordance with the approved site plan
- (e) Patio not to be enclosed without prior written approval being obtained from Council
- (f) Brick walls to be supported by footings of adequate size (300 mm x 300 mm) and to be securely tied to timber framework.
- (g) Roof cladding to be fixed and supported in accordance with the manufacturer's recommendations
- (h) Roof gutters and downpipes to be installed²
- (i) Roofwater to be connected to the existing house stormwater drainage system to Council's satisfaction
- (j) Building to be completed to conform with existing development and amenity of area

In accordance with provisions of the Local Government Act, 1919, as amended, you are advised that you have a right of appeal to the Land and Environment Court against this decision of the Council.

Name of Owner S.P. & E.M. CLARKE LOT 1115 FIFTH AVE., AUSTRAL

Name of Builder MACQUARIE FIELDS CONST.CO.PTY.LTD. COWPASTURE RD.HOXTON PARK

This approval shall not extend to and shall not affect the rights of the Council in respect of any matter appearing in or arising out of such Plans and Specifications which is not in conformity with the Local Government Act, 1919, and the Ordinances thereunder.

Dated 26th October 1981

P.T. Findley
Town Clerk.

Road Opening Fees:

Receipt No.:

Date Paid:

Damage Deposit Fees:

Receipt No.:

Date Paid:

BUILDING PERMIT

Local Government Act, 1919

No. 607/62

THIS IS TO CERTIFY that the Plans and Specifications numbered

submitted by **A. Lade** of **5th Avenue, Austral.**

~~NEW BUILDINGS~~
of ~~ADDITIONS~~
~~ALTERATIONS~~

and comprising **Fibro DWELLING ADDITION**

to be erected on Lot **1115 - 1116** Section of **5th Avenue, Austral.** Street

have been approved by Council.

SPECIAL CONDITIONS:

- (a) Compliance with the Local Government Act, 1919, and Ordinances thereunder.
- (b) That the building shall be erected on a building line of NOT LESS THAN TWENTY-FIVE (25) FEET back from the street alignment except in (i) commercial districts (ii) rural, non-urban and green belt areas — 66 feet (iii) rural, non-urban and green belt areas — 100 feet where land fronts a county road.
- (c) That 48 hours notice in writing be given to Council for inspection of trenches before foundations are laid, foundations before trenches are filled, drains before they are covered in and framework when complete. Buildings are not to be used or occupied until approval granted by Council.
- (d) Rafters to be not more than 24" centres for Corrugated Fibro Sheeting.
- (e) Clear lounge room window area to be not less than 1/10th the floor area of such room.

Name of Owner **E. Ladi**

Name of Builder **N. Lucich**

This approval shall not extend to and shall not affect the rights of the Council in respect of any matter appearing in or arising out of such Plans and Specifications which is not in conformity with the Local Government Act, 1919. and the Ordinances thereunder.

Dated **19 SEP 1962** 19

.....
Town Clerk

H. Gill
S

T.P. 3186

83 BM:AMS

9th January, 1979

Mr. & Mrs. S. Clarke,
19 Farnell Street,
CURL CURL. N.S.W. 2096

Dear Sir & Madam,

Lot 1115, D.P. 2475, Fifth Avenue, Austral

Reference is made to your development application proposing the erection of a garage/workshop 20' x 25' comprising a workshop of 20' x 15' as a home industry use, for design work and building small models and prototypes or samples of castings.

It is advised that your application has been approved in principle by Council, subject to compliance with the following conditions:

(1) Development to take place in accordance with development application dated 22nd December, 1978, except as modified by the following conditions.

(2) Compliance with the definition of a Home Industry under the Liverpool Planning Scheme Ordinance, as follows -

"Home Industry" means industry carried on in a building, not being a dwelling-house or dwelling in a residential flat building, under the following circumstances

(a) the building does not occupy a floor space exceeding 300sq.ft. and is erected within the curtilage of the dwelling house or residential flat building occupied by the person carrying on the industry or on adjoining land owned by such person;

(b) the industry does not interfere with the amenity of the locality by reason of the emission of noise, vibration, smell, fumes, smoke, vapour, steam, soot, ash, dust, waste water, waste products, grit, oil or otherwise;

(c) the industry does not involve exposure to view from any adjacent premises or from any public place of any unsightly matter;

(d) the industry does not require the provision of any essential service main of a greater capacity than that available in the locality.

(3) All buildings to be sited minimum 20.12m from street boundary of the land.

(4) The proposed garage is not to be used in conjunction with the home industry use.

...2/

(5) The workshop/garage is to be screened from view from all adjoining property, boundaries by the planting of dense tree/shrub planting to the satisfaction of Council's Town Planning Department.

(6) No advertising signs to be erected, painted or displayed without Council approval.

(7) No trees to be removed from property without Council consent.

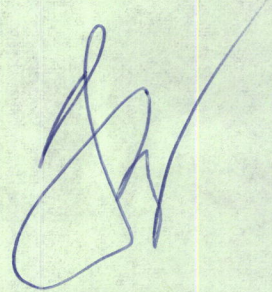
(8) Compliance with Council's Health and Building Department requirements. These will be forwarded as soon as available.

An appeal may be made against this decision to the Local Government Appeals Tribunal.

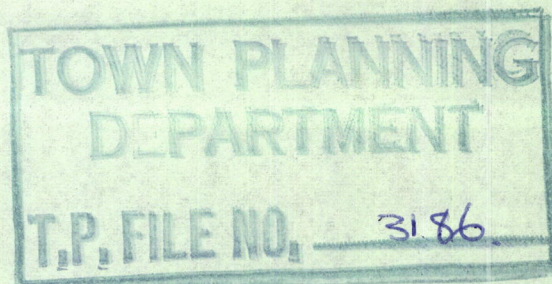
Yours faithfully,

(J.G. Facey)
DEPUTY TOWN CLERK

per JC



✓ AS 11/1/79.
Return to Mrs. Smart to
record Delegation item
(see under)



APPENDIX F SALINITY RISK MAP



Salinity Potential



Key

Site Location 



DRAWN
MS

Job #
E1292-2

Salinity Risk Map

DIPNR NSW 2003

185 Fifth Avenue, Austral NSW

APPENDIX G DPI (OFFICE OF WATER) DATABASE RECORDS

NSW Office of Water

Work Summary

GW107007
Licence: 10BL164442

Licence Status: CANCELLED

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

Work Type: Bore

Work Status:
Construct.Method: Rotary

Owner Type:
Commenced Date:
Completion Date: 23/11/2004

Final Depth: 267.00 m
Drilled Depth: 267.00 m

Contractor Name: Britt's Water Solutions

Driller: Thomas Garry Britt

Assistant Driller:
Property: LANDCOM COBBLE CCT WEST
 HOXTON

Standing Water Level: 4.000

GWMA: -
GW Zone: -

Salinity: Brackish
Yield: 0.160

Site Details

Site Chosen By:

County	Parish	Cadastre
Form A: CUMBE	CUMBE.9	3037 1032057
Licensed: CUMBERLAND	CABRAMATTA	Whole Lot 3037//1032057

Region: 10 - Sydney South Coast

CMA Map:
River Basin: - Unknown
Area/District:
Grid Zone:
Scale:
Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown

Northing: 6242678.0
Easting: 299198.0

Latitude: 33°56'14.0"S
Longitude: 150°49'38.6"E

GS Map: -

MGA Zone: 0

Coordinate Source: Unknown

Construction

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

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	28.00	200			Rotary Air
1		Hole	Hole	28.00	267.00	163			Rotary Air
1	1	Casing	Pvc Class 6	0.30	32.00	160			Seated on Bottom, Glued

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
37.00	37.10	0.10	Unknown	4.00		0.14	41.00		
182.00	182.10	0.10	Unknown	4.00		0.16	186.00		

Geologists Log

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	2.40	2.40	TOPSOIL/CLAY	Topsoil	
2.40	4.00	1.60	WEATHERED SHALE	Shale	

4.00	28.00	24.00	SHALE WITH BROKEN BANDS	Shale	
28.00	48.00	20.00	GREY SANDY SHALE	Shale	
48.00	102.00	54.00	HARD BLACK SLATE	Slate	
102.00	267.00	165.00	SANDSTONE	Sandstone	

Remarks

27/04/2006: Previous Lic No: 10BL164442

11/03/2011: Karla Abbs, 11-Mar-2011: Replaced invalid codes in Drillers Log

***** End of GW107007 *****

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

NSW Office of Water

Work Summary

GW112662

Licence: 10BL605092

Licence Status: ACTIVE

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

Work Type: Bore

Work Status: Equipped

Construct.Method:

Owner Type: Private

Commenced Date:

Completion Date: 23/02/2012

Final Depth:

Drilled Depth:

Contractor Name: ROCKWELL DRILLING

Driller: Unkown Unknown

Assistant Driller:

Property: GERACE 1466 CAMDEN VALLEY
WAY LEPPINGTON 2179 NSW

Standing Water Level:

GWMA:
GW Zone:

Salinity:
Yield:

Site Details

Site Chosen By:

County: CUMBE
Form A: CUMBE
Licensed:

Parish: CUMBE.33

Cadastre: 103//1175246

Region: 10 - Sydney South Coast

CMA Map:

River Basin: - Unknown
Area/District:

Grid Zone:

Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown

Northing: 6239902.0
Easting: 298951.0

Latitude: 33°57'43.9"S
Longitude: 150°49'26.7"E

GS Map: -

MGA Zone: 0

Coordinate Source: Unknown

Construction

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

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

Water Bearing Zones

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

Geologists Log

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments

Remarks

23/07/2014: Nat Carling, 23-July-2014; Added status, drill method & depth, updated work type.

NSW Office of Water

Work Summary

GW072372

Licence: 10BL156018

Licence Status: CONVERTED

Authorised Purpose(s): STOCK,DOMESTIC
Intended Purpose(s): STOCK, DOMESTIC

Work Type: Bore

Work Status: Supply Obtained

Construct.Method: Rotary

Owner Type: Private

Commenced Date:
Completion Date: 26/09/1994

Final Depth: 228.00 m
Drilled Depth: 228.00 m

Contractor Name: Watermin Drillers Pty Ltd

Driller: Rodney Ronald Orchard

Assistant Driller:

Property: N/A

GWMA: -
GW Zone: -

Standing Water Level
(m):

Salinity Description: Good
Yield (L/s): 1.440

Site Details

Site Chosen By:

County	Parish	Cadastre
Form A: CUMBE	CUMBE.14	11//229806
Licensed: CAMDEN	CAMDEN	Whole Lot 11//229806

Region: 10 - Sydney South Coast

CMA Map: 9030-2S

River Basin: 212 - HAWKESBURY RIVER
Area/District:

Grid Zone:

Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown

Northing: 6241243.0
Easting: 292136.0

Latitude: 33°56'55.6"S
Longitude: 150°45'02.5"E

GS Map: -

MGA Zone: 0

Coordinate Source: Unidentified Location

Construction

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

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	228.00	165			Rotary Air
1	1	Casing	Steel	-0.30	120.20	152			Driven into Hole, Welded

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
134.30	134.40	0.10	Unknown			0.25	134.40		
161.30	161.40	0.10	Unknown			0.19	161.40		
176.50	176.60	0.10	Unknown			0.69	176.60		
210.80	210.90	0.10	Unknown			0.31	210.90		

Geologists Log

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	0.20	0.20	TOPSOIL	Topsoil	
0.20	6.70	6.50	CLAY	Clay	

6.70	85.60	78.90	BLACK SHALE	Shale	
85.60	105.50	19.90	SANDSTONE WITH BANDS OF SHALE	Sandstone	
105.50	228.00	122.50	SANDSTONE	Sandstone	

Remarks

26/11/2012: Nat Carling, 26-Nov-2012; Added status & owner type (based on licence), & added rock type codes to driller's log. Confirmed coordinates are in centre of the authorised land.

***** End of GW072372 *****

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

APPENDIX H BUREAU OF METEOROLOGY

Monthly Rainfall (millimetres)

ROSSMORE (SOUTH CREEK)

Station Number: 067061 · State: NSW · Opened: 2007 · Status: Open · Latitude: 33.94°S · Longitude: 150.78°E · Elevation: Unknown m

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
2007			15.0	84.0	26.0	211.0	26.0	62.0	16.0	14.0	118.0	98.0	
2008	95.0	346.0	70.0	49.0	12.0	70.0	17.0	26.0	48.0	46.0	44.0	85.0	908.0
2009	18.0	109.0	54.0	113.0	105.0	35.0	20.0	4.0	27.0	42.0	22.0	53.0	602.0
2010	36.0	150.0	74.0	11.0	81.0	69.0	66.0	27.0	37.0	42.0	13.0	104.0	710.0
2011	40.0	19.0	111.0	34.0	58.0	53.0	55.0	48.0	70.0	31.0	135.0	104.0	758.0
2012	109.0	167.0	200.0	128.0	12.0	89.0	17.0	4.0	17.0	38.0	56.0	32.0	869.0
2013	171.0	133.0	56.0	78.0	52.0	139.0	3.0	7.0	20.0	1.0		29.0	
2014	9.0	58.0	202.0	45.0	7.0	30.0	9.0		15.0	42.0	0.0	21.0	
2015	121.0	25.0	57.0	240.0	41.0	61.0	31.0	47.0	12.0	42.0	93.0	47.0	817.0
2016	256.0	20.0	20.0	9.0	14.0	299.0	47.0	61.0	58.0	23.0		2.0	
2017			156.0	34.0									

Quality control: 12.3 Done & acceptable, 12.3 Not completed or unknown



Monthly Rainfall (millimetres)

ROSSMORE (SOUTH CREEK)

Station Number: 067061 · State: NSW · Opened: 2007 · Status: Open · Latitude: 33.94°S · Longitude: 150.78°E · Elevation: Unknown m

Statistics for this station calculated over all years of data

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Lowest	9.0	19.0	15.0	9.0	7.0	30.0	3.0	4.0	12.0	1.0	0.0	2.0	602.0
Highest	256.0	346.0	202.0	240.0	105.0	299.0	66.0	62.0	70.0	46.0	135.0	104.0	908.0

1) Calculation of statistics

Summary statistics, other than the Highest and Lowest values, are only calculated if there are at least 20 years of data available.

2) Gaps and missing data

Gaps may be caused by a damaged instrument, a temporary change to the site operation, or due to the absence or illness of an observer.

3) Further information

<http://www.bom.gov.au/climate/cdo/about/about-rain-data.shtml>.

Product code: IDCJAC0001 reference: 30346657 Created on Fri 12 May 2017 14:47:43 PM EST

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Prepared using Climate Data Online, Bureau of Meteorology <http://www.bom.gov.au/climate/data>.

Contact us using details on <http://www.bom.gov.au/climate/how/contacts.shtml>.

We have taken all due care but cannot provide any warranty nor accept any liability for this information.

<http://www.bom.gov.au/other/copyright.shtml>



APPENDIX I PROPOSED DEVELOPMENT PLANS & SURVEY

Table with 8 columns: Level, Name, Number, Unit Type, Area, Solar Access 2hrs, Cross Ventilation, Building. It lists unit details for Block A across multiple levels, including floor area and amenity status.

Table with 8 columns: Level, Name, Number, Unit Type, Area, Solar Access 2hrs, Cross Ventilation, Building. It lists unit details for Block A-56 across multiple levels, including floor area and amenity status.

Table with 8 columns: Level, Name, Number, Unit Type, Area, Solar Access 2hrs, Cross Ventilation, Building. It lists unit details for Block B across multiple levels, including floor area and amenity status.

Table with 8 columns: Level, Name, Number, Unit Type, Area, Solar Access 2hrs, Cross Ventilation, Building. It lists unit details for Block B-57 across multiple levels, including floor area and amenity status.

Table with 8 columns: Level, Name, Number, Unit Type, Area, Solar Access 2hrs, Cross Ventilation, Building. It lists unit details for Block C across multiple levels, including floor area and amenity status.

Table with 8 columns: Level, Name, Number, Unit Type, Area, Solar Access 2hrs, Cross Ventilation, Building. It lists unit details for Block C-57 across multiple levels, including floor area and amenity status.

Table with 8 columns: Level, Name, Number, Unit Type, Area, Solar Access 2hrs, Cross Ventilation, Building. It lists unit details for Block D across multiple levels, including floor area and amenity status.

Table with 8 columns: Level, Name, Number, Unit Type, Area, Solar Access 2hrs, Cross Ventilation, Building. It lists unit details for Block D-56 across multiple levels, including floor area and amenity status.

Table with 8 columns: Level, Name, Number, Unit Type, Area, Solar Access 2hrs, Cross Ventilation, Building. It lists unit details for Block D-56 across multiple levels, including floor area and amenity status.

DETAILS / CALCULATIONS

Site Details: Address: 185 fifth avenue, AUSTRAL 2475 & 1115. Site Area: 12000m². Site Frontage: 80.465m. Current Use: residential housing. Existing Gross Floor Area: 484m².

Floor Space Zone: R3. FSR: -. Max Area: -m².

Proposed for each building (a+d): Ground Floor 836m², Level 1 1058m², Level 2 1058m², Level 3 1058m², Level 4 577m², Total 4587m². Proposed F.S.R. -.

Proposed for each building (b+c): Ground Floor 890m², Level 1 1058m², Level 2 1058m², Level 3 1058m², Level 4 577m², Total 4641m². Proposed F.S.R. -.

Landscaping: Proposed Open Space (7% of site) -m².

Onsite parking for each building (a+d): Total Car Spaces Required 76 spaces + 1 car wash. Total Car Spaces Provided -.

Onsite parking for each building (b+c): Total Car Spaces Required 77 spaces + 1 car wash. Total Car Spaces Provided -.

Bikes: 1 space per 5 units (Bikes Residents) 11, 1 space per 10 units (Bikes Visitors) 06. Total Bike Spaces Required 17. Total Bike Spaces Provided 17.

Storage for each building (a+d): 6m³ Storage per 1 bedroom unit 48m³, 8m³ Storage per 2 bedroom unit 344m³, 10m³ Storage per 3 bedroom unit 50m³. Total Storage Required 442m³. Total Storage Provided -m³.

Storage for each building (b+c): 6m³ Storage per 1 bedroom unit 54m³, 8m³ Storage per 2 bedroom unit 344m³, 10m³ Storage per 3 bedroom unit 50m³. Total Storage Required 448m³. Total Storage Provided -m³.

Unit breakdown (per block): Block a: 1 bedroom - 8, 2 bedroom - 43, 3 bedroom - 5. Block b: 1 bedroom - 9, 2 bedroom - 43, 3 bedroom - 5.

Unit breakdown (per block): Block c: 1 bedroom - 9, 2 bedroom - 43, 3 bedroom - 5. Block d: 1 bedroom - 8, 2 bedroom - 43, 3 bedroom - 5.

total 1 bedroom - 34

total 2 bedroom - 172

total 3 bedroom - 20

total units - 226

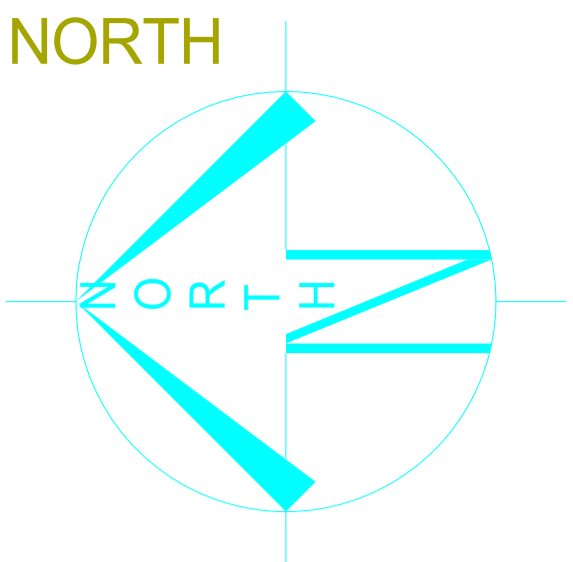
development application

- 185 fifth avenue, austral residential apartments + basements
a101 survey
a102 site plan
a103 site analysis
a104 demolition plan
a105 erosion + sediment control
a106 deep soil diagram
a107 landscaped area
a109 common open space diagram
a200 basement 1
a201 basement 2
a202 ground floor
a203 level 1
a204 level 2
a205 level 3
a206 level 4
a207 roof level
a208 adaptable units
a300 elevations
a301 elevations
a400 sections
a500 shadow diagrams - 21 June (8am, 10am, 11am + 12pm)
a501 shadow diagrams - 21 June (1pm, 2pm + 3pm)
a600 solar + cross ventilation
a700 waste management plan (ground floor)
a701 waste management plan (level 1)



LOCALITY SKETCH

UBD AREA: SYD REVISION: 53
74.52BASE PP MAP: 266 REF: D15
GPS



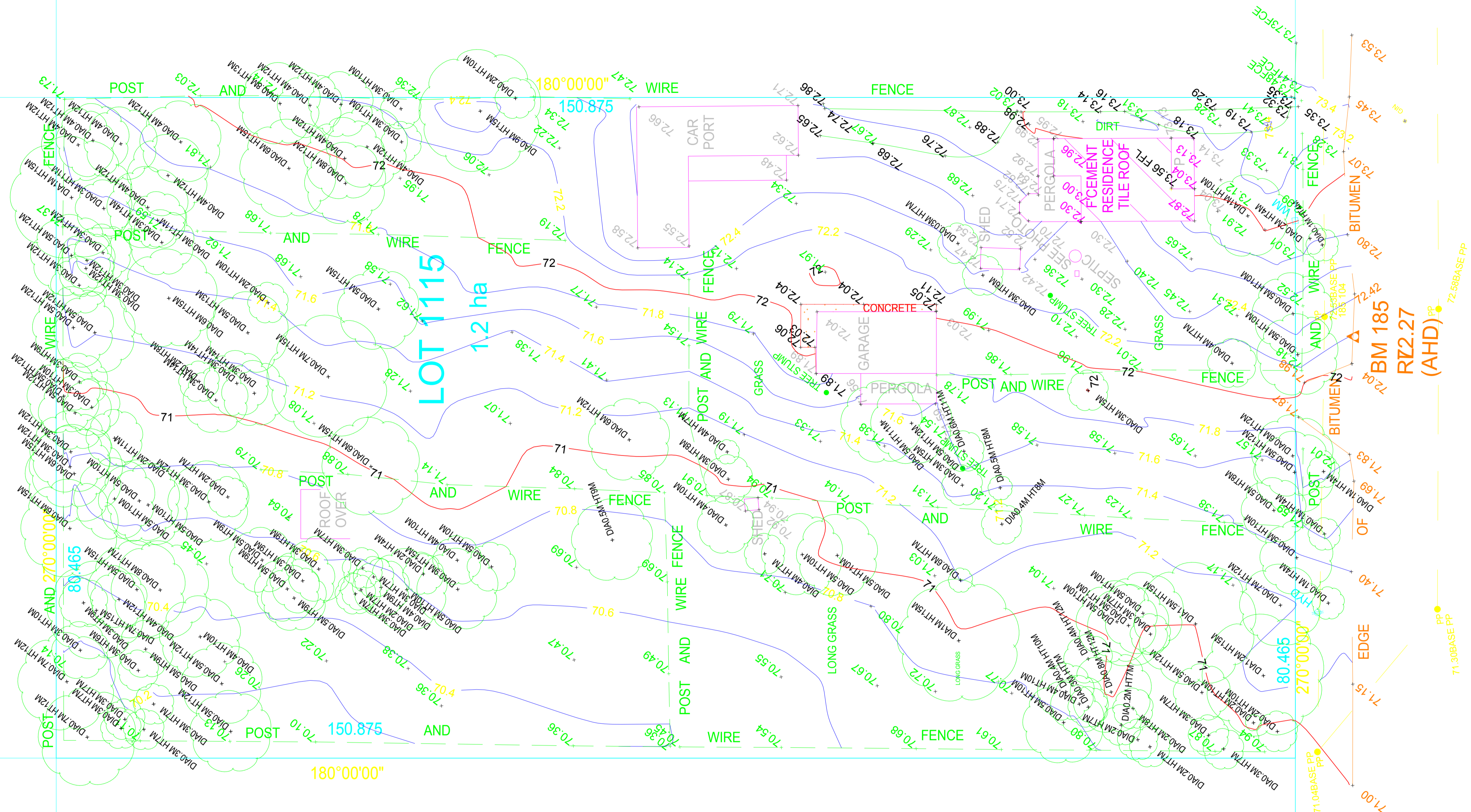
DP 2475

LOT 1065
LOT 1114

LOT 1064

LOT 1063

LOT 1116

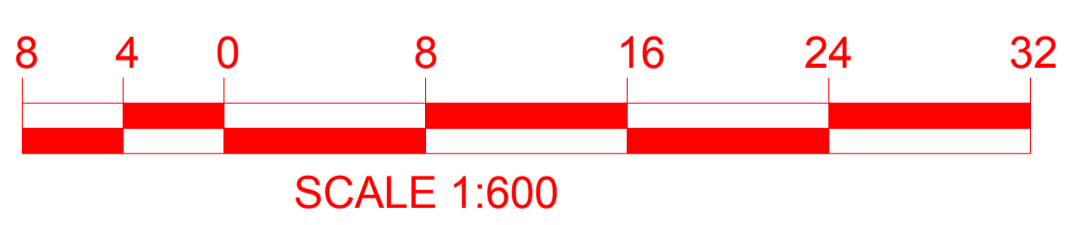


FIFTH AVENUE

ALL TREE HEIGHTS AND SPREAD ARE APPROXIMATE ONLY AND ARE SHOWN FOR TENDER PURPOSES ONLY. ALL TREE RELATED ISSUES TO BE REFERRED TO AN ARBORIST

NOTE: POSITION OF SEWER MAIN NOT YET AVAILABLE. REFER TO SYDNEY WATER DIAGRAM DATED 22/03/2017

HOW TO PROTECT SURVEY MARKS BEFORE WORKS COMMENCE
Find out if there are survey marks located in the area of interest by:
1. Viewing the survey mark layer in the Spatial Information Exchange 'Site' web page www.six.nsw.gov.au
2. Contacting Survey Services, LPI, 1300 052 637 who will advise the location and status of survey marks in the area
3. Inspecting the site, paying particular attention to survey marks.
IF SURVEY MARKS ARE IN THE AREA
The locality sketch plan (Survey Mark Sketches) should be downloaded from the LPI online Shop 'Specialised Searches' http://shop.lands.nsw.gov.au/see
IF SURVEY MARKS ARE LIKELY TO BE DISTURBED OR DESTROYED
Avoid disturbing or destroying survey marks by:
1. Diverting works to avoid disturbing the marks or
2. Contacting a Registered Surveyor to place and survey a mark at a more suitable site nearby to maintain survey integrity.
Any survey necessary to recover the position of survey marks proposed to be destroyed may only be undertaken by a surveyor registered under the Survey and Spatial Information Act 2002 or by survey staff authorised by the Surveyor General.
REPORT SURVEY MARKS AT RISK OF BEING DESTROYED
Look for the Survey Mark Status report at http://scims.lpi.nsw.gov.au/status/report_frames.htm



THE BOUNDARY POSITION IS APPROXIMATE ONLY AND SHOULD BE VERIFIED PRIOR TO ANY CONSTRUCTION WORKS.

COPYRIGHT

COPYRIGHT OF THIS PLAN AND IN THE ACCOMPANYING CAD FILE(S) WHERE APPLICABLE VESTS WITH ASPECT DEVELOPMENT & SURVEY PTY LTD.
THE PLAN AND CAD FILE SHALL ONLY BE USED BY THE ADDRESSED CLIENT FOR THE PURPOSE FOR WHICH THE SURVEY WAS CARRIED OUT.

GENERAL NOTES

- A) THIS SURVEY IS SPECIFICALLY FOR CONTOUR PURPOSES ONLY. THE BOUNDARIES OF THE SUBJECT PROPERTY HAVE NOT BEEN INVESTIGATED AND THE POSITION SHOWN IS APPROXIMATE ONLY
- B) AREAS AND DIMENSIONS ARE SUBJECT TO SURVEY
- C) SERVICES SHOWN HAVE BEEN DERIVED FROM VISUAL EVIDENCE APPARENT AT THE TIME OF SURVEY. THE RELEVANT SERVICE AUTHORITY SHALL BE CONTACTED TO VERIFY THE EXISTENCE AND POSITION OF ALL SERVICES PRIOR TO THE COMMENCEMENT OF ANY CONSTRUCTION OR EXCAVATION
- D) CONTOURS ARE INDICATIVE OF SURFACE TOPOGRAPHY ONLY. SURVEYED SPOT LEVELS ARE THE ONLY VALUES TO BE RELIED ON FOR REDUCED LEVELS ON PARTICULAR FEATURES.

SYMBOLS & ABBREVIATIONS:

GP	GULLY PIT	-E ³	OVERHEAD ELEC LINE
HYD	HYDRANT	-S-	SEWER LINE
SIP	SURFACE INLET PIT	GM	GAS METER
SIC	SEWER INSPECTION COVER	LP	LIGHT POLE
SMH	SEWER MANHOLE	EC	ELECTRICITY CONDUIT
WM	WATER METER	ETC	ELECT & TELE CONDUIT
EL	ELECTRICITY BOX	TC	TELECOM CONDUIT
TP	TELECOMMUNICATIONS PIT	WC	WATER CONDUIT
VC	VEHICLE CROSSING	INVERT	INVERT
SV	STOP VALVE	KO	KERB OUTLET
SWMH	STORMWATER MANHOLE	TK	TOP OF KERB

ASPECT DEVELOPMENT & SURVEY PTY LTD CONSULTING REGISTERED SURVEYORS

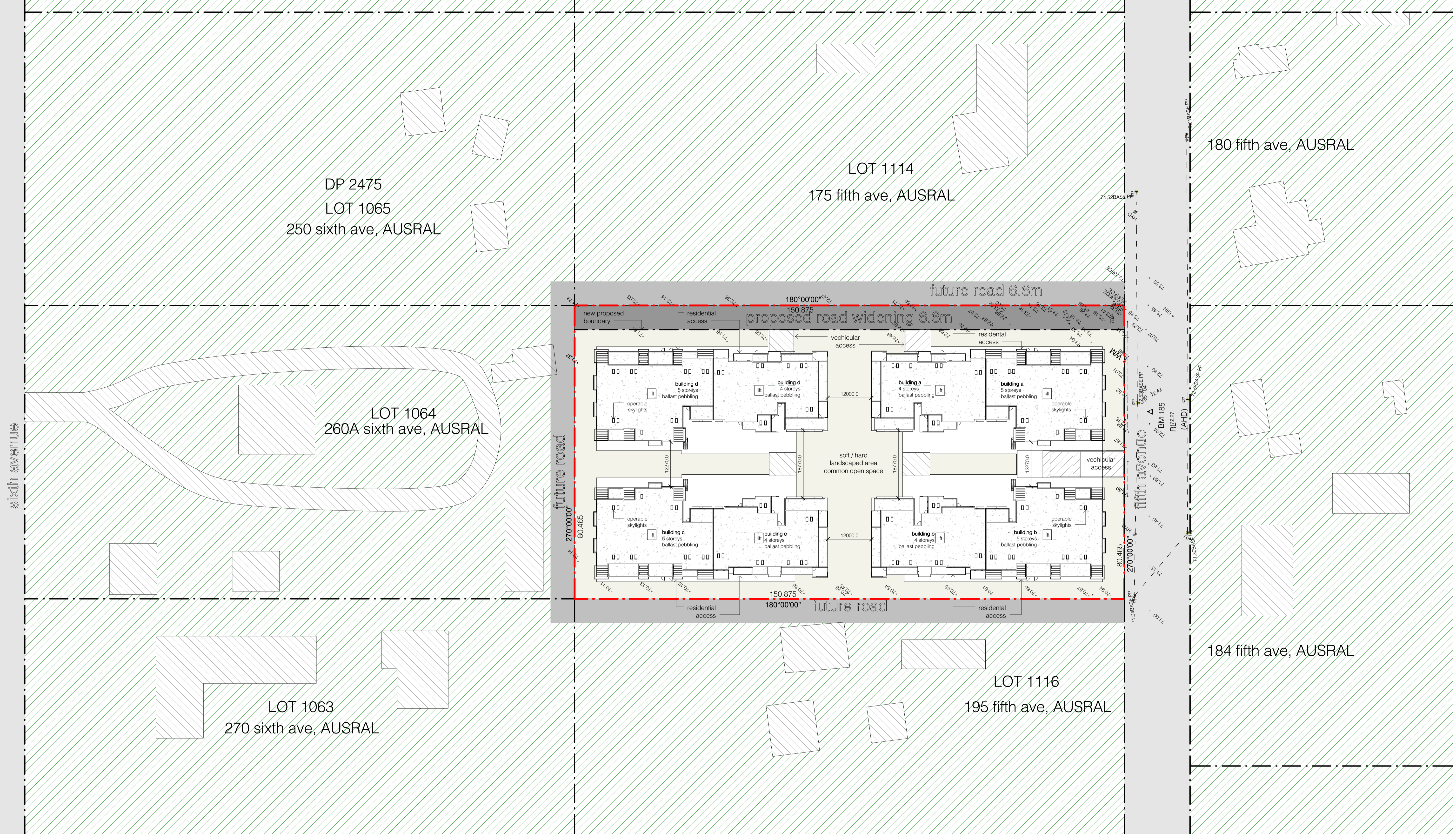
ABN 60 078 649 000
SUITE 1
103 VANESSA STREET
KINGSGROVE NSW 2208
PHONE (02) 9554 8388
FAX (02) 9554 8588
PO BOX 161
KINGSGROVE NSW 1480
DX 11392
HURSTVILLE

PROJECT

OUR REFERENCE	6/1038845/216964
LOT 1115	DP 2475
DATUM AHD	SECTION
ORIGIN OF LEVELS	SOURCE SCIMS 22/03/17
SURVEYED AC	REDUCED LEVEL 74.951
DRAWN NP	DATE 25/03/2017
SCALE 1: 600	DATE 29/03/2017
A3 SHEET	

CLIENT: GMARCHITECTS

REF:
REF:
ADDRESS: 185 FIFTH AVENUE
SUBURB AUSTRAL



DP 2475
 LOT 1065
 250 sixth ave, AUSRAL

LOT 1114
 175 fifth ave, AUSRAL

180 fifth ave, AUSRAL

LOT 1064
 260A sixth ave, AUSRAL

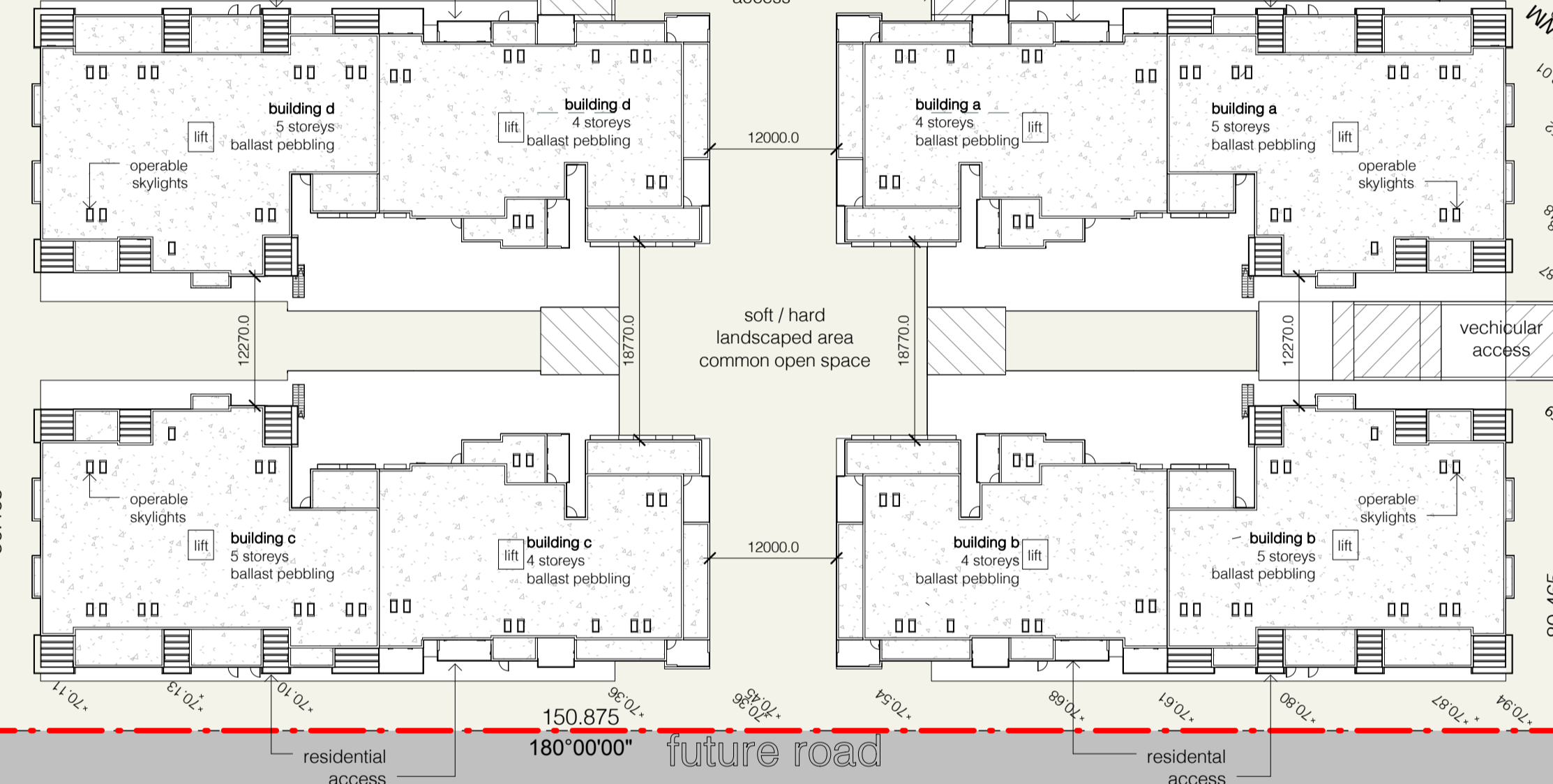
sixth avenue

future road

proposed road widening 6.6m

future road 6.6m

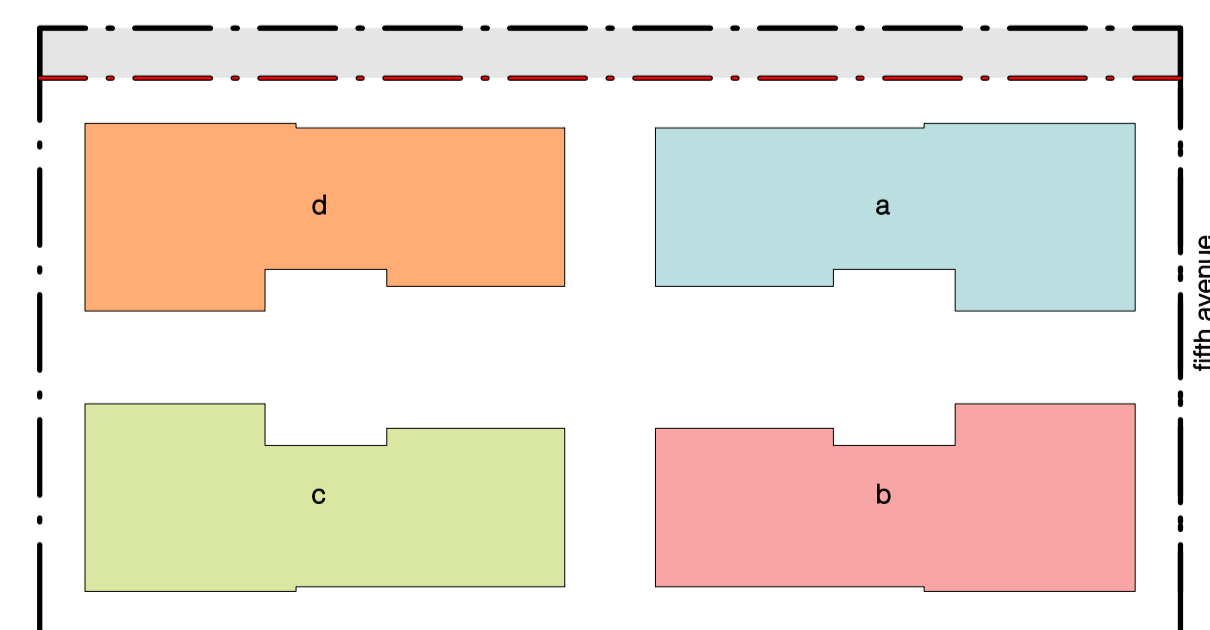
fifth avenue



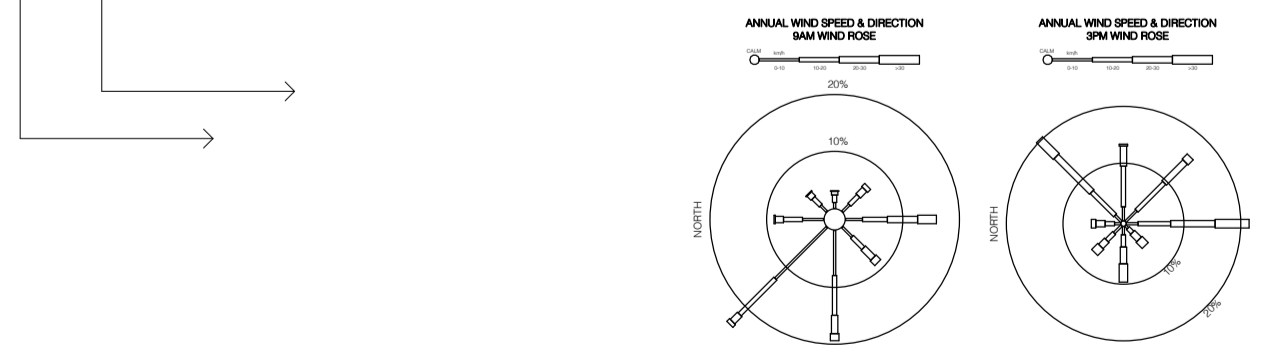
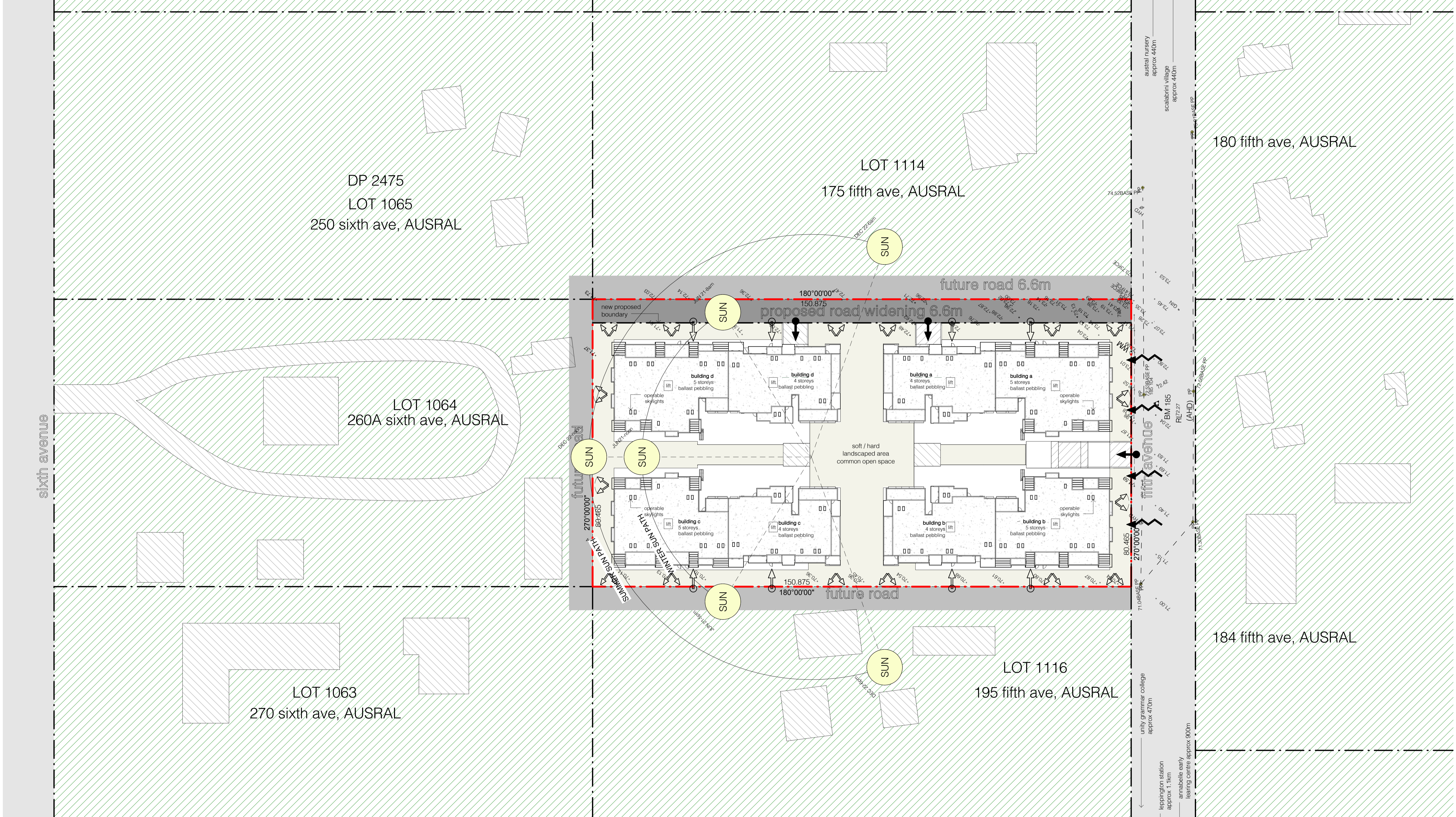
LOT 1063
 270 sixth ave, AUSRAL

LOT 1116
 195 fifth ave, AUSRAL

184 fifth ave, AUSRAL



building key
 1:1000



- legend**
- proposed vehicular access point
 - site boundary
 - noise source
 - proposed pedestrian access point
 - key views
- site analysis**

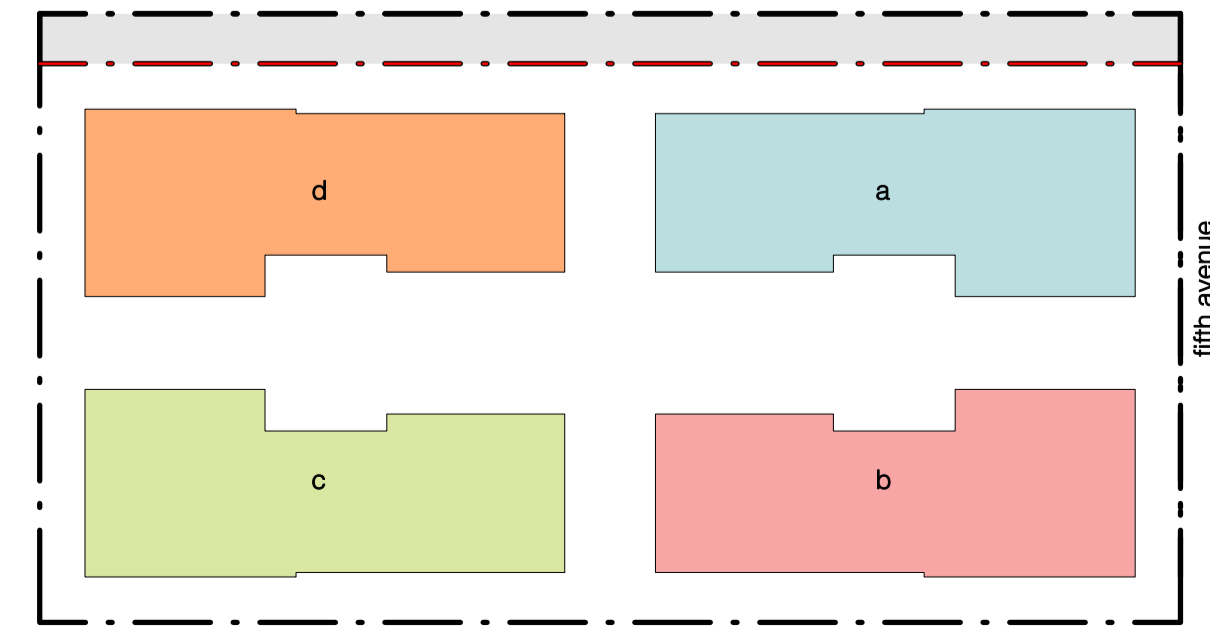
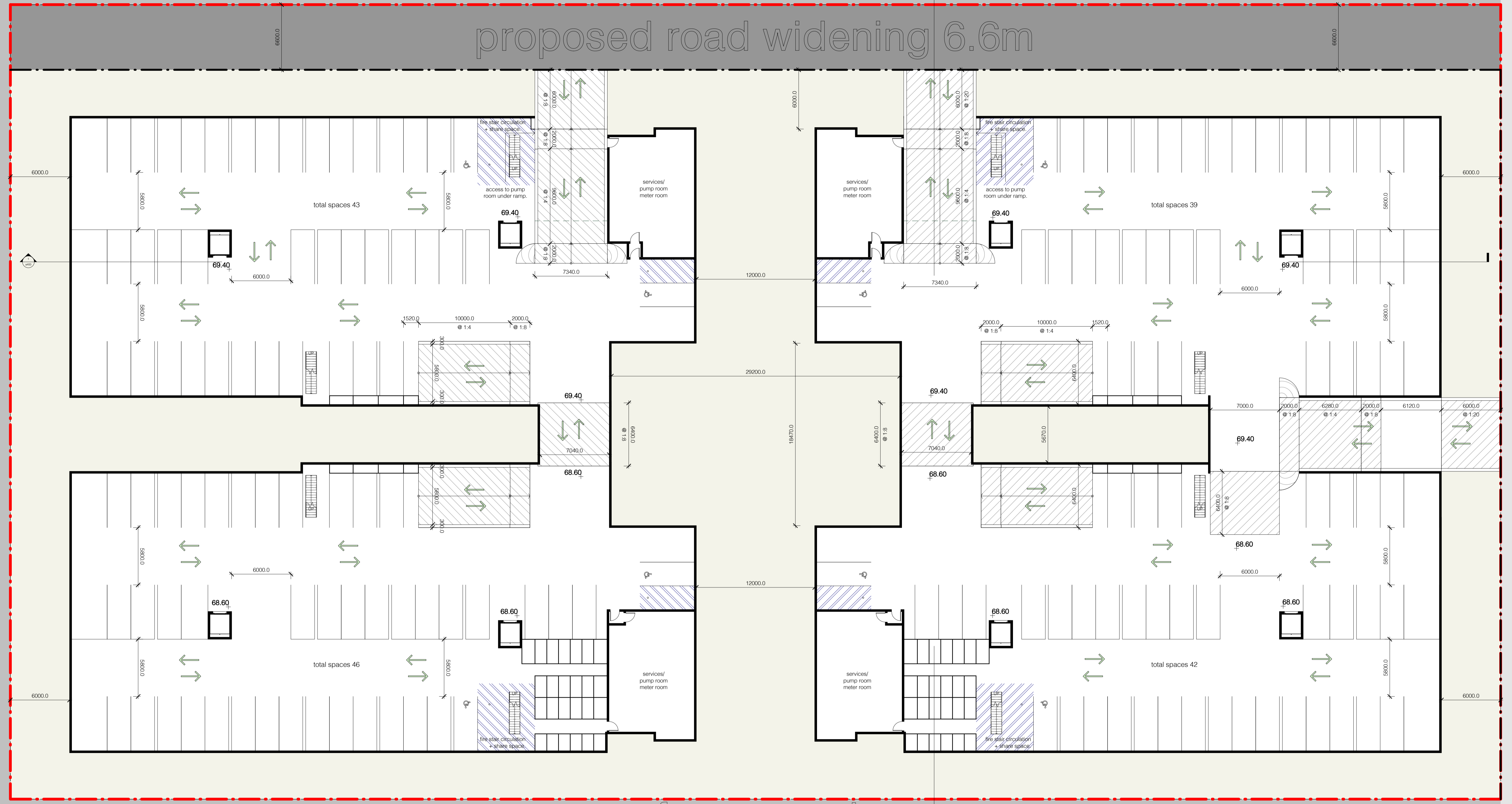
future road

future road 6.6m

proposed road widening 6.6m

fifth avenue

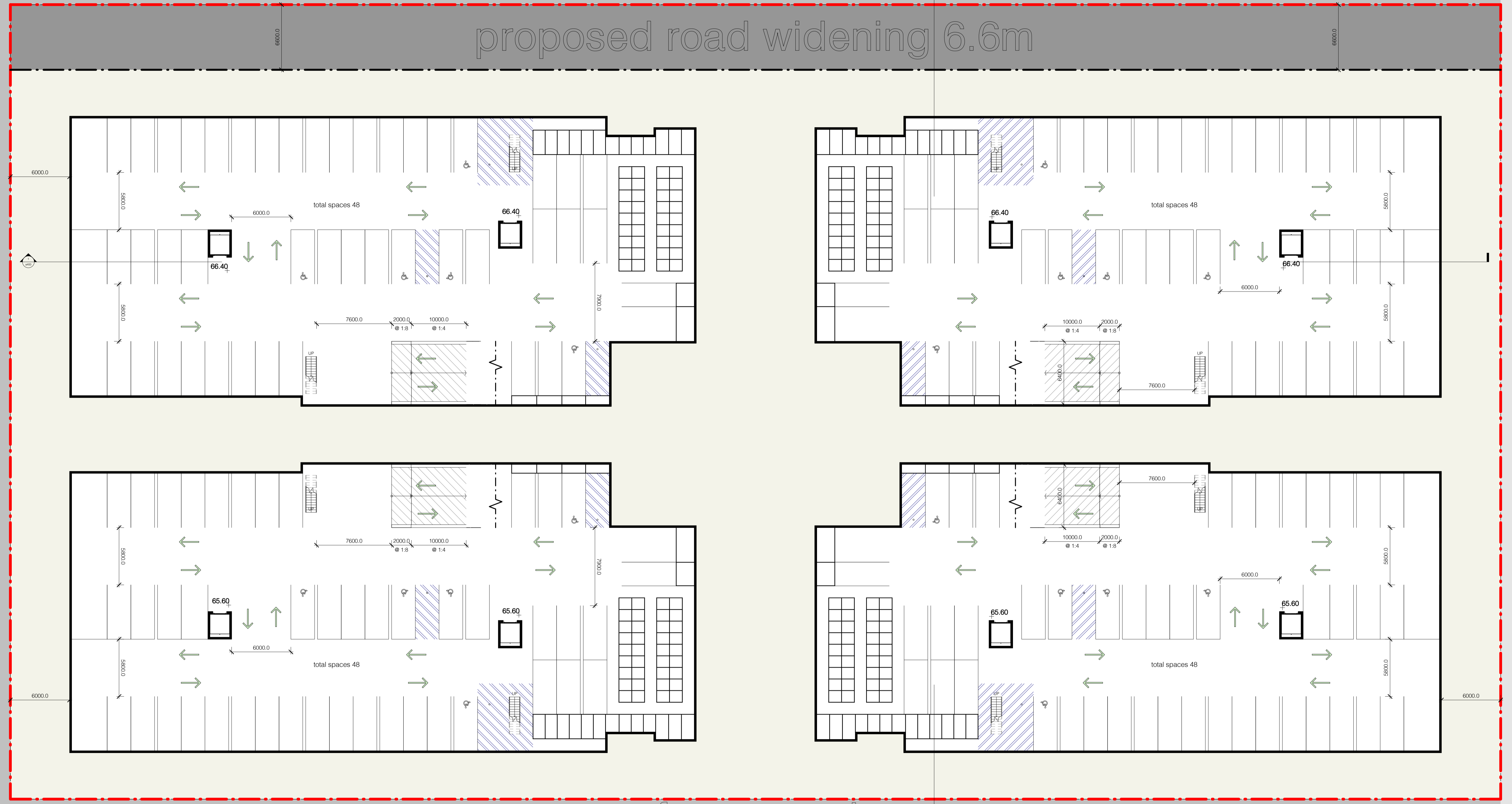
future road



future road

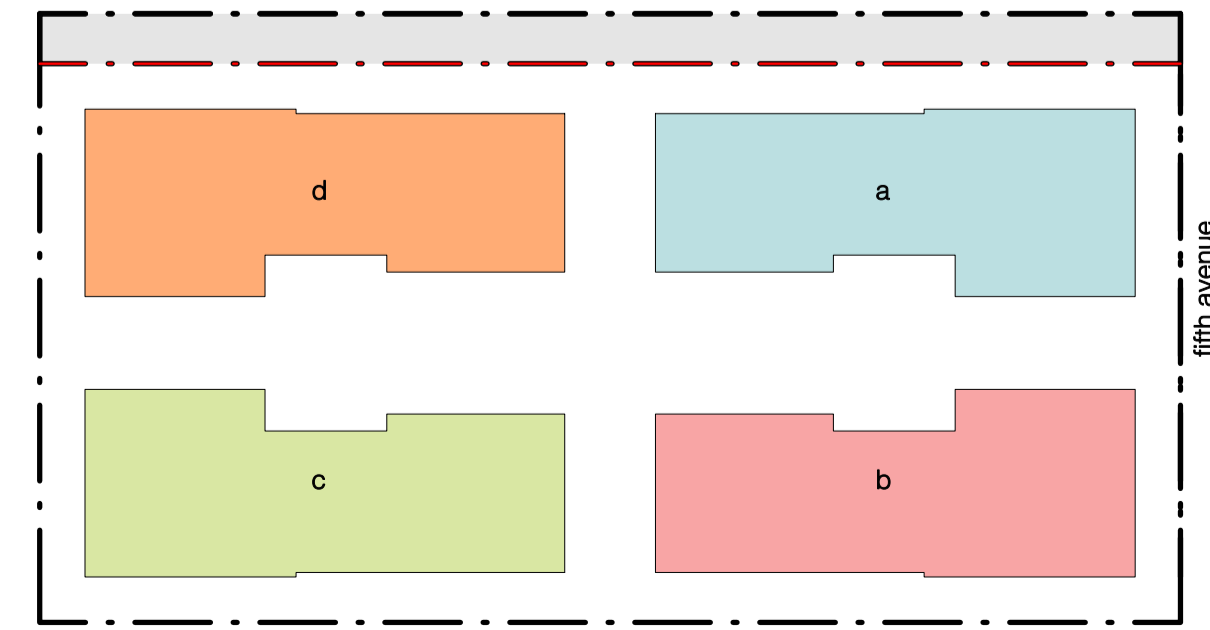
fifth avenue

future road 6.6m
proposed road widening 6.6m



basement 2
1:200

future road



building key
1:1000

DP 2475
LOT 1065

LOT 1114

future road 6.6m

proposed road widening 6.6m

future road
LOT 1064

PP 72.53BASE PP
185 104

fifth avenue

PP 71.04BASE PP
185 104

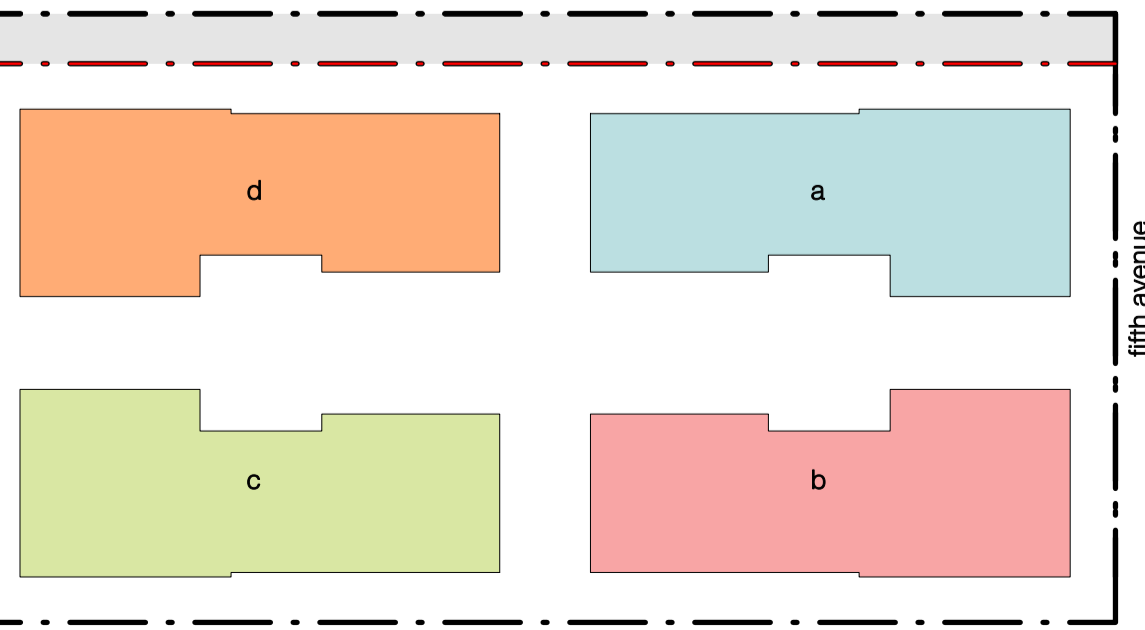
LOT 1063

LOT 1116

future road



ground floor plan
1:200



building key
1:1000

- b1 - bedroom 1
- b2 - bedroom 2
- b3 - bedroom 3
- liv - living room
- din - dining
- kit - kitchen
- bath - bath
- st - storage
- ens - ensuite
- wir - walk-in-robe
- ldy - laundry

future road

future road 6.6m

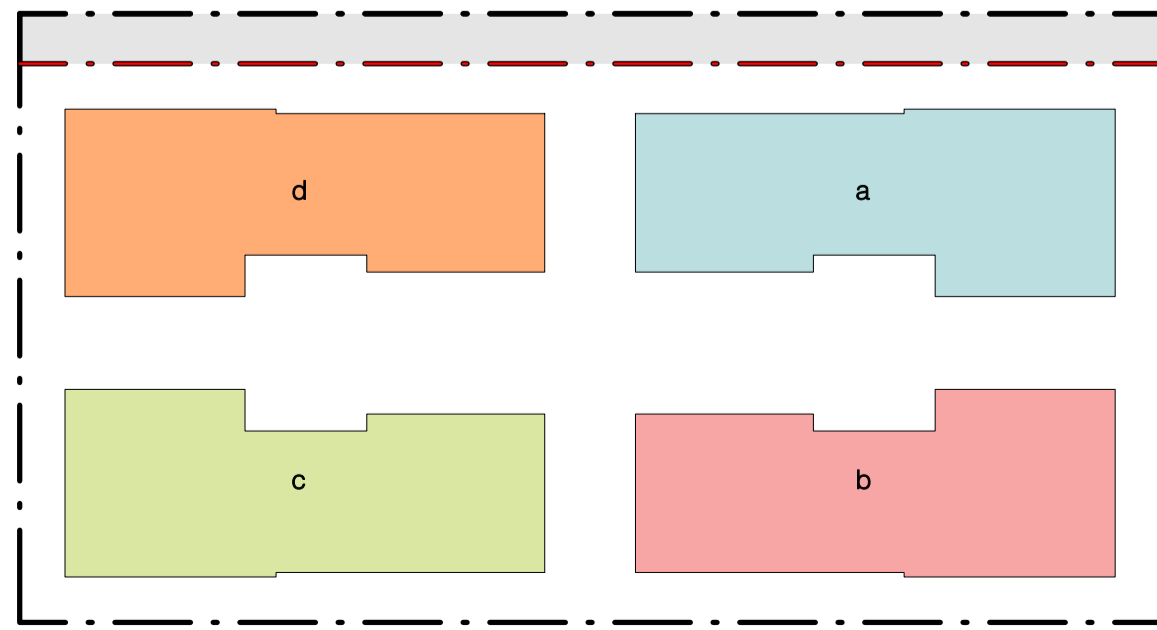
proposed road widening 6.6m

fifth avenue

future road



level 1 plan
1:200



building key
1:1000

- b1 - bedroom 1
- b2 - bedroom 2
- b3 - bedroom 3
- liv - living room
- din - dining
- kit - kitchen
- bath - bath
- st - storage
- ens - ensuite
- wir - walk-in-robe
- ldy - laundry

a203

level 1
185 fifth avenue, austral
residential apartments + basement
development application
gm architects
3/205 penshurst rd, homebush west NSW 2140
info@gmacreos.com.au

gm
9797 1599
n.casae 9457

level 1

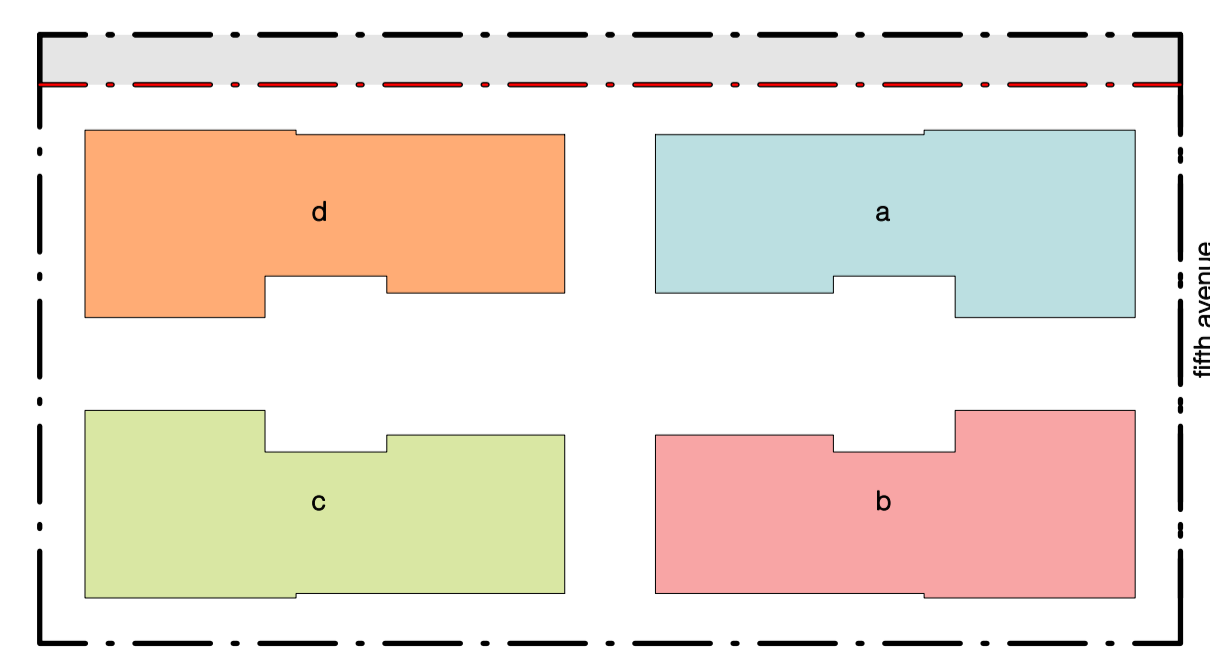
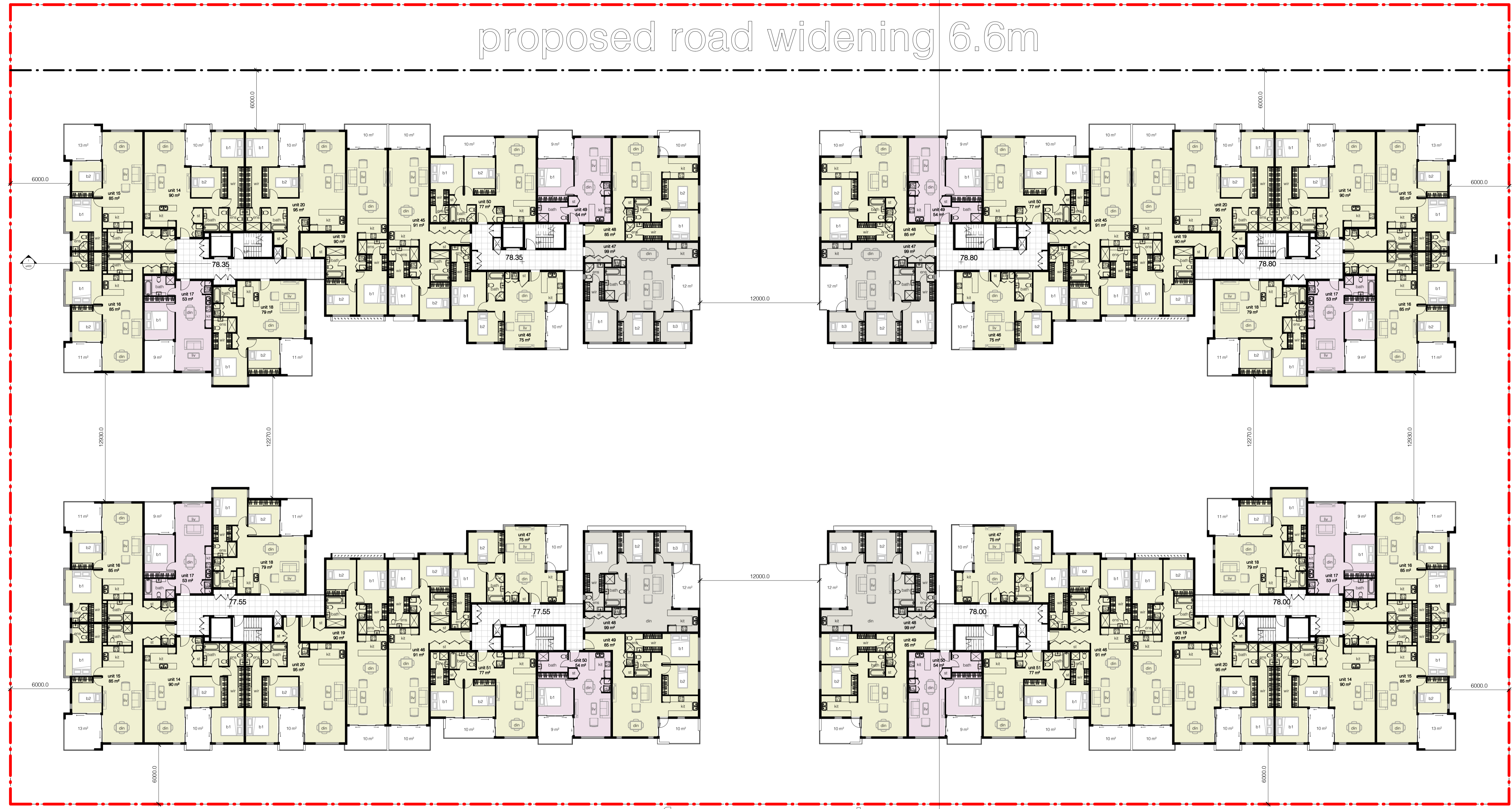
future road 6.6m

proposed road widening 6.6m

future road

fifth avenue

future road



- b1 - bedroom 1
- b2 - bedroom 2
- b3 - bedroom 3
- liv - living room
- din - dining
- kit - kitchen
- bath - bath
- st - storage
- ens - ensuite
- wir - walk-in-robe
- ldy - laundry

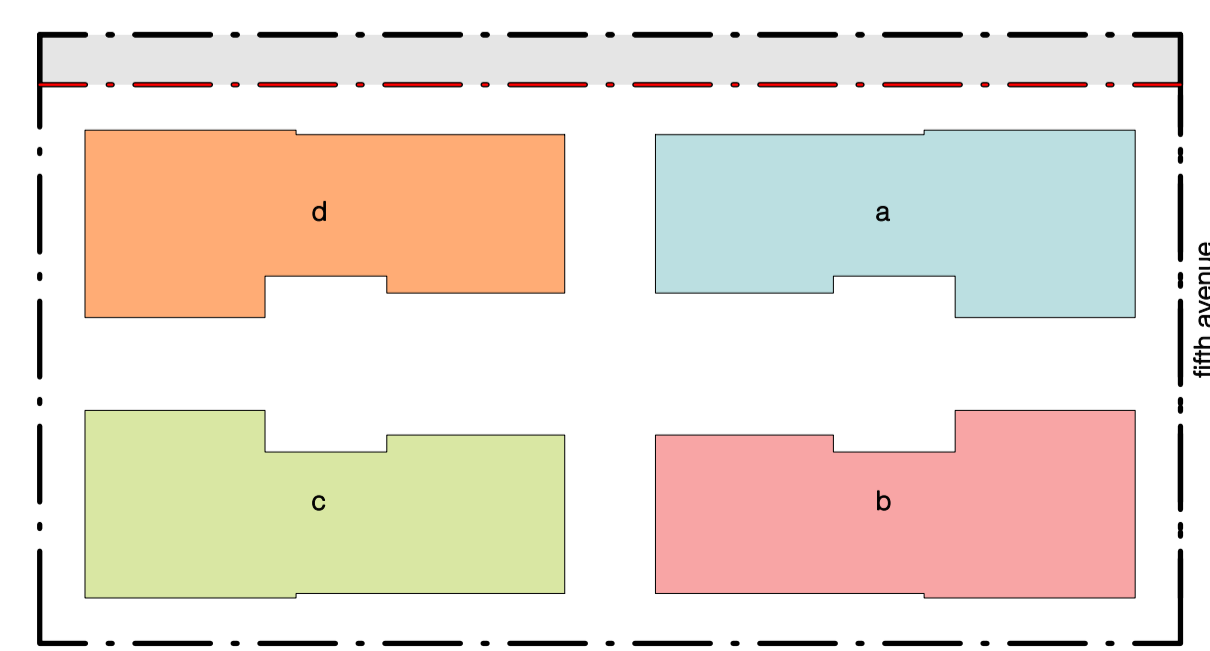
future road 6.6m

proposed road widening 6.6m

future road

fifth avenue

future road



building key
1:1000

- b1 - bedroom 1
- b2 - bedroom 2
- b3 - bedroom 3
- liv - living room
- din - dining
- kit - kitchen
- bath - bath
- st - storage
- ens - ensuite
- wir - walk-in-robe
- ldy - laundry

a205

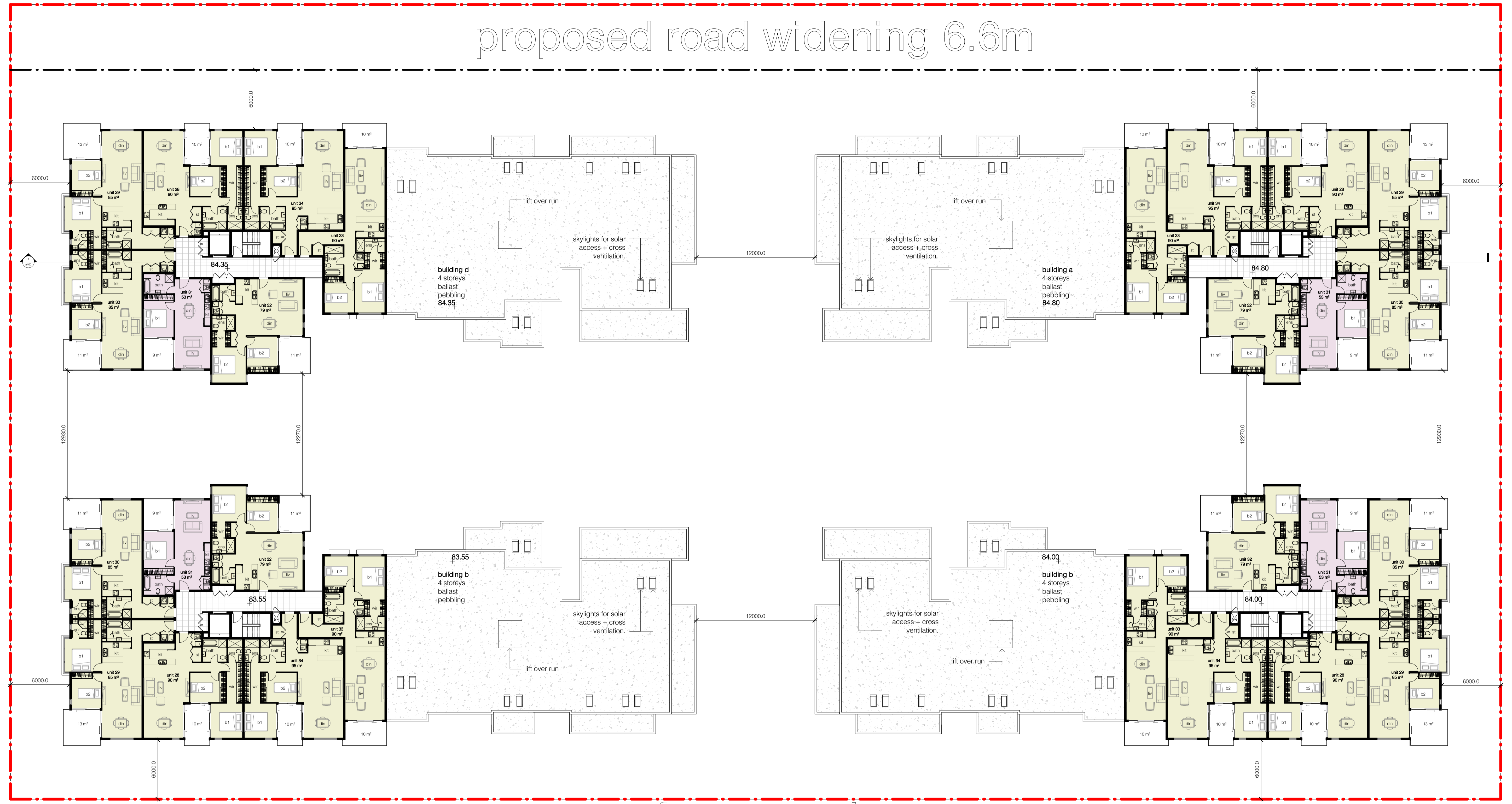
level 3
185 fifth avenue, austral
residential apartments + basement
development application
gm architects
3/20a parklands rd, hampden west NSW 2140
info@gmarchitects.com.au 0797 1599 n.r.s.n. 9457

future road 6.6m

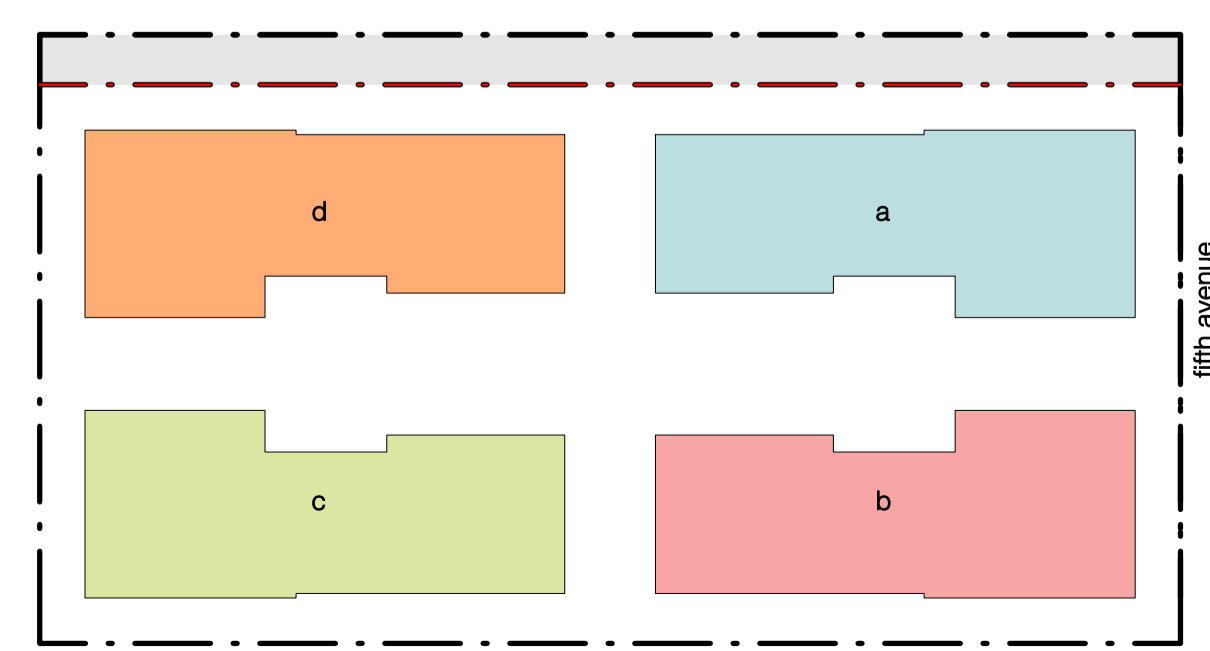
proposed road widening 6.6m

future road

fifth avenue



future road



- b1 - bedroom 1
- b2 - bedroom 2
- b3 - bedroom 3
- liv - living room
- din - dining
- kit - kitchen
- bath - bath
- st - storage
- ens - ensuite
- wir - walk-in-robe
- ldy - laundry

level 4

building key
1:1000

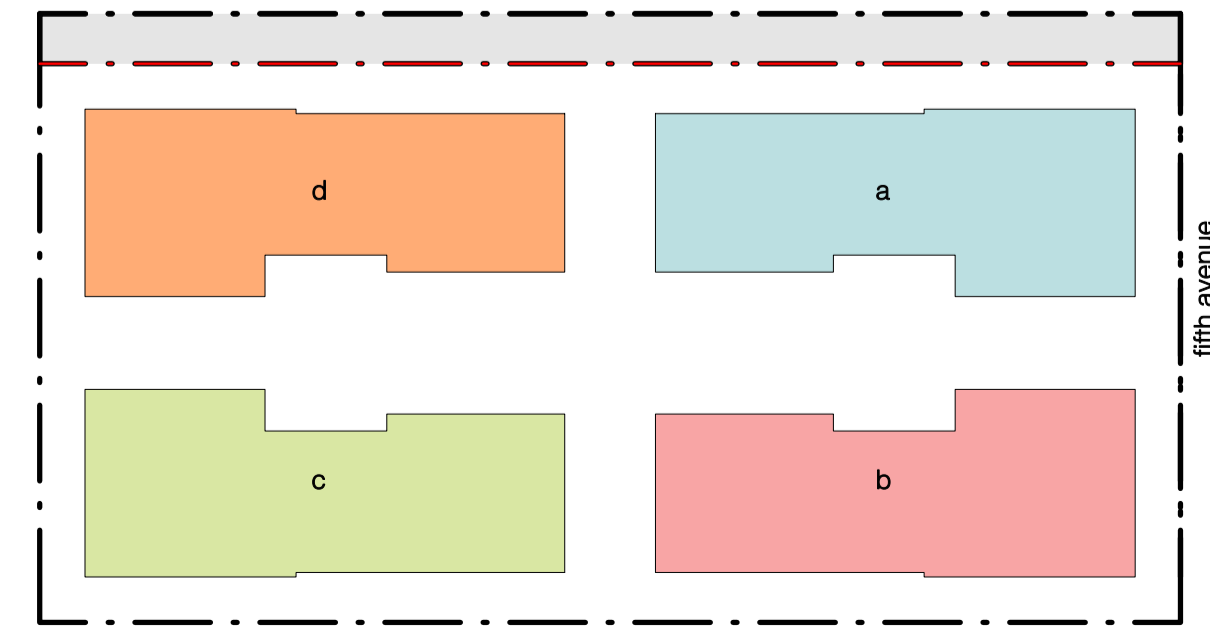
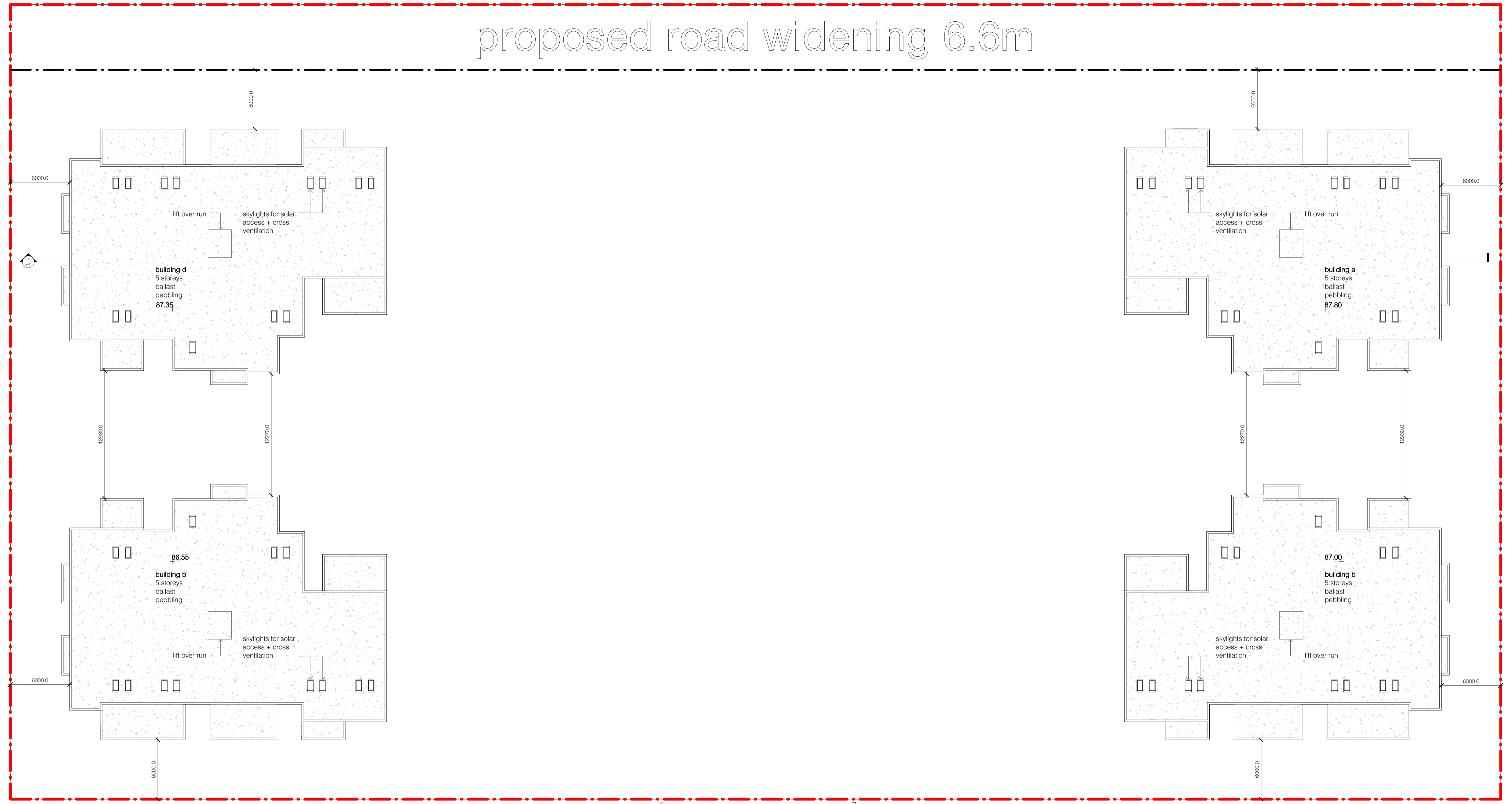
future road 6.6m

proposed road widening 6.6m

future road

fifth avenue

future road



- b1 - bedroom 1
- b2 - bedroom 2
- b3 - bedroom 3
- liv - living room
- din - dining
- kit - kitchen
- bath - bath
- st - storage
- ens - ensuite
- wir - walk-in-robe
- ldy - laundry

roof level

building key
1:1000

roof level
185 fifth avenue, austral
residential apartments + basement
development application
gm architects
3/20a parkside rd, homebush west NSW 2140
info@gmarchitects.com.au

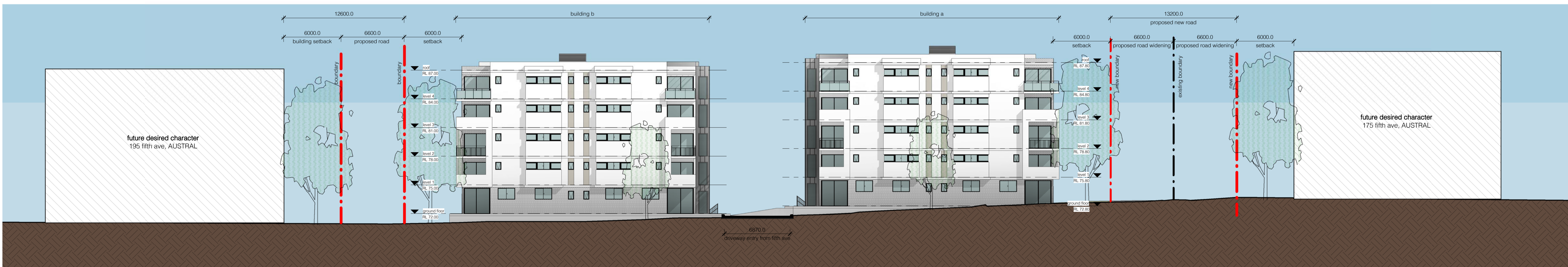
gm
9797 1599
n.caspe 9457



north elevation
1:200



east elevation (proposed road widening)
1:200

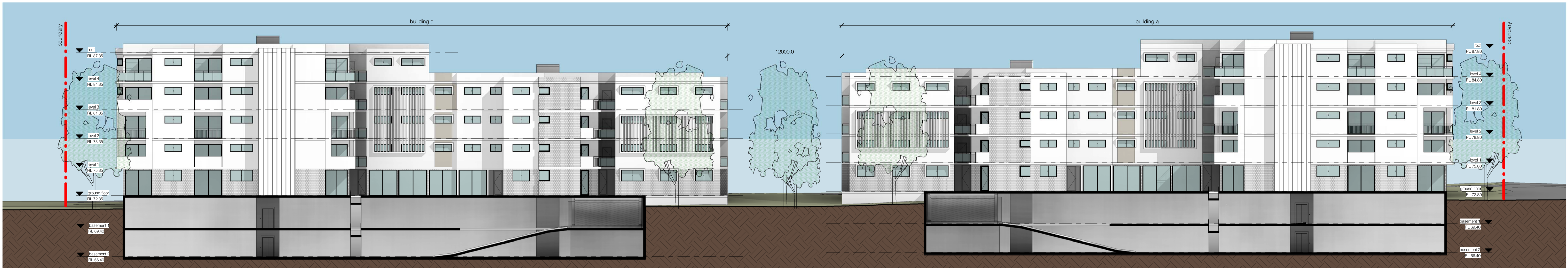


south elevation (fifth ave)
1:200

Date	Description



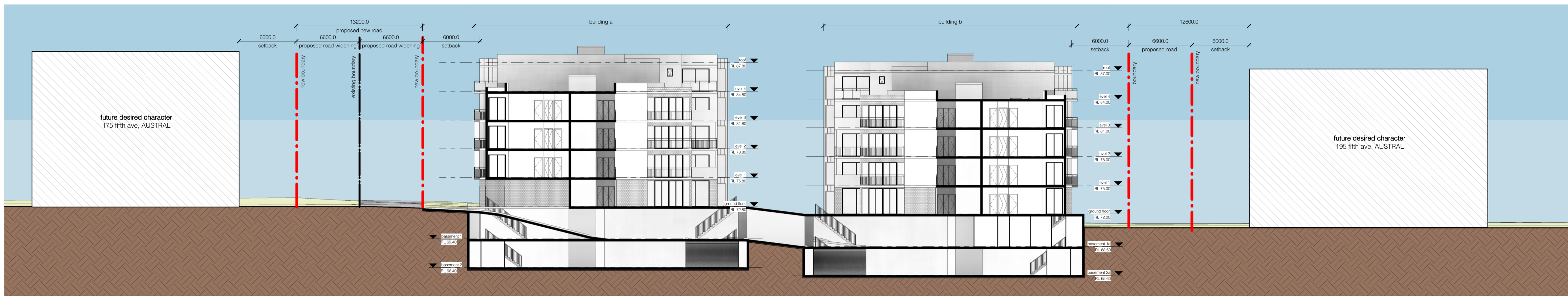
west elevation
1:200



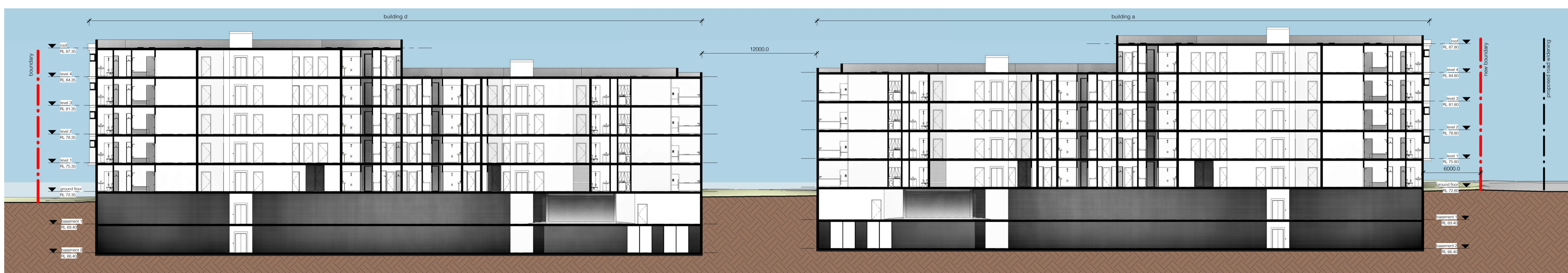
typical internal elevation 1
1:200



typical internal elevation 2
1:200



section a-a
1:200



section b-b
1:200

- b1 - bedroom 1
- b2 - bedroom 2
- b3 - bedroom 3
- liv - living room
- din - dining
- kit - kitchen
- bath - bath
- st - storage
- ens - ensuite
- wir - walk-in-robe
- ldy - laundry

o400

sections
185 fifth avenue, austral

residential apartments + basements
development application
jgm architects
3/205 penshurst rd, homebush west NSW 2140
info@jgmarchitects.com.au

scale 1:200
date 18/05/17
room architect
n.nasser 9457

Date	Description





shadow diagrams - 21st june 9am
1:1000



shadow diagrams - 21st june 10am
1:1000



shadow diagrams - 21st june 11am
1:1000



shadow diagrams - 21st june 12pm
1:1000



shadow diagrams - 21st june 1pm
1:1000

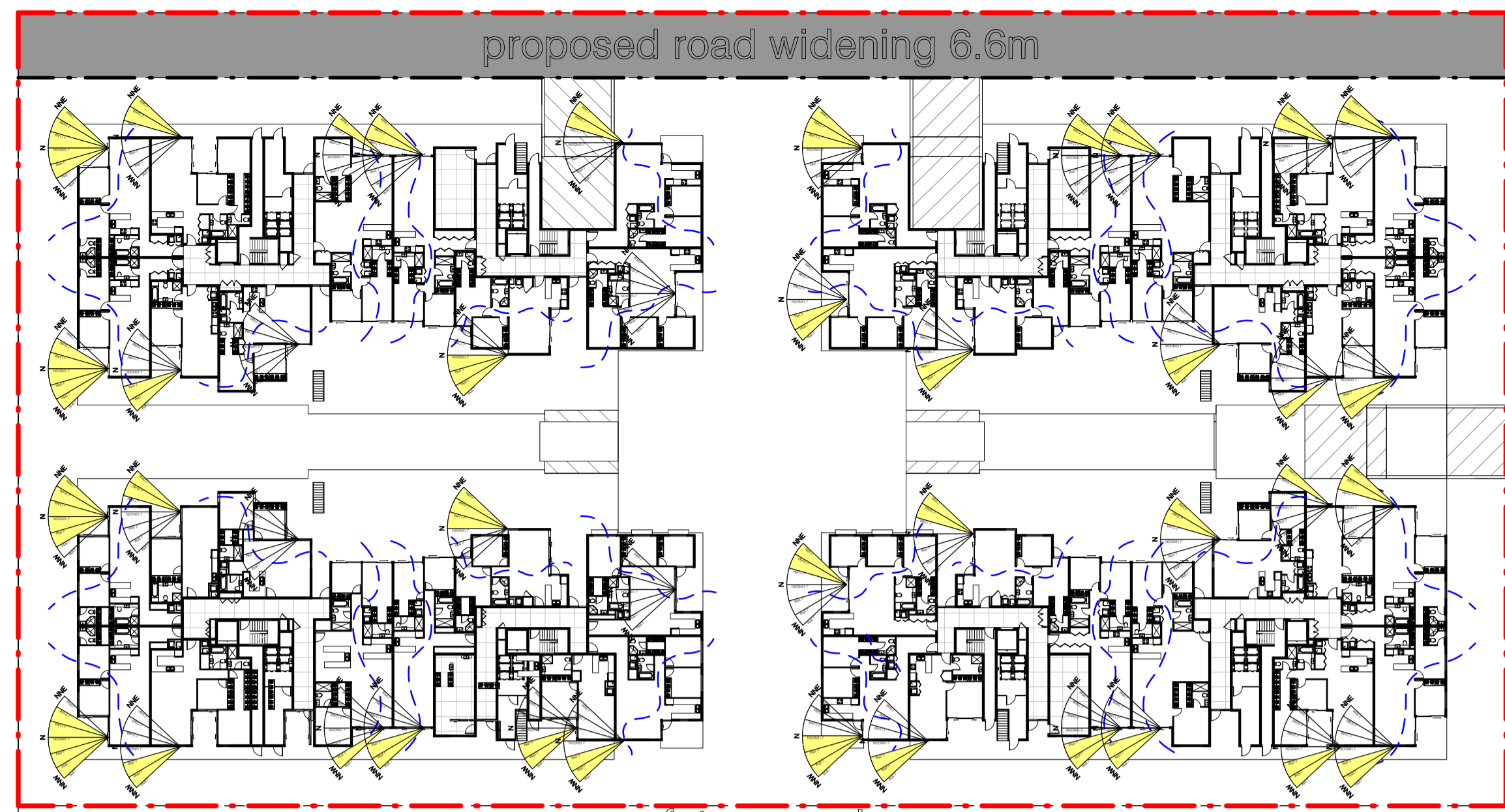


shadow diagrams - 21st june 2pm
1:1000

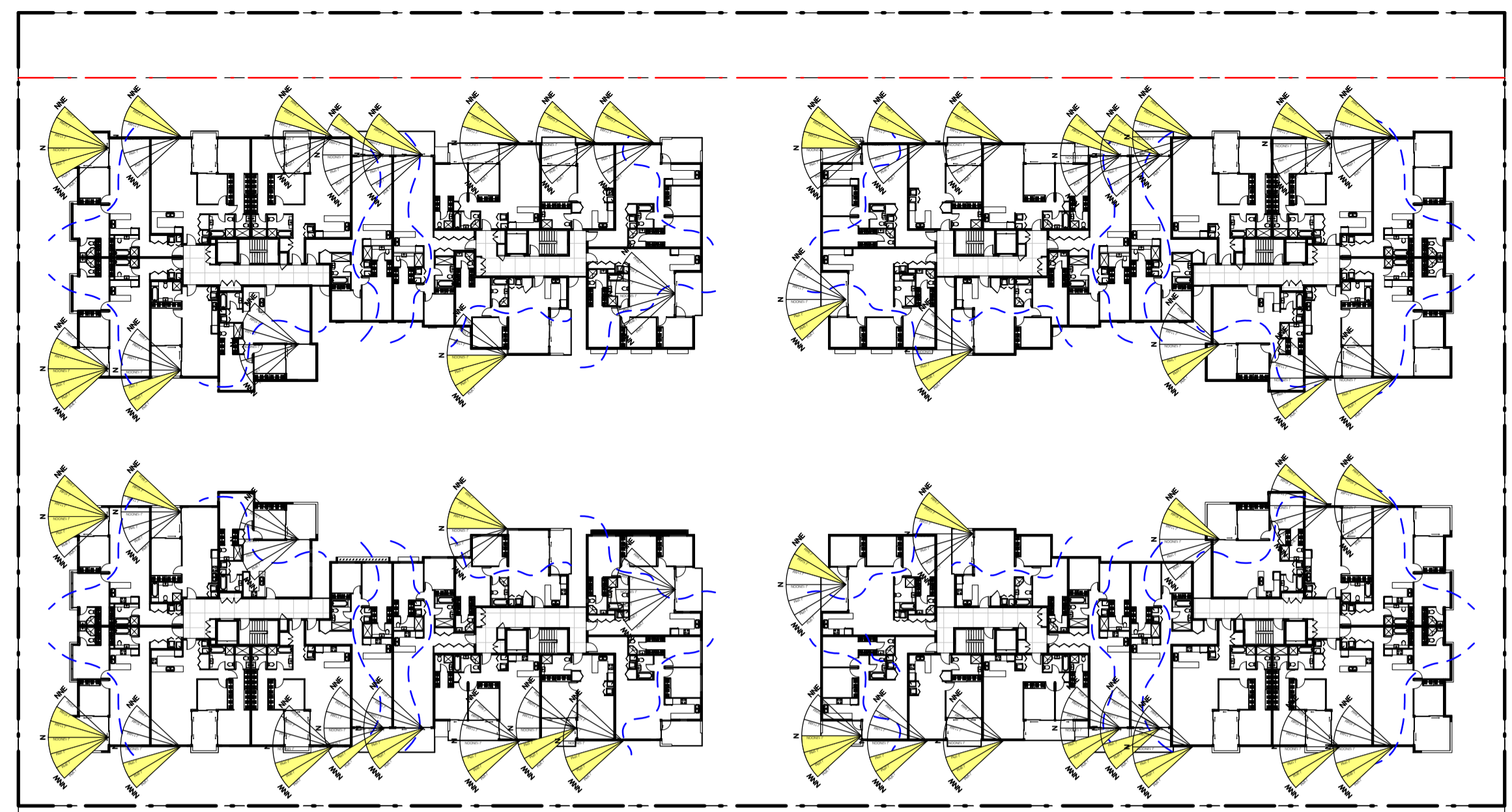


shadow diagrams - 21st june 3pm
1:1000

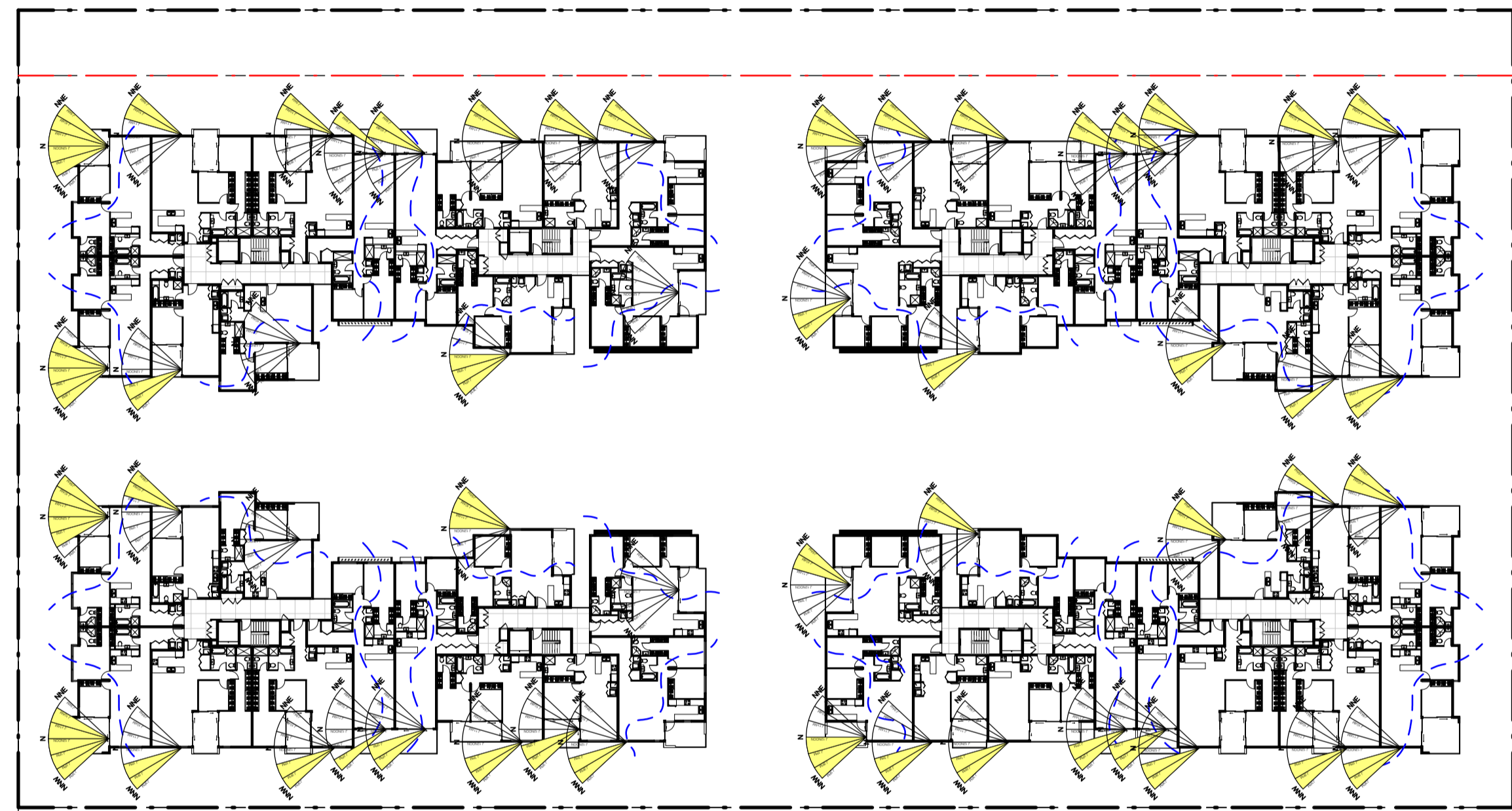
Date	Description



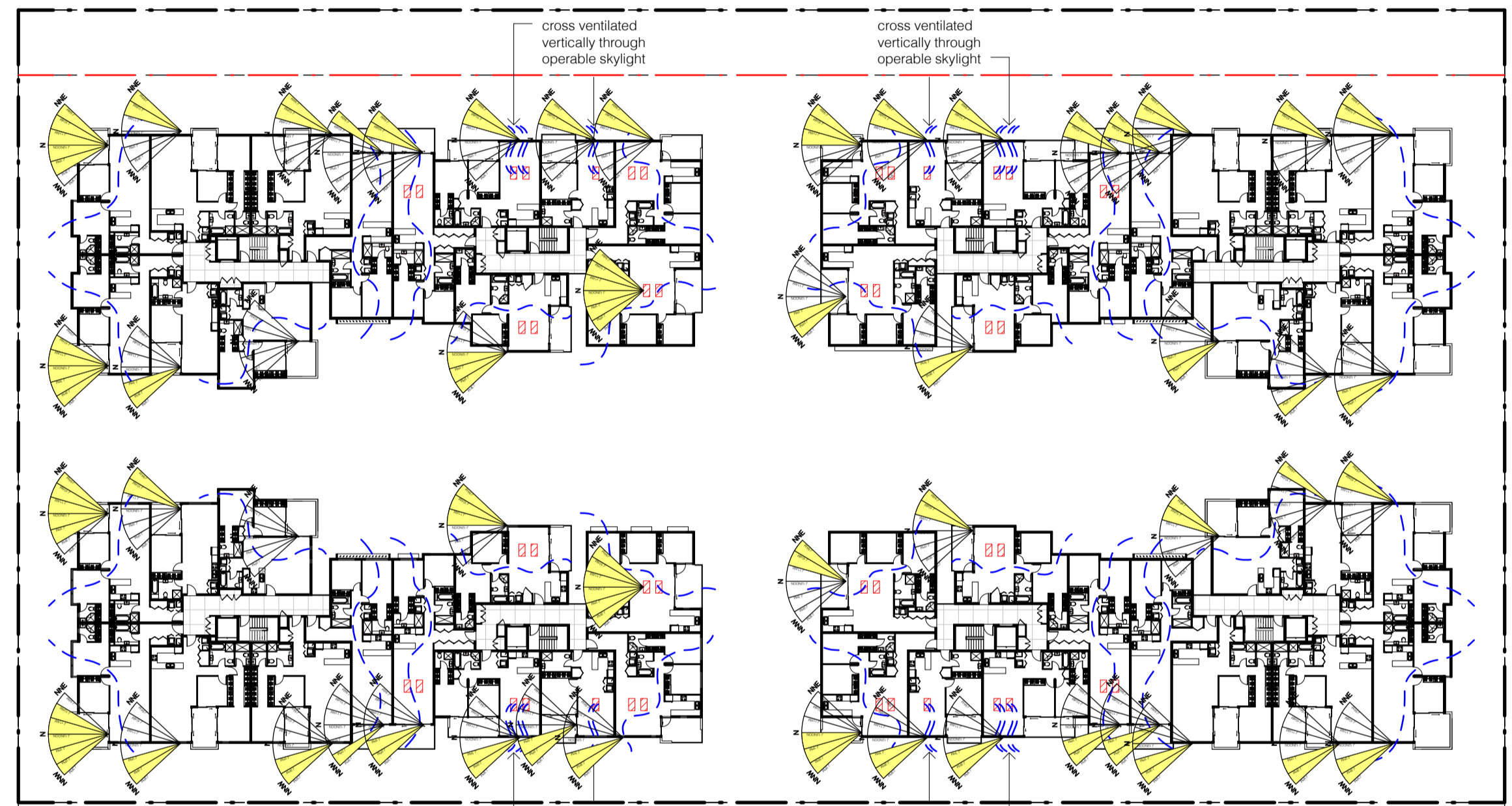
ground floor (solar + cross ventilation)
1:500



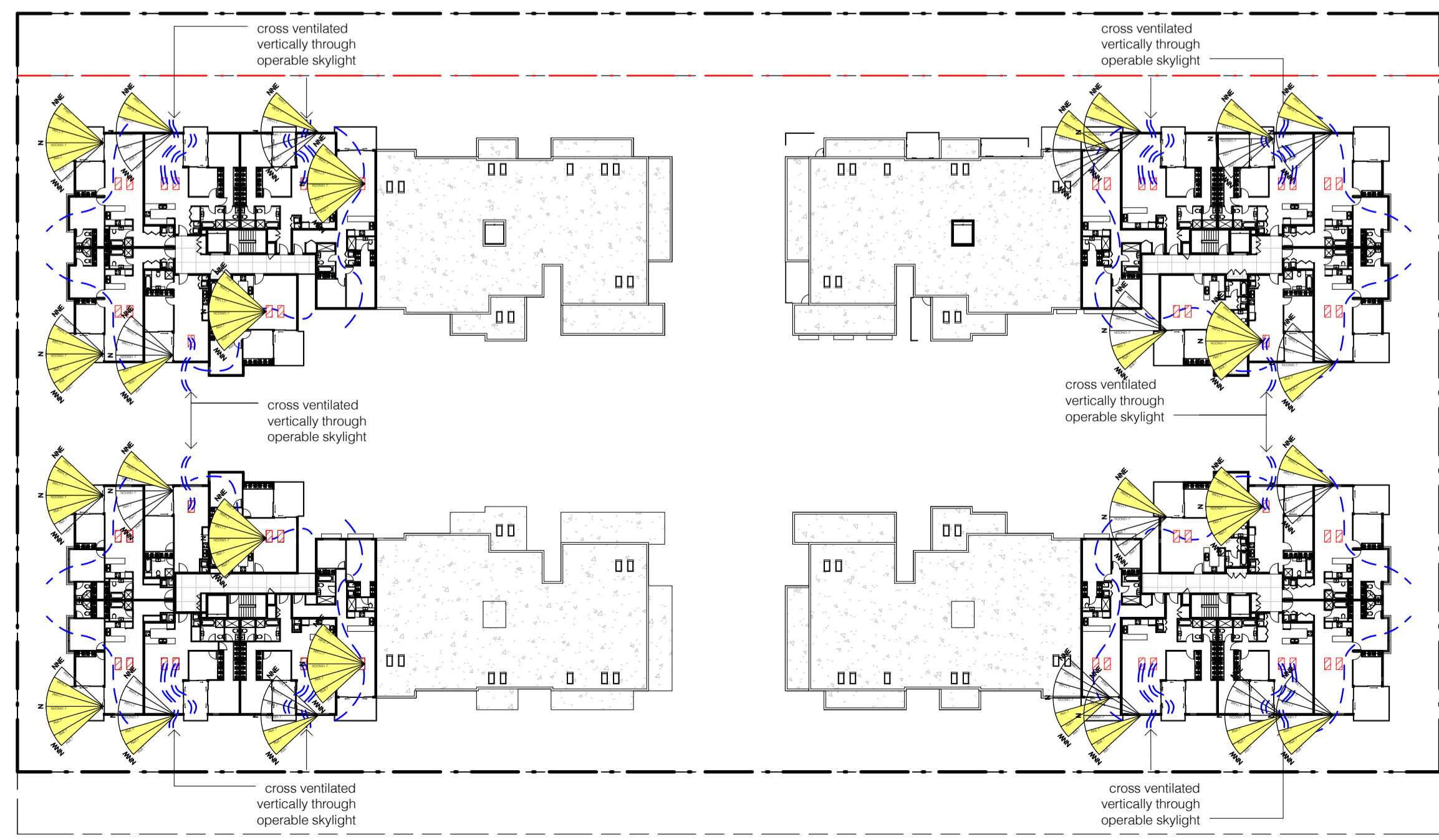
level 1 (solar + cross ventilation)
1:500



level 2 (solar + cross ventilation)
1:500

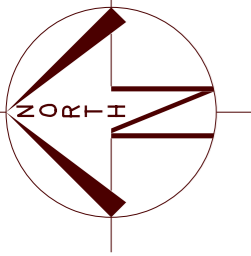


level 3 (solar + cross ventilation)
1:500



level 4 (solar + cross ventilation)
1:500

NORTH



DP 2475

LOT 1065

LOT 1114

LOT 1064

LOT 1063

LOT 1116

LOCALITY SKETCH

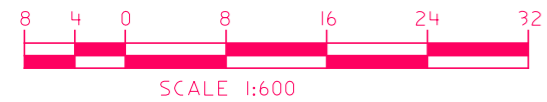
UBD AREA: SYD REVISION: 53
MAP: 266 REF: D15

GPS

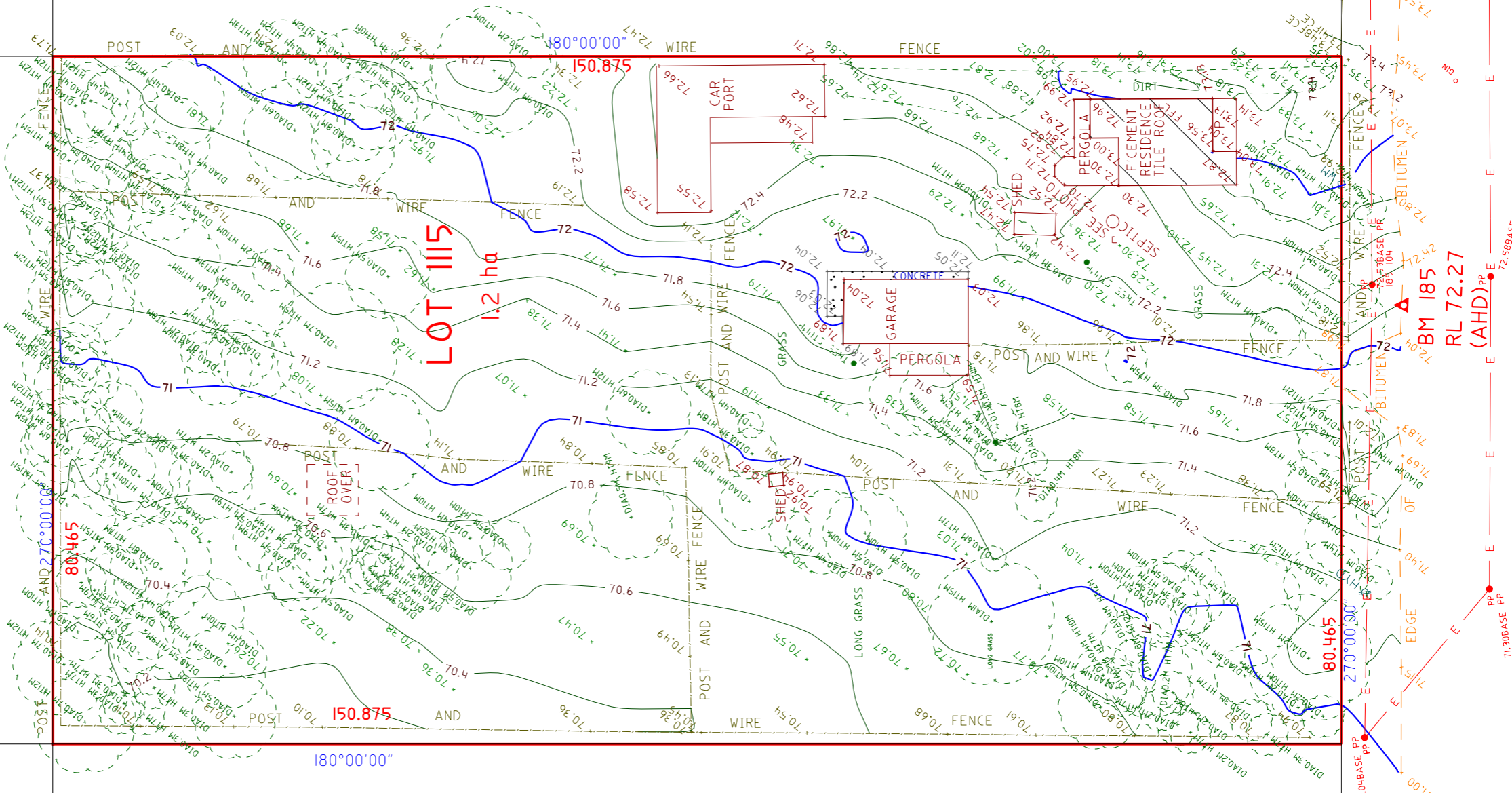
ALL TREE HEIGHTS AND SPREAD ARE APPROXIMATE ONLY AND ARE SHOWN FOR TENDER PURPOSES ONLY. ALL TREE RELATED ISSUES TO BE REFERRED TO AN ARBORIST

NOTE: POSITION OF SEWER MAIN NOT YET AVAILABLE. REFER TO SYDNEY WATER DIAGRAM DATED 22/03/2017

HOW TO PROTECT SURVEY MARKS BEFORE WORKS COMMENCE
For Details refer to http://www.lpi.nsw.gov.au/data/assets/pdf/file/00071649522/19608_Mark_Preservation_Flyer_web.pdf
Find out if there are survey marks located in the area of interest by:
1. Viewing the survey mark layer in the Spatial Information Exchange Six Lite web page www.six.nsw.gov.au
2. Contacting Survey Services, LPI, 1900 052 637 who will advise the location and status of survey marks in the area
3. Inspecting the site, paying particular attention to survey marks located in the footpath/kerb and gutter.
IF NO SURVEY MARKS ARE AFFECTED COMMENCE WORKS
IF SURVEY MARKS ARE IN THE AREA
The locality sketch plan (Survey Mark Sketches) should be downloaded from the LPI online Shop <http://shop.lands.nsw.gov.au> see Specialised Searches
IF SURVEY MARKS ARE LIKELY TO BE DISTURBED OR DESTROYED
Avoid disturbing or destroying survey marks by:
1. Diverting works to avoid disturbing the marks or
2. Contacting a Registered Surveyor to place and survey a mark at a more suitable site nearby to maintain survey integrity.
Any survey necessary to recover the position of survey marks proposed to be destroyed may only be undertaken by a surveyor registered under the Surveying and Spatial Information Act 2002 or by survey staff authorised by the Surveyor General.
REPORT SURVEY MARKS AT RISK OF BEING DESTROYED
Look for the Survey Mark Status report at http://scims.lpi.nsw.gov.au/status_report_frames.htm



THE BOUNDARY POSITION IS APPROXIMATE ONLY AND SHOULD BE VERIFIED PRIOR TO ANY CONSTRUCTION WORKS.



FIFTH AVENUE

BM 185 RL 72.27 (AHD)

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COPYRIGHT OF THIS PLAN AND IN THE ACCOMPANYING CAD FILE(S) WHERE APPLICABLE VESTS WITH ASPECT DEVELOPMENT & SURVEY PTY LTD.

THE PLAN AND CAD FILE SHALL ONLY BE USED BY THE ADDRESSED CLIENT FOR THE PURPOSE FOR WHICH THE SURVEY WAS CARRIED OUT.

GENERAL NOTES

- A) THIS SURVEY IS SPECIFICALLY FOR CONTOUR PURPOSES ONLY. THE BOUNDARIES OF THE SUBJECT PROPERTY HAVE NOT BEEN INVESTIGATED AND THE POSITION SHOWN IS APPROXIMATE ONLY
- B) AREAS AND DIMENSIONS ARE SUBJECT TO SURVEY
- C) SERVICES SHOWN HAVE BEEN DERIVED FROM VISUAL EVIDENCE APPARENT AT THE TIME OF SURVEY. THE RELEVANT SERVICE AUTHORITY SHALL BE CONTACTED TO VERIFY THE EXISTENCE AND POSITION OF ALL SERVICES PRIOR TO THE COMMENCEMENT OF ANY CONSTRUCTION OR EXCAVATION
- D) CONTOURS ARE INDICATIVE OF SURFACE TOPOGRAPHY ONLY. SURVEYED SPOT LEVELS ARE THE ONLY VALUES TO BE RELIED ON FOR REDUCED LEVELS ON PARTICULAR FEATURES.

SYMBOLS & ABBREVIATIONS:

GP	GULLY PIT	-E-	OVERHEAD ELEC LINE
HYD	HYDRANT	-S-	SEWER LINE
SIP	SURFACE INLET PIT	GM	GAS METER
SIC	SEWER INSPECTION COVER	LP	LIGHT POLE
SMH	SEWER MANHOLE	EC	ELECTRICITY CONDUIT
WM	WATER METER	ECT	ELEC & TELE CONDUIT
EL	ELECTRICITY BOX	TC	TELECOM CONDUIT
TP	TELECOMMUNICATIONS PIT	WC	WATER CONDUIT
VC	VEHICLE CROSSING	INV	INVERT
SV	STOP VALVE	KO	KERB OUTLET
SWMH	STORMWATER MANHOLE	TK	TOP OF KERB

ASPECT DEVELOPMENT & SURVEY PTY LTD
CONSULTING REGISTERED SURVEYORS
ABN 60 078 649 000

SUITE 1
103 VANESSA STREET
KINGSGROVE NSW 2208
PHONE (02) 9554 8388
FAX (02) 9554 8588

PO BOX 161
KINGSGROVE NSW 1480
DX 11392
HURSTVILLE

PROJECT

OUR REFERENCE	6/1038845/216964	SECTION
LOT	1115	DP 2475
DATUM AHD	SOURCE SCMS	22/03/17
ORIGIN OF LEVELS	PM 44229	REDUCED LEVEL 74.951
SURVEYED AC	DATE	25/03/2017
DRAWN NP	DATE	29/03/2017
SCALE 1: 600	A3 SHEET	

CLIENT: GMARCHITECTS

REF:

REF:

ADDRESS: 185 FIFTH AVENUE
SUBURB AUSTRAL

APPENDIX J SITE PHOTOGRAPHS

SITE PHOTOGRAPHS

Client:	GM Architects
Project:	DSI
Site Location:	185 Fifth Avenue, Austral NSW
Job No.:	E1292-2



Photo 1



View of chemical storage on sealed surface
Looking east
Inspected 06.02.18

Photo 2



View of the carport & animal shelter
Looking north
Inspected 06.02.18

Photo 3



View of the animal shelter
Looking east
Inspected 06.02.18

Photo 4



View of northern paddock area
Looking north west
Inspected 06.02.18

Photo 5



View of the garage / workshop area
Inspected 06.02.18

Photo 6



View of fibro cement sheeting adjacent
to garage / workshop area
Looking south
Inspected 06.02.18

SITE PHOTOGRAPHS

Client:	GM Architects
Project:	DSI
Site Location:	185 Fifth Avenue, Austral NSW
Job No.:	E1292-2



Photo 7



View of animal storage area
Inspected 06.02.18

Photo 8



View of roof shelter and stockpile
Looking south east
Inspected 06.02.18

Photo 9



View of house
Looking north east
Inspected 06.02.18

Photo 10



View of garage / workshop and paddock areas
Looking north
Inspected 06.02.18

Photo 11



View of garage / workshop and house
Looking north
Inspected 06.02.18

Photo 12



View of southern portion of property
along Fifth Avenue
Looking east
Inspected 06.02.18

APPENDIX K BOREHOLE LOGS

BOREHOLE & GROUNDWATER WELL LOG

CLIENT		GM Architects			BOREHOLE NO.	GW1	
PROJECT		Detailed Site Investigation			DATE.	18.05.2017	
LOCATION		185 Fifth Avenue, Austral NSW			JOB NO.	E1292-2	
METHOD		Drill Rig			SURFACE ELEV.	RL 71.20 (Approximate)	
LOGGED BY\		RL			CHECKED BY	MS	

Depth (m)	Sample	Graphic Symbol	Ground Water	Classification Symbol	Soil Description (Plasticity, particle characteristics, colour, moisture, etc.)	Moisture	Consis / Density	Observations	Well Construction	Design	
0.1					Silty CLAY, low to medium plasticity, brown with grass roots	M	Firm			Collar Cement	
0.2											
0.3											
0.4											
0.5					Silty CLAY, meidum plasticity, brown/ orange	M	F/St			Bentonite	
0.6											
0.7											
0.8											
0.9											
1											
1.1						Silty CLAY, low to meidum plasticity, light brown/ orange	M	St			
1.2											
1.3											
1.4											
1.5											
1.6											
1.7											
1.8											
1.9											
2											
2.1											
2.2											
2.3											
2.4											
2.5											
2.6											
2.7											
2.8											
2.9					Shale fragments noticed from 3.0m BGL						
3											
3.1											
3.2											
3.3											
3.4											
3.5											
3.6					SHALE, extremely weathered, greenish grey						
3.7											
3.8											
3.9											
4											
4.1											
4.2											
4.3											
4.4											
4.5											
4.6											
4.7											
4.8											
4.9											
5						SHALE, weathered, grey					
5.1											
5.2											
5.3											
5.4											
5.5											
5.6											
5.7											
5.8											
5.9											
6					Start coring from 6.0m						
6.1					No seepage noticed before coring						
6.2											
6.3					SHALE						
6.4											
6.5											
6.6											
6.7											
6.8											
6.9											
7											
7.1											
7.2											
7.3											
7.4											
7.5											
7.6											
7.7											
7.8											
7.9											
8											
8.1											
8.2											
8.3											
8.4											
8.5					SA NDSTONE						
8.6											
8.7											
8.8											
8.9											
9											
9.1					End of GW1 @ 9.0m BGL						
9.2											
9.3											

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



Job No:	E1292-2
Hole No:	BH1
Sheet	1 of 1

ENGINEERING LOG OF DRILLED BOREHOLE

Client:	GM Architects	Test Location:	Refer to Figure 2
Project:	Detailed Site Investigation	Test Method:	Hand Auger, DCP & U50
Project Location:	185 Fifth Avenue, Austral NSW	Date:	06.02.2018
		Logged by:	RL
		Surface Level: N/A	

Groundwater	Samples/ Field Tests	Depth (m)	Graphic Log	Unified	Classification	Description	Moisture Condition	Consistency/ Rel. Density	Additional Comments	Depth (m)
		0.1			F	Fill : Clayey Silt, fine to medium grained, brown	D	L	Fibro cement fragment observed No odours or staining	0.1
		0.2								0.2
		0.3								0.3
		0.4			CI	Silty CLAY, low plasticity, orange/brown	D	St	No visible fibro cement fragments No odours or staining	0.4
		0.5								0.5
		0.6				End of BH1 at 0.5m BGL				0.6
		0.7								0.7
		0.8								0.8
		0.9								0.9
		1.0								1.0
		1.1								1.1
		1.2								1.2
		1.3								1.3
		1.4								1.4
		1.5								1.5
		1.6								1.6
		1.7								1.7
		1.8								1.8
		1.9								1.9
		2.0								2.0
		2.1								2.1
		2.2								2.2
		2.3								2.3
		2.4								2.4
		2.5								2.5
		2.6								2.6
		2.7								2.7
		2.8								2.8
		2.9								2.9
		3.0								3.0
		3.1								3.1
		3.2								3.2
		3.3								3.3
		3.4								3.4
		3.5								3.5

Explanatory Notes:

<u>Consistency</u>	<u>Density Index</u>	<u>Samples</u>	<u>Moisture</u>
VS Very Soft	VL Very Loose	B Bulk Sample	D Dry
S Soft	L Loose	D Disturbed Sample	M Moist
F Firm	MD Medium Dense	U50 Undisturbed Sample (50mm diam.)	W Wet
St Stiff	D Dense	N S.P.T. Value	Wp Plastic Limit
VSt Very Stiff	VD Very Dense		Wl Liquid Limit
H Hard			

Job No:	E1292-2
Hole No:	BH2
Sheet	1 of 1

ENGINEERING LOG OF DRILLED BOREHOLE

Client:	GM Architects	Test Location:	Refer to Figure 2
Project:	Detailed Site Investigation	Test Method:	Hand Auger, DCP & U50
Project Location:	185 Fifth Avenue, Austral NSW	Date:	06.02.2018
		Logged by:	RL
		Surface Level:	N/A

Groundwater	Samples/ Field Tests	Depth (m)	Graphic Log	Unified	Classification	Description	Moisture Condition	Consistency/ Rel. Density	Additional Comments	Depth (m)
		0.1			F	Fill : Silty Clay, low plasticity, brown/ orange	D	L	Fibro cement fragments noticed No odours or staining	0.1
		0.2								0.2
		0.3								0.3
		0.4			CI	Silty CLAY, low plasticity, orange/brown	M	St	No visible fibro cement fragments No odours or staining	0.4
		0.5								0.5
		0.6				End of BH2 at 0.5m BGL				0.6
		0.7								0.7
		0.8								0.8
		0.9								0.9
		1.0								1.0
		1.1								1.1
		1.2								1.2
		1.3								1.3
		1.4								1.4
		1.5								1.5
		1.6								1.6
		1.7								1.7
		1.8								1.8
		1.9								1.9
		2.0								2.0
		2.1								2.1
		2.2								2.2
		2.3								2.3
		2.4								2.4
		2.5								2.5
		2.6								2.6
		2.7								2.7
		2.8								2.8
		2.9								2.9
		3.0								3.0
		3.1								3.1
		3.2								3.2
		3.3								3.3
		3.4								3.4
		3.5								3.5

Explanatory Notes:

<u>Consistency</u>	<u>Density Index</u>	<u>Samples</u>	<u>Moisture</u>
VS Very Soft	VL Very Loose	B Bulk Sample	D Dry
S Soft	L Loose	D Disturbed Sample	M Moist
F Firm	MD Medium Dense	U50 Undisturbed Sample (50mm diam.)	W Wet
St Stiff	D Dense	N S.P.T. Value	Wp Plastic Limit
VSt Very Stiff	VD Very Dense		Wl Liquid Limit
H Hard			

Job No:	E1292-2
Hole No:	BH3
Sheet	1 of 1

ENGINEERING LOG OF DRILLED BOREHOLE

Client:	GM Architects	Test Location:	Refer to Figure 2
Project:	Detailed Site Investigation	Test Method:	Hand Auger, DCP & U50
Project Location:	185 Fifth Avenue, Austral NSW	Date:	06.02.2018
		Logged by:	RL
		Surface Level:	N/A

Groundwater	Samples/ Field Tests	Depth (m)	Graphic Log	Unified Classification	Description	Moisture Condition	Consistency/ Rel. Density	Additional Comments	Depth (m)
		0.1			Fill : Clayey Silt, fine grained, brown with traces of glass & organic matter	D	L	No visible fibro cement fragments No odours or staining	0.1
		0.2		F					0.2
		0.3		CI	Silty CLAY, low plasticity, orange/brown			No visible fibro cement fragments No odours or staining	0.3
		0.4							0.4
		0.5			End of BH3 at 0.4m BGL				0.5
		0.6							0.6
		0.7							0.7
		0.8							0.8
		0.9							0.9
		1.0							1.0
		1.1							1.1
		1.2							1.2
		1.3							1.3
		1.4							1.4
		1.5							1.5
		1.6							1.6
		1.7							1.7
		1.8							1.8
		1.9							1.9
		2.0							2.0
		2.1							2.1
		2.2							2.2
		2.3							2.3
		2.4							2.4
		2.5							2.5
		2.6							2.6
		2.7							2.7
		2.8							2.8
		2.9							2.9
		3.0							3.0
		3.1							3.1
		3.2							3.2
		3.3							3.3
		3.4							3.4
		3.5							3.5

Explanatory Notes:

<u>Consistency</u>	<u>Density Index</u>	<u>Samples</u>	<u>Moisture</u>
VS Very Soft	VL Very Loose	B Bulk Sample	D Dry
S Soft	L Loose	D Disturbed Sample	M Moist
F Firm	MD Medium Dense	U50 Undisturbed Sample (50mm diam.)	W Wet
St Stiff	D Dense	N S.P.T. Value	Wp Plastic Limit
VSt Very Stiff	VD Very Dense		Wl Liquid Limit
H Hard			

Job No:	E1292-2
Hole No:	BH4
Sheet	1 of 1

ENGINEERING LOG OF DRILLED BOREHOLE

Client:	GM Architects	Test Location:	Refer to Figure 2
Project:	Detailed Site Investigation	Test Method:	Hand Auger, DCP & U50
Project Location:	185 Fifth Avenue, Austral NSW	Date:	06.02.2018
		Logged by:	RL

Groundwater Samples/ Field Tests	Depth (m)	Graphic Log Unified	Classification	Description	Moisture Condition	Consistency/ Rel. Density	Additional Comments	Depth (m)
	0.1	☒	F	Fill : Clayey Silt, fine grained, brown with traces of glass & organic matter			Fibro cement fragments noticed, No odours or staining	0.1
	0.2			End of BH4 at 0.1m BGL				0.2
	0.3							0.3
	0.4							0.4
	0.5							0.5
	0.6							0.6
	0.7							0.7
	0.8							0.8
	0.9							0.9
	1.0							1.0
	1.1							1.1
	1.2							1.2
	1.3							1.3
	1.4							1.4
	1.5							1.5
	1.6							1.6
	1.7							1.7
	1.8							1.8
	1.9							1.9
	2.0							2.0
	2.1							2.1
	2.2							2.2
	2.3							2.3
	2.4							2.4
	2.5							2.5
	2.6							2.6
	2.7							2.7
	2.8							2.8
	2.9							2.9
	3.0							3
	3.1							3.1
	3.2							3.2
	3.3							3.3
	3.4							3.4
	3.5							3.5

Explanatory Notes:

Consistency	Density Index	Samples	Moisture
VS Very Soft	VL Very Loose	B Bulk Sample	D Dry
S Soft	L Loose	D Disturbed Sample	M Moist
F Firm	MD Medium Dense	U50 Undisturbed Sample (50mm diam.)	W Wet
St Stiff	D Dense	N S.P.T. Value	Wp Plastic Limit
VSt Very Stiff	VD Very Dense		Wl Liquid Limit
H Hard			

Job No:	E1292-2
Hole No:	BH5
Sheet	1 of 1

ENGINEERING LOG OF DRILLED BOREHOLE

Client:	GM Architects	Test Location:	Refer to Figure 2
Project:	Detailed Site Investigation	Test Method:	Hand Auger, DCP & U50
Project Location:	185 Fifth Avenue, Austral NSW	Date:	06.02.2018
		Logged by:	RL
		Surface Level: N/A	

Groundwater	Samples/ Field Tests	Depth (m)	Graphic Log	Unified	Classification	Description	Moisture Condition	Consistency/ Rel. Density	Additional Comments	Depth (m)
		0.1			F	Fill : Silty Clay, low plasticity, brown/ orange	D	L	No visible fibro cement fragments No odours or staining	0.1
		0.2								0.2
		0.3								0.3
		0.4			CI	Silty CLAY, low plasticity, orange/brown/red	M	St		0.4
		0.5								0.5
		0.6				End of BH5 at 0.5m BGL				0.6
		0.7								0.7
		0.8								0.8
		0.9								0.9
		1.0								1.0
		1.1								1.1
		1.2								1.2
		1.3								1.3
		1.4								1.4
		1.5								1.5
		1.6								1.6
		1.7								1.7
		1.8								1.8
		1.9								1.9
		2.0								2.0
		2.1								2.1
		2.2								2.2
		2.3								2.3
		2.4								2.4
		2.5								2.5
		2.6								2.6
		2.7								2.7
		2.8								2.8
		2.9								2.9
		3.0								3.0
		3.1								3.1
		3.2								3.2
		3.3								3.3
		3.4								3.4
		3.5								3.5

Explanatory Notes:

<u>Consistency</u>	<u>Density Index</u>	<u>Samples</u>	<u>Moisture</u>
VS Very Soft	VL Very Loose	B Bulk Sample	D Dry
S Soft	L Loose	D Disturbed Sample	M Moist
F Firm	MD Medium Dense	U50 Undisturbed Sample (50mm diam.)	W Wet
St Stiff	D Dense	N S.P.T. Value	Wp Plastic Limit
VSt Very Stiff	VD Very Dense		Wl Liquid Limit
H Hard			

Job No:	E1292-2
Hole No:	BH6
Sheet	1 of 1

ENGINEERING LOG OF DRILLED BOREHOLE

Client:	GM Architects	Test Location:	Refer to Figure 2
Project:	Detailed Site Investigation	Test Method:	Hand Auger, DCP & U50
Project Location:	185 Fifth Avenue, Austral NSW	Date:	06.02.2018
		Logged by:	RL
		Surface Level: N/A	

Groundwater	Samples/ Field Tests	Depth (m)	Graphic Log	Unified	Classification	Description	Moisture Condition	Consistency/ Rel. Density	Additional Comments	Depth (m)
		0.1			F	Fill : Silty Clay, low plasticity, brown/ orange	D	L	No visible fibro cement fragments	0.1
		0.2							No odours or staining	0.2
		0.3			CI	Silty CLAY, low plasticity, orange/brown/red	M	St		0.3
		0.4								0.4
		0.5								0.5
		0.6				End of BH6 at 0.5m BGL				0.6
		0.7								0.7
		0.8								0.8
		0.9								0.9
		1.0								1.0
		1.1								1.1
		1.2								1.2
		1.3								1.3
		1.4								1.4
		1.5								1.5
		1.6								1.6
		1.7								1.7
		1.8								1.8
		1.9								1.9
		2.0								2.0
		2.1								2.1
		2.2								2.2
		2.3								2.3
		2.4								2.4
		2.5								2.5
		2.6								2.6
		2.7								2.7
		2.8								2.8
		2.9								2.9
		3.0								3.0
		3.1								3.1
		3.2								3.2
		3.3								3.3
		3.4								3.4
		3.5								3.5

Explanatory Notes:

<u>Consistency</u>	<u>Density Index</u>	<u>Samples</u>	<u>Moisture</u>
VS Very Soft	VL Very Loose	B Bulk Sample	D Dry
S Soft	L Loose	D Disturbed Sample	M Moist
F Firm	MD Medium Dense	U50 Undisturbed Sample (50mm diam.)	W Wet
St Stiff	D Dense	N S.P.T. Value	Wp Plastic Limit
VSt Very Stiff	VD Very Dense		Wl Liquid Limit
H Hard			

Job No:	E1292-2
Hole No:	BH7
Sheet	1 of 1

ENGINEERING LOG OF DRILLED BOREHOLE

Client:	GM Architects	Test Location:	Refer to Figure 2
Project:	Detailed Site Investigation	Test Method:	Hand Auger, DCP & U50
Project Location:	185 Fifth Avenue, Austral NSW	Date:	06.02.2018
		Logged by:	RL
		Surface Level:	N/A

Groundwater	Samples/ Field Tests	Depth (m)	Graphic Log	Unified	Classification	Description	Moisture Condition	Consistency/ Rel. Density	Additional Comments	Depth (m)	
		0.1	[Cross-hatched pattern]		F	Fill : Silty Clay, low plasticity, brown/ orange	D	L	No visible fibro cement fragments No odours or staining	0.1	
		0.2									0.2
		0.3									0.3
		0.4	[Cross-hatched pattern]		CI	Silty CLAY, low plasticity, orange/brown/red	M	St		0.4	
		0.5				End of BH7 at 0.4m BGL				0.5	
		0.6								0.6	
		0.7								0.7	
		0.8								0.8	
		0.9								0.9	
		1.0								1.0	
		1.1								1.1	
		1.2								1.2	
		1.3								1.3	
		1.4								1.4	
		1.5								1.5	
		1.6								1.6	
		1.7								1.7	
		1.8								1.8	
		1.9								1.9	
		2.0								2.0	
		2.1								2.1	
		2.2								2.2	
		2.3								2.3	
		2.4								2.4	
		2.5								2.5	
		2.6								2.6	
		2.7								2.7	
		2.8								2.8	
		2.9								2.9	
		3.0								3.0	
		3.1								3.1	
		3.2								3.2	
		3.3								3.3	
		3.4								3.4	
		3.5								3.5	

Explanatory Notes:

<u>Consistency</u>	<u>Density Index</u>	<u>Samples</u>	<u>Moisture</u>
VS Very Soft	VL Very Loose	B Bulk Sample	D Dry
S Soft	L Loose	D Disturbed Sample	M Moist
F Firm	MD Medium Dense	U50 Undisturbed Sample (50mm diam.)	W Wet
St Stiff	D Dense	N S.P.T. Value	Wp Plastic Limit
VSt Very Stiff	VD Very Dense		Wl Liquid Limit
H Hard			

Job No:	E1292-2
Hole No:	BH8
Sheet	1 of 1

ENGINEERING LOG OF DRILLED BOREHOLE

Client:	GM Architects	Test Location:	Refer to Figure 2
Project:	Detailed Site Investigation	Test Method:	Hand Auger, DCP & U50
Project Location:	185 Fifth Avenue, Austral NSW	Date:	06.02.2018
		Logged by:	RL

Groundwater	Samples/ Field Tests	Depth (m)	Graphic Log Unified	Classification	Description	Moisture Condition	Consistency/ Rel. Density	Additional Comments	Depth (m)
		0.1			Fill : Clayey Silt, fine grained, brown with traces of glass & organic matter			No visible fibro cement fragments	0.1
		0.2						No odours or staining	0.2
		0.3		CI	Silty CLAY, low plasticity, orange/brown/red				0.3
		0.4							0.4
		0.5			End of BH8 at 0.4m BGL				0.5
		0.6							0.6
		0.7							0.7
		0.8							0.8
		0.9							0.9
		1.0							1.0
		1.1							1.1
		1.2							1.2
		1.3							1.3
		1.4							1.4
		1.5							1.5
		1.6							1.6
		1.7							1.7
		1.8							1.8
		1.9							1.9
		2.0							2.0
		2.1							2.1
		2.2							2.2
		2.3							2.3
		2.4							2.4
		2.5							2.5
		2.6							2.6
		2.7							2.7
		2.8							2.8
		2.9							2.9
		3.0							3
		3.1							3.1
		3.2							3.2
		3.3							3.3
		3.4							3.4
		3.5							3.5

Explanatory Notes:

Consistency	Density Index	Samples	Moisture
VS Very Soft	VL Very Loose	B Bulk Sample	D Dry
S Soft	L Loose	D Disturbed Sample	M Moist
F Firm	MD Medium Dense	U50 Undisturbed Sample (50mm diam.)	W Wet
St Stiff	D Dense	N S.P.T. Value	Wp Plastic Limit
VSt Very Stiff	VD Very Dense		Wl Liquid Limit
H Hard			

Job No:	E1292-2
Hole No:	BH9
Sheet	1 of 1

ENGINEERING LOG OF DRILLED BOREHOLE

Client:	GM Architects	Test Location:	Refer to Figure 2
Project:	Detailed Site Investigation	Test Method:	Hand Auger, DCP & U50
Project Location:	185 Fifth Avenue, Austral NSW	Date:	06.02.2018
		Logged by:	RL
		Surface Level:	N/A

Groundwater	Samples/ Field Tests	Depth (m)	Graphic Log	Unified	Classification	Description	Moisture Condition	Consistency/ Rel. Density	Additional Comments	Depth (m)
		0.1			F	Fill : Clayey Silt, fine grained, brown with traces of glass & organic matter			No visible fibro cement fragments, No odours or staining	0.1
		0.2			CI	Silty CLAY, low plasticity, orange/brown/red				0.2
		0.3				End of BH9 at 0.2m BGL				0.3
		0.4								0.4
		0.5								0.5
		0.6								0.6
		0.7								0.7
		0.8								0.8
		0.9								0.9
		1.0								1.0
		1.1								1.1
		1.2								1.2
		1.3								1.3
		1.4								1.4
		1.5								1.5
		1.6								1.6
		1.7								1.7
		1.8								1.8
		1.9								1.9
		2.0								2.0
		2.1								2.1
		2.2								2.2
		2.3								2.3
		2.4								2.4
		2.5								2.5
		2.6								2.6
		2.7								2.7
		2.8								2.8
		2.9								2.9
		3.0								3
		3.1								3.1
		3.2								3.2
		3.3								3.3
		3.4								3.4
		3.5								3.5

Explanatory Notes:

Consistency	Density Index	Samples	Moisture
VS Very Soft	VL Very Loose	B Bulk Sample	D Dry
S Soft	L Loose	D Disturbed Sample	M Moist
F Firm	MD Medium Dense	U50 Undisturbed Sample	W Wet
St Stiff	D Dense	(50mm diam.)	Wp Plastic Limit
VSt Very Stiff	VD Very Dense	N S.P.T. Value	Wl Liquid Limit
H Hard			

Job No:	E1292-2
Hole No:	BH10
Sheet	1 of 1

ENGINEERING LOG OF DRILLED BOREHOLE

Client:	GM Architects	Test Location:	Refer to Figure 2
Project:	Detailed Site Investigation	Test Method:	Hand Auger, DCP & U50
Project Location:	185 Fifth Avenue, Austral NSW	Date:	06.02.2018
		Logged by:	RL
		Surface Level:	N/A

Groundwater	Samples/ Field Tests	Depth (m)	Graphic Log	Unified Classification	Description	Moisture Condition	Consistency/ Rel. Density	Additional Comments	Depth (m)
		0.1	☒	F	Fill : Clayey Silt, fine grained, brown with traces of glass& organic matter			No visible fibro cement fragments, No odours or staining	0.1
		0.2	☒	CI	Silty CLAY, low plasticity, orange/brown/red				0.2
		0.3	☒						0.3
		0.4			End of BH10 at 0.3m BGL				0.4
		0.5							0.5
		0.6							0.6
		0.7							0.7
		0.8							0.8
		0.9							0.9
		1.0							1.0
		1.1							1.1
		1.2							1.2
		1.3							1.3
		1.4							1.4
		1.5							1.5
		1.6							1.6
		1.7							1.7
		1.8							1.8
		1.9							1.9
		2.0							2.0
		2.1							2.1
		2.2							2.2
		2.3							2.3
		2.4							2.4
		2.5							2.5
		2.6							2.6
		2.7							2.7
		2.8							2.8
		2.9							2.9
		3.0							3
		3.1							3.1
		3.2							3.2
		3.3							3.3
		3.4							3.4
		3.5							3.5

Explanatory Notes:

<u>Consistency</u>	<u>Density Index</u>	<u>Samples</u>	<u>Moisture</u>
VS Very Soft	VL Very Loose	B Bulk Sample	D Dry
S Soft	L Loose	D Disturbed Sample	M Moist
F Firm	MD Medium Dense	U50 Undisturbed Sample	W Wet
St Stiff	D Dense	(50mm diam.)	Wp Plastic Limit
VSt Very Stiff	VD Very Dense	N S.P.T. Value	Wl Liquid Limit
H Hard			

Job No:	E1292-2
Hole No:	BH11
Sheet	1 of 1

ENGINEERING LOG OF DRILLED BOREHOLE

Client:	GM Architects	Test Location:	Refer to Figure 2
Project:	Detailed Site Investigation	Test Method:	Hand Auger, DCP & U50
Project Location:	185 Fifth Avenue, Austral NSW	Date:	06.02.2018
		Logged by:	RL
		Surface Level:	N/A

Groundwater	Samples/ Field Tests	Depth (m)	Graphic Log	Unified	Classification	Description	Moisture Condition	Consistency/ Rel. Density	Additional Comments	Depth (m)
		0.1			F	Fill : Silty Clay, low plasticity, brown/ orange	D	L	No visible fibro cement fragments	0.1
		0.2							No odours or staining	0.2
		0.3			CI	Silty CLAY, low plasticity, orange/brown/red	M	St	No visible fibro cement fragments	0.3
		0.4							No odours or staining	0.4
		0.5				End of BH11 at 0.4m BGL				0.5
		0.6								0.6
		0.7								0.7
		0.8								0.8
		0.9								0.9
		1.0								1.0
		1.1								1.1
		1.2								1.2
		1.3								1.3
		1.4								1.4
		1.5								1.5
		1.6								1.6
		1.7								1.7
		1.8								1.8
		1.9								1.9
		2.0								2.0
		2.1								2.1
		2.2								2.2
		2.3								2.3
		2.4								2.4
		2.5								2.5
		2.6								2.6
		2.7								2.7
		2.8								2.8
		2.9								2.9
		3.0								3.0
		3.1								3.1
		3.2								3.2
		3.3								3.3
		3.4								3.4
		3.5								3.5

Explanatory Notes:

Consistency

VS Very Soft
S Soft
F Firm
St Stiff
VSt Very Stiff
H Hard

Density Index

VL Very Loose
L Loose
MD Medium Dense
D Dense
VD Very Dense

Samples

B Bulk Sample
D Disturbed Sample
U50 Undisturbed Sample
(50mm diam.)
N S.P.T. Value

Moisture

D Dry
M Moist
W Wet
Wp Plastic Limit
Wl Liquid Limit

Job No:	E1292-2
Hole No:	BH12
Sheet	1 of 1

ENGINEERING LOG OF DRILLED BOREHOLE

Client:	GM Architects	Test Location: Refer to Figure 2
Project:	Detailed Site Investigation	Test Method: Hand Auger, DCP & U50
Project Location:	185 Fifth Avenue, Austral NSW	Date: 06.02.2018 Logged by: RL
		Surface Level: N/A

Groundwater	Samples/ Field Tests	Depth (m)	Graphic Log	Unified Classification	Description	Moisture Condition	Consistency/ Rel. Density	Additional Comments	Depth (m)
		0.1			Fill : Clayey Silt, fine grained, brown with traces of glass& organic matter	D	L	No visible fibro cement fragments No odours or staining	0.1
		0.2		F					0.2
		0.3		CI	Silty CLAY, low plasticity, orange/brown				0.3
		0.4							0.4
		0.5			End of BH12 at 0.4m BGL				0.5
		0.6							0.6
		0.7							0.7
		0.8							0.8
		0.9							0.9
		1.0							1.0
		1.1							1.1
		1.2							1.2
		1.3							1.3
		1.4							1.4
		1.5							1.5
		1.6							1.6
		1.7							1.7
		1.8							1.8
		1.9							1.9
		2.0							2.0
		2.1							2.1
		2.2							2.2
		2.3							2.3
		2.4							2.4
		2.5							2.5
		2.6							2.6
		2.7							2.7
		2.8							2.8
		2.9							2.9
		3.0							3.0
		3.1							3.1
		3.2							3.2
		3.3							3.3
		3.4							3.4
		3.5							3.5

Explanatory Notes:

<u>Consistency</u>	<u>Density Index</u>	<u>Samples</u>	<u>Moisture</u>
VS Very Soft	VL Very Loose	B Bulk Sample	D Dry
S Soft	L Loose	D Disturbed Sample	M Moist
F Firm	MD Medium Dense	U50 Undisturbed Sample (50mm diam.)	W Wet
St Stiff	D Dense	N S.P.T. Value	Wp Plastic Limit
VSt Very Stiff	VD Very Dense		WI Liquid Limit
H Hard			

Job No:	E1292-2
Hole No:	BH13
Sheet	1 of 1

ENGINEERING LOG OF DRILLED BOREHOLE

Client:	GM Architects	Test Location:	Refer to Figure 2
Project:	Detailed Site Investigation	Test Method:	Hand Auger, DCP & U50
Project Location:	185 Fifth Avenue, Austral NSW	Date:	06.02.2018
		Logged by:	RL
		Surface Level: N/A	

Groundwater	Samples/ Field Tests	Depth (m)	Graphic Log	Unified	Classification	Description	Moisture Condition	Consistency/ Rel. Density	Additional Comments	Depth (m)
		0.1			F	Road Base				0.1
		0.2			F	Fill : Silty Clay, low plasticity, brown/ orange	D	L	No visible fibro cement fragments	0.2
		0.3							No odours or staining	0.3
		0.4								0.4
		0.5			CI	Silty CLAY, low plasticity, orange/brown/red	M	St		0.5
		0.6				End of BH13 at 0.5m BGL				0.6
		0.7								0.7
		0.8								0.8
		0.9								0.9
		1.0								1.0
		1.1								1.1
		1.2								1.2
		1.3								1.3
		1.4								1.4
		1.5								1.5
		1.6								1.6
		1.7								1.7
		1.8								1.8
		1.9								1.9
		2.0								2.0
		2.1								2.1
		2.2								2.2
		2.3								2.3
		2.4								2.4
		2.5								2.5
		2.6								2.6
		2.7								2.7
		2.8								2.8
		2.9								2.9
		3.0								3.0
		3.1								3.1
		3.2								3.2
		3.3								3.3
		3.4								3.4
		3.5								3.5

Explanatory Notes:

<u>Consistency</u>	<u>Density Index</u>	<u>Samples</u>	<u>Moisture</u>
VS Very Soft	VL Very Loose	B Bulk Sample	D Dry
S Soft	L Loose	D Disturbed Sample	M Moist
F Firm	MD Medium Dense	U50 Undisturbed Sample	W Wet
St Stiff	D Dense	(50mm diam.)	Wp Plastic Limit
VSt Very Stiff	VD Very Dense	N S.P.T. Value	Wl Liquid Limit
H Hard			

Job No:	E1292-2
Hole No:	BH14
Sheet	1 of 1

ENGINEERING LOG OF DRILLED BOREHOLE

Client:	GM Architects	Test Location:	Refer to Figure 2
Project:	Detailed Site Investigation	Test Method:	Hand Auger, DCP & U50
Project Location:	185 Fifth Avenue, Austral NSW	Date:	06.02.2018
		Logged by:	RL
		Surface Level:	N/A

Groundwater	Samples/ Field Tests	Depth (m)	Graphic Log	Unified Classification	Description	Moisture Condition	Consistency/ Rel. Density	Additional Comments	Depth (m)
		0.1			Fill : Clayey Silt, fine grained, brown with traces of glass & organic matter	D	L	No visible fibro cement fragments No odours or staining	0.1
		0.2		F					0.2
		0.3		CI	Silty CLAY, low plasticity, orange/brown	M	St		0.3
		0.4							0.4
		0.5			End of BH14 at 0.4m BGL				0.5
		0.6							0.6
		0.7							0.7
		0.8							0.8
		0.9							0.9
		1.0							1.0
		1.1							1.1
		1.2							1.2
		1.3							1.3
		1.4							1.4
		1.5							1.5
		1.6							1.6
		1.7							1.7
		1.8							1.8
		1.9							1.9
		2.0							2.0
		2.1							2.1
		2.2							2.2
		2.3							2.3
		2.4							2.4
		2.5							2.5
		2.6							2.6
		2.7							2.7
		2.8							2.8
		2.9							2.9
		3.0							3.0
		3.1							3.1
		3.2							3.2
		3.3							3.3
		3.4							3.4
		3.5							3.5

Explanatory Notes:

<u>Consistency</u>	<u>Density Index</u>	<u>Samples</u>	<u>Moisture</u>
VS Very Soft	VL Very Loose	B Bulk Sample	D Dry
S Soft	L Loose	D Disturbed Sample	M Moist
F Firm	MD Medium Dense	U50 Undisturbed Sample (50mm diam.)	W Wet
St Stiff	D Dense	N S.P.T. Value	Wp Plastic Limit
VSt Very Stiff	VD Very Dense		WI Liquid Limit
H Hard			

Job No:	E1292-2
Hole No:	BH15
Sheet	1 of 1

ENGINEERING LOG OF DRILLED BOREHOLE

Client:	GM Architects	Test Location:	Refer to Figure 2
Project:	Detailed Site Investigation	Test Method:	Hand Auger, DCP & U50
Project Location:	185 Fifth Avenue, Austral NSW	Date:	06.02.2018
		Logged by:	RL
		Surface Level:	N/A

Groundwater	Samples/ Field Tests	Depth (m)	Graphic Log	Unified Classification	Description	Moisture Condition	Consistency/ Rel. Density	Additional Comments	Depth (m)	
		0.1			Fill : Clayey Silt, fine grained, brown with traces of glass & organic matter	D	L	No visible fibro cement fragments No odours or staining	0.1	
		0.2		F					0.2	
		0.3		CI	Silty CLAY, low plasticity, orange/brown	M	St	No visible fibro cement fragments No odours or staining	0.3	
		0.4							0.4	
		0.5			End of BH15 at 0.4m BGL				0.5	
		0.6								0.6
		0.7								0.7
		0.8								0.8
		0.9								0.9
		1.0								1.0
		1.1								1.1
		1.2								1.2
		1.3								1.3
		1.4								1.4
		1.5								1.5
		1.6								1.6
		1.7								1.7
		1.8								1.8
		1.9								1.9
		2.0								2.0
		2.1								2.1
		2.2								2.2
		2.3								2.3
		2.4								2.4
		2.5								2.5
		2.6								2.6
		2.7								2.7
		2.8								2.8
		2.9								2.9
		3.0								3.0
		3.1								3.1
		3.2								3.2
		3.3								3.3
		3.4								3.4
		3.5								3.5

Explanatory Notes:

<u>Consistency</u>	<u>Density Index</u>	<u>Samples</u>	<u>Moisture</u>
VS Very Soft	VL Very Loose	B Bulk Sample	D Dry
S Soft	L Loose	D Disturbed Sample	M Moist
F Firm	MD Medium Dense	U50 Undisturbed Sample (50mm diam.)	W Wet
St Stiff	D Dense	N S.P.T. Value	Wp Plastic Limit
VSt Very Stiff	VD Very Dense		Wl Liquid Limit
H Hard			

Job No:	E1292-2
Hole No:	BH16
Sheet	1 of 1

ENGINEERING LOG OF DRILLED BOREHOLE

Client:	GM Architects	Test Location:	Refer to Figure 2
Project:	Detailed Site Investigation	Test Method:	Hand Auger, DCP & U50
Project Location:	185 Fifth Avenue, Austral NSW	Date:	06.02.2018
		Logged by:	RL

Groundwater	Samples/ Field Tests	Depth (m)	Graphic Log Unified	Classification	Description	Moisture Condition	Consistency/ Rel. Density	Additional Comments	Depth (m)
		0.1		CI	Silty CLAY, low plasticity, orange/brown	M	St	No visible fibro cement fragments	0.1
		0.2						No odours or staining	0.2
		0.3			End of BH16 at 0.2m BGL				0.3
		0.4							0.4
		0.5							0.5
		0.6							0.6
		0.7							0.7
		0.8							0.8
		0.9							0.9
		1.0							1.0
		1.1							1.1
		1.2							1.2
		1.3							1.3
		1.4							1.4
		1.5							1.5
		1.6							1.6
		1.7							1.7
		1.8							1.8
		1.9							1.9
		2.0							2.0
		2.1							2.1
		2.2							2.2
		2.3							2.3
		2.4							2.4
		2.5							2.5
		2.6							2.6
		2.7							2.7
		2.8							2.8
		2.9							2.9
		3.0							3
		3.1							3.1
		3.2							3.2
		3.3							3.3
		3.4							3.4
		3.5							3.5

Explanatory Notes:

Consistency	Density Index	Samples	Moisture
VS Very Soft	VL Very Loose	B Bulk Sample	D Dry
S Soft	L Loose	D Disturbed Sample	M Moist
F Firm	MD Medium Dense	U50 Undisturbed Sample (50mm diam.)	W Wet
St Stiff	D Dense	N S.P.T. Value	Wp Plastic Limit
VSt Very Stiff	VD Very Dense		Wl Liquid Limit
H Hard			

Job No:	E1292-2
Hole No:	BH17
Sheet	1 of 1

ENGINEERING LOG OF DRILLED BOREHOLE

Client:	GM Architects	Test Location:	Refer to Figure 2
Project:	Detailed Site Investigation	Test Method:	Hand Auger, DCP & U50
Project Location:	185 Fifth Avenue, Austral NSW	Date:	06.02.2018
		Logged by:	RL
		Surface Level:	N/A

Groundwater	Samples/ Field Tests	Depth (m)	Graphic Log	Unified	Classification	Description	Moisture Condition	Consistency/ Rel. Density	Additional Comments	Depth (m)
		0.1	XXXX		F	Fill : Clayey Silt, fine grained, brown with traces of glass & organic matter			No visible fibro cement fragments, No odours or staining	0.1
		0.2			CI	Silty CLAY, low plasticity, orange/brown/red			No visible fibro cement fragments, No odours or staining	0.2
		0.3								0.3
		0.4								0.4
		0.5				End of BH17 at 0.4m BGL				0.5
		0.6								0.6
		0.7								0.7
		0.8								0.8
		0.9								0.9
		1.0								1.0
		1.1								1.1
		1.2								1.2
		1.3								1.3
		1.4								1.4
		1.5								1.5
		1.6								1.6
		1.7								1.7
		1.8								1.8
		1.9								1.9
		2.0								2.0
		2.1								2.1
		2.2								2.2
		2.3								2.3
		2.4								2.4
		2.5								2.5
		2.6								2.6
		2.7								2.7
		2.8								2.8
		2.9								2.9
		3.0								3
		3.1								3.1
		3.2								3.2
		3.3								3.3
		3.4								3.4
		3.5								3.5

Explanatory Notes:

<u>Consistency</u>	<u>Density Index</u>	<u>Samples</u>	<u>Moisture</u>
VS Very Soft	VL Very Loose	B Bulk Sample	D Dry
S Soft	L Loose	D Disturbed Sample	M Moist
F Firm	MD Medium Dense	U50 Undisturbed Sample	W Wet
St Stiff	D Dense	(50mm diam.)	Wp Plastic Limit
VSt Very Stiff	VD Very Dense	N S.P.T. Value	Wl Liquid Limit
H Hard			

Job No:	E1292-2
Hole No:	BH18
Sheet	1 of 1

ENGINEERING LOG OF DRILLED BOREHOLE

Client:	GM Architects	Test Location:	Refer to Figure 2
Project:	Detailed Site Investigation	Test Method:	Hand Auger, DCP & U50
Project Location:	185 Fifth Avenue, Austral NSW	Date:	06.02.2018
		Logged by:	RL

Groundwater	Samples/ Field Tests	Depth (m)	Graphic Log Unified	Classification	Description	Moisture Condition	Consistency/ Rel. Density	Additional Comments	Depth (m)
		0.1			Fill : Clayey Silt, fine grained, brown with traces of gravels, concrete, shale pieces & bitumen			No visible fibro fragments	0.1
		0.2						No odours or staining	0.2
		0.3							0.3
		0.4			End of BH18 at 0.3m BGL				0.4
		0.5							0.5
		0.6							0.6
		0.7							0.7
		0.8							0.8
		0.9							0.9
		1.0							1.0
		1.1							1.1
		1.2							1.2
		1.3							1.3
		1.4							1.4
		1.5							1.5
		1.6							1.6
		1.7							1.7
		1.8							1.8
		1.9							1.9
		2.0							2.0
		2.1							2.1
		2.2							2.2
		2.3							2.3
		2.4							2.4
		2.5							2.5
		2.6							2.6
		2.7							2.7
		2.8							2.8
		2.9							2.9
		3.0							3
		3.1							3.1
		3.2							3.2
		3.3							3.3
		3.4							3.4
		3.5							3.5

Explanatory Notes:

Consistency	Density Index	Samples	Moisture
VS Very Soft	VL Very Loose	B Bulk Sample	D Dry
S Soft	L Loose	D Disturbed Sample	M Moist
F Firm	MD Medium Dense	U50 Undisturbed Sample (50mm diam.)	W Wet
St Stiff	D Dense	N S.P.T. Value	Wp Plastic Limit
VSt Very Stiff	VD Very Dense		Wl Liquid Limit
H Hard			

Job No:	E1292-2
Hole No:	BH19
Sheet	1 of 1

ENGINEERING LOG OF DRILLED BOREHOLE

Client:	GM Architects	Test Location:	Refer to Figure 2
Project:	Detailed Site Investigation	Test Method:	Hand Auger, DCP & U50
Project Location:	185 Fifth Avenue, Austral NSW	Date:	06.02.2018
		Logged by:	RL
		Surface Level:	N/A

Groundwater	Samples/ Field Tests	Depth (m)	Graphic Log	Unified Classification	Description	Moisture Condition	Consistency/ Rel. Density	Additional Comments	Depth (m)
		0.1			Fill : Clayey Silt, fine grained, brown with traces of glass & organic matter	D	L	No visible fibro cement fragments No odours or staining	0.1
		0.2		F					0.2
		0.3		CI	Silty CLAY, low plasticity, orange/brown				0.3
		0.4							0.4
		0.5			End of BH19 at 0.4m BGL				0.5
		0.6							0.6
		0.7							0.7
		0.8							0.8
		0.9							0.9
		1.0							1.0
		1.1							1.1
		1.2							1.2
		1.3							1.3
		1.4							1.4
		1.5							1.5
		1.6							1.6
		1.7							1.7
		1.8							1.8
		1.9							1.9
		2.0							2.0
		2.1							2.1
		2.2							2.2
		2.3							2.3
		2.4							2.4
		2.5							2.5
		2.6							2.6
		2.7							2.7
		2.8							2.8
		2.9							2.9
		3.0							3.0
		3.1							3.1
		3.2							3.2
		3.3							3.3
		3.4							3.4
		3.5							3.5

Explanatory Notes:

<u>Consistency</u>	<u>Density Index</u>	<u>Samples</u>	<u>Moisture</u>
VS Very Soft	VL Very Loose	B Bulk Sample	D Dry
S Soft	L Loose	D Disturbed Sample	M Moist
F Firm	MD Medium Dense	U50 Undisturbed Sample (50mm diam.)	W Wet
St Stiff	D Dense	N S.P.T. Value	Wp Plastic Limit
VSt Very Stiff	VD Very Dense		WI Liquid Limit
H Hard			

Job No:	E1292-2
Hole No:	BH20
Sheet	1 of 1

ENGINEERING LOG OF DRILLED BOREHOLE

Client:	GM Architects	Test Location:	Refer to Figure 2
Project:	Detailed Site Investigation	Test Method:	Hand Auger, DCP & U50
Project Location:	185 Fifth Avenue, Austral NSW	Date:	06.02.2018
		Logged by:	RL
		Surface Level: N/A	

Groundwater	Samples/ Field Tests	Depth (m)	Graphic Log	Unified Classification	Description	Moisture Condition	Consistency/ Rel. Density	Additional Comments	Depth (m)
		0.1		F	Fill : Silty Clay, low plasticity, brown/ orange	D	L	No visible fibro cement fragments No odours or staining	0.1
		0.2		0.2					
		0.3		0.3					
		0.4		0.4					
		0.5		CI	Silty CLAY, low plasticity, orange/brown	M	St		0.5
		0.6			End of BH20 at 0.5m BGL				0.6
		0.7							0.7
		0.8							0.8
		0.9							0.9
		1.0							1.0
		1.1							1.1
		1.2							1.2
		1.3							1.3
		1.4							1.4
		1.5							1.5
		1.6							1.6
		1.7							1.7
		1.8							1.8
		1.9							1.9
		2.0							2.0
		2.1							2.1
		2.2							2.2
		2.3							2.3
		2.4							2.4
		2.5							2.5
		2.6							2.6
		2.7							2.7
		2.8							2.8
		2.9							2.9
		3.0							3.0
		3.1							3.1
		3.2							3.2
		3.3							3.3
		3.4							3.4
		3.5							3.5

Explanatory Notes:

<u>Consistency</u>	<u>Density Index</u>	<u>Samples</u>	<u>Moisture</u>
VS Very Soft	VL Very Loose	B Bulk Sample	D Dry
S Soft	L Loose	D Disturbed Sample	M Moist
F Firm	MD Medium Dense	U50 Undisturbed Sample (50mm diam.)	W Wet
St Stiff	D Dense	N S.P.T. Value	Wp Plastic Limit
VSt Very Stiff	VD Very Dense		Wl Liquid Limit
H Hard			

Job No:	E1292-2
Hole No:	BH21
Sheet	1 of 1

ENGINEERING LOG OF DRILLED BOREHOLE

Client:	GM Architects	Test Location:	Refer to Figure 2
Project:	Detailed Site Investigation	Test Method:	Hand Auger, DCP & U50
Project Location:	185 Fifth Avenue, Austral NSW	Date:	06.02.2018
		Logged by:	RL

Groundwater	Samples/ Field Tests	Depth (m)	Graphic Log Unified	Classification	Description	Moisture Condition	Consistency/ Rel. Density	Additional Comments	Depth (m)
		0.1		CI	Silty CLAY, low plasticity, orange/brown	M	St	No visible fibro cement fragments noticed	0.1
		0.2						No odours or staining	0.2
		0.3			End of BH21 at 0.2m BGL				0.3
		0.4							0.4
		0.5							0.5
		0.6							0.6
		0.7							0.7
		0.8							0.8
		0.9							0.9
		1.0							1.0
		1.1							1.1
		1.2							1.2
		1.3							1.3
		1.4							1.4
		1.5							1.5
		1.6							1.6
		1.7							1.7
		1.8							1.8
		1.9							1.9
		2.0							2.0
		2.1							2.1
		2.2							2.2
		2.3							2.3
		2.4							2.4
		2.5							2.5
		2.6							2.6
		2.7							2.7
		2.8							2.8
		2.9							2.9
		3.0							3
		3.1							3.1
		3.2							3.2
		3.3							3.3
		3.4							3.4
		3.5							3.5

Explanatory Notes:

Consistency	Density Index	Samples	Moisture
VS Very Soft	VL Very Loose	B Bulk Sample	D Dry
S Soft	L Loose	D Disturbed Sample	M Moist
F Firm	MD Medium Dense	U50 Undisturbed Sample (50mm diam.)	W Wet
St Stiff	D Dense	N S.P.T. Value	Wp Plastic Limit
VSt Very Stiff	VD Very Dense		Wl Liquid Limit
H Hard			

Job No:	E1292-2
Hole No:	BH22
Sheet	1 of 1

ENGINEERING LOG OF DRILLED BOREHOLE

Client:	GM Architects	Test Location:	Refer to Figure 2
Project:	Detailed Site Investigation	Test Method:	Hand Auger, DCP & U50
Project Location:	185 Fifth Avenue, Austral NSW	Date:	06.02.2018
		Logged by:	RL

Groundwater	Samples/ Field Tests	Depth (m)	Graphic Log Unified	Classification	Description	Moisture Condition	Consistency/ Rel. Density	Additional Comments	Depth (m)
		0.1		CI	Silty CLAY, low plasticity, orange/brown	M	St	No visible fibro cement fragments noticed	0.1
		0.2						No odours or staining	0.2
		0.3			End of BH22 at 0.2m BGL				0.3
		0.4							0.4
		0.5							0.5
		0.6							0.6
		0.7							0.7
		0.8							0.8
		0.9							0.9
		1.0							1.0
		1.1							1.1
		1.2							1.2
		1.3							1.3
		1.4							1.4
		1.5							1.5
		1.6							1.6
		1.7							1.7
		1.8							1.8
		1.9							1.9
		2.0							2.0
		2.1							2.1
		2.2							2.2
		2.3							2.3
		2.4							2.4
		2.5							2.5
		2.6							2.6
		2.7							2.7
		2.8							2.8
		2.9							2.9
		3.0							3
		3.1							3.1
		3.2							3.2
		3.3							3.3
		3.4							3.4
		3.5							3.5

Explanatory Notes:

Consistency	Density Index	Samples	Moisture
VS Very Soft	VL Very Loose	B Bulk Sample	D Dry
S Soft	L Loose	D Disturbed Sample	M Moist
F Firm	MD Medium Dense	U50 Undisturbed Sample (50mm diam.)	W Wet
St Stiff	D Dense	N S.P.T. Value	Wp Plastic Limit
VSt Very Stiff	VD Very Dense		Wl Liquid Limit
H Hard			

Job No:	E1292-2
Hole No:	BH23
Sheet	1 of 1

ENGINEERING LOG OF DRILLED BOREHOLE

Client:	GM Architects	Test Location:	Refer to Figure 2
Project:	Detailed Site Investigation	Test Method:	Hand Auger, DCP & U50
Project Location:	185 Fifth Avenue, Austral NSW	Date:	06.02.2018
		Logged by:	RL
		Surface Level:	N/A

Groundwater	Samples/ Field Tests	Depth (m)	Graphic Log	Unified	Classification	Description	Moisture Condition	Consistency/ Rel. Density	Additional Comments	Depth (m)
		0.1			F	Fill : Silty Clay, low plasticity, brown/ orange with rocks	D	L	No fibro cement fragments noticed No odours or staining	0.1
		0.2								0.2
		0.3								0.3
		0.4			CI	Silty CLAY, low plasticity, orange/brown	M	St	No visible fibro cement fragments No odours or staining	0.4
		0.5								0.5
		0.6				End of BH23 at 0.5m BGL				0.6
		0.7					0.7			
		0.8					0.8			
		0.9					0.9			
		1.0					1.0			
		1.1					1.1			
		1.2					1.2			
		1.3					1.3			
		1.4					1.4			
		1.5					1.5			
		1.6					1.6			
		1.7					1.7			
		1.8					1.8			
		1.9					1.9			
		2.0					2.0			
		2.1					2.1			
		2.2					2.2			
		2.3					2.3			
		2.4					2.4			
		2.5				2.5				
		2.6				2.6				
		2.7				2.7				
		2.8				2.8				
		2.9				2.9				
		3.0				3.0				
		3.1				3.1				
		3.2				3.2				
		3.3				3.3				
		3.4				3.4				
		3.5				3.5				

Explanatory Notes:

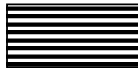
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VS Very Soft	VL Very Loose	B Bulk Sample	D Dry
S Soft	L Loose	D Disturbed Sample	M Moist
F Firm	MD Medium Dense	U50 Undisturbed Sample (50mm diam.)	W Wet
St Stiff	D Dense	N S.P.T. Value	Wp Plastic Limit
VSt Very Stiff	VD Very Dense		Wl Liquid Limit
H Hard			

GRAPHIC SYMBOLS FOR SOIL AND ROCK

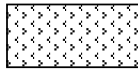
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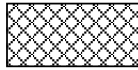
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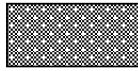
Concrete



Topsoil



Fill



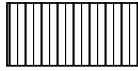
Peat



Clay



Silty Clay



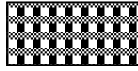
Silt



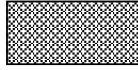
Sandy Clay



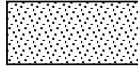
Gravelly Clay



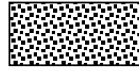
Shaly Clay



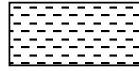
Clayey Silt



Sandy Silt



Sand



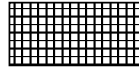
Clayey Sand



Silty Sand

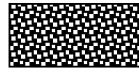


Gravel

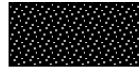


Sandy Gravel

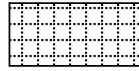
Sedimentary Rock



Sandstone Coarse Grained



Sandstone Fine Grained



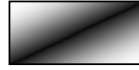
Siltstone



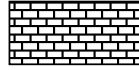
Laminite



Shale



Coal



Limestone

APPENDIX L CALIBRATION CERTIFICATES

RENTALS

Equipment Certification Report – In-situ SmarTroll Water Quality Meter

This Water Quality Meter has been performance checked and calibrated as follows:

Sensor	Concentration	Span 1	Span 2	Traceability Lot #	Pass?
pH	pH 7.00 / pH 4.00	7.00 pH	4.00 pH	310933/312725	<input checked="" type="checkbox"/>
Conductivity	1288 uS/cm	N/A uS/cm	12.88 uS/cm	312392	<input checked="" type="checkbox"/>
Dissolved Oxygen	Sodium Sulphite / Air	0 % in Sodium Sulphite	100 % Saturation in Air	5656 (DI) 300125 (SS)	<input checked="" type="checkbox"/>
Redox (ORP) *	Electrode operability test	240mV +/- 10%	234 mV	31190 1(A) 308904 (B)	<input checked="" type="checkbox"/>

- Battery Status 100%
 Electrical Safety Tag attached (AS/NZS 3760)

- Temperature 21.6 °C
 Electrodes Cleaned and checked

Tag No: SMART-24

Valid to: 02/04/2018

Date: 05/02/2018

Signed: [Signature]

Please check that the following items are received and that all items are cleaned and decontaminated before return. A minimum \$30 cleaning / service / repair charge may be applied to any unclean or damaged items. Items not returned will be billed for at the full replacement cost.

Sent	Returned	Item
<input checked="" type="checkbox"/>	<input type="checkbox"/>	iPod Touch 5 with waterproof casing
<input checked="" type="checkbox"/>	<input type="checkbox"/>	pH sensor/Redox (ORP) sensor
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Conductivity/TDS sensor
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Dissolved oxygen sensor
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Red caps for probe and Bluetooth battery pack
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Connector cable <u>4.6</u> m
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Bluetooth Battery Pack Serial #: <u>396465</u>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Spare 4 AA batteries
<input checked="" type="checkbox"/>	<input type="checkbox"/>	AC charger with USB cable
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Car charger with USB cable
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Instruction Manual
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Quick Guide
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Calibration cup with vented cap and sponge
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Storage cap with sponge
<input checked="" type="checkbox"/>	<input type="checkbox"/>	SS Protective Shroud
<input checked="" type="checkbox"/>	<input type="checkbox"/>	SmarTROLL MP Flow Cell
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Check to confirm electrical safety (tag must be valid)

Date: 05/02/2018

Signed: [Signature]

TFS Reference	<u>C500 8249</u>	Return Date:	<u>/ /</u>
Customer Reference		Return Time:	
Equipment ID	<u>SMART-24</u>	Condition on return:	
Equipment Serial No.	<u>392908</u>		

"We do more than give you great equipment... We give you great solutions!"

Phone: (Free Call) 1300 735 295		Fax: (Free Call) 1800 675 123		Email: RentalsAU@ThermoFisher.com	
Melbourne Branch 5 Caribbean Drive, Scoresby 3179	Sydney Branch Level 1, 4 Talavera Road, North Ryde 2113	Adelaide Branch 27 Beulah Road, Norwood, South Australia 5067	Brisbane Branch Unit 2/5 Ross St Newstead 4006	Perth Branch 121 Beringarra Ave Malaga WA 6090	

RENTALS

Equipment Report – Geo Pump 2 PERISTALTIC PUMP

This pump has been cleaned and checked:

<input checked="" type="checkbox"/> Clean and check all components	Ops check
--	-----------

Date: 02/02/2018 Checked by: [Signature]

Signed: [Signature]

Electrical Safety Tag attached (AS/NZS 3760)

Tag No: 000408

Valid to: 22/04/2018

Please check that the following items are received and that all items are cleaned and decontaminated before return. A minimum \$20 cleaning / service / repair charge may be applied to any unclean or damaged items. Items not returned will be billed for at the full replacement cost.

Sent	Received	Returned	Item
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Peristaltic Model (GP2) Pump, Alligator Clips
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Instruction Sheet
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3/8" Medical Grade Silicone Tubing (pump head) 30cm
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2 metal Hose Clips
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Transport Case
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Charger
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Electrical Safety Tag attached (AS/NZS 3760)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>2 X WEIGHTS</u>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>2 X BATTERIES</u>
Processors Signature/ Initials			<u>[Signature]</u>

EE Quote Reference	<u>C5008249</u>	Condition on return
Customer Ref		
Equipment ID	<u>GP2-10</u>	
Equipment serial no.		
Return Date	<u> / /</u>	
Return Time		

Phone: (Free Call) 1300 735 295		Environmental Assessment Technologies		Fax: (Free Call) 1800 657 123	
Melbourne Branch 5 Caribbean Drive, Scoresby 3179 Email: RentalsEnviroVIC@thermofisher.com	Sydney Branch Level 1, 4 Talavera Road, North Ryde 2113 Email: RentalsEnviroNSW@thermofisher.com	Adelaide Branch 27 Beulah Road, Norwood, South Australia 5067 Email: RentalsEnviroSA@thermofisher.com	Brisbane Branch Unit 2/5 Ross St Newstead 4006 Email: RentalsEnviroQLD@thermofisher.com	Perth Branch 121 Beringarra Ave Malaga WA 6090 Email: RentalsEnviroWA@thermofisher.com	

APPENDIX M FIELD RECORD FORMS

Site Inspection Daily Worksheet Record

PROJECT NAME: DSI	PROJECT NO: E1292-2
CLIENT: Gm Architects	DATE: 6/2/18
SITE ADDRESS: 185 Fifth Ave, Austral	
SITE CONTACT:	PHONE:
REPRESENTATIVE:	
TITLE:	PHONE:

FIELD NOTES:

Start Time 9:00

Finish Time 2:50

Weather Sunny

Rainfall (mm) /

Wind Direction /

Wind Speed /

Humidity /

Odours Present No

Staining Present Yes ~ BH 23

Environmental and Safety Concerns

Actions

Site Safety Induction

Stormwater Control

Dust Suppression

Traffic Control

Machinery onsite

Equipment onsite

GROUNDWATER MONITORING RECORD FORM

PROJECT INFORMATION			
Client:	GM Architect	Monitoring Well ID:	AW1
Site Address:	185 Fifth Ave, Auckland	Logged By:	
Project:	E1242-2 VSI	Date:	06/02/2018

MONITORING WELL DETAILS			
Depth (m) as constructed:	9.0m	Depth (m) as measured:	9.0m
Finish:	Grille Cover	Co-ordinates:	
Condition:		Surveyed Levels:	

METHODOLOGY AND EQUIPMENT			
Water Measurement Device:	Dip Meter	Reference Point:	around Surface
Water Quality Meter:	Smart Tool	Reference Point to Ground Surface (mm):	
GW Extraction Method:	Per Pump		

GROUNDWATER GAUGING (PRE-PURGE)		GROUNDWATER GAUGING (POST-PURGE)	
SWL (m bgl):	1.4m	SWL (m bgl):	1.6m
Depth to Product (m bgl):	N/A	Depth to Product (m bgl):	N/A
Product Thickness (mm):	N/A	Product Thickness (mm):	N/A
Time:	10:00 am	Time:	10:50 am

PURGING AND PHYSICO-CHEMICAL PARAMETERS								
Time (Started)	Time (Finished)	Volume Purged	Pump Rate (mL/min)	Temperature (°C)	DO (mg/L)	pH (pH units)	EC (µS/cm)	Redox Potential (mV)
10:10	10:12	1L	500	28.17	8.00	7.03	8020.7	116.8
10:12	10:15	1.5L	500	25.87	7.63	7.04	11869.3	84.7
10:15	10:20	2L	400	24.92	8.00	6.68	21962.2	11.2
10:20	10:25	2L	400	23.38	3.96	6.72	2393.34	11.2
10:25	10:30	2L	400	23.33	6.42	6.69	24464.3	30.5
Stabilisation Criteria				± 0.2 °C	± 0.2 mg/L	± 0.1 pH units	± 5%	± 10 mV

OBSERVATIONS			
Odour:	NO	Sneen:	NO
Colour / Turbidity:	Clear	Recent Rain (Days):	

SAMPLING						
Samples Taken:	Primary	Blind	Split	Rinsate	TS/TB	
Containers:						
Field Filtered:						
Preservation:						

APPENDIX N NATA ACCREDITED LABORATORY CERTIFICATES



Telephone : + 61-2-8784 8556

Chain of Custody Record



Client Details:
 Benviron Group
 PO Box 4405, East Gosford NSW 2250
ben@benvirongroup.com.au
michael@benvirongroup.com.au
ray@benvirongroup.com.au
 ph: +61466 385 221

Delivery Details:
 ALS Environmental
 277-289 woodpark Road, Smithfield, 2164
 email: Vibeshan.dayalan@alsglobal.com
 ph: +61287848555

Project Manager: Michael Silk
Project #: E1292-2
Sampled By: RL
Project Name: Austral
Purchase Order #: N/A
Quote #:
Page #: 1
Turnaround time: Fast- 2 days

#	Sample ID	Date Sampled	Matrix	Analytes								Sample Comments	
				Heavy Metals(8)	TRH	BTEXN	PAH	OC	PCB	ALS Suites			
1	SS1	06.02.2018	Soil	x	x	x	x	x	x	x		S-8	Keep
2	SS2	06.02.2018	Soil	x	x	x	x	x	x	x		S-8	Keep
3													
4													
5													
6													
7													

F.A.T

Special Directions and Comments:

Relinquished by	Ray Liu	Received By	ANDREW	Method of shipment	courier
Signature	<i>Ray Liu</i>	Signature	<i>ANDREW</i>		
Date	07.02.2018	Date	7/2/18		

2008m



Telephone : + 61-2-8784 8556

Chain of Custody Record



Client Details:
 Benviron Group
 PO Box 4405, East Gosford NSW 2250
ben@benvirongroup.com.au
michael@benvirongroup.com.au
ray@benvirongroup.com.au
 ph: +61466 385 221

Delivery Details:
 ALS Environmental
 277-289 woodpark Road, Smithfield, 2164
 email: Vibeshan.dayalan@alsglobal.com
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Project Manager: Michael Silk
Project #: E1292-2
Sampled By: RL
Project Name: Austral
Purchase Order #: N/A
Quote #:
Page #: 1
Turnaround time: Fast- 2 days

#	Sample ID	Date Sampled	Matrix	Analytes								Sample Comments	
				Heavy Metals(8)	TRH	BTEXN	PAH	OC	PCB	ALS Suites			
1	SS1	06.02.2018	Soil	x	x	x	x	x	x	x		S-8	Keep
2	SS2	06.02.2018	Soil	x	x	x	x	x	x	x		S-8	Keep
3													
4													
5													
6													
7													

F.A.T.

Special Directions and Comments:

Relinquished by	Received By	Method of shipment
Signature	Signature	courier
Date	Date	
	Ray Liu	
	<i>[Signature]</i>	
	07.02.2018	
	7/2/18	
	2:00pm	



SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : ES1804146

Client	: BENVIRON GROUP	Laboratory	: Environmental Division Sydney
Contact	: MR MICHAEL SILK	Contact	: Customer Services ES
Address	: PO BOX 4405 EAST GOSFORD NSW 2250	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: michael@benvirongroup.com.au	E-mail	: ALSEnviro.Sydney@alsglobal.com
Telephone	: +61 02 0466 385 221	Telephone	: +61-2-8784 8555
Facsimile	: ----	Facsimile	: +61-2-8784 8500
Project	: E1292-2 Austral	Page	: 1 of 2
Order number	: ----	Quote number	: EB2017BENVIRON0001 (EN/222/17)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: ----		
Sampler	:		

Dates

Date Samples Received	: 07-Feb-2018 02:00	Issue Date	: 07-Feb-2018
Client Requested Due Date	: 09-Feb-2018	Scheduled Reporting Date	: 09-Feb-2018

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 1	Temperature	: 7.5°C - Ice Bricks present
Receipt Detail	:	No. of samples received / analysed	: 2 / 2

General Comments

- This report contains the following information:
 - Sample Container(s)/Preservation Non-Compliances
 - Summary of Sample(s) and Requested Analysis
 - Proactive Holding Time Report
 - Requested Deliverables
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- **Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: ES1804146	Page	: 1 of 4
Client	: BENVIRON GROUP	Laboratory	: Environmental Division Sydney
Contact	: MR MICHAEL SILK	Telephone	: +61-2-8784 8555
Project	: E1292-2 Austral	Date Samples Received	: 07-Feb-2018
Site	: ----	Issue Date	: 09-Feb-2018
Sampler	: ----	No. of samples received	: 2
Order number	: ----	No. of samples analysed	: 2

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**



Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: * = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)							
Soil Glass Jar - Unpreserved (EA055) SS1, SS2	06-Feb-2018	----	----	----	08-Feb-2018	20-Feb-2018	✓
EG005T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved (EG005T) SS1, SS2	06-Feb-2018	08-Feb-2018	05-Aug-2018	✓	08-Feb-2018	05-Aug-2018	✓
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved (EG035T) SS1, SS2	06-Feb-2018	08-Feb-2018	06-Mar-2018	✓	09-Feb-2018	06-Mar-2018	✓
EP066: Polychlorinated Biphenyls (PCB)							
Soil Glass Jar - Unpreserved (EP066) SS1, SS2	06-Feb-2018	08-Feb-2018	20-Feb-2018	✓	08-Feb-2018	20-Mar-2018	✓
EP068A: Organochlorine Pesticides (OC)							
Soil Glass Jar - Unpreserved (EP068) SS1, SS2	06-Feb-2018	08-Feb-2018	20-Feb-2018	✓	08-Feb-2018	20-Mar-2018	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved (EP075(SIM)) SS1, SS2	06-Feb-2018	08-Feb-2018	20-Feb-2018	✓	08-Feb-2018	20-Mar-2018	✓
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP080) SS1, SS2	06-Feb-2018	08-Feb-2018	20-Feb-2018	✓	08-Feb-2018	20-Feb-2018	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Soil Glass Jar - Unpreserved (EP080) SS1, SS2	06-Feb-2018	08-Feb-2018	20-Feb-2018	✓	08-Feb-2018	20-Feb-2018	✓
EP080: BTEXN							
Soil Glass Jar - Unpreserved (EP080) SS1, SS2	06-Feb-2018	08-Feb-2018	20-Feb-2018	✓	08-Feb-2018	20-Feb-2018	✓



Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: * = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Reaular	Actual	Expected	Evaluation	
Analytical Methods							
Laboratory Duplicates (DUP)							
Moisture Content	EA055	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	1	6	16.67	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	2	50.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	2	50.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	12	16.67	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	19	10.53	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	5	20.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
PAH/Phenols (SIM)	EP075(SIM)	1	6	16.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	2	50.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	2	50.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	12	8.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	5	20.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
PAH/Phenols (SIM)	EP075(SIM)	1	6	16.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	2	50.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	2	50.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	12	8.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	5	20.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
PAH/Phenols (SIM)	EP075(SIM)	1	6	16.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	2	50.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	2	50.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	12	8.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	5	20.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard



Brief Method Summaries

The analytical procedures used by the Environmental Division 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 in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. 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 (2013) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl ₂) (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 SnCl ₂ which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
Polychlorinated Biphenyls (PCB)	EP066	SOIL	In house: Referenced to USEPA SW 846 - 8270D 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 (2013) Schedule B(3) (Method 504)
Pesticides by GCMS	EP068	SOIL	In house: Referenced to USEPA SW 846 - 8270D 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 (2013) Schedule B(3) (Method 504,505)
TRH - Semivolatile Fraction	EP071	SOIL	In house: Referenced to USEPA SW 846 - 8015A Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C40. Compliant with NEPM amended 2013.
PAH/Phenols (SIM)	EP075(SIM)	SOIL	In house: Referenced to USEPA SW 846 - 8270D. 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 (2013) Schedule B(3) (Method 502 and 507)
TRH Volatiles/BTEX	EP080	SOIL	In house: Referenced to 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. Compliant with NEPM amended 2013.

Preparation Methods	Method	Matrix	Method Descriptions
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	In house: Referenced to USEPA 200.2. 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 (2013) Schedule B(3) (Method 202)
Methanolic Extraction of Soils for Purge and Trap	ORG16	SOIL	In house: Referenced to USEPA SW 846 - 5030A. 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids	ORG17	SOIL	In house: Mechanical agitation (tumbler). 10g of sample, Na ₂ SO ₄ and surrogate are extracted with 30mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.

QUALITY CONTROL REPORT

Work Order	: ES1804146	Page	: 1 of 8
Client	: BENVIRON GROUP	Laboratory	: Environmental Division Sydney
Contact	: MR MICHAEL SILK	Contact	: Customer Services ES
Address	: PO BOX 4405 EAST GOSFORD NSW 2250	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: +61 02 0466 385 221	Telephone	: +61-2-8784 8555
Project	: E1292-2 Austral	Date Samples Received	: 07-Feb-2018
Order number	: ----	Date Analysis Commenced	: 08-Feb-2018
C-O-C number	: ----	Issue Date	: 09-Feb-2018
Sampler	: ----		
Site	: ----		
Quote number	: EN/222/17		
No. of samples received	: 2		
No. of samples analysed	: 2		



This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW



General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high

Key :
 Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
 CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
 LOR = Limit of reporting
 RPD = Relative Percentage Difference
 # = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates 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%.

Sub-Matrix: SOIL

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 1420339)									
ES1804116-066	Anonymous	EA055: Moisture Content	----	1	%	19.2	19.0	1.09	0% - 50%
EW1800504-004	Anonymous	EA055: Moisture Content	----	1	%	9.8	10.9	10.5	0% - 50%
EG005T: Total Metals by ICP-AES (QC Lot: 1420555)									
ES1803983-003	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	10	10	0.00	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	4	5	20.7	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	41	38	6.17	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	25	25	0.00	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	30	33	9.79	No Limit
ES1804146-002	SS2	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	11	12	0.00	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	4	4	0.00	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	26	27	5.43	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	34	38	9.82	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	210	216	2.88	0% - 20%
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 1420556)									
ES1803983-003	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
ES1804146-002	SS2	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EP066: Polychlorinated Biphenyls (PCB) (QC Lot: 1419131)									
ES1804146-001	SS1	EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EP068A: Organochlorine Pesticides (OC) (QC Lot: 1419130)									
ES1804146-001	SS1	EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP068A: Organochlorine Pesticides (OC) (QC Lot: 1419130) - continued									
ES1804146-001	SS1	EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4,4'-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4,4'-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
EP068: 4,4'-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	0.00	No Limit		
EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	0.00	No Limit		
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 1419129)									
ES1804146-001	SS1	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(k)fluoranthene	205-82-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)	
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 1419129) - continued										
ES1804146-001	SS1	EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1419128)										
ES1804146-001	SS1	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit	
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit	
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit	
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1419147)										
ES1803738-002	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit	
ES1804078-001	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 1419128)										
ES1804146-001	SS1	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit	
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit	
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 1419147)										
ES1803738-002	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit	
ES1804078-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit	
EP080: BTEXN (QC Lot: 1419147)										
ES1803738-002	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit	
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
			106-42-3							
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
ES1804078-001	Anonymous	EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit	
		EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit	
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
			106-42-3							
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit			



Method Blank (MB) and Laboratory Control Spike (LCS) Report

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 parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Spike (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
EG005T: Total Metals by ICP-AES (QCLot: 1420555)									
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	94.8	86	126	
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	97.6	83	113	
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	98.0	76	128	
EG005T: Copper	7440-50-8	5	mg/kg	<5	32 mg/kg	98.4	86	120	
EG005T: Lead	7439-92-1	5	mg/kg	<5	40 mg/kg	96.4	80	114	
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55 mg/kg	103	87	123	
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	107	80	122	
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1420556)									
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	72.4	70	105	
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 1419131)									
EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	1 mg/kg	88.0	62	126	
EP068A: Organochlorine Pesticides (OC) (QCLot: 1419130)									
EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	0.5 mg/kg	97.2	69	113	
EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	0.5 mg/kg	93.1	65	117	
EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	0.5 mg/kg	98.3	67	119	
EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	0.5 mg/kg	95.8	68	116	
EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	96.8	65	117	
EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	0.5 mg/kg	95.0	67	115	
EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	0.5 mg/kg	96.6	69	115	
EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	0.5 mg/kg	96.3	62	118	
EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	0.5 mg/kg	98.6	63	117	
EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	0.5 mg/kg	101	66	116	
EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	0.5 mg/kg	97.4	64	116	
EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	0.5 mg/kg	98.5	66	116	
EP068: 4,4'-DDE	72-55-9	0.05	mg/kg	<0.05	0.5 mg/kg	87.3	67	115	
EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	0.5 mg/kg	95.9	67	123	
EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	0.5 mg/kg	96.2	69	115	
EP068: 4,4'-DDD	72-54-8	0.05	mg/kg	<0.05	0.5 mg/kg	103	69	121	
EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	0.5 mg/kg	81.4	56	120	
EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	0.5 mg/kg	84.2	62	124	
EP068: 4,4'-DDT	50-29-3	0.2	mg/kg	<0.2	0.5 mg/kg	87.8	66	120	
EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	0.5 mg/kg	89.2	64	122	
EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	0.5 mg/kg	86.4	54	130	
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1419129)									



Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1419129) - continued									
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	6 mg/kg	97.2	77	125	
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	6 mg/kg	94.9	72	124	
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	6 mg/kg	96.0	73	127	
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	6 mg/kg	95.9	72	126	
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	6 mg/kg	98.0	75	127	
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	6 mg/kg	103	77	127	
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	6 mg/kg	97.4	73	127	
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	6 mg/kg	97.7	74	128	
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	6 mg/kg	89.8	69	123	
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	6 mg/kg	90.8	75	127	
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	6 mg/kg	82.6	68	116	
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	6 mg/kg	95.8	74	126	
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	6 mg/kg	90.3	70	126	
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	6 mg/kg	81.1	61	121	
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	6 mg/kg	77.6	62	118	
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	6 mg/kg	81.4	63	121	
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1419128)									
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	200 mg/kg	103	75	129	
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	300 mg/kg	109	77	131	
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	200 mg/kg	104	71	129	
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1419147)									
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	124	68	128	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1419128)									
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	250 mg/kg	108	77	125	
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	350 mg/kg	102	74	138	
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	150 mg/kg	97.0	63	131	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1419147)									
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	124	68	128	
EP080: BTEXN (QCLot: 1419147)									
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	113	62	116	
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	121	67	121	
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	117	65	117	
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	115	66	118	
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	118	68	120	
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	119	63	119	



Matrix Spike (MS) Report

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 parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report			
				Spike Concentration	Spike Recovery(%) MS	Recovery Limits (%)	
						Low	High
EG005T: Total Metals by ICP-AES (QCLot: 1420555)							
ES1803983-003	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	98.2	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	99.8	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	100.0	70	130
		EG005T: Copper	7440-50-8	250 mg/kg	96.9	70	130
		EG005T: Lead	7439-92-1	250 mg/kg	99.5	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	100	70	130
		EG005T: Zinc	7440-66-6	250 mg/kg	99.9	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1420556)							
ES1803983-003	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	107	70	130
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 1419131)							
ES1804146-001	SS1	EP066: Total Polychlorinated biphenyls	----	1 mg/kg	80.0	70	130
EP068A: Organochlorine Pesticides (OC) (QCLot: 1419130)							
ES1804146-001	SS1	EP068: gamma-BHC	58-89-9	0.5 mg/kg	95.8	70	130
		EP068: Heptachlor	76-44-8	0.5 mg/kg	92.5	70	130
		EP068: Aldrin	309-00-2	0.5 mg/kg	93.1	70	130
		EP068: Dieldrin	60-57-1	0.5 mg/kg	93.8	70	130
		EP068: Endrin	72-20-8	2 mg/kg	93.8	70	130
		EP068: 4,4'-DDT	50-29-3	2 mg/kg	86.0	70	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1419129)							
ES1804146-001	SS1	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	99.5	70	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	96.2	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1419128)							
ES1804146-001	SS1	EP071: C10 - C14 Fraction	----	523 mg/kg	109	73	137
		EP071: C15 - C28 Fraction	----	2319 mg/kg	126	53	131
		EP071: C29 - C36 Fraction	----	1714 mg/kg	131	52	132
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1419147)							
ES1803738-002	Anonymous	EP080: C6 - C9 Fraction	----	32.5 mg/kg	97.1	70	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1419128)							
ES1804146-001	SS1	EP071: >C10 - C16 Fraction	----	860 mg/kg	100	73	137
		EP071: >C16 - C34 Fraction	----	3223 mg/kg	122	53	131
		EP071: >C34 - C40 Fraction	----	1058 mg/kg	110	52	132
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1419147)							



Sub-Matrix: **SOIL**

				<i>Matrix Spike (MS) Report</i>				
				<i>Spike</i>	<i>SpikeRecovery(%)</i>	<i>Recovery Limits (%)</i>		
<i>Laboratory sample ID</i>	<i>Client sample ID</i>	<i>Method: Compound</i>	<i>CAS Number</i>	<i>Concentration</i>	<i>MS</i>	<i>Low</i>	<i>High</i>	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1419147) - continued								
ES1803738-002	Anonymous	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	97.5	70	130	
EP080: BTEXN (QCLot: 1419147)								
ES1803738-002	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	91.9	70	130	
		EP080: Toluene	108-88-3	2.5 mg/kg	92.8	70	130	
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	93.6	70	130	
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	94.8	70	130	
			106-42-3					
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	98.1	70	130	
	EP080: Naphthalene	91-20-3	2.5 mg/kg	97.4	70	130		

CERTIFICATE OF ANALYSIS

Work Order : **ES1804146**
Client : **BENVIRON GROUP**
Contact : **MR MICHAEL SILK**
Address : **PO BOX 4405**
EAST GOSFORD NSW 2250
Telephone : **+61 02 0466 385 221**
Project : **E1292-2 Austral**
Order number : **----**
C-O-C number : **----**
Sampler : **----**
Site : **----**
Quote number : **EN/222/17**
No. of samples received : **2**
No. of samples analysed : **2**

Page : 1 of 7
Laboratory : Environmental Division Sydney
Contact : Customer Services ES
Address : 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone : +61-2-8784 8555
Date Samples Received : 07-Feb-2018 02:00
Date Analysis Commenced : 08-Feb-2018
Issue Date : 09-Feb-2018 15:59



Accreditation No. 825
 Accredited for compliance with
 ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW



General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP068: Positive results have been confirmed by re-extraction and re-analysis.
- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero, for 'TEQ 1/2LOR' are treated as half the reported LOR, and for 'TEQ LOR' are treated as being equal to the reported LOR.
Note: TEQ 1/2LOR and TEQ LOR will calculate as 0.6mg/Kg and 1.2mg/Kg respectively for samples with non-detects for all of the eight TEQ PAHs.



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID			SS1	SS2	----	----	----
Client sampling date / time				06-Feb-2018 00:00	06-Feb-2018 00:00	----	----	----	----	----	
Compound	CAS Number	LOR	Unit	ES1804146-001	ES1804146-002	-----	-----	-----	-----	-----	
				Result	Result	----	----	----	----	----	
EA055: Moisture Content (Dried @ 105-110°C)											
Moisture Content	----	1.0	%	10.1	4.8	----	----	----	----	----	
EG005T: Total Metals by ICP-AES											
Arsenic	7440-38-2	5	mg/kg	7	<5	----	----	----	----	----	
Cadmium	7440-43-9	1	mg/kg	<1	<1	----	----	----	----	----	
Chromium	7440-47-3	2	mg/kg	20	11	----	----	----	----	----	
Copper	7440-50-8	5	mg/kg	14	26	----	----	----	----	----	
Lead	7439-92-1	5	mg/kg	23	34	----	----	----	----	----	
Nickel	7440-02-0	2	mg/kg	8	4	----	----	----	----	----	
Zinc	7440-66-6	5	mg/kg	40	210	----	----	----	----	----	
EG035T: Total Recoverable Mercury by FIMS											
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	----	----	----	----	----	
EP066: Polychlorinated Biphenyls (PCB)											
Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	----	----	----	----	----	
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	----	----	----	----	----	
^ Total Chlordane (sum)	----	0.05	mg/kg	<0.05	0.07	----	----	----	----	----	
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	0.07	----	----	----	----	----	
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	0.75	----	----	----	----	----	
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	----	----	----	----	----	
^ Endosulfan (sum)	115-29-7	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	----	----	----	----	----	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID				
Client sampling date / time				SS1	SS2	----	----	----
Compound				ES1804146-001	ES1804146-002	-----	-----	-----
CAS Number	LOR	Unit	Result	Result	----	----	----	
EP068A: Organochlorine Pesticides (OC) - Continued								
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	----	----	----
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg	<0.05	0.75	----	----	----
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/5 0-2	0.05	mg/kg	<0.05	<0.05	----	----	----
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+j)fluoranthene	205-99-2 205-82-3	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	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	----	----	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	0.6	0.6	----	----	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	1.2	1.2	----	----	----
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	----	----	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SS1	SS2	----	----	----
Client sampling date / time				06-Feb-2018 00:00	06-Feb-2018 00:00	----	----	----	
Compound	CAS Number	LOR	Unit	ES1804146-001	ES1804146-002	-----	-----	-----	
				Result	Result	----	----	----	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued									
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	----	----	----	
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	----	----	----	
>C10 - C16 Fraction	----	50	mg/kg	<50	<50	----	----	----	
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	----	----	----	
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	----	----	----	
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	----	----	----	
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	<50	----	----	----	
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	----	----	----	
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	----	----	----	
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	----	----	----	
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	----	----	----	
^ Total Xylenes	----	0.5	mg/kg	<0.5	<0.5	----	----	----	
Naphthalene	91-20-3	1	mg/kg	<1	<1	----	----	----	
EP066S: PCB Surrogate									
Decachlorobiphenyl	2051-24-3	0.1	%	90.1	94.6	----	----	----	
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%	67.9	99.8	----	----	----	
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%	86.1	101	----	----	----	
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%	72.5	71.6	----	----	----	
2-Chlorophenol-D4	93951-73-6	0.5	%	72.6	72.4	----	----	----	
2,4,6-Tribromophenol	118-79-6	0.5	%	65.0	64.4	----	----	----	
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%	78.6	77.8	----	----	----	
Anthracene-d10	1719-06-8	0.5	%	77.3	76.0	----	----	----	
4-Terphenyl-d14	1718-51-0	0.5	%	73.4	72.1	----	----	----	
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.2	%	108	114	----	----	----	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SS1	SS2	----	----	----
Client sampling date / time				06-Feb-2018 00:00	06-Feb-2018 00:00	----	----	----	
Compound	CAS Number	LOR	Unit	ES1804146-001	ES1804146-002	-----	-----	-----	
				Result	Result	----	----	----	
EP080S: TPH(V)/BTEX Surrogates - Continued									
Toluene-D8	2037-26-5	0.2	%	99.0	105	----	----	----	
4-Bromofluorobenzene	460-00-4	0.2	%	100	99.0	----	----	----	



Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP066S: PCB Surrogate			
Decachlorobiphenyl	2051-24-3	39	149
EP068S: Organochlorine Pesticide Surrogate			
Dibromo-DDE	21655-73-2	49	147
EP068T: Organophosphorus Pesticide Surrogate			
DEF	78-48-8	35	143
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	63	123
2-Chlorophenol-D4	93951-73-6	66	122
2,4,6-Tribromophenol	118-79-6	40	138
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	70	122
Anthracene-d10	1719-06-8	66	128
4-Terphenyl-d14	1718-51-0	65	129
EP080S: TPH(V)/BTEX Surrogates			
1,2-Dichloroethane-D4	17060-07-0	73	133
Toluene-D8	2037-26-5	74	132
4-Bromofluorobenzene	460-00-4	72	130

SAMPLE RECEIPT ADVICE

Client Details

Client	Benviron Group
Attention	Michael Silk

Sample Login Details

Your reference	E1292-2, Austral
Envirolab Reference	184736
Date Sample Received	07/02/2018
Date Instructions Received	07/02/2018
Date Results Expected to be Reported	09/02/2018

Sample Condition

Samples received in appropriate condition for analysis	YES
No. of Samples Provided	36 soil
Turnaround Time Requested	2 days
Temperature on Receipt (°C)	16.0
Cooling Method	Ice
Sampling Date Provided	YES

Comments

CLAY DUE 12/02

Please direct any queries to:

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Jacinta Hurst

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Analysis Underway, details on the following page:



Sample ID	VTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Organochlorine Pesticides in soil	PCBs in Soil	Acid Extractable metals in soil	Asbestos ID - soils NEPM - ASB-001	pH1:5 soil:water	Clay 50-120g	CEC	Asbestos ID - materials
BH1-0-0.2	✓	✓	✓	✓	✓	✓	✓				
BH1-0.4-0.5	✓	✓	✓	✓	✓	✓					
BH1-0.1											✓
BH2-0.1-0.2	✓	✓	✓	✓	✓	✓		✓	✓	✓	
BH2-0.4-0.5	✓	✓	✓	✓	✓	✓		✓	✓	✓	
BH3-0.0-0.2	✓	✓	✓	✓	✓	✓	✓				
BH3-0.3-0.4	✓	✓	✓	✓	✓	✓					
BH4-0-0.1	✓	✓	✓	✓	✓	✓	✓				
BH4-0-0.1											✓
BH5-0.1-0.2	✓	✓	✓	✓	✓	✓					
BH6-0-0.1	✓	✓	✓	✓	✓	✓					
BH7-0.2-0.3	✓	✓	✓	✓	✓	✓					
BH8-0.1-0.2	✓	✓	✓	✓	✓	✓					
BH9-0-0.1	✓	✓	✓	✓	✓	✓					
BH10-0-0.1	✓	✓	✓	✓	✓	✓					
BH11-0-0.1	✓	✓	✓	✓	✓	✓	✓				
BH11-0.3-0.4	✓	✓	✓	✓	✓	✓					
BH12-0-0.2	✓	✓	✓	✓	✓	✓					
BH13-0.2-0.3	✓	✓	✓	✓	✓	✓					
BH14-0-0.2	✓	✓	✓	✓	✓	✓					
BH15-0.1-0.2	✓	✓	✓	✓	✓	✓		✓	✓	✓	
BH15-0.3-0.4	✓	✓	✓	✓	✓	✓		✓	✓	✓	
BH16-0-0.1	✓	✓	✓	✓	✓	✓					
BH17-0-0.1	✓	✓	✓	✓	✓	✓					
BH17-0.2-0.3	✓	✓	✓	✓	✓	✓					
BH18-0-0.2	✓	✓	✓	✓	✓	✓					
BH19-0-0.2	✓	✓	✓	✓	✓	✓					
BH20-0.1-0.3	✓	✓	✓	✓	✓	✓					
BH21-0-0.1	✓	✓	✓	✓	✓	✓					
BH22-0-0.1	✓	✓	✓	✓	✓	✓					
BH23-0-0.2	✓	✓	✓	✓	✓	✓	✓				
BH23-0.3-0.4	✓	✓	✓	✓	✓	✓					



Sample ID	VTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Organochlorine Pesticides in soil	PCBs in Soil	Acid Extractable metals in soil	Asbestos ID - soils NEPM - ASB-001	pH1:5 soil:water	Clay 50-120g	CEC	Asbestos ID - materials
D1-0.2-0.3	✓	✓	✓	✓	✓	✓					
D2-0-0.1	✓	✓	✓	✓	✓	✓					
TB1	✓										
TS1	✓										

The '✓' indicates the testing you have requested. **THIS IS NOT A REPORT OF THE RESULTS.**

Additional Info

Sample storage - Waters are routinely disposed of approximately 1 month and soils approximately 2 months from receipt.

Requests for longer term sample storage must be received in writing.



EnviroLab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

Job No: 188736



Chain of Custody Record

Date Received: 7/2/18
Time Received: 17:30
Received by: MT 160

Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

Project #: E1292-2

Project Name: Austral

Quote #:

Turnaround time: Fast - 2 days

Project Manager: Michael Silk

Sampled By: RL

Purchase Order #: N/A

Page #: 1 of 2

Benviron Group
PO Box 4405, East Gosford NSW 2250
email: ben@benvirongroup.com.au
michael@benvirongroup.com.au; ray@benvirongroup.com.au
ph: +61466 385 221

EnviroLab Pty Ltd
12 Ashley Street, Chatswood NSW 2067
email: ahie@envirolab.com.au
ph: +612 9910 6200

#	Sample ID	Depth	Date Sampled	Matrix	Analytes										Sample Comments			
					ph	CEC	%CLAY	Heavy Metals (8)	TRH	BTEXN	PAH	OC	PCB	Asbestos ID		Asbestos %w/w (NEPM /WA)	TRH C6-C10 & BTEXN	
1	BH1	0-0.2	06.02.2018	Soil				X	X	X	X	X	X	X	X		EnviroLab Suites	Keep
2	BH1	0.4-0.5	06.02.2018	Soil			X	X	X	X	X	X	X	X	X		Combo 5a	Keep
3	BH1	0.1	06.02.2018	Fragments										X			Combo 5	Keep
4	BH2	0.1-0.2	06.02.2018	Soil	X	X	X	X	X	X	X	X	X	X	X		Combo 5	Keep
5	BH2	0.4-0.5	06.02.2018	Soil	X	X	X	X	X	X	X	X	X	X	X		Combo 5	Keep
6	BH3	0-0.2	06.02.2018	Soil				X	X	X	X	X	X	X	X		Combo 5a	Keep
7	BH3	0.3-0.4	06.02.2018	Soil				X	X	X	X	X	X	X	X		Combo 5	Keep
8	BH4	0-0.1	06.02.2018	Soil										X			Combo 5a	Keep
9	BH4	0-0.1	06.02.2018	Fragments													Combo 5	Keep
10	BH5	0.1-0.2	06.02.2018	Soil				X	X	X	X	X	X	X	X		Combo 5	Keep
11	BH6	0-0.1	06.02.2018	Soil				X	X	X	X	X	X	X	X		Combo 5	Keep
12	BH7	0.2-0.4	06.02.2018	Soil				X	X	X	X	X	X	X	X		Combo 5	Keep
13	BH8	0.1-0.2	06.02.2018	Soil				X	X	X	X	X	X	X	X		Combo 5	Keep
14	BH9	0-0.1	06.02.2018	Soil				X	X	X	X	X	X	X	X		Combo 5	Keep
15	BH10	0-0.1	06.02.2018	Soil				X	X	X	X	X	X	X	X		Combo 5	Keep
16	BH11	0-0.1	06.02.2018	Soil				X	X	X	X	X	X	X	X		Combo 5	Keep
17	BH11	0.3-0.4	06.02.2018	Soil				X	X	X	X	X	X	X	X		Combo 5a	Keep
18	BH12	0-0.2	06.02.2018	Soil				X	X	X	X	X	X	X	X		Combo 5	Keep
19	BH13	0.2-0.3	06.02.2018	Soil				X	X	X	X	X	X	X	X		Combo 5	Keep

Special Directions and Comments: 7.5% discount

Relinquished by	Ray Liu	Received By	MT	Method of shipment	Courier
Signature	<i>Ray Liu</i>	Signature	<i>MT</i>		
Date	07.02.2018	Date	7/2/18 17:30		



Chain of Custody Record

Client Details: Benviron Group PO Box 4405, East Gosford NSW 2250 email: ben@benvirongroup.com.au michael@benvirongroup.com.au; ray@benvirongroup.com.au ph: +61466 385 221	Project Manager: Michael Silk Sampled By: RL Purchase Order #: N/A Page #: 2 of 2	Project #: E1292-2 Project Name: Austral Quote #: Turnaround time: Fast - 2 days
Delivery Details: Envirolab Pty Ltd 12 Ashley Street, Chatswood NSW 2067 email: ahie@envirolab.com.au ph: +612 9910 6200		

#	Sample ID	Depth	Date Sampled	Matrix	Analytes											Sample Comments			
					ph	CEC	%CLAY	Heavy Metals (8)	TRH	BTEXN	PAH	OC	PCB	Asbestos ID	Asbestos %w/w (NEPM /WA)		TRH C6-C10 & BTEXN		
20	BH14	0-0.2	06.02.2018	Soil				X	X	X	X	X	X	X			Envirolab Suites	Combo 5	Keep
21	BH15	0.1-0.2	06.02.2018	Soil	X	X	X	X	X	X	X	X	X	X				Combo 5	Keep
22	BH15	0.3-0.4	06.02.2018	Soil	X	X	X	X	X	X	X	X	X	X				Combo 5	Keep
23	BH16	0-0.1	06.02.2018	Soil				X	X	X	X	X	X	X				Combo 5	Keep
24	BH17	0-0.1	06.02.2018	Soil				X	X	X	X	X	X	X				Combo 5	Keep
25	BH17	0.2-0.3	06.02.2018	Soil				X	X	X	X	X	X	X				Combo 5	Keep
26	BH18	0-0.2	06.02.2018	Soil				X	X	X	X	X	X	X				Combo 5	Keep
27	BH19	0-0.2	06.02.2018	Soil				X	X	X	X	X	X	X				Combo 5	Keep
28	BH20	0.1-0.3	06.02.2018	Soil				X	X	X	X	X	X	X				Combo 5	Keep
29	BH21	0-0.1	06.02.2018	Soil				X	X	X	X	X	X	X				Combo 5	Keep
30	BH22	0-0.1	06.02.2018	Soil				X	X	X	X	X	X	X				Combo 5	Keep
31	BH23	0-0.2	06.02.2018	Soil				X	X	X	X	X	X	X				Combo 5	Keep
32	BH23	0.3-0.4	06.02.2018	Soil				X	X	X	X	X	X	X				Combo 5a	Keep
33	D1	0.2-0.3	06.02.2018	Soil				X	X	X	X	X	X	X				Combo 5	Keep
34	D2	0-0.1	06.02.2018	Soil				X	X	X	X	X	X	X				Combo 5	Keep
35	TB1	-	06.02.2018	Soil				X	X	X	X	X	X	X				Combo 5	Keep
36	TS1	-	06.02.2018	Soil				X	X	X	X	X	X	X				Combo 5	Keep

Special Directions and Comments: 7.5% discount			
Relinquished by	Ray Liu	Received By	M7 ECU
Signature	<i>Ray Liu</i>	Signature	<i>M7 ECU</i>
Date	07.02.2018	Date	7/2/18 17:20
			Method of shipment Courier



CERTIFICATE OF ANALYSIS 184736

Client Details

Client	Benviron Group
Attention	Michael Silk
Address	PO Box 4405, East Gosford, NSW, 2250

Sample Details

Your Reference	<u>E1292-2, Austral</u>
Number of Samples	36 soil
Date samples received	07/02/2018
Date completed instructions received	07/02/2018

Analysis Details

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

Report Details

Date results requested by	13/02/2018
Date of Issue	13/02/2018
NATA Accreditation Number 2901. This document shall not be reproduced except in full.	
Accredited for compliance with ISO/IEC 17025 - Testing. Tests not covered by NATA are denoted with *	

Asbestos Approved By

Analysed by Asbestos Approved Identifier: Lulu Scott, Lucy Zhu
 Authorised by Asbestos Approved Signatory: Lulu Scott

Results Approved By

Long Pham, Team Leader, Metals
 Lulu Scott, Asbestos Supervisor
 Nick Sarlamis, Inorganics Supervisor
 Paul Ching, Senior Analyst
 Steven Luong, Senior Chemist

Authorised By



David Springer, General Manager

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		184736-1	184736-2	184736-4	184736-5	184736-6
Your Reference	UNITS	BH1	BH1	BH2	BH2	BH3
Depth		0-0.2	0.4-0.5	0.1-0.2	0.4-0.5	0.0-0.2
Date Sampled		06/02/2018	06/02/2018	06/02/2018	06/02/2018	06/02/2018
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	08/02/2018	08/02/2018	08/02/2018	08/02/2018	08/02/2018
Date analysed	-	08/02/2018	08/02/2018	08/02/2018	08/02/2018	08/02/2018
TRH C ₆ - C ₉	mg/kg	<25	<25	<25	<25	<25
TRH C ₆ - C ₁₀	mg/kg	<25	<25	<25	<25	<25
vTPH C ₆ - C ₁₀ less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	110	108	110	108	108

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		184736-7	184736-8	184736-10	184736-11	184736-12
Your Reference	UNITS	BH3	BH4	BH5	BH6	BH7
Depth		0.3-0.4	0-0.1	0.1-0.2	0-0.1	0.2-0.3
Date Sampled		06/02/2018	06/02/2018	06/02/2018	06/02/2018	06/02/2018
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	08/02/2018	08/02/2018	08/02/2018	08/02/2018	08/02/2018
Date analysed	-	08/02/2018	08/02/2018	08/02/2018	08/02/2018	08/02/2018
TRH C ₆ - C ₉	mg/kg	<25	<25	<25	<25	<25
TRH C ₆ - C ₁₀	mg/kg	<25	<25	<25	<25	<25
vTPH C ₆ - C ₁₀ less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	107	107	114	103	111

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		184736-13	184736-14	184736-15	184736-16	184736-17
Your Reference	UNITS	BH8	BH9	BH10	BH11	BH11
Depth		0.1-0.2	0-0.1	0-0.1	0-0.1	0.3-0.4
Date Sampled		06/02/2018	06/02/2018	06/02/2018	06/02/2018	06/02/2018
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	08/02/2018	08/02/2018	08/02/2018	08/02/2018	08/02/2018
Date analysed	-	08/02/2018	08/02/2018	08/02/2018	08/02/2018	08/02/2018
TRH C ₆ - C ₉	mg/kg	<25	<25	<25	<25	<25
TRH C ₆ - C ₁₀	mg/kg	<25	<25	<25	<25	<25
vTPH C ₆ - C ₁₀ less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	106	106	106	102	102

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		184736-18	184736-19	184736-20	184736-21	184736-22
Your Reference	UNITS	BH12	BH13	BH14	BH15	BH15
Depth		0-0.2	0.2-0.3	0-0.2	0.1-0.2	0.3-0.4
Date Sampled		06/02/2018	06/02/2018	06/02/2018	06/02/2018	06/02/2018
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	08/02/2018	08/02/2018	08/02/2018	08/02/2018	08/02/2018
Date analysed	-	08/02/2018	08/02/2018	08/02/2018	08/02/2018	08/02/2018
TRH C ₆ - C ₉	mg/kg	<25	<25	<25	<25	<25
TRH C ₆ - C ₁₀	mg/kg	<25	<25	<25	<25	<25
vTPH C ₆ - C ₁₀ less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	109	107	106	107	101

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		184736-23	184736-24	184736-25	184736-26	184736-27
Your Reference	UNITS	BH16	BH17	BH17	BH18	BH19
Depth		0-0.1	0-0.1	0.2-0.3	0-0.2	0-0.2
Date Sampled		06/02/2018	06/02/2018	06/02/2018	06/02/2018	06/02/2018
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	08/02/2018	08/02/2018	08/02/2018	08/02/2018	08/02/2018
Date analysed	-	08/02/2018	08/02/2018	08/02/2018	08/02/2018	08/02/2018
TRH C ₆ - C ₉	mg/kg	<25	<25	<25	<25	<25
TRH C ₆ - C ₁₀	mg/kg	<25	<25	<25	<25	<25
vTPH C ₆ - C ₁₀ less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	112	104	112	105	106

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		184736-28	184736-29	184736-30	184736-31	184736-32
Your Reference	UNITS	BH20	BH21	BH22	BH23	BH23
Depth		0.1-0.3	0-0.1	0-0.1	0-0.2	0.3-0.4
Date Sampled		06/02/2018	06/02/2018	06/02/2018	06/02/2018	06/02/2018
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	08/02/2018	08/02/2018	08/02/2018	08/02/2018	08/02/2018
Date analysed	-	08/02/2018	08/02/2018	08/02/2018	08/02/2018	08/02/2018
TRH C ₆ - C ₉	mg/kg	<25	<25	<25	<25	<25
TRH C ₆ - C ₁₀	mg/kg	<25	<25	<25	<25	<25
vTPH C ₆ - C ₁₀ less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	104	103	107	103	104

vTRH(C6-C10)/BTEXN in Soil					
Our Reference		184736-33	184736-34	184736-35	184736-36
Your Reference	UNITS	D1	D2	TB1	TS1
Depth		0.2-0.3	0-0.1	-	-
Date Sampled		06/02/2018	06/02/2018	06/02/2018	06/02/2018
Type of sample		soil	soil	soil	soil
Date extracted	-	08/02/2018	08/02/2018	08/02/2018	08/02/2018
Date analysed	-	08/02/2018	08/02/2018	08/02/2018	08/02/2018
TRH C ₆ - C ₉	mg/kg	<25	<25	<25	[NA]
TRH C ₆ - C ₁₀	mg/kg	<25	<25	<25	[NA]
vTPH C ₆ - C ₁₀ less BTEX (F1)	mg/kg	<25	<25	<25	[NA]
Benzene	mg/kg	<0.2	<0.2	<0.2	118%
Toluene	mg/kg	<0.5	<0.5	<0.5	125%
Ethylbenzene	mg/kg	<1	<1	<1	130%
m+p-xylene	mg/kg	<2	<2	<2	131%
o-Xylene	mg/kg	<1	<1	<1	130%
naphthalene	mg/kg	<1	<1	<1	[NA]
Total +ve Xylenes	mg/kg	<1	<1	<1	[NA]
Surrogate aaa-Trifluorotoluene	%	106	111	101	101

svTRH (C10-C40) in Soil						
Our Reference		184736-1	184736-2	184736-4	184736-5	184736-6
Your Reference	UNITS	BH1	BH1	BH2	BH2	BH3
Depth		0-0.2	0.4-0.5	0.1-0.2	0.4-0.5	0.0-0.2
Date Sampled		06/02/2018	06/02/2018	06/02/2018	06/02/2018	06/02/2018
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	08/02/2018	08/02/2018	08/02/2018	08/02/2018	08/02/2018
Date analysed	-	08/02/2018	08/02/2018	08/02/2018	08/02/2018	08/02/2018
TRH C ₁₀ - C ₁₄	mg/kg	<50	<50	<50	<50	<50
TRH C ₁₅ - C ₂₈	mg/kg	<100	<100	<100	<100	<100
TRH C ₂₉ - C ₃₆	mg/kg	<100	<100	120	<100	140
TRH >C ₁₀ -C ₁₆	mg/kg	<50	<50	<50	<50	<50
TRH >C ₁₀ - C ₁₆ less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C ₁₆ -C ₃₄	mg/kg	<100	<100	130	<100	140
TRH >C ₃₄ -C ₄₀	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	130	<50	140
Surrogate o-Terphenyl	%	92	88	92	87	92

svTRH (C10-C40) in Soil						
Our Reference		184736-7	184736-8	184736-10	184736-11	184736-12
Your Reference	UNITS	BH3	BH4	BH5	BH6	BH7
Depth		0.3-0.4	0-0.1	0.1-0.2	0-0.1	0.2-0.3
Date Sampled		06/02/2018	06/02/2018	06/02/2018	06/02/2018	06/02/2018
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	08/02/2018	08/02/2018	08/02/2018	08/02/2018	08/02/2018
Date analysed	-	08/02/2018	08/02/2018	08/02/2018	08/02/2018	08/02/2018
TRH C ₁₀ - C ₁₄	mg/kg	<50	<50	<50	<50	<50
TRH C ₁₅ - C ₂₈	mg/kg	<100	<100	<100	<100	<100
TRH C ₂₉ - C ₃₆	mg/kg	<100	<100	<100	<100	<100
TRH >C ₁₀ -C ₁₆	mg/kg	<50	<50	<50	<50	<50
TRH >C ₁₀ - C ₁₆ less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C ₁₆ -C ₃₄	mg/kg	<100	<100	<100	<100	<100
TRH >C ₃₄ -C ₄₀	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	88	89	88	88	87

svTRH (C10-C40) in Soil						
Our Reference		184736-13	184736-14	184736-15	184736-16	184736-17
Your Reference	UNITS	BH8	BH9	BH10	BH11	BH11
Depth		0.1-0.2	0-0.1	0-0.1	0-0.1	0.3-0.4
Date Sampled		06/02/2018	06/02/2018	06/02/2018	06/02/2018	06/02/2018
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	08/02/2018	08/02/2018	08/02/2018	08/02/2018	08/02/2018
Date analysed	-	08/02/2018	08/02/2018	08/02/2018	08/02/2018	08/02/2018
TRH C ₁₀ - C ₁₄	mg/kg	<50	<50	<50	<50	<50
TRH C ₁₅ - C ₂₈	mg/kg	<100	<100	<100	<100	<100
TRH C ₂₉ - C ₃₆	mg/kg	<100	<100	<100	<100	<100
TRH >C ₁₀ -C ₁₆	mg/kg	<50	<50	<50	<50	<50
TRH >C ₁₀ - C ₁₆ less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C ₁₆ -C ₃₄	mg/kg	<100	<100	<100	<100	<100
TRH >C ₃₄ -C ₄₀	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	88	89	89	86	86

svTRH (C10-C40) in Soil						
Our Reference		184736-18	184736-19	184736-20	184736-21	184736-22
Your Reference	UNITS	BH12	BH13	BH14	BH15	BH15
Depth		0-0.2	0.2-0.3	0-0.2	0.1-0.2	0.3-0.4
Date Sampled		06/02/2018	06/02/2018	06/02/2018	06/02/2018	06/02/2018
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	08/02/2018	08/02/2018	08/02/2018	08/02/2018	08/02/2018
Date analysed	-	08/02/2018	09/02/2018	09/02/2018	09/02/2018	09/02/2018
TRH C ₁₀ - C ₁₄	mg/kg	<50	<50	<50	<50	<50
TRH C ₁₅ - C ₂₈	mg/kg	<100	<100	<100	<100	<100
TRH C ₂₉ - C ₃₆	mg/kg	150	110	<100	<100	<100
TRH >C ₁₀ -C ₁₆	mg/kg	<50	<50	<50	<50	<50
TRH >C ₁₀ - C ₁₆ less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C ₁₆ -C ₃₄	mg/kg	140	<100	<100	<100	<100
TRH >C ₃₄ -C ₄₀	mg/kg	<100	150	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	140	150	<50	<50	<50
Surrogate o-Terphenyl	%	90	87	91	88	88

svTRH (C10-C40) in Soil						
Our Reference		184736-23	184736-24	184736-25	184736-26	184736-27
Your Reference	UNITS	BH16	BH17	BH17	BH18	BH19
Depth		0-0.1	0-0.1	0.2-0.3	0-0.2	0-0.2
Date Sampled		06/02/2018	06/02/2018	06/02/2018	06/02/2018	06/02/2018
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	08/02/2018	08/02/2018	08/02/2018	08/02/2018	08/02/2018
Date analysed	-	09/02/2018	09/02/2018	09/02/2018	09/02/2018	09/02/2018
TRH C ₁₀ - C ₁₄	mg/kg	<50	<50	<50	<50	<50
TRH C ₁₅ - C ₂₈	mg/kg	<100	<100	<100	<100	<100
TRH C ₂₉ - C ₃₆	mg/kg	<100	<100	<100	<100	<100
TRH >C ₁₀ -C ₁₆	mg/kg	<50	<50	<50	<50	<50
TRH >C ₁₀ - C ₁₆ less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C ₁₆ -C ₃₄	mg/kg	<100	<100	<100	<100	<100
TRH >C ₃₄ -C ₄₀	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	90	90	89	91	89

svTRH (C10-C40) in Soil						
Our Reference		184736-28	184736-29	184736-30	184736-31	184736-32
Your Reference	UNITS	BH20	BH21	BH22	BH23	BH23
Depth		0.1-0.3	0-0.1	0-0.1	0-0.2	0.3-0.4
Date Sampled		06/02/2018	06/02/2018	06/02/2018	06/02/2018	06/02/2018
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	08/02/2018	08/02/2018	08/02/2018	08/02/2018	08/02/2018
Date analysed	-	09/02/2018	09/02/2018	09/02/2018	09/02/2018	09/02/2018
TRH C ₁₀ - C ₁₄	mg/kg	<50	<50	<50	<50	<50
TRH C ₁₅ - C ₂₈	mg/kg	<100	<100	<100	<100	<100
TRH C ₂₉ - C ₃₆	mg/kg	<100	<100	140	<100	<100
TRH >C ₁₀ -C ₁₆	mg/kg	<50	<50	<50	<50	<50
TRH >C ₁₀ - C ₁₆ less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C ₁₆ -C ₃₄	mg/kg	<100	<100	130	<100	<100
TRH >C ₃₄ -C ₄₀	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	130	<50	<50
Surrogate o-Terphenyl	%	89	87	90	89	87

svTRH (C10-C40) in Soil			
Our Reference		184736-33	184736-34
Your Reference	UNITS	D1	D2
Depth		0.2-0.3	0-0.1
Date Sampled		06/02/2018	06/02/2018
Type of sample		soil	soil
Date extracted	-	08/02/2018	08/02/2018
Date analysed	-	09/02/2018	09/02/2018
TRH C ₁₀ - C ₁₄	mg/kg	<50	<50
TRH C ₁₅ - C ₂₈	mg/kg	<100	<100
TRH C ₂₉ - C ₃₆	mg/kg	120	170
TRH >C ₁₀ -C ₁₆	mg/kg	<50	<50
TRH >C ₁₀ - C ₁₆ less Naphthalene (F2)	mg/kg	<50	<50
TRH >C ₁₆ -C ₃₄	mg/kg	130	150
TRH >C ₃₄ -C ₄₀	mg/kg	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	130	150
Surrogate o-Terphenyl	%	90	91

PAHs in Soil						
Our Reference		184736-1	184736-2	184736-4	184736-5	184736-6
Your Reference	UNITS	BH1	BH1	BH2	BH2	BH3
Depth		0-0.2	0.4-0.5	0.1-0.2	0.4-0.5	0.0-0.2
Date Sampled		06/02/2018	06/02/2018	06/02/2018	06/02/2018	06/02/2018
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	08/02/2018	08/02/2018	08/02/2018	08/02/2018	08/02/2018
Date analysed	-	08/02/2018	08/02/2018	08/02/2018	08/02/2018	08/02/2018
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Surrogate <i>p</i> -Terphenyl-d14	%	101	102	102	102	98

PAHs in Soil						
Our Reference		184736-7	184736-8	184736-10	184736-11	184736-12
Your Reference	UNITS	BH3	BH4	BH5	BH6	BH7
Depth		0.3-0.4	0-0.1	0.1-0.2	0-0.1	0.2-0.3
Date Sampled		06/02/2018	06/02/2018	06/02/2018	06/02/2018	06/02/2018
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	08/02/2018	08/02/2018	08/02/2018	08/02/2018	08/02/2018
Date analysed	-	08/02/2018	08/02/2018	08/02/2018	08/02/2018	08/02/2018
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Surrogate <i>p</i> -Terphenyl-d14	%	100	103	103	104	99

PAHs in Soil						
Our Reference		184736-13	184736-14	184736-15	184736-16	184736-17
Your Reference	UNITS	BH8	BH9	BH10	BH11	BH11
Depth		0.1-0.2	0-0.1	0-0.1	0-0.1	0.3-0.4
Date Sampled		06/02/2018	06/02/2018	06/02/2018	06/02/2018	06/02/2018
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	08/02/2018	08/02/2018	08/02/2018	08/02/2018	08/02/2018
Date analysed	-	08/02/2018	08/02/2018	08/02/2018	08/02/2018	08/02/2018
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	0.3	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	<0.05	0.3	<0.05	<0.05	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Surrogate <i>p</i> -Terphenyl-d14	%	100	102	103	101	101

PAHs in Soil						
Our Reference		184736-18	184736-19	184736-20	184736-21	184736-22
Your Reference	UNITS	BH12	BH13	BH14	BH15	BH15
Depth		0-0.2	0.2-0.3	0-0.2	0.1-0.2	0.3-0.4
Date Sampled		06/02/2018	06/02/2018	06/02/2018	06/02/2018	06/02/2018
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	08/02/2018	08/02/2018	08/02/2018	08/02/2018	08/02/2018
Date analysed	-	08/02/2018	08/02/2018	08/02/2018	08/02/2018	08/02/2018
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Surrogate <i>p</i> -Terphenyl-d14	%	100	99	101	104	103

PAHs in Soil						
Our Reference		184736-23	184736-24	184736-25	184736-26	184736-27
Your Reference	UNITS	BH16	BH17	BH17	BH18	BH19
Depth		0-0.1	0-0.1	0.2-0.3	0-0.2	0-0.2
Date Sampled		06/02/2018	06/02/2018	06/02/2018	06/02/2018	06/02/2018
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	08/02/2018	08/02/2018	08/02/2018	08/02/2018	08/02/2018
Date analysed	-	08/02/2018	08/02/2018	08/02/2018	08/02/2018	08/02/2018
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	0.6	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	0.2	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	0.2	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	0.4	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	0.06	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	0.1	<0.1
Total +ve PAH's	mg/kg	<0.05	<0.05	<0.05	1.6	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Surrogate <i>p</i> -Terphenyl-d14	%	106	102	99	102	101

PAHs in Soil						
Our Reference		184736-28	184736-29	184736-30	184736-31	184736-32
Your Reference	UNITS	BH20	BH21	BH22	BH23	BH23
Depth		0.1-0.3	0-0.1	0-0.1	0-0.2	0.3-0.4
Date Sampled		06/02/2018	06/02/2018	06/02/2018	06/02/2018	06/02/2018
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	08/02/2018	08/02/2018	08/02/2018	08/02/2018	08/02/2018
Date analysed	-	08/02/2018	08/02/2018	08/02/2018	08/02/2018	08/02/2018
Naphthalene	mg/kg	<0.1	<0.1	<0.1	0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	0.3	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	<0.05	<0.05	<0.05	0.4	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Surrogate <i>p</i> -Terphenyl-d14	%	102	105	104	103	102

PAHs in Soil			
Our Reference		184736-33	184736-34
Your Reference	UNITS	D1	D2
Depth		0.2-0.3	0-0.1
Date Sampled		06/02/2018	06/02/2018
Type of sample		soil	soil
Date extracted	-	08/02/2018	08/02/2018
Date analysed	-	08/02/2018	08/02/2018
Naphthalene	mg/kg	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1
Total +ve PAH's	mg/kg	<0.05	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5
Surrogate <i>p</i> -Terphenyl-d14	%	101	98

Organochlorine Pesticides in soil						
Our Reference		184736-1	184736-2	184736-4	184736-5	184736-6
Your Reference	UNITS	BH1	BH1	BH2	BH2	BH3
Depth		0-0.2	0.4-0.5	0.1-0.2	0.4-0.5	0.0-0.2
Date Sampled		06/02/2018	06/02/2018	06/02/2018	06/02/2018	06/02/2018
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	08/02/2018	08/02/2018	08/02/2018	08/02/2018	08/02/2018
Date analysed	-	08/02/2018	08/02/2018	08/02/2018	08/02/2018	08/02/2018
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	0.2
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	2
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	96	102	98	102	111

Organochlorine Pesticides in soil						
Our Reference		184736-7	184736-8	184736-10	184736-11	184736-12
Your Reference	UNITS	BH3	BH4	BH5	BH6	BH7
Depth		0.3-0.4	0-0.1	0.1-0.2	0-0.1	0.2-0.3
Date Sampled		06/02/2018	06/02/2018	06/02/2018	06/02/2018	06/02/2018
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	08/02/2018	08/02/2018	08/02/2018	08/02/2018	08/02/2018
Date analysed	-	08/02/2018	08/02/2018	08/02/2018	08/02/2018	08/02/2018
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	0.7	<0.1
Dieldrin	mg/kg	0.9	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	0.7	<0.1
Surrogate TCMX	%	102	104	102	102	102

Organochlorine Pesticides in soil						
Our Reference		184736-13	184736-14	184736-15	184736-16	184736-17
Your Reference	UNITS	BH8	BH9	BH10	BH11	BH11
Depth		0.1-0.2	0-0.1	0-0.1	0-0.1	0.3-0.4
Date Sampled		06/02/2018	06/02/2018	06/02/2018	06/02/2018	06/02/2018
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	08/02/2018	08/02/2018	08/02/2018	08/02/2018	08/02/2018
Date analysed	-	08/02/2018	08/02/2018	08/02/2018	08/02/2018	08/02/2018
TCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	104	102	102	102	100

Organochlorine Pesticides in soil						
Our Reference		184736-18	184736-19	184736-20	184736-21	184736-22
Your Reference	UNITS	BH12	BH13	BH14	BH15	BH15
Depth		0-0.2	0.2-0.3	0-0.2	0.1-0.2	0.3-0.4
Date Sampled		06/02/2018	06/02/2018	06/02/2018	06/02/2018	06/02/2018
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	08/02/2018	08/02/2018	08/02/2018	08/02/2018	08/02/2018
Date analysed	-	08/02/2018	08/02/2018	08/02/2018	08/02/2018	08/02/2018
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	104	100	100	105	102

Organochlorine Pesticides in soil						
Our Reference		184736-23	184736-24	184736-25	184736-26	184736-27
Your Reference	UNITS	BH16	BH17	BH17	BH18	BH19
Depth		0-0.1	0-0.1	0.2-0.3	0-0.2	0-0.2
Date Sampled		06/02/2018	06/02/2018	06/02/2018	06/02/2018	06/02/2018
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	08/02/2018	08/02/2018	08/02/2018	08/02/2018	08/02/2018
Date analysed	-	08/02/2018	08/02/2018	08/02/2018	08/02/2018	08/02/2018
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	105	102	104	104	102

Organochlorine Pesticides in soil						
Our Reference		184736-28	184736-29	184736-30	184736-31	184736-32
Your Reference	UNITS	BH20	BH21	BH22	BH23	BH23
Depth		0.1-0.3	0-0.1	0-0.1	0-0.2	0.3-0.4
Date Sampled		06/02/2018	06/02/2018	06/02/2018	06/02/2018	06/02/2018
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	08/02/2018	08/02/2018	08/02/2018	08/02/2018	08/02/2018
Date analysed	-	08/02/2018	08/02/2018	08/02/2018	08/02/2018	08/02/2018
TCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	98	102	102	104	100

Organochlorine Pesticides in soil			
Our Reference		184736-33	184736-34
Your Reference	UNITS	D1	D2
Depth		0.2-0.3	0-0.1
Date Sampled		06/02/2018	06/02/2018
Type of sample		soil	soil
Date extracted	-	08/02/2018	08/02/2018
Date analysed	-	08/02/2018	08/02/2018
HCB	mg/kg	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1
Dieldrin	mg/kg	<0.1	1
Endrin	mg/kg	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1
Surrogate TCMX	%	100	104

PCBs in Soil						
Our Reference		184736-1	184736-2	184736-4	184736-5	184736-6
Your Reference	UNITS	BH1	BH1	BH2	BH2	BH3
Depth		0-0.2	0.4-0.5	0.1-0.2	0.4-0.5	0.0-0.2
Date Sampled		06/02/2018	06/02/2018	06/02/2018	06/02/2018	06/02/2018
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	08/02/2018	08/02/2018	08/02/2018	08/02/2018	08/02/2018
Date analysed	-	08/02/2018	08/02/2018	08/02/2018	08/02/2018	08/02/2018
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	96	102	98	102	111

PCBs in Soil						
Our Reference		184736-7	184736-8	184736-10	184736-11	184736-12
Your Reference	UNITS	BH3	BH4	BH5	BH6	BH7
Depth		0.3-0.4	0-0.1	0.1-0.2	0-0.1	0.2-0.3
Date Sampled		06/02/2018	06/02/2018	06/02/2018	06/02/2018	06/02/2018
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	08/02/2018	08/02/2018	08/02/2018	08/02/2018	08/02/2018
Date analysed	-	08/02/2018	08/02/2018	08/02/2018	08/02/2018	08/02/2018
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	102	104	102	102	102

PCBs in Soil						
Our Reference		184736-13	184736-14	184736-15	184736-16	184736-17
Your Reference	UNITS	BH8	BH9	BH10	BH11	BH11
Depth		0.1-0.2	0-0.1	0-0.1	0-0.1	0.3-0.4
Date Sampled		06/02/2018	06/02/2018	06/02/2018	06/02/2018	06/02/2018
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	08/02/2018	08/02/2018	08/02/2018	08/02/2018	08/02/2018
Date analysed	-	08/02/2018	08/02/2018	08/02/2018	08/02/2018	08/02/2018
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	104	102	102	102	100

PCBs in Soil						
Our Reference		184736-18	184736-19	184736-20	184736-21	184736-22
Your Reference	UNITS	BH12	BH13	BH14	BH15	BH15
Depth		0-0.2	0.2-0.3	0-0.2	0.1-0.2	0.3-0.4
Date Sampled		06/02/2018	06/02/2018	06/02/2018	06/02/2018	06/02/2018
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	08/02/2018	08/02/2018	08/02/2018	08/02/2018	08/02/2018
Date analysed	-	08/02/2018	08/02/2018	08/02/2018	08/02/2018	08/02/2018
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	104	100	100	105	102

PCBs in Soil						
Our Reference		184736-23	184736-24	184736-25	184736-26	184736-27
Your Reference	UNITS	BH16	BH17	BH17	BH18	BH19
Depth		0-0.1	0-0.1	0.2-0.3	0-0.2	0-0.2
Date Sampled		06/02/2018	06/02/2018	06/02/2018	06/02/2018	06/02/2018
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	08/02/2018	08/02/2018	08/02/2018	08/02/2018	08/02/2018
Date analysed	-	08/02/2018	08/02/2018	08/02/2018	08/02/2018	08/02/2018
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	105	102	104	104	102

PCBs in Soil						
Our Reference		184736-28	184736-29	184736-30	184736-31	184736-32
Your Reference	UNITS	BH20	BH21	BH22	BH23	BH23
Depth		0.1-0.3	0-0.1	0-0.1	0-0.2	0.3-0.4
Date Sampled		06/02/2018	06/02/2018	06/02/2018	06/02/2018	06/02/2018
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	08/02/2018	08/02/2018	08/02/2018	08/02/2018	08/02/2018
Date analysed	-	08/02/2018	08/02/2018	08/02/2018	08/02/2018	08/02/2018
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	98	102	102	104	100

PCBs in Soil			
Our Reference		184736-33	184736-34
Your Reference	UNITS	D1	D2
Depth		0.2-0.3	0-0.1
Date Sampled		06/02/2018	06/02/2018
Type of sample		soil	soil
Date extracted	-	08/02/2018	08/02/2018
Date analysed	-	08/02/2018	08/02/2018
Aroclor 1016	mg/kg	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1
Surrogate TCLMX	%	100	104

Acid Extractable metals in soil						
Our Reference		184736-1	184736-2	184736-4	184736-5	184736-6
Your Reference	UNITS	BH1	BH1	BH2	BH2	BH3
Depth		0-0.2	0.4-0.5	0.1-0.2	0.4-0.5	0.0-0.2
Date Sampled		06/02/2018	06/02/2018	06/02/2018	06/02/2018	06/02/2018
Type of sample		soil	soil	soil	soil	soil
Date prepared	-	08/02/2018	08/02/2018	08/02/2018	08/02/2018	08/02/2018
Date analysed	-	09/02/2018	09/02/2018	09/02/2018	09/02/2018	09/02/2018
Arsenic	mg/kg	6	<4	6	6	6
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	20	9	20	17	18
Copper	mg/kg	16	12	15	11	32
Lead	mg/kg	24	10	21	14	110
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	10	3	9	6	7
Zinc	mg/kg	32	11	41	12	180

Acid Extractable metals in soil						
Our Reference		184736-7	184736-8	184736-10	184736-11	184736-12
Your Reference	UNITS	BH3	BH4	BH5	BH6	BH7
Depth		0.3-0.4	0-0.1	0.1-0.2	0-0.1	0.2-0.3
Date Sampled		06/02/2018	06/02/2018	06/02/2018	06/02/2018	06/02/2018
Type of sample		soil	soil	soil	soil	soil
Date prepared	-	08/02/2018	08/02/2018	08/02/2018	08/02/2018	08/02/2018
Date analysed	-	09/02/2018	09/02/2018	09/02/2018	09/02/2018	09/02/2018
Arsenic	mg/kg	7	9	7	10	8
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	21	23	20	22	18
Copper	mg/kg	19	13	16	21	12
Lead	mg/kg	39	32	32	22	9
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	6	9	11	12	7
Zinc	mg/kg	63	52	65	55	28

Acid Extractable metals in soil						
Our Reference		184736-13	184736-14	184736-15	184736-16	184736-17
Your Reference	UNITS	BH8	BH9	BH10	BH11	BH11
Depth		0.1-0.2	0-0.1	0-0.1	0-0.1	0.3-0.4
Date Sampled		06/02/2018	06/02/2018	06/02/2018	06/02/2018	06/02/2018
Type of sample		soil	soil	soil	soil	soil
Date prepared	-	08/02/2018	08/02/2018	08/02/2018	08/02/2018	08/02/2018
Date analysed	-	09/02/2018	09/02/2018	09/02/2018	09/02/2018	09/02/2018
Arsenic	mg/kg	8	9	<4	6	5
Cadmium	mg/kg	<0.4	35	<0.4	<0.4	<0.4
Chromium	mg/kg	29	35	16	21	20
Copper	mg/kg	8	1,800	16	15	11
Lead	mg/kg	21	1,500	32	27	15
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	6	94	7	10	8
Zinc	mg/kg	18	1,900	99	49	18

Acid Extractable metals in soil						
Our Reference		184736-18	184736-19	184736-20	184736-21	184736-22
Your Reference	UNITS	BH12	BH13	BH14	BH15	BH15
Depth		0-0.2	0.2-0.3	0-0.2	0.1-0.2	0.3-0.4
Date Sampled		06/02/2018	06/02/2018	06/02/2018	06/02/2018	06/02/2018
Type of sample		soil	soil	soil	soil	soil
Date prepared	-	08/02/2018	08/02/2018	08/02/2018	08/02/2018	08/02/2018
Date analysed	-	09/02/2018	09/02/2018	09/02/2018	09/02/2018	09/02/2018
Arsenic	mg/kg	6	<4	6	7	5
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	17	15	16	20	19
Copper	mg/kg	28	71	13	16	15
Lead	mg/kg	41	18	23	23	16
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	6	11	8	8	9
Zinc	mg/kg	180	54	23	21	13

Acid Extractable metals in soil						
Our Reference		184736-23	184736-24	184736-25	184736-26	184736-27
Your Reference	UNITS	BH16	BH17	BH17	BH18	BH19
Depth		0-0.1	0-0.1	0.2-0.3	0-0.2	0-0.2
Date Sampled		06/02/2018	06/02/2018	06/02/2018	06/02/2018	06/02/2018
Type of sample		soil	soil	soil	soil	soil
Date prepared	-	08/02/2018	08/02/2018	08/02/2018	08/02/2018	08/02/2018
Date analysed	-	09/02/2018	09/02/2018	09/02/2018	09/02/2018	09/02/2018
Arsenic	mg/kg	6	<4	<4	<4	7
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	20	55	36	13	23
Copper	mg/kg	12	31	34	51	10
Lead	mg/kg	22	12	13	23	21
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	9	52	36	16	6
Zinc	mg/kg	26	62	69	160	12

Acid Extractable metals in soil						
Our Reference		184736-28	184736-29	184736-30	184736-31	184736-32
Your Reference	UNITS	BH20	BH21	BH22	BH23	BH23
Depth		0.1-0.3	0-0.1	0-0.1	0-0.2	0.3-0.4
Date Sampled		06/02/2018	06/02/2018	06/02/2018	06/02/2018	06/02/2018
Type of sample		soil	soil	soil	soil	soil
Date prepared	-	08/02/2018	08/02/2018	08/02/2018	08/02/2018	08/02/2018
Date analysed	-	09/02/2018	09/02/2018	09/02/2018	09/02/2018	09/02/2018
Arsenic	mg/kg	8	6	30	6	4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	24	18	19	22	17
Copper	mg/kg	9	13	14	48	11
Lead	mg/kg	20	17	22	51	16
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	6	7	9	21	8
Zinc	mg/kg	11	18	90	200	14

Acid Extractable metals in soil			
Our Reference		184736-33	184736-34
Your Reference	UNITS	D1	D2
Depth		0.2-0.3	0-0.1
Date Sampled		06/02/2018	06/02/2018
Type of sample		soil	soil
Date prepared	-	08/02/2018	08/02/2018
Date analysed	-	09/02/2018	09/02/2018
Arsenic	mg/kg	6	5
Cadmium	mg/kg	<0.4	<0.4
Chromium	mg/kg	17	16
Copper	mg/kg	15	31
Lead	mg/kg	21	37
Mercury	mg/kg	<0.1	<0.1
Nickel	mg/kg	7	7
Zinc	mg/kg	37	220

Client Reference: E1292-2, Austral

Moisture						
Our Reference		184736-1	184736-2	184736-4	184736-5	184736-6
Your Reference	UNITS	BH1	BH1	BH2	BH2	BH3
Depth		0-0.2	0.4-0.5	0.1-0.2	0.4-0.5	0.0-0.2
Date Sampled		06/02/2018	06/02/2018	06/02/2018	06/02/2018	06/02/2018
Type of sample		soil	soil	soil	soil	soil
Date prepared	-	08/02/2018	08/02/2018	08/02/2018	08/02/2018	08/02/2018
Date analysed	-	09/02/2018	09/02/2018	09/02/2018	09/02/2018	09/02/2018
Moisture	%	9.3	12	10	9.1	3.3

Moisture						
Our Reference		184736-7	184736-8	184736-10	184736-11	184736-12
Your Reference	UNITS	BH3	BH4	BH5	BH6	BH7
Depth		0.3-0.4	0-0.1	0.1-0.2	0-0.1	0.2-0.3
Date Sampled		06/02/2018	06/02/2018	06/02/2018	06/02/2018	06/02/2018
Type of sample		soil	soil	soil	soil	soil
Date prepared	-	08/02/2018	08/02/2018	08/02/2018	08/02/2018	08/02/2018
Date analysed	-	09/02/2018	09/02/2018	09/02/2018	09/02/2018	09/02/2018
Moisture	%	7.2	4.0	5.2	6.9	10

Moisture						
Our Reference		184736-13	184736-14	184736-15	184736-16	184736-17
Your Reference	UNITS	BH8	BH9	BH10	BH11	BH11
Depth		0.1-0.2	0-0.1	0-0.1	0-0.1	0.3-0.4
Date Sampled		06/02/2018	06/02/2018	06/02/2018	06/02/2018	06/02/2018
Type of sample		soil	soil	soil	soil	soil
Date prepared	-	08/02/2018	08/02/2018	08/02/2018	08/02/2018	08/02/2018
Date analysed	-	09/02/2018	09/02/2018	09/02/2018	09/02/2018	09/02/2018
Moisture	%	6.0	5.5	4.5	7.6	9.8

Moisture						
Our Reference		184736-18	184736-19	184736-20	184736-21	184736-22
Your Reference	UNITS	BH12	BH13	BH14	BH15	BH15
Depth		0-0.2	0.2-0.3	0-0.2	0.1-0.2	0.3-0.4
Date Sampled		06/02/2018	06/02/2018	06/02/2018	06/02/2018	06/02/2018
Type of sample		soil	soil	soil	soil	soil
Date prepared	-	08/02/2018	08/02/2018	08/02/2018	08/02/2018	08/02/2018
Date analysed	-	09/02/2018	09/02/2018	09/02/2018	09/02/2018	09/02/2018
Moisture	%	4.9	7.4	5.6	8.2	12

Client Reference: E1292-2, Austral

Moisture						
Our Reference		184736-23	184736-24	184736-25	184736-26	184736-27
Your Reference	UNITS	BH16	BH17	BH17	BH18	BH19
Depth		0-0.1	0-0.1	0.2-0.3	0-0.2	0-0.2
Date Sampled		06/02/2018	06/02/2018	06/02/2018	06/02/2018	06/02/2018
Type of sample		soil	soil	soil	soil	soil
Date prepared	-	08/02/2018	08/02/2018	08/02/2018	08/02/2018	08/02/2018
Date analysed	-	09/02/2018	09/02/2018	09/02/2018	09/02/2018	09/02/2018
Moisture	%	4.1	6.0	7.7	3.4	6.1

Moisture						
Our Reference		184736-28	184736-29	184736-30	184736-31	184736-32
Your Reference	UNITS	BH20	BH21	BH22	BH23	BH23
Depth		0.1-0.3	0-0.1	0-0.1	0-0.2	0.3-0.4
Date Sampled		06/02/2018	06/02/2018	06/02/2018	06/02/2018	06/02/2018
Type of sample		soil	soil	soil	soil	soil
Date prepared	-	08/02/2018	08/02/2018	08/02/2018	08/02/2018	08/02/2018
Date analysed	-	09/02/2018	09/02/2018	09/02/2018	09/02/2018	09/02/2018
Moisture	%	6.8	11	7.9	5.4	10

Moisture			
Our Reference		184736-33	184736-34
Your Reference	UNITS	D1	D2
Depth		0.2-0.3	0-0.1
Date Sampled		06/02/2018	06/02/2018
Type of sample		soil	soil
Date prepared	-	08/02/2018	08/02/2018
Date analysed	-	09/02/2018	09/02/2018
Moisture	%	10	4.5

Asbestos ID - soils NEPM - ASB-001						
Our Reference		184736-1	184736-6	184736-8	184736-16	184736-31
Your Reference	UNITS	BH1	BH3	BH4	BH11	BH23
Depth		0-0.2	0.0-0.2	0-0.1	0-0.1	0-0.2
Date Sampled		06/02/2018	06/02/2018	06/02/2018	06/02/2018	06/02/2018
Type of sample		soil	soil	soil	soil	soil
Date analysed	-	09/02/2018	09/02/2018	09/02/2018	09/02/2018	09/02/2018
Sample mass tested	g	548.78	550.28	564.38	637.86	642.31
Sample Description	-	Brown coarse-grained soil & debris	Brown coarse-grained soil & debris	Brown coarse-grained soil & debris	Brown coarse-grained soil & debris	Brown coarse-grained soil & debris
Asbestos ID in soil (AS4964) >0.1g/kg	-	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg
		Organic fibres detected	Organic fibres detected	Organic fibres detected	Organic fibres detected	Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected
Total Asbestos ^{#1}	g/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Asbestos ID in soil <0.1g/kg*	-	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected
ACM >7mm Estimation*	g	-	-	-	-	-
FA and AF Estimation*	g	-	-	-	-	-
ACM >7mm Estimation*	%(w/w)	<0.01	<0.01	<0.01	<0.01	<0.01
FA and AF Estimation*#2	%(w/w)	<0.001	<0.001	<0.001	<0.001	<0.001

Misc Inorg - Soil					
Our Reference		184736-4	184736-5	184736-21	184736-22
Your Reference	UNITS	BH2	BH2	BH15	BH15
Depth		0.1-0.2	0.4-0.5	0.1-0.2	0.3-0.4
Date Sampled		06/02/2018	06/02/2018	06/02/2018	06/02/2018
Type of sample		soil	soil	soil	soil
Date prepared	-	09/02/2018	09/02/2018	09/02/2018	09/02/2018
Date analysed	-	09/02/2018	09/02/2018	09/02/2018	09/02/2018
pH 1:5 soil:water	pH Units	6.6	6.5	5.9	6.5

Client Reference: E1292-2, Austral

Clay 50-120g					
Our Reference		184736-4	184736-5	184736-21	184736-22
Your Reference	UNITS	BH2	BH2	BH15	BH15
Depth		0.1-0.2	0.4-0.5	0.1-0.2	0.3-0.4
Date Sampled		06/02/2018	06/02/2018	06/02/2018	06/02/2018
Type of sample		soil	soil	soil	soil
Date prepared	-	09/02/2018	09/02/2018	09/02/2018	09/02/2018
Date analysed	-	12/02/2018	12/02/2018	12/02/2018	12/02/2018
Clay in soils <2µm	% (w/w)	38	39	32	45

Client Reference: E1292-2, Austral

CEC					
Our Reference		184736-4	184736-5	184736-21	184736-22
Your Reference	UNITS	BH2	BH2	BH15	BH15
Depth		0.1-0.2	0.4-0.5	0.1-0.2	0.3-0.4
Date Sampled		06/02/2018	06/02/2018	06/02/2018	06/02/2018
Type of sample		soil	soil	soil	soil
Date prepared	-	09/02/2018	09/02/2018	09/02/2018	09/02/2018
Date analysed	-	09/02/2018	09/02/2018	09/02/2018	09/02/2018
Exchangeable Ca	meq/100g	12	1.1	2.1	0.3
Exchangeable K	meq/100g	0.6	0.1	0.3	0.1
Exchangeable Mg	meq/100g	8.0	9.1	4.3	13
Exchangeable Na	meq/100g	0.26	1.5	0.40	1.8
Cation Exchange Capacity	meq/100g	21	12	7.1	15

Asbestos ID - materials			
Our Reference		184736-3	184736-9
Your Reference	UNITS	BH1	BH4
Depth		0.1	0-0.1
Date Sampled		06/02/2018	06/02/2018
Type of sample		soil	soil
Date analysed	-	08/02/2018	08/02/2018
Mass / Dimension of Sample	-	100x55x5mm	75x20x5mm
Sample Description	-	Grey compressed fibre cement material	Beige fibre cement material
Asbestos ID in materials	-	Chrysotile asbestos detected Amosite asbestos detected	Chrysotile asbestos detected Amosite asbestos detected

Method ID	Methodology Summary
AS1289.3.6.3	Determination Particle Size Analysis using AS1289.3.6.3 and AS1289.3.6.1 and in house method INORG-107. Clay fraction at <2µm reported.
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.
ASB-001	Asbestos ID - Identification of asbestos in soil samples using Polarised Light Microscopy and Dispersion Staining Techniques. Minimum 500mL soil sample was analysed as recommended by "National Environment Protection (Assessment of site contamination) Measure, Schedule B1 and "The Guidelines from the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia - May 2009" with a reporting limit of 0.1g/kg (0.01% w/w) as per Australian Standard AS4964-2004. Results reported denoted with * are outside our scope of NATA accreditation. NOTE #1 Total Asbestos g/kg was analysed and reported as per Australian Standard AS4964 (This is the sum of ACM >7mm, <7mm and FA/AF) NOTE #2 The screening level of 0.001% w/w asbestos in soil for FA and AF only applies where the FA and AF are able to be quantified by gravimetric procedures. This screening level is not applicable to free fibres. Estimation = Estimated asbestos weight Results reported with "--" is equivalent to no visible asbestos identified using Polarised Light microscopy and Dispersion Staining Techniques.
Inorg-001	pH - Measured using pH meter and electrode in accordance with APHA latest edition, 4500-H+. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times.
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Metals-009	Determination of exchangeable cations and cation exchange capacity in soils using 1M Ammonium Chloride exchange and ICP-AES analytical finish.
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.

Method ID	Methodology Summary
Org-003	<p>Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID.</p> <p>F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.</p> <p>Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).</p>
Org-005	<p>Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.</p>
Org-005	<p>Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.</p> <p>Note, the Total +ve reported DDD+DDE+DDT PQL is reflective of the lowest individual PQL and is therefore simply a sum of the positive individually report DDD+DDE+DDT.</p>
Org-006	<p>Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.</p>
Org-006	<p>Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.</p> <p>Note, the Total +ve PCBs PQL is reflective of the lowest individual PQL and is therefore "Total +ve PCBs" is simply a sum of the positive individual PCBs.</p>
Org-012	<p>Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013.</p> <p>For soil results:-</p> <ol style="list-style-type: none"> 1. 'EQ PQL' values are assuming all contributing PAHs reported as <PQL are actually at the PQL. This is the most conservative approach and can give false positive TEQs given that PAHs that contribute to the TEQ calculation may not be present. 2. 'EQ zero' values are assuming all contributing PAHs reported as <PQL are zero. This is the least conservative approach and is more susceptible to false negative TEQs when PAHs that contribute to the TEQ calculation are present but below PQL. 3. 'EQ half PQL' values are assuming all contributing PAHs reported as <PQL are half the stipulated PQL. Hence a mid-point between the most and least conservative approaches above. <p>Note, the Total +ve PAHs PQL is reflective of the lowest individual PQL and is therefore "Total +ve PAHs" is simply a sum of the positive individual PAHs.</p>
Org-014	<p>Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.</p>
Org-016	<p>Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.</p>
Org-016	<p>Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.</p> <p>Note, the Total +ve Xylene PQL is reflective of the lowest individual PQL and is therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes.</p>

Client Reference: E1292-2, Austral

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil				Duplicate				Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	184736-2
Date extracted	-			08/02/2018	1	08/02/2018	08/02/2018		08/02/2018	08/02/2018
Date analysed	-			08/02/2018	1	08/02/2018	08/02/2018		08/02/2018	08/02/2018
TRH C ₆ - C ₉	mg/kg	25	Org-016	<25	1	<25	<25	0	103	110
TRH C ₆ - C ₁₀	mg/kg	25	Org-016	<25	1	<25	<25	0	103	110
Benzene	mg/kg	0.2	Org-016	<0.2	1	<0.2	<0.2	0	85	87
Toluene	mg/kg	0.5	Org-016	<0.5	1	<0.5	<0.5	0	109	113
Ethylbenzene	mg/kg	1	Org-016	<1	1	<1	<1	0	99	106
m+p-xylene	mg/kg	2	Org-016	<2	1	<2	<2	0	112	121
o-Xylene	mg/kg	1	Org-016	<1	1	<1	<1	0	106	114
naphthalene	mg/kg	1	Org-014	<1	1	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	109	1	110	110	0	108	111

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil				Duplicate				Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	184736-22
Date extracted	-			[NT]	11	08/02/2018	08/02/2018		08/02/2018	08/02/2018
Date analysed	-			[NT]	11	08/02/2018	08/02/2018		08/02/2018	08/02/2018
TRH C ₆ - C ₉	mg/kg	25	Org-016	[NT]	11	<25	<25	0	101	100
TRH C ₆ - C ₁₀	mg/kg	25	Org-016	[NT]	11	<25	<25	0	101	100
Benzene	mg/kg	0.2	Org-016	[NT]	11	<0.2	<0.2	0	82	77
Toluene	mg/kg	0.5	Org-016	[NT]	11	<0.5	<0.5	0	106	100
Ethylbenzene	mg/kg	1	Org-016	[NT]	11	<1	<1	0	97	95
m+p-xylene	mg/kg	2	Org-016	[NT]	11	<2	<2	0	110	113
o-Xylene	mg/kg	1	Org-016	[NT]	11	<1	<1	0	105	106
naphthalene	mg/kg	1	Org-014	[NT]	11	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	[NT]	11	103	115	11	107	100

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil				Duplicate				Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	21	08/02/2018	08/02/2018		[NT]	[NT]
Date analysed	-			[NT]	21	08/02/2018	08/02/2018		[NT]	[NT]
TRH C ₆ - C ₉	mg/kg	25	Org-016	[NT]	21	<25	<25	0	[NT]	[NT]
TRH C ₆ - C ₁₀	mg/kg	25	Org-016	[NT]	21	<25	<25	0	[NT]	[NT]
Benzene	mg/kg	0.2	Org-016	[NT]	21	<0.2	<0.2	0	[NT]	[NT]
Toluene	mg/kg	0.5	Org-016	[NT]	21	<0.5	<0.5	0	[NT]	[NT]
Ethylbenzene	mg/kg	1	Org-016	[NT]	21	<1	<1	0	[NT]	[NT]
m+p-xylene	mg/kg	2	Org-016	[NT]	21	<2	<2	0	[NT]	[NT]
o-Xylene	mg/kg	1	Org-016	[NT]	21	<1	<1	0	[NT]	[NT]
naphthalene	mg/kg	1	Org-014	[NT]	21	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	[NT]	21	107	114	6	[NT]	[NT]

Client Reference: E1292-2, Austral

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	31	08/02/2018	08/02/2018		[NT]	[NT]
Date analysed	-			[NT]	31	08/02/2018	08/02/2018		[NT]	[NT]
TRH C ₆ - C ₉	mg/kg	25	Org-016	[NT]	31	<25	<25	0	[NT]	[NT]
TRH C ₆ - C ₁₀	mg/kg	25	Org-016	[NT]	31	<25	<25	0	[NT]	[NT]
Benzene	mg/kg	0.2	Org-016	[NT]	31	<0.2	<0.2	0	[NT]	[NT]
Toluene	mg/kg	0.5	Org-016	[NT]	31	<0.5	<0.5	0	[NT]	[NT]
Ethylbenzene	mg/kg	1	Org-016	[NT]	31	<1	<1	0	[NT]	[NT]
m+p-xylene	mg/kg	2	Org-016	[NT]	31	<2	<2	0	[NT]	[NT]
o-Xylene	mg/kg	1	Org-016	[NT]	31	<1	<1	0	[NT]	[NT]
naphthalene	mg/kg	1	Org-014	[NT]	31	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	[NT]	31	103	106	3	[NT]	[NT]

Client Reference: E1292-2, Austral

QUALITY CONTROL: svTRH (C10-C40) in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	184736-2
Date extracted	-			08/02/2018	1	08/02/2018	08/02/2018		08/02/2018	08/02/2018
Date analysed	-			09/02/2018	1	08/02/2018	08/02/2018		08/02/2018	08/02/2018
TRH C ₁₀ - C ₁₄	mg/kg	50	Org-003	<50	1	<50	<50	0	107	105
TRH C ₁₅ - C ₂₈	mg/kg	100	Org-003	<100	1	<100	<100	0	104	104
TRH C ₂₉ - C ₃₆	mg/kg	100	Org-003	<100	1	<100	<100	0	108	90
TRH >C ₁₀ -C ₁₆	mg/kg	50	Org-003	<50	1	<50	<50	0	107	105
TRH >C ₁₆ -C ₃₄	mg/kg	100	Org-003	<100	1	<100	<100	0	104	104
TRH >C ₃₄ -C ₄₀	mg/kg	100	Org-003	<100	1	<100	<100	0	108	90
Surrogate o-Terphenyl	%		Org-003	90	1	92	92	0	94	88

QUALITY CONTROL: svTRH (C10-C40) in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	184736-22
Date extracted	-			[NT]	11	08/02/2018	08/02/2018		08/02/2018	08/02/2018
Date analysed	-			[NT]	11	08/02/2018	08/02/2018		09/02/2018	09/02/2018
TRH C ₁₀ - C ₁₄	mg/kg	50	Org-003	[NT]	11	<50	<50	0	111	102
TRH C ₁₅ - C ₂₈	mg/kg	100	Org-003	[NT]	11	<100	<100	0	103	103
TRH C ₂₉ - C ₃₆	mg/kg	100	Org-003	[NT]	11	<100	<100	0	108	97
TRH >C ₁₀ -C ₁₆	mg/kg	50	Org-003	[NT]	11	<50	<50	0	111	102
TRH >C ₁₆ -C ₃₄	mg/kg	100	Org-003	[NT]	11	<100	<100	0	103	103
TRH >C ₃₄ -C ₄₀	mg/kg	100	Org-003	[NT]	11	<100	<100	0	108	97
Surrogate o-Terphenyl	%		Org-003	[NT]	11	88	88	0	92	88

QUALITY CONTROL: svTRH (C10-C40) in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	21	08/02/2018	08/02/2018		[NT]	[NT]
Date analysed	-			[NT]	21	09/02/2018	09/02/2018		[NT]	[NT]
TRH C ₁₀ - C ₁₄	mg/kg	50	Org-003	[NT]	21	<50	<50	0	[NT]	[NT]
TRH C ₁₅ - C ₂₈	mg/kg	100	Org-003	[NT]	21	<100	<100	0	[NT]	[NT]
TRH C ₂₉ - C ₃₆	mg/kg	100	Org-003	[NT]	21	<100	<100	0	[NT]	[NT]
TRH >C ₁₀ -C ₁₆	mg/kg	50	Org-003	[NT]	21	<50	<50	0	[NT]	[NT]
TRH >C ₁₆ -C ₃₄	mg/kg	100	Org-003	[NT]	21	<100	<100	0	[NT]	[NT]
TRH >C ₃₄ -C ₄₀	mg/kg	100	Org-003	[NT]	21	<100	<100	0	[NT]	[NT]
Surrogate o-Terphenyl	%		Org-003	[NT]	21	88	88	0	[NT]	[NT]

Client Reference: E1292-2, Austral

QUALITY CONTROL: svTRH (C10-C40) in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	31	08/02/2018	08/02/2018		[NT]	[NT]
Date analysed	-			[NT]	31	09/02/2018	09/02/2018		[NT]	[NT]
TRH C ₁₀ - C ₁₄	mg/kg	50	Org-003	[NT]	31	<50	<50	0	[NT]	[NT]
TRH C ₁₅ - C ₂₈	mg/kg	100	Org-003	[NT]	31	<100	<100	0	[NT]	[NT]
TRH C ₂₉ - C ₃₆	mg/kg	100	Org-003	[NT]	31	<100	<100	0	[NT]	[NT]
TRH >C ₁₀ -C ₁₆	mg/kg	50	Org-003	[NT]	31	<50	<50	0	[NT]	[NT]
TRH >C ₁₆ -C ₃₄	mg/kg	100	Org-003	[NT]	31	<100	100	0	[NT]	[NT]
TRH >C ₃₄ -C ₄₀	mg/kg	100	Org-003	[NT]	31	<100	<100	0	[NT]	[NT]
Surrogate o-Terphenyl	%		Org-003	[NT]	31	89	88	1	[NT]	[NT]

Client Reference: E1292-2, Austral

QUALITY CONTROL: PAHs in Soil				Duplicate				Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	184736-2
Date extracted	-			08/02/2018	1	08/02/2018	08/02/2018		08/02/2018	08/02/2018
Date analysed	-			08/02/2018	1	08/02/2018	08/02/2018		08/02/2018	08/02/2018
Naphthalene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	87	86
Acenaphthylene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	93	91
Phenanthrene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	91	89
Anthracene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	92	90
Pyrene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	92	91
Benzo(a)anthracene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	113	110
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-012	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-012	<0.05	1	<0.05	<0.05	0	85	82
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012	101	1	101	105	4	127	125

QUALITY CONTROL: PAHs in Soil				Duplicate				Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	184736-22
Date extracted	-			[NT]	11	08/02/2018	08/02/2018		08/02/2018	08/02/2018
Date analysed	-			[NT]	11	08/02/2018	08/02/2018		08/02/2018	08/02/2018
Naphthalene	mg/kg	0.1	Org-012	[NT]	11	<0.1	<0.1	0	87	83
Acenaphthylene	mg/kg	0.1	Org-012	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-012	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-012	[NT]	11	<0.1	<0.1	0	93	86
Phenanthrene	mg/kg	0.1	Org-012	[NT]	11	<0.1	<0.1	0	91	85
Anthracene	mg/kg	0.1	Org-012	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-012	[NT]	11	<0.1	<0.1	0	92	86
Pyrene	mg/kg	0.1	Org-012	[NT]	11	<0.1	<0.1	0	92	87
Benzo(a)anthracene	mg/kg	0.1	Org-012	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-012	[NT]	11	<0.1	<0.1	0	113	104
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-012	[NT]	11	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-012	[NT]	11	<0.05	<0.05	0	85	75
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012	[NT]	11	104	102	2	127	123

Client Reference: E1292-2, Austral

QUALITY CONTROL: PAHs in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	21	08/02/2018	08/02/2018		[NT]	[NT]
Date analysed	-			[NT]	21	08/02/2018	08/02/2018		[NT]	[NT]
Naphthalene	mg/kg	0.1	Org-012	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Acenaphthylene	mg/kg	0.1	Org-012	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-012	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-012	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Phenanthrene	mg/kg	0.1	Org-012	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Anthracene	mg/kg	0.1	Org-012	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-012	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Pyrene	mg/kg	0.1	Org-012	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-012	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-012	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-012	[NT]	21	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-012	[NT]	21	<0.05	<0.05	0	[NT]	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012	[NT]	21	104	101	3	[NT]	[NT]

QUALITY CONTROL: PAHs in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	31	08/02/2018	08/02/2018		[NT]	[NT]
Date analysed	-			[NT]	31	08/02/2018	08/02/2018		[NT]	[NT]
Naphthalene	mg/kg	0.1	Org-012	[NT]	31	0.1	0.1	0	[NT]	[NT]
Acenaphthylene	mg/kg	0.1	Org-012	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-012	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-012	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
Phenanthrene	mg/kg	0.1	Org-012	[NT]	31	0.3	0.3	0	[NT]	[NT]
Anthracene	mg/kg	0.1	Org-012	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-012	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
Pyrene	mg/kg	0.1	Org-012	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-012	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-012	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-012	[NT]	31	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-012	[NT]	31	<0.05	<0.05	0	[NT]	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012	[NT]	31	103	101	2	[NT]	[NT]

Client Reference: E1292-2, Austral

QUALITY CONTROL: Organochlorine Pesticides in soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	184736-2
Date extracted	-			08/02/2018	1	08/02/2018	08/02/2018		08/02/2018	08/02/2018
Date analysed	-			08/02/2018	1	08/02/2018	08/02/2018		08/02/2018	08/02/2018
HCB	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	98	97
gamma-BHC	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	78	81
Heptachlor	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	70	68
delta-BHC	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	90	88
Heptachlor Epoxide	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	84	84
gamma-Chlordane	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	97	97
Dieldrin	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	85	85
Endrin	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	79	82
pp-DDD	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	72	70
Endosulfan II	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	90	66
Methoxychlor	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-005	102	1	96	98	2	125	121

Client Reference: E1292-2, Austral

QUALITY CONTROL: Organochlorine Pesticides in soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	184736-22
Date extracted	-			[NT]	11	08/02/2018	08/02/2018		08/02/2018	08/02/2018
Date analysed	-			[NT]	11	08/02/2018	08/02/2018		08/02/2018	08/02/2018
HCB	mg/kg	0.1	Org-005	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-005	[NT]	11	<0.1	<0.1	0	98	90
gamma-BHC	mg/kg	0.1	Org-005	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-005	[NT]	11	<0.1	<0.1	0	78	72
Heptachlor	mg/kg	0.1	Org-005	[NT]	11	<0.1	<0.1	0	70	63
delta-BHC	mg/kg	0.1	Org-005	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-005	[NT]	11	<0.1	<0.1	0	90	85
Heptachlor Epoxide	mg/kg	0.1	Org-005	[NT]	11	<0.1	<0.1	0	84	79
gamma-Chlordane	mg/kg	0.1	Org-005	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-005	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-005	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-005	[NT]	11	0.7	0.6	15	97	93
Dieldrin	mg/kg	0.1	Org-005	[NT]	11	<0.1	<0.1	0	85	79
Endrin	mg/kg	0.1	Org-005	[NT]	11	<0.1	<0.1	0	79	69
pp-DDD	mg/kg	0.1	Org-005	[NT]	11	<0.1	<0.1	0	72	67
Endosulfan II	mg/kg	0.1	Org-005	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-005	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-005	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-005	[NT]	11	<0.1	<0.1	0	90	66
Methoxychlor	mg/kg	0.1	Org-005	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-005	[NT]	11	102	102	0	125	119

Client Reference: E1292-2, Austral

QUALITY CONTROL: Organochlorine Pesticides in soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	21	08/02/2018	08/02/2018		[NT]	[NT]
Date analysed	-			[NT]	21	08/02/2018	08/02/2018		[NT]	[NT]
HCB	mg/kg	0.1	Org-005	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-005	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
gamma-BHC	mg/kg	0.1	Org-005	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-005	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-005	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
delta-BHC	mg/kg	0.1	Org-005	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-005	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-005	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
gamma-Chlordane	mg/kg	0.1	Org-005	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-005	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-005	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-005	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Dieldrin	mg/kg	0.1	Org-005	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Endrin	mg/kg	0.1	Org-005	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-005	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Endosulfan II	mg/kg	0.1	Org-005	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-005	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-005	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-005	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Methoxychlor	mg/kg	0.1	Org-005	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-005	[NT]	21	105	104	1	[NT]	[NT]

Client Reference: E1292-2, Austral

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate		Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	31	08/02/2018	08/02/2018		[NT]	[NT]
Date analysed	-			[NT]	31	08/02/2018	08/02/2018		[NT]	[NT]
HCB	mg/kg	0.1	Org-005	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-005	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
gamma-BHC	mg/kg	0.1	Org-005	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-005	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-005	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
delta-BHC	mg/kg	0.1	Org-005	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-005	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-005	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
gamma-Chlordane	mg/kg	0.1	Org-005	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-005	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-005	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-005	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
Dieldrin	mg/kg	0.1	Org-005	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
Endrin	mg/kg	0.1	Org-005	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-005	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
Endosulfan II	mg/kg	0.1	Org-005	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-005	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-005	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-005	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
Methoxychlor	mg/kg	0.1	Org-005	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-005	[NT]	31	104	102	2	[NT]	[NT]

Client Reference: E1292-2, Austral

QUALITY CONTROL: PCBs in Soil				Duplicate				Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	184736-2
Date extracted	-			08/02/2018	1	08/02/2018	08/02/2018		08/02/2018	08/02/2018
Date analysed	-			08/02/2018	1	08/02/2018	08/02/2018		08/02/2018	08/02/2018
Aroclor 1016	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	120	108
Aroclor 1260	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCLMX	%		Org-006	102	1	96	98	2	125	121

QUALITY CONTROL: PCBs in Soil				Duplicate				Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	184736-22
Date extracted	-			[NT]	11	08/02/2018	08/02/2018		08/02/2018	08/02/2018
Date analysed	-			[NT]	11	08/02/2018	08/02/2018		08/02/2018	08/02/2018
Aroclor 1016	mg/kg	0.1	Org-006	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-006	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-006	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-006	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-006	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-006	[NT]	11	<0.1	<0.1	0	120	107
Aroclor 1260	mg/kg	0.1	Org-006	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCLMX	%		Org-006	[NT]	11	102	102	0	125	119

QUALITY CONTROL: PCBs in Soil				Duplicate				Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	21	08/02/2018	08/02/2018		[NT]	[NT]
Date analysed	-			[NT]	21	08/02/2018	08/02/2018		[NT]	[NT]
Aroclor 1016	mg/kg	0.1	Org-006	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-006	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-006	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-006	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-006	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-006	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1260	mg/kg	0.1	Org-006	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCLMX	%		Org-006	[NT]	21	105	104	1	[NT]	[NT]

Client Reference: E1292-2, Austral

QUALITY CONTROL: PCBs in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	31	08/02/2018	08/02/2018		[NT]	[NT]
Date analysed	-			[NT]	31	08/02/2018	08/02/2018		[NT]	[NT]
Aroclor 1016	mg/kg	0.1	Org-006	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-006	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-006	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-006	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-006	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-006	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1260	mg/kg	0.1	Org-006	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCLMX	%		Org-006	[NT]	31	104	102	2	[NT]	[NT]

Client Reference: E1292-2, Austral

QUALITY CONTROL: Acid Extractable metals in soil				Duplicate				Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	184736-2
Date prepared	-			08/02/2018	1	08/02/2018	08/02/2018		08/02/2018	08/02/2018
Date analysed	-			09/02/2018	1	09/02/2018	09/02/2018		09/02/2018	09/02/2018
Arsenic	mg/kg	4	Metals-020	<4	1	6	5	18	110	88
Cadmium	mg/kg	0.4	Metals-020	<0.4	1	<0.4	<0.4	0	103	90
Chromium	mg/kg	1	Metals-020	<1	1	20	14	35	110	100
Copper	mg/kg	1	Metals-020	<1	1	16	16	0	112	109
Lead	mg/kg	1	Metals-020	<1	1	24	17	34	107	90
Mercury	mg/kg	0.1	Metals-021	<0.1	1	<0.1	<0.1	0	104	109
Nickel	mg/kg	1	Metals-020	<1	1	10	7	35	110	97
Zinc	mg/kg	1	Metals-020	<1	1	32	24	29	104	94

QUALITY CONTROL: Acid Extractable metals in soil				Duplicate				Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	184736-22
Date prepared	-			[NT]	11	08/02/2018	08/02/2018		08/02/2018	08/02/2018
Date analysed	-			[NT]	11	09/02/2018	09/02/2018		09/02/2018	09/02/2018
Arsenic	mg/kg	4	Metals-020	[NT]	11	10	10	0	107	79
Cadmium	mg/kg	0.4	Metals-020	[NT]	11	<0.4	<0.4	0	98	87
Chromium	mg/kg	1	Metals-020	[NT]	11	22	22	0	106	88
Copper	mg/kg	1	Metals-020	[NT]	11	21	23	9	108	101
Lead	mg/kg	1	Metals-020	[NT]	11	22	23	4	102	85
Mercury	mg/kg	0.1	Metals-021	[NT]	11	<0.1	<0.1	0	104	99
Nickel	mg/kg	1	Metals-020	[NT]	11	12	12	0	104	94
Zinc	mg/kg	1	Metals-020	[NT]	11	55	61	10	100	85

QUALITY CONTROL: Acid Extractable metals in soil				Duplicate				Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	21	08/02/2018	08/02/2018		[NT]	[NT]
Date analysed	-			[NT]	21	09/02/2018	09/02/2018		[NT]	[NT]
Arsenic	mg/kg	4	Metals-020	[NT]	21	7	8	13	[NT]	[NT]
Cadmium	mg/kg	0.4	Metals-020	[NT]	21	<0.4	<0.4	0	[NT]	[NT]
Chromium	mg/kg	1	Metals-020	[NT]	21	20	23	14	[NT]	[NT]
Copper	mg/kg	1	Metals-020	[NT]	21	16	15	6	[NT]	[NT]
Lead	mg/kg	1	Metals-020	[NT]	21	23	23	0	[NT]	[NT]
Mercury	mg/kg	0.1	Metals-021	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Nickel	mg/kg	1	Metals-020	[NT]	21	8	8	0	[NT]	[NT]
Zinc	mg/kg	1	Metals-020	[NT]	21	21	20	5	[NT]	[NT]

Client Reference: E1292-2, Austral

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	31	08/02/2018	08/02/2018		[NT]	[NT]
Date analysed	-			[NT]	31	09/02/2018	09/02/2018		[NT]	[NT]
Arsenic	mg/kg	4	Metals-020	[NT]	31	6	5	18	[NT]	[NT]
Cadmium	mg/kg	0.4	Metals-020	[NT]	31	<0.4	<0.4	0	[NT]	[NT]
Chromium	mg/kg	1	Metals-020	[NT]	31	22	16	32	[NT]	[NT]
Copper	mg/kg	1	Metals-020	[NT]	31	48	37	26	[NT]	[NT]
Lead	mg/kg	1	Metals-020	[NT]	31	51	40	24	[NT]	[NT]
Mercury	mg/kg	0.1	Metals-021	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
Nickel	mg/kg	1	Metals-020	[NT]	31	21	20	5	[NT]	[NT]
Zinc	mg/kg	1	Metals-020	[NT]	31	200	170	16	[NT]	[NT]

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	14	08/02/2018	08/02/2018		[NT]	[NT]
Date analysed	-			[NT]	14	09/02/2018	09/02/2018		[NT]	[NT]
Arsenic	mg/kg	4	Metals-020	[NT]	14	9	9	0	[NT]	[NT]
Cadmium	mg/kg	0.4	Metals-020	[NT]	14	35	34	3	[NT]	[NT]
Chromium	mg/kg	1	Metals-020	[NT]	14	35	38	8	[NT]	[NT]
Copper	mg/kg	1	Metals-020	[NT]	14	1800	2200	20	[NT]	[NT]
Lead	mg/kg	1	Metals-020	[NT]	14	1500	1600	6	[NT]	[NT]
Mercury	mg/kg	0.1	Metals-021	[NT]	14	<0.1	0.1	0	[NT]	[NT]
Nickel	mg/kg	1	Metals-020	[NT]	14	94	94	0	[NT]	[NT]
Zinc	mg/kg	1	Metals-020	[NT]	14	1900	2000	5	[NT]	[NT]

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	30	08/02/2018	08/02/2018		[NT]	[NT]
Date analysed	-			[NT]	30	09/02/2018	09/02/2018		[NT]	[NT]
Arsenic	mg/kg	4	Metals-020	[NT]	30	30	35	15	[NT]	[NT]
Cadmium	mg/kg	0.4	Metals-020	[NT]	30	<0.4	<0.4	0	[NT]	[NT]
Chromium	mg/kg	1	Metals-020	[NT]	30	19	21	10	[NT]	[NT]
Copper	mg/kg	1	Metals-020	[NT]	30	14	13	7	[NT]	[NT]
Lead	mg/kg	1	Metals-020	[NT]	30	22	22	0	[NT]	[NT]
Mercury	mg/kg	0.1	Metals-021	[NT]	30	<0.1	<0.1	0	[NT]	[NT]
Nickel	mg/kg	1	Metals-020	[NT]	30	9	8	12	[NT]	[NT]
Zinc	mg/kg	1	Metals-020	[NT]	30	90	130	36	[NT]	[NT]

Client Reference: E1292-2, Austral

QUALITY CONTROL: Misc Inorg - Soil				Duplicate				Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	[NT]
Date prepared	-			09/02/2018	[NT]	[NT]	[NT]	[NT]	09/02/2018	[NT]
Date analysed	-			09/02/2018	[NT]	[NT]	[NT]	[NT]	09/02/2018	[NT]
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	[NT]	[NT]	[NT]	[NT]	99	[NT]

Client Reference: E1292-2, Austral

QUALITY CONTROL: CEC				Duplicate				Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	[NT]
Date prepared	-			09/02/2018	[NT]	[NT]	[NT]	[NT]	09/02/2018	[NT]
Date analysed	-			09/02/2018	[NT]	[NT]	[NT]	[NT]	09/02/2018	[NT]
Exchangeable Ca	meq/100g	0.1	Metals-009	<0.1	[NT]	[NT]	[NT]	[NT]	97	[NT]
Exchangeable K	meq/100g	0.1	Metals-009	<0.1	[NT]	[NT]	[NT]	[NT]	104	[NT]
Exchangeable Mg	meq/100g	0.1	Metals-009	<0.1	[NT]	[NT]	[NT]	[NT]	93	[NT]
Exchangeable Na	meq/100g	0.1	Metals-009	<0.1	[NT]	[NT]	[NT]	[NT]	95	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

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

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

Laboratory Acceptance Criteria

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

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

Report Comments

Asbestos-ID in soil: NEPM

This report is consistent with the reporting recommendations in the National Environment Protection (Assessment of Site Contamination) Measure, Schedule B1, May 2013.

This is reported outside our scope of NATA accreditation.



Telephone : + 61-2-8784 8555

Chain of Custody Record

Client Details:
 Benviron Group
 PO Box 4405, East Gosford NSW 2250
ben@benvirongroup.com.au
michael@benvirongroup.com.au; ray@benvirongroup.com.au
 ph: +61466 385 221

Delivery Details:
 ALS Environmental
 277-289 woodpark Road, Smithfield, 2164
 email: Vibeshan.dayalan@alsglobal.com
 ph: +61287848555

Project Manager: Michael Silk
Project #: E1292-2
Sampled By: RL
Project Name: Austral
Purchase Order #: N/A
Quote #:
Page #: 1
Turnaround time: Fast- 2 days

#	Sample ID	Date Sampled	Matrix	Analytes					Sample Comments
				Heavy Metals (8)	TRH	BTEXN	PAH Ultra Trace	VOC Ultra Trace	
1	GWSS1	06.02.2018	Water	X	X	X	X	X	ALS Suites W5, EP074, EP132B
3									
4									
5									
6									
7									
8									

Submittal / Return to Lab / Split WO
 Lab / Analysis: Melbourne LPIZS
 Organized By / Date:
 Relinquished By / Date:
 Container / Label:
 WO
 Attach / Internal Sign

TA

Special Directions and Comments: Extra 2 amber bottles provided for lab QC

Relinquished by: Ray Liu
 Signature: *Ray Liu*
 Date: 07.02.2018

Received By: *ANDREW*
 Signature: *ANDREW*
 Date: *7/2/18*

2:00pm



SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : ES1804143

Client	: BENVIRON GROUP	Laboratory	: Environmental Division Sydney
Contact	: MR MICHAEL SILK	Contact	: Customer Services ES
Address	: PO BOX 4405 EAST GOSFORD NSW 2250	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: michael@benvirongroup.com.au	E-mail	: ALSEnviro.Sydney@alsglobal.com
Telephone	: +61 02 0466 385 221	Telephone	: +61-2-8784 8555
Facsimile	: ----	Facsimile	: +61-2-8784 8500
Project	: E1292-2 Austral	Page	: 1 of 2
Order number	: ----	Quote number	: EB2017BENVIRON0001 (EN/222/17)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: ----		
Sampler	:		

Dates

Date Samples Received	: 07-Feb-2018 15:00	Issue Date	: 07-Feb-2018
Client Requested Due Date	: 09-Feb-2018	Scheduled Reporting Date	: 09-Feb-2018

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 1	Temperature	: 13.0'C - Ice Bricks present
Receipt Detail	:	No. of samples received / analysed	: 1 / 1

General Comments

- This report contains the following information:
 - Sample Container(s)/Preservation Non-Compliances
 - Summary of Sample(s) and Requested Analysis
 - Proactive Holding Time Report
 - Requested Deliverables
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please note that the scheduled reporting date has not been confirmed with laboratory management . If the scheduled reporting date is not achievable ALS will be in contact with you.
- **Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).**
- Ultra Trace VOC Analysis to be conducted by ALS Melbourne.
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.



Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Client sampling date / time	Client sample ID	WATER - EP125 VOCs by HS GCMS in SIM Mode	WATER - EP132(PAH) Ultra Trace Polynuclear Aromatic Compounds	WATER - W-05 TRH/BTEXN/8 Metals
ES1804143-001	06-Feb-2018 00:00	GWSS1	✓	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

ACCOUNTS PAYABLE

- A4 - AU Tax Invoice (INV) Email accounts@benvirongroup.com.au

BEN BUCKLEY

- *AU Certificate of Analysis - NATA (COA) Email ben@benvirongroup.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email ben@benvirongroup.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email ben@benvirongroup.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email ben@benvirongroup.com.au
- Chain of Custody (CoC) (COC) Email ben@benvirongroup.com.au
- EDI Format - ENMRG (ENMRG) Email ben@benvirongroup.com.au
- EDI Format - ESDAT (ESDAT) Email ben@benvirongroup.com.au
- EDI Format - XTab (XTAB) Email ben@benvirongroup.com.au

MICHAEL SILK

- *AU Certificate of Analysis - NATA (COA) Email michael@benvirongroup.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email michael@benvirongroup.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email michael@benvirongroup.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email michael@benvirongroup.com.au
- Chain of Custody (CoC) (COC) Email michael@benvirongroup.com.au
- EDI Format - ENMRG (ENMRG) Email michael@benvirongroup.com.au
- EDI Format - ESDAT (ESDAT) Email michael@benvirongroup.com.au
- EDI Format - XTab (XTAB) Email michael@benvirongroup.com.au

RAY LIU

- *AU Certificate of Analysis - NATA (COA) Email ray@benvirongroup.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email ray@benvirongroup.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email ray@benvirongroup.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email ray@benvirongroup.com.au
- Chain of Custody (CoC) (COC) Email ray@benvirongroup.com.au
- EDI Format - ENMRG (ENMRG) Email ray@benvirongroup.com.au
- EDI Format - ESDAT (ESDAT) Email ray@benvirongroup.com.au
- EDI Format - XTab (XTAB) Email ray@benvirongroup.com.au

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: ES1804143	Page	: 1 of 5
Client	: BENVIRON GROUP	Laboratory	: Environmental Division Sydney
Contact	: MR MICHAEL SILK	Telephone	: +61-2-8784 8555
Project	: E1292-2 Austral	Date Samples Received	: 07-Feb-2018
Site	: ----	Issue Date	: 09-Feb-2018
Sampler	: ----	No. of samples received	: 1
Order number	: ----	No. of samples analysed	: 1

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**



Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type Method	Count		Rate (%)		Quality Control Specification
	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
Dissolved Mercury by FIMS	0	1	0.00	10.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: * = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG020F: Dissolved Metals by ICP-MS							
Clear Plastic Bottle - Nitric Acid; Filtered (EG020A-F) GWSS1	06-Feb-2018	----	----	----	08-Feb-2018	05-Aug-2018	✓
EG035F: Dissolved Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Filtered (EG035F) GWSS1	06-Feb-2018	----	----	----	08-Feb-2018	06-Mar-2018	✓
EP080/071: Total Petroleum Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP071) GWSS1	06-Feb-2018	08-Feb-2018	13-Feb-2018	✓	08-Feb-2018	20-Mar-2018	✓
Clear glass VOC vial - HCl (EP080) GWSS1	06-Feb-2018	08-Feb-2018	20-Feb-2018	✓	08-Feb-2018	20-Feb-2018	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Amber Glass Bottle - Unpreserved (EP071) GWSS1	06-Feb-2018	08-Feb-2018	13-Feb-2018	✓	08-Feb-2018	20-Mar-2018	✓
Clear glass VOC vial - HCl (EP080) GWSS1	06-Feb-2018	08-Feb-2018	20-Feb-2018	✓	08-Feb-2018	20-Feb-2018	✓
EP080: BTEXN							
Clear glass VOC vial - HCl (EP080) GWSS1	06-Feb-2018	08-Feb-2018	20-Feb-2018	✓	08-Feb-2018	20-Feb-2018	✓
EP125A: Monocyclic Aromatic Hydrocarbons							
Clear glass VOC vial - HCl (EP125) GWSS1	06-Feb-2018	----	----	----	09-Feb-2018	20-Feb-2018	✓
EP125D: Fumigants							
Clear glass VOC vial - HCl (EP125) GWSS1	06-Feb-2018	----	----	----	09-Feb-2018	20-Feb-2018	✓



Matrix: **WATER** Evaluation: * = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP125E: Halogenated Aliphatic Compounds							
Clear glass VOC vial - HCl (EP125) GWSS1	06-Feb-2018	----	----	----	09-Feb-2018	20-Feb-2018	✓
EP125F: Halogenated Aromatic Compounds							
Clear glass VOC vial - HCl (EP125) GWSS1	06-Feb-2018	----	----	----	09-Feb-2018	20-Feb-2018	✓
EP125G: Trihalomethanes							
Clear glass VOC vial - HCl (EP125) GWSS1	06-Feb-2018	----	----	----	09-Feb-2018	20-Feb-2018	✓
EP125H: Naphthalene							
Clear glass VOC vial - HCl (EP125) GWSS1	06-Feb-2018	----	----	----	09-Feb-2018	20-Feb-2018	✓
EP125L: Methyl t-butyl ether							
Clear glass VOC vial - HCl (EP125) GWSS1	06-Feb-2018	----	----	----	09-Feb-2018	20-Feb-2018	✓
EP132B: Polynuclear Aromatic Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP132) GWSS1	06-Feb-2018	08-Feb-2018	13-Feb-2018	✓	08-Feb-2018	20-Mar-2018	✓



Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER** Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Reaular	Actual	Expected	Evaluation	
Analytical Methods							
Laboratory Duplicates (DUP)							
Dissolved Mercury by FIMS	EG035F	0	1	0.00	10.00	✖	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	2	50.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	1	1	100.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	1	100.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	20	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
VOC by HS GCMS in SIM Mode	EP125	1	2	50.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Dissolved Mercury by FIMS	EG035F	1	1	100.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	2	50.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	1	1	100.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	1	100.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
VOC by HS GCMS in SIM Mode	EP125	1	2	50.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Dissolved Mercury by FIMS	EG035F	1	1	100.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	2	50.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	1	1	100.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	1	100.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
VOC by HS GCMS in SIM Mode	EP125	1	2	50.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Dissolved Mercury by FIMS	EG035F	1	1	100.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	2	50.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	1	1	100.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	1	100.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
VOC by HS GCMS in SIM Mode	EP125	1	2	50.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard



Brief Method Summaries

The analytical procedures used by the Environmental Division 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 in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Dissolved Metals by ICP-MS - Suite A	EG020A-F	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. Samples are 0.45µm filtered prior to analysis. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Dissolved Mercury by FIMS	EG035F	WATER	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl ₂)(Cold Vapour generation) AAS) Samples are 0.45µm filtered prior to analysis. FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the filtered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl ₂ which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
TRH - Semivolatile Fraction	EP071	WATER	In house: Referenced to USEPA SW 846 - 8015A The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with the QC requirements of NEPM (2013) Schedule B(3)
TRH Volatiles/BTEX	EP080	WATER	In house: Referenced to USEPA SW 846 - 8260B Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. Alternatively, a sample is equilibrated in a headspace vial and a portion of the headspace determined by GCMS analysis. This method is compliant with the QC requirements of NEPM (2013) Schedule B(3)
VOC by HS GCMS in SIM Mode	EP125	WATER	In house: A sample is saturated with sodium chloride and achieving thermodynamic equilibrium between the water and gas phase in a closed thermostatted vessel. A reproducible headspace gas is extracted from the vial and injected into a gas chromatograph and the analyte of interest is separated by means of gas/liquid partition chromatography and quantified using automated static headspace GCMS in SIM mode.
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	WATER	In house: Referenced to USEPA 3640 (GPC Cleanup), 8270D GCMS Capillary column, SIM mode. This method is compliant with NEPM (2013) Schedule B(3)
Preparation Methods	Method	Matrix	Method Descriptions
Separatory Funnel Extraction of Liquids	ORG14	WATER	In house: Referenced to USEPA SW 846 - 3510B 100 mL to 1L of sample is transferred to a separatory funnel and serially extracted three times using 60mL DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is compliant with NEPM (2013) Schedule B(3) . ALS default excludes sediment which may be resident in the container.
Sep. Funnel Extraction /Acetylation of Phenolic Compounds	ORG14-AC	WATER	In house: Referenced to USEPA 3510 (Extraction) / In-house (Acetylation): A 1L sample is extracted into dichloromethane and concentrated to 1 mL with exchange into cyclohexane. Phenolic compounds are reacted with acetic anhydride to yield phenyl acetates suitable for ultra-trace analysis. This method is compliant with NEPM (2013) Schedule B(3) . ALS default excludes sediment which may be resident in the container.
Volatiles Water Preparation	ORG16-W	WATER	A 5 mL aliquot or 5 mL of a diluted sample is added to a 40 mL VOC vial for sparging.

QUALITY CONTROL REPORT

Work Order	: ES1804143	Page	: 1 of 10
Client	: BENVIRON GROUP	Laboratory	: Environmental Division Sydney
Contact	: MR MICHAEL SILK	Contact	: Customer Services ES
Address	: PO BOX 4405 EAST GOSFORD NSW 2250	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: +61 02 0466 385 221	Telephone	: +61-2-8784 8555
Project	: E1292-2 Austral	Date Samples Received	: 07-Feb-2018
Order number	: ----	Date Analysis Commenced	: 08-Feb-2018
C-O-C number	: ----	Issue Date	: 09-Feb-2018
Sampler	: ----		
Site	: ----		
Quote number	: EN/222/17		
No. of samples received	: 1		
No. of samples analysed	: 1		



This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW
Nancy Wang	2IC Organic Chemist	Melbourne Organics, Springvale, VIC
Sanjeshni Jyoti	Senior Chemist Volatiles	Sydney Organics, Smithfield, NSW



General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high

Key :
 Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
 CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
 LOR = Limit of reporting
 RPD = Relative Percentage Difference
 # = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates 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%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EG020F: Dissolved Metals by ICP-MS (QC Lot: 1419185)									
ES1804136-001	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	0.038	0.038	0.00	0% - 20%
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.004	0.004	0.00	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.015	0.014	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1419534)									
EB1803407-001	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.00	No Limit
ES1804111-006	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1419724)									
ES1804143-001	GWSS1	EP071: C15 - C28 Fraction	----	100	µg/L	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	µg/L	<50	<50	0.00	No Limit
		EP071: C29 - C36 Fraction	----	50	µg/L	<50	<50	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 1419534)									
EB1803407-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.00	No Limit
ES1804111-006	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 1419724)									
ES1804143-001	GWSS1	EP071: >C10 - C16 Fraction	----	100	µg/L	<100	<100	0.00	No Limit
		EP071: >C16 - C34 Fraction	----	100	µg/L	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	µg/L	<100	<100	0.00	No Limit
EP080: BTEXN (QC Lot: 1419534)									
EB1803407-001	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.00	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.00	No Limit



Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP080: BTEXN (QC Lot: 1419534) - continued									
EB1803407-001	Anonymous	EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.00	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit
ES1804111-006	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.00	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.00	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit
EP125A: Monocyclic Aromatic Hydrocarbons (QC Lot: 1423111)									
ES1804143-001	GWSS1	EP125: Benzene	71-43-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP125: Ethylbenzene	100-41-4	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP125: meta- & para-Xylene	108-38-3 106-42-3	0.05	µg/L	0.06	0.07	0.00	No Limit
		EP125: Styrene	100-42-5	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP125: ortho-Xylene	95-47-6	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP125: 1.3.5-Trimethylbenzene	108-67-8	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP125: 1.2.4-Trimethylbenzene	95-63-6	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP125: Toluene	108-88-3	0.5	µg/L	<0.5	<0.5	0.00	No Limit
EP125D: Fumigants (QC Lot: 1423111)									
ES1804143-001	GWSS1	EP125: 1.2-Dichloropropane	78-87-5	0.1	µg/L	<0.1	<0.1	0.00	No Limit
		EP125: cis-1.3-Dichloropropylene	10061-01-5	0.1	µg/L	<0.1	<0.1	0.00	No Limit
		EP125: trans-1.3-Dichloropropylene	10061-02-6	0.1	µg/L	<0.1	<0.1	0.00	No Limit
		EP125: 1.2-Dibromoethane (EDB)	106-93-4	0.1	µg/L	<0.1	<0.1	0.00	No Limit
EP125E: Halogenated Aliphatic Compounds (QC Lot: 1423111)									
ES1804143-001	GWSS1	EP125: Hexachlorobutadiene	87-68-3	0.04	µg/L	<0.04	<0.04	0.00	No Limit
		EP125: Carbon Tetrachloride	56-23-5	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP125: Trichloroethene	79-01-6	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP125: Tetrachloroethene	127-18-4	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP125: 1.1-Dichloroethene	75-35-4	0.1	µg/L	<0.1	<0.1	0.00	No Limit
		EP125: trans-1.2-Dichloroethene	156-60-5	0.1	µg/L	<0.1	<0.1	0.00	No Limit
		EP125: 1.1-Dichloroethane	75-34-3	0.1	µg/L	<0.1	<0.1	0.00	No Limit
		EP125: cis-1.2-Dichloroethene	156-59-2	0.1	µg/L	<0.1	<0.1	0.00	No Limit
		EP125: 1.2-Dichloroethane	107-06-2	0.1	µg/L	<0.1	<0.1	0.00	No Limit
		EP125: 1.1.1-Trichloroethane	71-55-6	0.1	µg/L	<0.1	<0.1	0.00	No Limit
		EP125: Vinyl chloride	75-01-4	0.3	µg/L	<0.3	<0.3	0.00	No Limit
		EP125: Dichlorodifluoromethane	75-71-8	0.5	µg/L	<0.5	<0.5	0.00	No Limit



Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)	
EP125E: Halogenated Aliphatic Compounds (QC Lot: 1423111) - continued										
ES1804143-001	GWSS1	EP125: Bromomethane	74-83-9	0.5	µg/L	<0.5	<0.5	0.00	No Limit	
		EP125: Chloroethane	75-00-3	0.5	µg/L	<0.5	<0.5	0.00	No Limit	
		EP125: Trichlorofluoromethane	75-69-4	0.5	µg/L	<0.5	<0.5	0.00	No Limit	
		EP125: Bromochloromethane	74-97-5	0.5	µg/L	<0.5	<0.5	0.00	No Limit	
		EP125: Dichloromethane	75-09-2	1	µg/L	<1.0	<1.0	0.00	No Limit	
EP125F: Halogenated Aromatic Compounds (QC Lot: 1423111)										
ES1804143-001	GWSS1	EP125: Chlorobenzene	108-90-7	0.1	µg/L	<0.10	<0.10	0.00	No Limit	
		EP125: Bromobenzene	108-86-1	0.1	µg/L	<0.10	<0.10	0.00	No Limit	
		EP125: 1,3-Dichlorobenzene	541-73-1	0.1	µg/L	<0.10	<0.10	0.00	No Limit	
		EP125: 1,4-Dichlorobenzene	106-46-7	0.1	µg/L	<0.10	<0.10	0.00	No Limit	
		EP125: 1,2-Dichlorobenzene	95-50-1	0.1	µg/L	<0.10	<0.10	0.00	No Limit	
		EP125: 2-Chlorotoluene	95-49-8	0.1	µg/L	<0.1	<0.1	0.00	No Limit	
		EP125: 4-Chlorotoluene	106-43-4	0.1	µg/L	<0.1	<0.1	0.00	No Limit	
		EP125: 1,2,4-Trichlorobenzene	120-82-1	0.1	µg/L	<0.1	<0.1	0.00	No Limit	
		EP125: 1,2,3-Trichlorobenzene	87-61-6	0.1	µg/L	<0.1	<0.1	0.00	No Limit	
		EP125: Trichlorobenzenes (Sum)	----	0.1	µg/L	<0.1	<0.1	0.00	No Limit	
EP125: Benzylchloride	100-44-7	0.2	µg/L	<0.2	<0.2	0.00	No Limit			
EP125G: Trihalomethanes (QC Lot: 1423111)										
ES1804143-001	GWSS1	EP125: Chloroform	67-66-3	0.1	µg/L	<0.10	<0.10	0.00	No Limit	
		EP125: Bromodichloromethane	75-27-4	0.1	µg/L	<0.10	<0.10	0.00	No Limit	
		EP125: Dibromochloromethane	124-48-1	0.1	µg/L	<0.10	<0.10	0.00	No Limit	
		EP125: Bromoform	75-25-2	0.1	µg/L	<0.10	<0.10	0.00	No Limit	
		EP125: Total Trihalomethanes	----	0.1	µg/L	<0.10	<0.10	0.00	No Limit	
EP125H: Naphthalene (QC Lot: 1423111)										
ES1804143-001	GWSS1	EP125: Naphthalene	91-20-3	0.05	µg/L	<0.05	<0.05	0.00	No Limit	
EP125L: Methyl t-butyl ether (QC Lot: 1423111)										
ES1804143-001	GWSS1	EP125: Methyl tert-butyl ether (MTBE)	1634-04-4	0.1	µg/L	<0.1	<0.1	0.00	No Limit	
EP132B: Polynuclear Aromatic Hydrocarbons (QC Lot: 1419721)										
ES1804143-001	GWSS1	EP132: Benzo(a)pyrene	50-32-8	0.05	µg/L	<0.05	<0.05	0.00	No Limit	
		EP132: 3-Methylcholanthrene	56-49-5	0.1	µg/L	<0.1	<0.1	0.00	No Limit	
		EP132: 2-Methylnaphthalene	91-57-6	0.1	µg/L	<0.1	<0.1	0.00	No Limit	
		EP132: 7,12-Dimethylbenz(a)anthracene	57-97-6	0.1	µg/L	<0.1	<0.1	0.00	No Limit	
		EP132: Acenaphthene	83-32-9	0.1	µg/L	<0.1	<0.1	0.00	No Limit	
		EP132: Acenaphthylene	208-96-8	0.1	µg/L	<0.1	<0.1	0.00	No Limit	
		EP132: Anthracene	120-12-7	0.1	µg/L	<0.1	<0.1	0.00	No Limit	
		EP132: Benz(a)anthracene	56-55-3	0.1	µg/L	<0.1	<0.1	0.00	No Limit	
		EP132: Benzo(b+j)fluoranthene	205-99-2	0.1	µg/L	<0.1	<0.1	0.00	No Limit	
			205-82-3							
		EP132: Benzo(e)pyrene	192-97-2	0.1	µg/L	<0.1	<0.1	0.00	No Limit	

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 Work Order : ES1804143
 Client : BENVIRON GROUP
 Project : E1292-2 Austral



Sub-Matrix: **WATER**

				<i>Laboratory Duplicate (DUP) Report</i>					
<i>Laboratory sample ID</i>	<i>Client sample ID</i>	<i>Method: Compound</i>	<i>CAS Number</i>	<i>LOR</i>	<i>Unit</i>	<i>Original Result</i>	<i>Duplicate Result</i>	<i>RPD (%)</i>	<i>Recovery Limits (%)</i>
EP132B: Polynuclear Aromatic Hydrocarbons (QC Lot: 1419721) - continued									
ES1804143-001	GWSS1	EP132: Benzo(g,h,i)perylene	191-24-2	0.1	µg/L	<0.1	<0.1	0.00	No Limit
		EP132: Benzo(k)fluoranthene	207-08-9	0.1	µg/L	<0.1	<0.1	0.00	No Limit
		EP132: Chrysene	218-01-9	0.1	µg/L	<0.1	<0.1	0.00	No Limit
		EP132: Coronene	191-07-1	0.1	µg/L	<0.1	<0.1	0.00	No Limit
		EP132: Dibenz(a,h)anthracene	53-70-3	0.1	µg/L	<0.1	<0.1	0.00	No Limit
		EP132: Fluoranthene	206-44-0	0.1	µg/L	<0.1	<0.1	0.00	No Limit
		EP132: Fluorene	86-73-7	0.1	µg/L	<0.1	<0.1	0.00	No Limit
		EP132: Indeno(1,2,3-cd)pyrene	193-39-5	0.1	µg/L	<0.1	<0.1	0.00	No Limit
		EP132: Naphthalene	91-20-3	0.1	µg/L	<0.1	<0.1	0.00	No Limit
		EP132: Perylene	198-55-0	0.1	µg/L	<0.1	<0.1	0.00	No Limit
		EP132: Phenanthrene	85-01-8	0.1	µg/L	<0.1	<0.1	0.00	No Limit
EP132: Pyrene	129-00-0	0.1	µg/L	<0.1	<0.1	0.00	No Limit		



Method Blank (MB) and Laboratory Control Spike (LCS) Report

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 parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Spike (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
EG020F: Dissolved Metals by ICP-MS (QCLot: 1419185)									
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	89.5	85	114	
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	91.1	84	110	
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	92.6	85	111	
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	90.0	81	111	
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	92.4	83	111	
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	86.7	82	112	
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	87.0	81	117	
EG035F: Dissolved Mercury by FIMS (QCLot: 1419186)									
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	88.4	83	105	
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1419534)									
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	121	75	127	
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1419724)									
EP071: C10 - C14 Fraction	----	50	µg/L	<50	2000 µg/L	87.0	76	116	
EP071: C15 - C28 Fraction	----	100	µg/L	<100	3000 µg/L	94.1	83	109	
EP071: C29 - C36 Fraction	----	50	µg/L	<50	2000 µg/L	97.5	75	113	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1419534)									
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	310 µg/L	116	75	127	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1419724)									
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	2500 µg/L	97.2	76	114	
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	3500 µg/L	87.0	81	111	
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	1500 µg/L	105	77	119	
EP080: BTEXN (QCLot: 1419534)									
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	109	70	122	
EP080: Toluene	108-88-3	2	µg/L	<2	10 µg/L	104	69	123	
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	97.9	70	120	
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	10 µg/L	99.8	69	121	
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	99.3	72	122	
EP080: Naphthalene	91-20-3	5	µg/L	<5	10 µg/L	98.1	70	120	
EP125A: Monocyclic Aromatic Hydrocarbons (QCLot: 1423111)									
EP125: Benzene	71-43-2	0.05	µg/L	<0.05	1 µg/L	94.7	88	114	
EP125: Toluene	108-88-3	0.5	µg/L	<0.5	1 µg/L	106	82	118	
EP125: Ethylbenzene	100-41-4	0.05	µg/L	<0.05	1 µg/L	108	79	121	



Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB)	Laboratory Control Spike (LCS) Report				
				Report	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
				Result		LCS	Low	High	
EP125A: Monocyclic Aromatic Hydrocarbons (QCLot: 1423111) - continued									
EP125: meta- & para-Xylene	108-38-3 106-42-3	0.05	µg/L	<0.05	2 µg/L	109	79	119	
EP125: Styrene	100-42-5	0.05	µg/L	<0.05	1 µg/L	103	82	116	
EP125: ortho-Xylene	95-47-6	0.05	µg/L	<0.05	1 µg/L	103	82	116	
EP125: 1.3.5-Trimethylbenzene	108-67-8	0.05	µg/L	<0.05	1 µg/L	105	78	120	
EP125: 1.2.4-Trimethylbenzene	95-63-6	0.05	µg/L	<0.05	1 µg/L	100	77	119	
EP125D: Fumigants (QCLot: 1423111)									
EP125: 1.2-Dichloropropane	78-87-5	0.1	µg/L	<0.1	1 µg/L	91.8	84	120	
EP125: cis-1.3-Dichloropropylene	10061-01-5	0.1	µg/L	<0.1	1 µg/L	86.4	82	120	
EP125: trans-1.3-Dichloropropylene	10061-02-6	0.1	µg/L	<0.1	1 µg/L	90.2	77	125	
EP125: 1.2-Dibromoethane (EDB)	106-93-4	0.1	µg/L	<0.1	1 µg/L	98.7	78	128	
EP125E: Halogenated Aliphatic Compounds (QCLot: 1423111)									
EP125: Dichlorodifluoromethane	75-71-8	0.5	µg/L	<0.5	10 µg/L	106	71	133	
EP125: Vinyl chloride	75-01-4	0.3	µg/L	<0.3	10 µg/L	105	75	129	
EP125: Bromomethane	74-83-9	0.5	µg/L	<0.5	10 µg/L	103	56	136	
EP125: Chloroethane	75-00-3	0.5	µg/L	<0.5	10 µg/L	99.9	68	134	
EP125: Trichlorofluoromethane	75-69-4	0.5	µg/L	<0.5	10 µg/L	105	77	129	
EP125: 1.1-Dichloroethene	75-35-4	0.1	µg/L	<0.1	1 µg/L	99.4	81	123	
EP125: Dichloromethane	75-09-2	1	µg/L	<1.0	1 µg/L	100	70	130	
EP125: trans-1.2-Dichloroethene	156-60-5	0.1	µg/L	<0.1	1 µg/L	99.5	85	119	
EP125: 1.1-Dichloroethane	75-34-3	0.1	µg/L	<0.1	1 µg/L	95.6	84	122	
EP125: cis-1.2-Dichloroethene	156-59-2	0.1	µg/L	<0.1	1 µg/L	93.4	85	119	
EP125: Bromochloromethane	74-97-5	0.5	µg/L	<0.5	1 µg/L	97.1	78	132	
EP125: 1.2-Dichloroethane	107-06-2	0.1	µg/L	<0.1	1 µg/L	96.2	76	132	
EP125: 1.1.1-Trichloroethane	71-55-6	0.1	µg/L	<0.1	1 µg/L	93.4	82	122	
EP125: Carbon Tetrachloride	56-23-5	0.05	µg/L	<0.05	1 µg/L	95.5	79	125	
EP125: Trichloroethene	79-01-6	0.05	µg/L	<0.05	1 µg/L	96.0	79	125	
EP125: Tetrachloroethene	127-18-4	0.05	µg/L	<0.05	1 µg/L	106	75	131	
EP125: Hexachlorobutadiene	87-68-3	0.04	µg/L	<0.04	1 µg/L	106	63	137	
EP125F: Halogenated Aromatic Compounds (QCLot: 1423111)									
EP125: Chlorobenzene	108-90-7	0.1	µg/L	<0.10	1 µg/L	106	87	113	
EP125: Bromobenzene	108-86-1	0.1	µg/L	<0.10	1 µg/L	98.7	80	118	
EP125: Benzylchloride	100-44-7	0.2	µg/L	<0.2	1 µg/L	94.6	62	124	
EP125: 1.3-Dichlorobenzene	541-73-1	0.1	µg/L	<0.10	1 µg/L	104	84	114	
EP125: 1.4-Dichlorobenzene	106-46-7	0.1	µg/L	<0.10	1 µg/L	103	83	113	
EP125: 1.2-Dichlorobenzene	95-50-1	0.1	µg/L	<0.10	1 µg/L	104	90	112	
EP125: 2-Chlorotoluene	95-49-8	0.1	µg/L	<0.1	1 µg/L	106	82	116	
EP125: 4-Chlorotoluene	106-43-4	0.1	µg/L	<0.1	1 µg/L	104	80	116	



Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
EP125F: Halogenated Aromatic Compounds (QCLot: 1423111) - continued									
EP125: 1,2,4-Trichlorobenzene	120-82-1	0.1	µg/L	<0.1	1 µg/L	107	83	117	
EP125: 1,2,3-Trichlorobenzene	87-61-6	0.1	µg/L	<0.1	1 µg/L	106	82	118	
EP125: Trichlorobenzenes (Sum)	----	0.1	µg/L	<0.1	----	----	----	----	
EP125G: Trihalomethanes (QCLot: 1423111)									
EP125: Chloroform	67-66-3	0.1	µg/L	<0.10	1 µg/L	93.2	83	125	
EP125: Bromodichloromethane	75-27-4	0.1	µg/L	<0.10	1 µg/L	90.0	80	128	
EP125: Dibromochloromethane	124-48-1	0.1	µg/L	<0.10	1 µg/L	110	78	130	
EP125: Bromoform	75-25-2	0.1	µg/L	<0.10	1 µg/L	101	74	132	
EP125: Total Trihalomethanes	----	0.1	µg/L	<0.10	----	----	----	----	
EP125H: Naphthalene (QCLot: 1423111)									
EP125: Naphthalene	91-20-3	0.05	µg/L	<0.05	1 µg/L	105	89	113	
EP125L: Methyl t-butyl ether (QCLot: 1423111)									
EP125: Methyl tert-butyl ether (MTBE)	1634-04-4	0.1	µg/L	<0.1	1 µg/L	89.2	81	123	
EP132B: Polynuclear Aromatic Hydrocarbons (QCLot: 1419721)									
EP132: 3-Methylcholanthrene	56-49-5	0.1	µg/L	<0.1	2 µg/L	80.6	60	120	
EP132: 2-Methylnaphthalene	91-57-6	0.1	µg/L	<0.1	2 µg/L	63.0	59	123	
EP132: 7,12-Dimethylbenz(a)anthracene	57-97-6	0.1	µg/L	<0.1	2 µg/L	77.0	36	144	
EP132: Acenaphthene	83-32-9	0.1	µg/L	<0.1	2 µg/L	70.5	64	122	
EP132: Acenaphthylene	208-96-8	0.1	µg/L	<0.1	2 µg/L	69.0	64	126	
EP132: Anthracene	120-12-7	0.1	µg/L	<0.1	2 µg/L	77.2	65	127	
EP132: Benz(a)anthracene	56-55-3	0.1	µg/L	<0.1	2 µg/L	77.5	64	130	
EP132: Benzo(a)pyrene	50-32-8	0.05	µg/L	<0.05	2 µg/L	79.9	64	126	
EP132: Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.1	µg/L	<0.1	2 µg/L	77.5	62	126	
EP132: Benzo(e)pyrene	192-97-2	0.1	µg/L	<0.1	2 µg/L	79.6	62	126	
EP132: Benzo(g,h,i)perylene	191-24-2	0.1	µg/L	<0.1	2 µg/L	79.3	56	126	
EP132: Benzo(k)fluoranthene	207-08-9	0.1	µg/L	<0.1	2 µg/L	81.1	68	130	
EP132: Chrysene	218-01-9	0.1	µg/L	<0.1	2 µg/L	78.4	66	130	
EP132: Coronene	191-07-1	0.1	µg/L	<0.1	2 µg/L	84.2	35	133	
EP132: Dibenz(a,h)anthracene	53-70-3	0.1	µg/L	<0.1	2 µg/L	78.7	58	128	
EP132: Fluoranthene	206-44-0	0.1	µg/L	<0.1	2 µg/L	82.0	65	127	
EP132: Fluorene	86-73-7	0.1	µg/L	<0.1	2 µg/L	74.1	64	124	
EP132: Indeno(1,2,3-cd)pyrene	193-39-5	0.1	µg/L	<0.1	2 µg/L	78.7	57	127	
EP132: Naphthalene	91-20-3	0.1	µg/L	<0.1	2 µg/L	66.3	54	128	
EP132: Perylene	198-55-0	0.1	µg/L	<0.1	2 µg/L	79.6	66	130	
EP132: Phenanthrene	85-01-8	0.1	µg/L	<0.1	2 µg/L	77.1	65	129	
EP132: Pyrene	129-00-0	0.1	µg/L	<0.1	2 µg/L	78.4	66	128	



Matrix Spike (MS) Report

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 parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report				
				Spike Concentration	SpikeRecovery(%) MS	Recovery Limits (%)		
						Low	High	
EG020F: Dissolved Metals by ICP-MS (QCLot: 1419185)								
ES1804143-001	GWSS1	EG020A-F: Arsenic	7440-38-2	1 mg/L	101	70	130	
		EG020A-F: Cadmium	7440-43-9	0.25 mg/L	91.0	70	130	
		EG020A-F: Chromium	7440-47-3	1 mg/L	90.4	70	130	
		EG020A-F: Copper	7440-50-8	1 mg/L	91.7	70	130	
		EG020A-F: Lead	7439-92-1	1 mg/L	112	70	130	
		EG020A-F: Nickel	7440-02-0	1 mg/L	92.1	70	130	
		EG020A-F: Zinc	7440-66-6	1 mg/L	90.3	70	130	
EG035F: Dissolved Mercury by FIMS (QCLot: 1419186)								
ES1804143-001	GWSS1	EG035F: Mercury	7439-97-6	0.01 mg/L	101	70	130	
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1419534)								
EB1803407-001	Anonymous	EP080: C6 - C9 Fraction	----	325 µg/L	102	70	130	
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1419724)								
ES1804143-001	GWSS1	EP071: C10 - C14 Fraction	----	200 µg/L	103	74	150	
		EP071: C15 - C28 Fraction	----	300 µg/L	89.5	77	153	
		EP071: C29 - C36 Fraction	----	200 µg/L	96.6	67	153	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1419534)								
EB1803407-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	98.6	70	130	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1419724)								
ES1804143-001	GWSS1	EP071: >C10 - C16 Fraction	----	250 µg/L	96.9	74	150	
		EP071: >C16 - C34 Fraction	----	350 µg/L	88.2	77	153	
		EP071: >C34 - C40 Fraction	----	150 µg/L	107	67	153	
EP080: BTEXN (QCLot: 1419534)								
EB1803407-001	Anonymous	EP080: Benzene	71-43-2	25 µg/L	86.5	70	130	
		EP080: Toluene	108-88-3	25 µg/L	90.4	70	130	
		EP080: Ethylbenzene	100-41-4	25 µg/L	91.6	70	130	
		EP080: meta- & para-Xylene	108-38-3	25 µg/L	92.6	70	130	
			106-42-3					
		EP080: ortho-Xylene	95-47-6	25 µg/L	94.9	70	130	
EP080: Naphthalene	91-20-3	25 µg/L	99.0	70	130			
EP125A: Monocyclic Aromatic Hydrocarbons (QCLot: 1423111)								
ES1804152-001	Anonymous	EP125: Benzene	71-43-2	10 µg/L	102	71	133	
		EP125: Toluene	108-88-3	10 µg/L	101	70	128	



Sub-Matrix: WATER

				Matrix Spike (MS) Report				
				Spike	SpikeRecovery(%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High	
EP125E: Halogenated Aliphatic Compounds (QCLot: 1423111)								
ES1804152-001	Anonymous	EP125: 1,1-Dichloroethene	75-35-4	10 µg/L	108	54	130	
		EP125: Trichloroethene	79-01-6	10 µg/L	99.0	57	100	
EP125F: Halogenated Aromatic Compounds (QCLot: 1423111)								
ES1804152-001	Anonymous	EP125: Chlorobenzene	108-90-7	10 µg/L	101	75	129	
EP132B: Polynuclear Aromatic Hydrocarbons (QCLot: 1419721)								
ES1804143-001	GWSS1	EP132: 3-Methylcholanthrene	56-49-5	2 µg/L	104	59	115	
		EP132: 2-Methylnaphthalene	91-57-6	2 µg/L	84.2	46	120	
		EP132: 7,12-Dimethylbenz(a)anthracene	57-97-6	2 µg/L	98.8	21	135	
		EP132: Acenaphthene	83-32-9	2 µg/L	88.6	62	114	
		EP132: Acenaphthylene	208-96-8	2 µg/L	87.4	61	119	
		EP132: Anthracene	120-12-7	2 µg/L	96.5	68	116	
		EP132: Benz(a)anthracene	56-55-3	2 µg/L	99.2	67	122	
		EP132: Benzo(a)pyrene	50-32-8	2 µg/L	102	72	114	
		EP132: Benzo(b+j)fluoranthene	205-99-2	2 µg/L	99.9	69	119	
			205-82-3					
		EP132: Benzo(e)pyrene	192-97-2	2 µg/L	100	71	119	
		EP132: Benzo(g,h,i)perylene	191-24-2	2 µg/L	101	49	133	
		EP132: Benzo(k)fluoranthene	207-08-9	2 µg/L	100	71	124	
		EP132: Chrysene	218-01-9	2 µg/L	99.5	70	118	
		EP132: Coronene	191-07-1	2 µg/L	104	29	138	
		EP132: Dibenz(a,h)anthracene	53-70-3	2 µg/L	100	60	122	
		EP132: Fluoranthene	206-44-0	2 µg/L	104	65	121	
		EP132: Fluorene	86-73-7	2 µg/L	93.1	63	118	
		EP132: Indeno(1,2,3,cd)pyrene	193-39-5	2 µg/L	100	57	123	
		EP132: Naphthalene	91-20-3	2 µg/L	81.1	53	115	
EP132: Perylene	198-55-0	2 µg/L	101	71	118			
EP132: Phenanthrene	85-01-8	2 µg/L	96.9	67	120			
EP132: Pyrene	129-00-0	2 µg/L	98.8	70	117			

CERTIFICATE OF ANALYSIS

Work Order	: ES1804143	Page	: 1 of 7
Client	: BENVIRON GROUP	Laboratory	: Environmental Division Sydney
Contact	: MR MICHAEL SILK	Contact	: Customer Services ES
Address	: PO BOX 4405	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
	EAST GOSFORD NSW 2250		
Telephone	: +61 02 0466 385 221	Telephone	: +61-2-8784 8555
Project	: E1292-2 Austral	Date Samples Received	: 07-Feb-2018 14:00
Order number	: ----	Date Analysis Commenced	: 08-Feb-2018
C-O-C number	: ----	Issue Date	: 09-Feb-2018 17:14
Sampler	: ----		
Site	: ----		
Quote number	: EN/222/17		
No. of samples received	: 1		
No. of samples analysed	: 1		



Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Edwandy Fadjjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW
Nancy Wang	2IC Organic Chemist	Melbourne Organics, Springvale, VIC
Sanjeshni Jyoti	Senior Chemist Volatiles	Sydney Organics, Smithfield, NSW



General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- Total PAH reported as the sum of Naphthalene, Acenaphthylene, Acenaphthene, Fluorene, Phenanthrene, Anthracene, Fluoranthene, Pyrene, Benz(a)anthracene, Chrysene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Indeno(1,2,3-cd)pyrene, Dibenz(a,h)anthracene and Benzo(g,h,i)perylene.



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	GWSS1	----	----	----	----
Client sampling date / time				06-Feb-2018 00:00	----	----	----	----	
Compound	CAS Number	LOR	Unit	ES1804143-001	-----	-----	-----	-----	
				Result	----	----	----	----	
EG020F: Dissolved Metals by ICP-MS									
Arsenic	7440-38-2	0.001	mg/L	0.001	----	----	----	----	
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	----	----	----	----	
Chromium	7440-47-3	0.001	mg/L	<0.001	----	----	----	----	
Copper	7440-50-8	0.001	mg/L	<0.001	----	----	----	----	
Nickel	7440-02-0	0.001	mg/L	0.002	----	----	----	----	
Lead	7439-92-1	0.001	mg/L	<0.001	----	----	----	----	
Zinc	7440-66-6	0.005	mg/L	<0.005	----	----	----	----	
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L	<0.0001	----	----	----	----	
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L	<20	----	----	----	----	
C10 - C14 Fraction	----	50	µg/L	<50	----	----	----	----	
C15 - C28 Fraction	----	100	µg/L	<100	----	----	----	----	
C29 - C36 Fraction	----	50	µg/L	<50	----	----	----	----	
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	----	----	----	----	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L	<20	----	----	----	----	
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	<20	----	----	----	----	
>C10 - C16 Fraction	----	100	µg/L	<100	----	----	----	----	
>C16 - C34 Fraction	----	100	µg/L	<100	----	----	----	----	
>C34 - C40 Fraction	----	100	µg/L	<100	----	----	----	----	
^ >C10 - C40 Fraction (sum)	----	100	µg/L	<100	----	----	----	----	
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	<100	----	----	----	----	
EP080: BTEXN									
Benzene	71-43-2	1	µg/L	<1	----	----	----	----	
Toluene	108-88-3	2	µg/L	<2	----	----	----	----	
Ethylbenzene	100-41-4	2	µg/L	<2	----	----	----	----	
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	----	----	----	----	
ortho-Xylene	95-47-6	2	µg/L	<2	----	----	----	----	
^ Total Xylenes	----	2	µg/L	<2	----	----	----	----	
^ Sum of BTEX	----	1	µg/L	<1	----	----	----	----	
Naphthalene	91-20-3	5	µg/L	<5	----	----	----	----	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	GWSS1	----	----	----	----
Client sampling date / time				06-Feb-2018 00:00	----	----	----	----	
Compound	CAS Number	LOR	Unit	ES1804143-001	-----	-----	-----	-----	
				Result	----	----	----	----	
EP125A: Monocyclic Aromatic Hydrocarbons									
Benzene	71-43-2	0.05	µg/L	<0.05	----	----	----	----	
Toluene	108-88-3	0.5	µg/L	<0.5	----	----	----	----	
Ethylbenzene	100-41-4	0.05	µg/L	<0.05	----	----	----	----	
meta- & para-Xylene	108-38-3 106-42-3	0.05	µg/L	0.06	----	----	----	----	
Styrene	100-42-5	0.05	µg/L	<0.05	----	----	----	----	
ortho-Xylene	95-47-6	0.05	µg/L	<0.05	----	----	----	----	
1.3.5-Trimethylbenzene	108-67-8	0.05	µg/L	<0.05	----	----	----	----	
1.2.4-Trimethylbenzene	95-63-6	0.05	µg/L	<0.05	----	----	----	----	
EP125D: Fumigants									
1.2-Dichloropropane	78-87-5	0.1	µg/L	<0.1	----	----	----	----	
cis-1.3-Dichloropropylene	10061-01-5	0.1	µg/L	<0.1	----	----	----	----	
trans-1.3-Dichloropropylene	10061-02-6	0.1	µg/L	<0.1	----	----	----	----	
1.2-Dibromoethane (EDB)	106-93-4	0.1	µg/L	<0.1	----	----	----	----	
EP125E: Halogenated Aliphatic Compounds									
Dichlorodifluoromethane	75-71-8	0.5	µg/L	<0.5	----	----	----	----	
Vinyl chloride	75-01-4	0.3	µg/L	<0.3	----	----	----	----	
Bromomethane	74-83-9	0.5	µg/L	<0.5	----	----	----	----	
Chloroethane	75-00-3	0.5	µg/L	<0.5	----	----	----	----	
Trichlorofluoromethane	75-69-4	0.5	µg/L	<0.5	----	----	----	----	
1.1-Dichloroethene	75-35-4	0.1	µg/L	<0.1	----	----	----	----	
Dichloromethane	75-09-2	1.0	µg/L	<1.0	----	----	----	----	
trans-1.2-Dichloroethene	156-60-5	0.1	µg/L	<0.1	----	----	----	----	
1.1-Dichloroethane	75-34-3	0.1	µg/L	<0.1	----	----	----	----	
cis-1.2-Dichloroethene	156-59-2	0.1	µg/L	<0.1	----	----	----	----	
Bromochloromethane	74-97-5	0.5	µg/L	<0.5	----	----	----	----	
1.2-Dichloroethane	107-06-2	0.1	µg/L	<0.1	----	----	----	----	
1.1.1-Trichloroethane	71-55-6	0.1	µg/L	<0.1	----	----	----	----	
Carbon Tetrachloride	56-23-5	0.05	µg/L	<0.05	----	----	----	----	
Trichloroethene	79-01-6	0.05	µg/L	<0.05	----	----	----	----	
Tetrachloroethene	127-18-4	0.05	µg/L	<0.05	----	----	----	----	
Hexachlorobutadiene	87-68-3	0.04	µg/L	<0.04	----	----	----	----	
EP125F: Halogenated Aromatic Compounds									
Chlorobenzene	108-90-7	0.10	µg/L	<0.10	----	----	----	----	
Bromobenzene	108-86-1	0.10	µg/L	<0.10	----	----	----	----	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	GWSS1	----	----	----	----
Client sampling date / time				06-Feb-2018 00:00	----	----	----	----	
Compound	CAS Number	LOR	Unit	ES1804143-001	-----	-----	-----	-----	
				Result	----	----	----	----	
EP125F: Halogenated Aromatic Compounds - Continued									
Benzylchloride	100-44-7	0.2	µg/L	<0.2	----	----	----	----	
1.3-Dichlorobenzene	541-73-1	0.10	µg/L	<0.10	----	----	----	----	
1.4-Dichlorobenzene	106-46-7	0.10	µg/L	<0.10	----	----	----	----	
1.2-Dichlorobenzene	95-50-1	0.10	µg/L	<0.10	----	----	----	----	
2-Chlorotoluene	95-49-8	0.1	µg/L	<0.1	----	----	----	----	
4-Chlorotoluene	106-43-4	0.1	µg/L	<0.1	----	----	----	----	
1.2.4-Trichlorobenzene	120-82-1	0.1	µg/L	<0.1	----	----	----	----	
1.2.3-Trichlorobenzene	87-61-6	0.1	µg/L	<0.1	----	----	----	----	
[^] Trichlorobenzenes (Sum)	----	0.1	µg/L	<0.1	----	----	----	----	
EP125G: Trihalomethanes									
Chloroform	67-66-3	0.10	µg/L	<0.10	----	----	----	----	
Bromodichloromethane	75-27-4	0.10	µg/L	<0.10	----	----	----	----	
Dibromochloromethane	124-48-1	0.10	µg/L	<0.10	----	----	----	----	
Bromoform	75-25-2	0.10	µg/L	<0.10	----	----	----	----	
[^] Total Trihalomethanes	----	0.10	µg/L	<0.10	----	----	----	----	
EP125H: Naphthalene									
Naphthalene	91-20-3	0.05	µg/L	<0.05	----	----	----	----	
EP125L: Methyl t-butyl ether									
Methyl tert-butyl ether (MTBE)	1634-04-4	0.1	µg/L	<0.1	----	----	----	----	
EP132B: Polynuclear Aromatic Hydrocarbons									
3-Methylcholanthrene	56-49-5	0.1	µg/L	<0.1	----	----	----	----	
2-Methylnaphthalene	91-57-6	0.1	µg/L	<0.1	----	----	----	----	
7.12-Dimethylbenz(a)anthracene	57-97-6	0.1	µg/L	<0.1	----	----	----	----	
Acenaphthene	83-32-9	0.1	µg/L	<0.1	----	----	----	----	
Acenaphthylene	208-96-8	0.1	µg/L	<0.1	----	----	----	----	
Anthracene	120-12-7	0.1	µg/L	<0.1	----	----	----	----	
Benz(a)anthracene	56-55-3	0.1	µg/L	<0.1	----	----	----	----	
Benzo(a)pyrene	50-32-8	0.05	µg/L	<0.05	----	----	----	----	
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.1	µg/L	<0.1	----	----	----	----	
Benzo(e)pyrene	192-97-2	0.1	µg/L	<0.1	----	----	----	----	
Benzo(g,h,i)perylene	191-24-2	0.1	µg/L	<0.1	----	----	----	----	
Benzo(k)fluoranthene	207-08-9	0.1	µg/L	<0.1	----	----	----	----	
Chrysene	218-01-9	0.1	µg/L	<0.1	----	----	----	----	
Coronene	191-07-1	0.1	µg/L	<0.1	----	----	----	----	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	GWSS1	----	----	----	----
Client sampling date / time				06-Feb-2018 00:00	----	----	----	----	
Compound	CAS Number	LOR	Unit	ES1804143-001	-----	-----	-----	-----	
				Result	----	----	----	----	
EP132B: Polynuclear Aromatic Hydrocarbons - Continued									
Dibenz(a,h)anthracene	53-70-3	0.1	µg/L	<0.1	----	----	----	----	
Fluoranthene	206-44-0	0.1	µg/L	<0.1	----	----	----	----	
Fluorene	86-73-7	0.1	µg/L	<0.1	----	----	----	----	
Indeno(1.2.3.cd)pyrene	193-39-5	0.1	µg/L	<0.1	----	----	----	----	
Naphthalene	91-20-3	0.1	µg/L	<0.1	----	----	----	----	
Perylene	198-55-0	0.1	µg/L	<0.1	----	----	----	----	
Phenanthrene	85-01-8	0.1	µg/L	<0.1	----	----	----	----	
Pyrene	129-00-0	0.1	µg/L	<0.1	----	----	----	----	
^ Sum of PAHs	----	0.05	µg/L	<0.05	----	----	----	----	
^ Benzo(a)pyrene TEQ (zero)	----	0.05	µg/L	<0.05	----	----	----	----	
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	2	%	95.0	----	----	----	----	
Toluene-D8	2037-26-5	2	%	104	----	----	----	----	
4-Bromofluorobenzene	460-00-4	2	%	98.6	----	----	----	----	
EP125S: VOC Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.1	%	96.6	----	----	----	----	
Toluene-D8	2037-26-5	0.1	%	108	----	----	----	----	
4-Bromofluorobenzene	460-00-4	0.1	%	103	----	----	----	----	
EP132T: Base/Neutral Extractable Surrogates									
2-Fluorobiphenyl	321-60-8	0.1	%	76.7	----	----	----	----	
Anthracene-d10	1719-06-8	0.1	%	88.6	----	----	----	----	
4-Terphenyl-d14	1718-51-0	0.1	%	104	----	----	----	----	



Surrogate Control Limits

Sub-Matrix: WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP080S: TPH(V)/BTEX Surrogates			
1,2-Dichloroethane-D4	17060-07-0	71	137
Toluene-D8	2037-26-5	79	131
4-Bromofluorobenzene	460-00-4	70	128
EP125S: VOC Surrogates			
1,2-Dichloroethane-D4	17060-07-0	73	130
Toluene-D8	2037-26-5	68	128
4-Bromofluorobenzene	460-00-4	71	120
EP132T: Base/Neutral Extractable Surrogates			
2-Fluorobiphenyl	321-60-8	43	135
Anthracene-d10	1719-06-8	48	138
4-Terphenyl-d14	1718-51-0	48	144



Envirolab Services Pty Ltd

ABN 37 112 535 645

12 Ashley St Chatswood NSW 2067

ph 02 9910 6200 fax 02 9910 6201

customerservice@envirolab.com.au

www.envirolab.com.au

SAMPLE RECEIPT ADVICE

Client Details

Client	Benviron Group
Attention	Ben Buckley

Sample Login Details

Your reference	E1292-2, Austral
Envirolab Reference	184735
Date Sample Received	07/02/2018
Date Instructions Received	07/02/2018
Date Results Expected to be Reported	09/02/2018

Sample Condition

Samples received in appropriate condition for analysis	YES
No. of Samples Provided	4 Water
Turnaround Time Requested	2 days
Temperature on Receipt (°C)	12.1
Cooling Method	Ice Pack
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

Aileen Hie

Phone: 02 9910 6200

Fax: 02 9910 6201

Email: ahie@envirolab.com.au

Jacinta Hurst

Phone: 02 9910 6200

Fax: 02 9910 6201

Email: jhurst@envirolab.com.au

Analysis Underway, details on the following page:



Sample ID	VOCs in water	VTRH(C6-C10)/BTEXN in Water	svTRH (C10-C40) in Water	PAHs in Water - Low Level	HM in water - dissolved
GW1	✓	✓	✓	✓	✓
GWD1	✓	✓	✓	✓	✓
TS1		✓			
TB1		✓			

The '✓' indicates the testing you have requested. **THIS IS NOT A REPORT OF THE RESULTS.**

Additional Info

Sample storage - Waters are routinely disposed of approximately 1 month and soils approximately 2 months from receipt.

Requests for longer term sample storage must be received in writing.



Chain of Custody Record

Client Details: Benviron Group PO Box 4405, East Gosford NSW 2250 email: ben@benvirongroup.com.au michael@benvirongroup.com.au; ray@benvirongroup.com.au ph: +61466 385 221	Project Manager: Michael Silk Sampled By: RL Purchase Order #: N/A Page #: 1	Project #: E1292-2 Project Name: Austral Quote #: Turnaround time: Fast - 2 days
Delivery Details: Envirolab Pty Ltd 12 Ashley Street, Chatswood NSW 2067 email: ahie@envirolab.com.au ph: +612 9910 6200		

#	Sample ID	Depth	Date Sampled	Matrix	Analytes						Sample Comments	
					Heavy Metals (8)	TRH	BTEXN	PAH Low	VOC	TRH C6-C10 & BTEXN		Envirolab Suites
1	GW1	-	06.02.2018	Water	X	X	X	X	X			Keep
4	GWD1	-	06.02.2018	Water	X	X	X	X	X			Keep
5	TS1	-	-	Water					X			Keep
6	TB1	-	-	Water					X			Keep

Special Directions and Comments:

Relinquished by	Received By
Signature	Signature
Date	Date
	Ray Liu 06.02.2018
	EUS RV 7/21/18 17:30
	Method of shipment Courier

Envirolab Services
 12 Ashley St
 Chatswood NSW 2067
 PH: (02) 9910 6200
 Job No: 184735
 Date Received: 7/21/18
 Time Received: 17:30
 Received by: RV
 Temp: Cool/Ambient
 Cooling: Ice/Repack
 Security: intact/Broken/None

123



CERTIFICATE OF ANALYSIS 184735

Client Details

Client	Benviron Group
Attention	Ben Buckley
Address	PO Box 4405, East Gosford, NSW, 2250

Sample Details

Your Reference	<u>E1292-2, Austral</u>
Number of Samples	4 Water
Date samples received	07/02/2018
Date completed instructions received	07/02/2018

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.
Samples were analysed as received from the client. Results relate specifically to the samples as received.
Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Report Details

Date results requested by	09/02/2018
Date of Issue	09/02/2018
NATA Accreditation Number 2901. This document shall not be reproduced except in full.	
Accredited for compliance with ISO/IEC 17025 - Testing. Tests not covered by NATA are denoted with *	

Results Approved By

Jeremy Faircloth, Organics Supervisor
Long Pham, Team Leader, Metals
Steven Luong, Senior Chemist

Authorised By

David Springer, General Manager

VOCs in water			
Our Reference		184735-1	184735-2
Your Reference	UNITS	GW1	GWD1
Date Sampled		06/02/2018	06/02/2018
Type of sample		Water	Water
Date extracted	-	08/02/2018	08/02/2018
Date analysed	-	08/02/2018	08/02/2018
Dichlorodifluoromethane	µg/L	<10	<10
Chloromethane	µg/L	<10	<10
Vinyl Chloride	µg/L	<10	<10
Bromomethane	µg/L	<10	<10
Chloroethane	µg/L	<10	<10
Trichlorofluoromethane	µg/L	<10	<10
1,1-Dichloroethene	µg/L	<1	<1
Trans-1,2-dichloroethene	µg/L	<1	<1
1,1-dichloroethane	µg/L	<1	<1
Cis-1,2-dichloroethene	µg/L	<1	<1
Bromochloromethane	µg/L	<1	<1
Chloroform	µg/L	<1	<1
2,2-dichloropropane	µg/L	<1	<1
1,2-dichloroethane	µg/L	<1	<1
1,1,1-trichloroethane	µg/L	<1	<1
1,1-dichloropropene	µg/L	<1	<1
Cyclohexane	µg/L	<1	<1
Carbon tetrachloride	µg/L	<1	<1
Benzene	µg/L	<1	<1
Dibromomethane	µg/L	<1	<1
1,2-dichloropropane	µg/L	<1	<1
Trichloroethene	µg/L	<1	<1
Bromodichloromethane	µg/L	<1	<1
trans-1,3-dichloropropene	µg/L	<1	<1
cis-1,3-dichloropropene	µg/L	<1	<1
1,1,2-trichloroethane	µg/L	<1	<1
Toluene	µg/L	<1	<1
1,3-dichloropropane	µg/L	<1	<1
Dibromochloromethane	µg/L	<1	<1
1,2-dibromoethane	µg/L	<1	<1
Tetrachloroethene	µg/L	<1	<1
1,1,1,2-tetrachloroethane	µg/L	<1	<1
Chlorobenzene	µg/L	<1	<1
Ethylbenzene	µg/L	<1	<1
Bromoform	µg/L	<1	<1

VOCs in water			
Our Reference		184735-1	184735-2
Your Reference	UNITS	GW1	GWD1
Date Sampled		06/02/2018	06/02/2018
Type of sample		Water	Water
m+p-xylene	µg/L	<2	<2
Styrene	µg/L	<1	<1
1,1,2,2-tetrachloroethane	µg/L	<1	<1
o-xylene	µg/L	<1	<1
1,2,3-trichloropropane	µg/L	<1	<1
Isopropylbenzene	µg/L	<1	<1
Bromobenzene	µg/L	<1	<1
n-propyl benzene	µg/L	<1	<1
2-chlorotoluene	µg/L	<1	<1
4-chlorotoluene	µg/L	<1	<1
1,3,5-trimethyl benzene	µg/L	<1	<1
Tert-butyl benzene	µg/L	<1	<1
1,2,4-trimethyl benzene	µg/L	<1	<1
1,3-dichlorobenzene	µg/L	<1	<1
Sec-butyl benzene	µg/L	<1	<1
1,4-dichlorobenzene	µg/L	<1	<1
4-isopropyl toluene	µg/L	<1	<1
1,2-dichlorobenzene	µg/L	<1	<1
n-butyl benzene	µg/L	<1	<1
1,2-dibromo-3-chloropropane	µg/L	<1	<1
1,2,4-trichlorobenzene	µg/L	<1	<1
Hexachlorobutadiene	µg/L	<1	<1
1,2,3-trichlorobenzene	µg/L	<1	<1
Surrogate Dibromofluoromethane	%	103	124
Surrogate toluene-d8	%	99	98
Surrogate 4-BFB	%	95	94

vTRH(C6-C10)/BTEXN in Water					
Our Reference		184735-1	184735-2	184735-3	184735-4
Your Reference	UNITS	GW1	GWD1	TS1	TB1
Date Sampled		06/02/2018	06/02/2018	-	-
Type of sample		Water	Water	Water	Water
Date extracted	-	08/02/2018	08/02/2018	08/02/2018	08/02/2018
Date analysed	-	08/02/2018	08/02/2018	08/02/2018	08/02/2018
TRH C ₆ - C ₉	µg/L	<10	<10	[NA]	<10
TRH C ₆ - C ₁₀	µg/L	<10	<10	[NA]	<10
TRH C ₆ - C ₁₀ less BTEX (F1)	µg/L	<10	<10	[NA]	[NA]
Benzene	µg/L	<1	<1	85%	<1
Toluene	µg/L	<1	<1	90%	<1
Ethylbenzene	µg/L	<1	<1	100%	<1
m+p-xylene	µg/L	<2	<2	105%	<2
o-xylene	µg/L	<1	<1	110%	<1
Naphthalene	µg/L	<1	<1	[NA]	[NA]
Surrogate Dibromofluoromethane	%	103	124	98	100
Surrogate toluene-d8	%	99	98	95	91
Surrogate 4-BFB	%	95	94	104	94

svTRH (C10-C40) in Water			
Our Reference		184735-1	184735-2
Your Reference	UNITS	GW1	GWD1
Date Sampled		06/02/2018	06/02/2018
Type of sample		Water	Water
Date extracted	-	08/02/2018	08/02/2018
Date analysed	-	09/02/2018	09/02/2018
TRH C ₁₀ - C ₁₄	µg/L	<50	<50
TRH C ₁₅ - C ₂₈	µg/L	<100	<100
TRH C ₂₉ - C ₃₆	µg/L	<100	<100
TRH >C ₁₀ - C ₁₆	µg/L	<50	<50
TRH >C ₁₀ - C ₁₆ less Naphthalene (F2)	µg/L	<50	<50
TRH >C ₁₆ - C ₃₄	µg/L	<100	<100
TRH >C ₃₄ - C ₄₀	µg/L	<100	<100
Surrogate o-Terphenyl	%	93	90

PAHs in Water - Low Level			
Our Reference		184735-1	184735-2
Your Reference	UNITS	GW1	GWD1
Date Sampled		06/02/2018	06/02/2018
Type of sample		Water	Water
Date extracted	-	08/02/2018	08/02/2018
Date analysed	-	08/02/2018	08/02/2018
Naphthalene	µg/L	<0.2	<0.2
Acenaphthylene	µg/L	<0.1	<0.1
Acenaphthene	µg/L	<0.1	<0.1
Fluorene	µg/L	<0.1	<0.1
Phenanthrene	µg/L	<0.1	<0.1
Anthracene	µg/L	<0.1	<0.1
Fluoranthene	µg/L	<0.1	<0.1
Pyrene	µg/L	<0.1	<0.1
Benzo(a)anthracene	µg/L	<0.1	<0.1
Chrysene	µg/L	<0.1	<0.1
Benzo(b,j+k)fluoranthene	µg/L	<0.2	<0.2
Benzo(a)pyrene	µg/L	<0.1	<0.1
Indeno(1,2,3-c,d)pyrene	µg/L	<0.1	<0.1
Dibenzo(a,h)anthracene	µg/L	<0.1	<0.1
Benzo(g,h,i)perylene	µg/L	<0.1	<0.1
Benzo(a)pyrene TEQ	µg/L	<0.5	<0.5
Total +ve PAH's	µg/L	NIL (+)VE	NIL (+)VE
Surrogate <i>p</i> -Terphenyl-d14	%	108	100

HM in water - dissolved			
Our Reference		184735-1	184735-2
Your Reference	UNITS	GW1	GWD1
Date Sampled		06/02/2018	06/02/2018
Type of sample		Water	Water
Date prepared	-	08/02/2018	08/02/2018
Date analysed	-	08/02/2018	08/02/2018
Arsenic-Dissolved	µg/L	1	1
Cadmium-Dissolved	µg/L	<0.1	<0.1
Chromium-Dissolved	µg/L	<1	<1
Copper-Dissolved	µg/L	<1	<1
Lead-Dissolved	µg/L	<1	<1
Mercury-Dissolved	µg/L	<0.05	<0.05
Nickel-Dissolved	µg/L	2	2
Zinc-Dissolved	µg/L	4	3

Method ID	Methodology Summary
Metals-021	Determination of Mercury by Cold Vapour AAS.
Metals-022	Determination of various metals by ICP-MS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-012	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013.
Org-013	Water samples are analysed directly by purge and trap GC-MS.
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.

Client Reference: E1292-2, Austral

QUALITY CONTROL: VOCs in water					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			08/02/2018	[NT]	[NT]	[NT]	[NT]	08/02/2018	[NT]
Date analysed	-			08/02/2018	[NT]	[NT]	[NT]	[NT]	08/02/2018	[NT]
Dichlorodifluoromethane	µg/L	10	Org-013	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chloromethane	µg/L	10	Org-013	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Vinyl Chloride	µg/L	10	Org-013	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bromomethane	µg/L	10	Org-013	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chloroethane	µg/L	10	Org-013	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Trichlorofluoromethane	µg/L	10	Org-013	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1-Dichloroethene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Trans-1,2-dichloroethene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1-dichloroethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	111	[NT]
Cis-1,2-dichloroethene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bromochloromethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chloroform	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	127	[NT]
2,2-dichloropropane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dichloroethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	102	[NT]
1,1,1-trichloroethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	104	[NT]
1,1-dichloropropene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Cyclohexane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Carbon tetrachloride	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibromomethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dichloropropane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Trichloroethene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	117	[NT]
Bromodichloromethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	102	[NT]
trans-1,3-dichloropropene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
cis-1,3-dichloropropene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1,2-trichloroethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Toluene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,3-dichloropropane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibromochloromethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	100	[NT]
1,2-dibromoethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Tetrachloroethene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	101	[NT]
1,1,1,2-tetrachloroethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chlorobenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ethylbenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bromoform	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
m+p-xylene	µg/L	2	Org-013	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Styrene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1,2,2-tetrachloroethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
o-xylene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]

Client Reference: E1292-2, Austral

QUALITY CONTROL: VOCs in water					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
1,2,3-trichloropropane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Isopropylbenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bromobenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
n-propyl benzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
2-chlorotoluene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
4-chlorotoluene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,3,5-trimethyl benzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Tert-butyl benzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2,4-trimethyl benzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,3-dichlorobenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Sec-butyl benzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,4-dichlorobenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
4-isopropyl toluene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dichlorobenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
n-butyl benzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dibromo-3-chloropropane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2,4-trichlorobenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Hexachlorobutadiene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2,3-trichlorobenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-013	96	[NT]	[NT]	[NT]	[NT]	120	[NT]
Surrogate toluene-d8	%		Org-013	99	[NT]	[NT]	[NT]	[NT]	100	[NT]
Surrogate 4-BFB	%		Org-013	95	[NT]	[NT]	[NT]	[NT]	89	[NT]

Client Reference: E1292-2, Austral

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Water					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			08/02/2018	[NT]	[NT]	[NT]	[NT]	08/02/2018	[NT]
Date analysed	-			08/02/2018	[NT]	[NT]	[NT]	[NT]	08/02/2018	[NT]
TRH C ₆ - C ₉	µg/L	10	Org-016	<10	[NT]	[NT]	[NT]	[NT]	92	[NT]
TRH C ₆ - C ₁₀	µg/L	10	Org-016	<10	[NT]	[NT]	[NT]	[NT]	92	[NT]
Benzene	µg/L	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	101	[NT]
Toluene	µg/L	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	99	[NT]
Ethylbenzene	µg/L	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	87	[NT]
m+p-xylene	µg/L	2	Org-016	<2	[NT]	[NT]	[NT]	[NT]	87	[NT]
o-xylene	µg/L	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	88	[NT]
Naphthalene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-016	96	[NT]	[NT]	[NT]	[NT]	120	[NT]
Surrogate toluene-d8	%		Org-016	99	[NT]	[NT]	[NT]	[NT]	100	[NT]
Surrogate 4-BFB	%		Org-016	95	[NT]	[NT]	[NT]	[NT]	89	[NT]

Client Reference: E1292-2, Austral

QUALITY CONTROL: svTRH (C10-C40) in Water					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			09/02/2018	[NT]	[NT]	[NT]	[NT]	09/02/2018	[NT]
Date analysed	-			09/02/2018	[NT]	[NT]	[NT]	[NT]	09/02/2018	[NT]
TRH C ₁₀ - C ₁₄	µg/L	50	Org-003	<50	[NT]	[NT]	[NT]	[NT]	126	[NT]
TRH C ₁₅ - C ₂₈	µg/L	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	130	[NT]
TRH C ₂₉ - C ₃₆	µg/L	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	100	[NT]
TRH >C ₁₀ - C ₁₆	µg/L	50	Org-003	<50	[NT]	[NT]	[NT]	[NT]	126	[NT]
TRH >C ₁₆ - C ₃₄	µg/L	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	130	[NT]
TRH >C ₃₄ - C ₄₀	µg/L	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	100	[NT]
Surrogate o-Terphenyl	%		Org-003	92	[NT]	[NT]	[NT]	[NT]	96	[NT]

Client Reference: E1292-2, Austral

QUALITY CONTROL: PAHs in Water - Low Level				Duplicate				Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date extracted	-			08/02/2018	[NT]	[NT]	[NT]	[NT]	08/02/2018	[NT]
Date analysed	-			08/02/2018	[NT]	[NT]	[NT]	[NT]	08/02/2018	[NT]
Naphthalene	µg/L	0.2	Org-012	<0.2	[NT]	[NT]	[NT]	[NT]	84	[NT]
Acenaphthylene	µg/L	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene	µg/L	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluorene	µg/L	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	89	[NT]
Phenanthrene	µg/L	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	92	[NT]
Anthracene	µg/L	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene	µg/L	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	89	[NT]
Pyrene	µg/L	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	106	[NT]
Benzo(a)anthracene	µg/L	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene	µg/L	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	88	[NT]
Benzo(b,j+k)fluoranthene	µg/L	0.2	Org-012	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene	µg/L	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	110	[NT]
Indeno(1,2,3-c,d)pyrene	µg/L	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene	µg/L	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene	µg/L	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012	104	[NT]	[NT]	[NT]	[NT]	90	[NT]

Client Reference: E1292-2, Austral

QUALITY CONTROL: HM in water - dissolved				Duplicate				Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W3	[NT]
Date prepared	-			08/02/2018	[NT]	[NT]	[NT]	[NT]	08/02/2018	[NT]
Date analysed	-			08/02/2018	[NT]	[NT]	[NT]	[NT]	08/02/2018	[NT]
Arsenic-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	101	[NT]
Cadmium-Dissolved	µg/L	0.1	Metals-022	<0.1	[NT]	[NT]	[NT]	[NT]	106	[NT]
Chromium-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	103	[NT]
Copper-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	105	[NT]
Lead-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	104	[NT]
Mercury-Dissolved	µg/L	0.05	Metals-021	<0.05	[NT]	[NT]	[NT]	[NT]	102	[NT]
Nickel-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	100	[NT]
Zinc-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	101	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

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

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

Laboratory Acceptance Criteria

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

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

APPENDIX O SUMMARY TABLES

Table O2

Sample Information		Heavy Metals								TRH		BTEX						PAH						
SAMPLE ID	GME Date	ARSENIC	CADMIUM	CHROMIUM	COPPER	LEAD	MERCURY	NICKEL	ZINC	F1 (C ₆ -C ₁₀) ²	F2 (>C ₁₀ -C ₁₆) ³	BENZENE	TOLUENE	ETHYL BENZENE	M/P-XYLENE	O-XYLENE	NAPHTHALENE	TOTAL-XYLENE	BENZO(A)PYRENE	ANTHRACENE	PHENANTHRENE	FLUORANTHENE	NAPHTHALENE	
Benviron Group DSI 2018																								
GW1	06.02.18	1	<0.1	<1	<1	<1	<0.05	2	4	<10	<50	<1	<1	<1	<2	<1	<1	<3	<0.1	<0.1	<0.1	<0.1	<0.2	
GWD1	06.02.18	1	<0.1	<1	<1	<1	<0.05	2	3	<10	<50	<1	<1	<1	<2	<1	<1	<3	<0.1	<0.1	<0.1	<0.1	<0.2	
GWSS1	06.02.18	1	<0.1	<1	<1	<1	<0.1	2	<5	<20	<100	<1	<2	<2	<2	<2	<5	<2	<0.1	<0.1	<0.1	<0.1	<0.1	
Limit of Resolution (LOR)		1	0.1	1	1	1	0.05	1	1	10	50	1	1	1	2	1	1	3	0.1	0.1	0.1	0.1	0.2	
GILs - NEPM (2013) - Groundwater Investigation Levels																								
<i>Fresh Waters</i> ²		24/13	0.20	1.00	1.40	3.40	0.06	11.00	8.00			950	-	-	200	350			-	-	-	-	16	
<i>Fresh Waters - Low Reliability (Trigger Values)</i> ³												180	80	-	-				0.1	0.01	0.6	1	-	
<i>Marine Water</i> ²		-	0.70	4.40	1.30	4.40	0.10	7.00	15.00			500	-	-	-	-			-	-	-	-	50	
<i>Drinking Water</i> ⁴		10.00	2.00	50.00	2.00	10.00	1.00	20.00	-			1	800	300	600				0.01	-	-	-	-	
Groundwater HSLs - NEPM (2013) HSL A & B (CLAY)																								
2m to <4m										NL	NL	5,000	NL	NL	-	-	NL	NL						
4m to <8m										NL	NL	5,000	NL	NL	-	-	NL	NL						
8m +										NL	NL	5,000	NL	NL	-	-	NL	NL						
Solubility Limit										9,000	3,000	59,000	61,000	3,900	-	-	170	21,000						

Notes

- 1 All units are in ug/L
- 2 Investigation Levels apply to typical slightly-moderately disturbed systems
- 3 QSAR derived, statistical distribution method used, 95% trigger values applied as per ANZECC 2000
- 4 Investigation levels are taken from the health values of the Australian Drinking Water Guidelines NHMRC 2011
- NL Non Limiting

Table O3

Sample Information		ALKANES						ALKENES					BENZENES										Other VOC				
SAMPLE ID	GME DATE	TETRACHLOROMETHANE (CARBON TETRACHLORID	TRICHLOROMETHANE (CHLOROFORM)	BROMODICHLOROMETHANE	TRIHALOMETHANES (TOTAL)	1, 2-DICHLOROETHANE	CYCLOHEXANE	1,1,2-TRICHLOROETHANE	CHLOROETHENE (VINYL CHLORIDE)	TRICHLOROETHENE	CIS-1,2-DICHLOROETHENE	1,1-DICHLOROETHENE	TETRACHLOROETHENE (PCE PERCHLOROETHENE)	CHLOROBENZENE	1,2-DICHLOROBENZENE	1,3-DICHLOROBENZENE	1,4-DICHLOROBENZENE	1,2,3-TRICHLOROBENZENE	1,2,4-TRICHLOROBENZENE	ISOPROPYL BENZENE (CUMENE)	SEC-BUTYL BENZENE	1,3,5-TRIMETHYL BENZENE	N-PROPYL BENZENE	N-BUTYL BENZENE	1,2,4 - TRIMETHYLBENZENE	4-ISOPROPYL TOULENE	HEXACHLOROBUTADIENE
Benviron Group DSI 2018																											
GW1	06.02.18	<1	<1	<1	<1	<1	<1	<1	<10	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
GWD1	06.02.18	<1	<1	<1	<1	<1	<1	<1	<10	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
GWSS1	06.02.18	<0.05	<0.1	<0.1	<0.1	<0.1	-	-	<0.3	<0.05	<0.1	<0.1	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	<0.05	-	-	<0.05	-	<0.04
Limit of Resolution (LOR)		1	1	1	1	1	1	1	10	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
GILs - NEPM (2013) - Groundwater Investigation Levels																											
Fresh Waters²		NV	NV	-	NV	NV	6,500	NV	NV	NV	NV	NV	NV	160	260	60	3	85							NV		NV
<i>Fresh Water Low reliability (Trigger Values -99%)^a</i>			370	-																							
<i>Fresh Water Low reliability (Trigger Values -95%)^b</i>										330									30								
<i>Drinking Water⁴</i>		3	3		250	3		0.30		60	30	50															
US EPA Regional Screening Levels (RSLs) May 2016																											
US EPA MCLs^c							NV													NV	NV	NV	NV	NV	NV		NV
US EPA Tapwater^d							13,000														NV	2,000	120	660	1,000	15	NV

Notes

- 1 All units are in ug/L
- 2 Investigation levels apply to typical slightly-moderately disturbed systems
- 4 Investigation levels are taken from the health values of the Australian Drinking Water Guidelines NHMRC 2011
- NV - no derived value
- " - " Not Tested
- a: QSAR derived, statistical distribution method used, 99% trigger value applied as per ANZECC guidelines for slightly-moderately disturbed systems
- b: QSAR derived, statistical distribution method used, 95% trigger value applied as per ANZECC guidelines for slightly-moderately disturbed systems
- c: US EPA Region 9 RSL (MCLs) utilised in absence of criteria from NEPM 2013. MCLs are legally enforceable USEPA drinking water standards
- d: US EPA Region 9 RSL (Tapwater) utilised in absence of criteria from NEPM 2013. Non cancer

APPENDIX P STATISTICAL INFORMATION

A	B	C	D	E	F	G	H	I	J	K	L	
1	UCL Statistics for Uncensored Full Data Sets											
2												
3	User Selected Options											
4	Date/Time of Computation	10/02/2018 6:08:05 PM										
5	From File	WorkSheet.xls										
6	Full Precision	OFF										
7	Confidence Coefficient	95%										
8	Number of Bootstrap Operations	2000										
9												
10												
11	C0											
12												
13	General Statistics											
14	Total Number of Observations	24						Number of Distinct Observations	12			
15								Number of Missing Observations	12			
16		Minimum	4						Mean	14.25		
17		Maximum	94						Median	8		
18		SD	19.46						Std. Error of Mean	3.972		
19		Coefficient of Variation	1.366						Skewness	3.572		
20												
21	Normal GOF Test											
22	Shapiro Wilk Test Statistic	0.463						Shapiro Wilk GOF Test				
23	5% Shapiro Wilk Critical Value	0.916						Data Not Normal at 5% Significance Level				
24	Lilliefors Test Statistic	0.379						Lilliefors GOF Test				
25	5% Lilliefors Critical Value	0.181						Data Not Normal at 5% Significance Level				
26	Data Not Normal at 5% Significance Level											
27												
28	Assuming Normal Distribution											
29	95% Normal UCL			95% UCLs (Adjusted for Skewness)								
30		95% Student's-t UCL	21.06						95% Adjusted-CLT UCL (Chen-1995)	23.88		
31									95% Modified-t UCL (Johnson-1978)	21.54		
32												
33	Gamma GOF Test											
34	A-D Test Statistic	3.201						Anderson-Darling Gamma GOF Test				
35	5% A-D Critical Value	0.761						Data Not Gamma Distributed at 5% Significance Level				
36	K-S Test Statistic	0.306						Kolmogrov-Smirnoff Gamma GOF Test				
37	5% K-S Critical Value	0.181						Data Not Gamma Distributed at 5% Significance Level				
38	Data Not Gamma Distributed at 5% Significance Level											
39												
40	Gamma Statistics											
41		k hat (MLE)	1.533						k star (bias corrected MLE)	1.369		
42		Theta hat (MLE)	9.297						Theta star (bias corrected MLE)	10.41		
43		nu hat (MLE)	73.58						nu star (bias corrected)	65.71		
44		MLE Mean (bias corrected)	14.25						MLE Sd (bias corrected)	12.18		
45									Approximate Chi Square Value (0.05)	48.06		
46		Adjusted Level of Significance	0.0392						Adjusted Chi Square Value	47		
47												
48	Assuming Gamma Distribution											
49	95% Approximate Gamma UCL (use when n>=50))	19.48						95% Adjusted Gamma UCL (use when n<50)	19.92			
50												
51	Lognormal GOF Test											
52	Shapiro Wilk Test Statistic	0.772						Shapiro Wilk Lognormal GOF Test				
53	5% Shapiro Wilk Critical Value	0.916						Data Not Lognormal at 5% Significance Level				
54	Lilliefors Test Statistic	0.234						Lilliefors Lognormal GOF Test				
55	5% Lilliefors Critical Value	0.181						Data Not Lognormal at 5% Significance Level				

	A	B	C	D	E	F	G	H	I	J	K	L
56	Data Not Lognormal at 5% Significance Level											
57												
58	Lognormal Statistics											
59	Minimum of Logged Data				1.386		Mean of logged Data				2.296	
60	Maximum of Logged Data				4.543		SD of logged Data				0.699	
61												
62	Assuming Lognormal Distribution											
63	95% H-UCL				17.44		90% Chebyshev (MVUE) UCL				18.3	
64	95% Chebyshev (MVUE) UCL				20.92		97.5% Chebyshev (MVUE) UCL				24.54	
65	99% Chebyshev (MVUE) UCL				31.66							
66												
67	Nonparametric Distribution Free UCL Statistics											
68	Data do not follow a Discernible Distribution (0.05)											
69												
70	Nonparametric Distribution Free UCLs											
71	95% CLT UCL				20.78		95% Jackknife UCL				21.06	
72	95% Standard Bootstrap UCL				20.75		95% Bootstrap-t UCL				47.29	
73	95% Hall's Bootstrap UCL				48.16		95% Percentile Bootstrap UCL				21.38	
74	95% BCA Bootstrap UCL				25.21							
75	90% Chebyshev(Mean, Sd) UCL				26.17		95% Chebyshev(Mean, Sd) UCL				31.56	
76	97.5% Chebyshev(Mean, Sd) UCL				39.05		99% Chebyshev(Mean, Sd) UCL				53.77	
77												
78	Suggested UCL to Use											
79	95% Chebyshev (Mean, Sd) UCL				31.56							
80												
81	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
82	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
83	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.											
84	For additional insight the user may want to consult a statistician.											
85												

A	B	C	D	E	F	G	H	I	J	K	L		
1	UCL Statistics for Uncensored Full Data Sets												
2													
3	User Selected Options												
4	Date/Time of Computation	10/02/2018 4:36:52 PM											
5	From File	WorkSheet.xls											
6	Full Precision	OFF											
7	Confidence Coefficient	95%											
8	Number of Bootstrap Operations	2000											
9													
10													
11	C0												
12													
13	General Statistics												
14	Total Number of Observations	24						Number of Distinct Observations	16				
15								Number of Missing Observations	12				
16		Minimum	9						Mean	90.71			
17		Maximum	1500						Median	23			
18		SD	300.8						Std. Error of Mean	61.4			
19		Coefficient of Variation	3.316						Skewness	4.867			
20													
21	Normal GOF Test												
22	Shapiro Wilk Test Statistic	0.25						Shapiro Wilk GOF Test					
23	5% Shapiro Wilk Critical Value	0.916						Data Not Normal at 5% Significance Level					
24	Lilliefors Test Statistic	0.469						Lilliefors GOF Test					
25	5% Lilliefors Critical Value	0.181						Data Not Normal at 5% Significance Level					
26	Data Not Normal at 5% Significance Level												
27													
28	Assuming Normal Distribution												
29	95% Normal UCL			95% UCLs (Adjusted for Skewness)									
30		95% Student's-t UCL	195.9						95% Adjusted-CLT UCL (Chen-1995)	256.9			
31									95% Modified-t UCL (Johnson-1978)	206.1			
32													
33	Gamma GOF Test												
34	A-D Test Statistic	5.571						Anderson-Darling Gamma GOF Test					
35	5% A-D Critical Value	0.8						Data Not Gamma Distributed at 5% Significance Level					
36	K-S Test Statistic	0.402						Kolmogrov-Smirnoff Gamma GOF Test					
37	5% K-S Critical Value	0.187						Data Not Gamma Distributed at 5% Significance Level					
38	Data Not Gamma Distributed at 5% Significance Level												
39													
40	Gamma Statistics												
41		k hat (MLE)	0.571						k star (bias corrected MLE)	0.528			
42		Theta hat (MLE)	158.7						Theta star (bias corrected MLE)	171.9			
43		nu hat (MLE)	27.43						nu star (bias corrected)	25.34			
44		MLE Mean (bias corrected)	90.71						MLE Sd (bias corrected)	124.9			
45									Approximate Chi Square Value (0.05)	14.87			
46		Adjusted Level of Significance	0.0392						Adjusted Chi Square Value	14.31			
47													
48	Assuming Gamma Distribution												
49	95% Approximate Gamma UCL (use when n>=50))	154.6						95% Adjusted Gamma UCL (use when n<50)	160.7				
50													
51	Lognormal GOF Test												
52	Shapiro Wilk Test Statistic	0.654						Shapiro Wilk Lognormal GOF Test					
53	5% Shapiro Wilk Critical Value	0.916						Data Not Lognormal at 5% Significance Level					
54	Lilliefors Test Statistic	0.254						Lilliefors Lognormal GOF Test					
55	5% Lilliefors Critical Value	0.181						Data Not Lognormal at 5% Significance Level					

	A	B	C	D	E	F	G	H	I	J	K	L
56	Data Not Lognormal at 5% Significance Level											
57												
58	Lognormal Statistics											
59	Minimum of Logged Data				2.197		Mean of logged Data				3.419	
60	Maximum of Logged Data				7.313		SD of logged Data				0.958	
61												
62	Assuming Lognormal Distribution											
63	95% H-UCL				79.35		90% Chebyshev (MVUE) UCL				78.05	
64	95% Chebyshev (MVUE) UCL				92.11		97.5% Chebyshev (MVUE) UCL				111.6	
65	99% Chebyshev (MVUE) UCL				149.9							
66												
67	Nonparametric Distribution Free UCL Statistics											
68	Data do not follow a Discernible Distribution (0.05)											
69												
70	Nonparametric Distribution Free UCLs											
71	95% CLT UCL				191.7		95% Jackknife UCL				195.9	
72	95% Standard Bootstrap UCL				190.4		95% Bootstrap-t UCL				2317	
73	95% Hall's Bootstrap UCL				919.5		95% Percentile Bootstrap UCL				212.5	
74	95% BCA Bootstrap UCL				278.1							
75	90% Chebyshev(Mean, Sd) UCL				274.9		95% Chebyshev(Mean, Sd) UCL				358.4	
76	97.5% Chebyshev(Mean, Sd) UCL				474.2		99% Chebyshev(Mean, Sd) UCL				701.6	
77												
78	Suggested UCL to Use											
79	95% Chebyshev (Mean, Sd) UCL				358.4							
80												
81	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
82	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
83	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.											
84	For additional insight the user may want to consult a statistician.											
85												