Douglas Partners
Geotechnics / Environment / Groundwater

Integrated Practical Solutions

Report on
Detailed Site (Contamination) Investigation

Lots 2 to 5, Stanley Street
Bathurst

Prepared for
Opal Aged Care Pty Ltd

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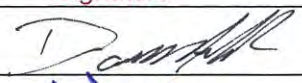
Author		10 December 2015
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Executive Summary

This report details the methodology and results of a detailed site (contamination) investigation (DSI) undertaken by Douglas Partners Pty Ltd on the unoccupied land identified as Lots 2 to 5 Deposited Plan 1089380, located on Stanley Street, Bathurst. The current investigation was commissioned for the purpose of supporting a development application for the proposed construction of a two storey residential aged care facility.

The objectives of the DSI were to:

- Review current and historical information to gain an understanding of likely current and past landuses and hence site activities which may be potentially contaminating;
- Develop a preliminary conceptual site model (CSM) based on the available desktop information and site walkover;
- Assess potential contamination source – pathway – receptor linkages identified in the preliminary CSM and revise the CSM on the basis of the additional data; and
- Provide an opinion on the suitability of the site for the proposed development.

The scope of works comprised a review of desktop information (previous reports, land titles, Planning 149 Certificates, online databases and published maps), site inspection, soil sampling from 22 test pits, installation and sampling of three groundwater wells and laboratory analysis of 20 soil samples, three groundwater samples and two material samples for a range of common contaminants.

The desktop review indicated that the site was originally open space, possibly used for grazing, and was subsequently used as a trotting track from the 1960's/1970's. The 1974 aerial photograph indicated quarrying works being undertaken on the land between the site and Macquarie River with these operations potentially intruding onto the north-eastern section of the site.

Previous investigations on the site by others recorded the deepest filling (at least 1 m depth) in the northern corner of the site. Fill generally comprised grey and brown clayey sand, clay and silty clay with variable quantities of gravel. Stockpiles consisted of clayey sand mixed with building rubble (including train and car parts, metal drums, PVC pipes, plastics, particle boards, concrete slabs, wood spray cans and old paint cans). The results recorded generally low concentrations of chemical contamination. It was concluded that lead in the area of the sheds on Lot 3 and asbestos within a stockpile of dumped building waste (ASB 02, within Lot 3 towards Stanley Street) were areas of contaminant concern.

An intrusive investigation was also previously undertaken on the adjacent property to the north-west by others. It identified an old quarry that has been backfilled with filling (including building waste) approximately 2 m to - 4 m deep. It was unclear if the former quarry extended onto the aged care facility site, in particular Lot 5. Contaminants of concern identified on the adjacent site included lead, PAH, TRH and asbestos.

There was a sporadic coverage of mature trees across the site and thick grass coverage, with several sheds constructed of corrugated iron located adjacent to the south-eastern boundary and a further shed located on the north-western boundary. There was sporadic fly tipping of scrap metal, car parts and corrugated iron, however, there were no observations of asbestos or building materials spread across the site surface. Sections of the former trotting track were still visible.

The site can generally be split in to two areas: the north east of the site with the deeper filling where the old quarry has been backfilled; and the remainder of the site which has generally shallower filling. For the north east section of the site, the fill varied between 1.4 m (TP22) and 3.2 m (BH101) bgl. There was generally an upper filling layer between 0.2 m and 0.8 m thick comprising a brown gravelly sand, silty sand, sandy gravelly clay, silty clay, sandy clay or clayey silt which did not appear to contain significant quantities of building/demolition waste. The filling underlying this contained significant building/demolition waste (concrete, brick, plastic, wood, tiles, lead flashing, asphalt, fibrous materials (possible asbestos- TP2, TP5, TP11, BH101) and a brown soil matrix comprising sandy clay, silty clay, silty gravelly clay and clays. This filling was underlain by natural brown clayey silts, sandy clays, silty clays, gravelly clays and clays and highly weathered granite bedrock.

For the remaining area of the site the filling comprised various compositions of brown clayey silt, silty clay, gravelly clay to depths of between 0.1 m and 0.8 m bgl. Brick was observed in the pits along the north-western boundary (TP6, TP7, TP8, TP19) and in TP14. This filling was underlain natural soils comprising brown and brown-orange silty clays and clayey silts to depths of between 0.5 m and 1.2 m bgl in the test pits and highly weathered granite bedrock.

There were no signs of gross chemical contamination (e.g. odours or staining) during the fieldwork. Potential ACM was only observed in the north east of the site, were there was notably deeper filling and more building/demolition waste present. Free groundwater was observed in all three wells following development at levels between 6.1 m and 6.5 m AHD.

Soil samples were analysed for a variety of potential contaminants including TRH, BTEX, PAH, OCP, OPP, PCB, phenols and asbestos. The concentrations of BTEX, PCB, OCP, OPP and phenols were all below the laboratory practical quantitation limits (PQL), and below the site assessment criteria (SAC), for all samples analysed. Heavy metals were recorded at all locations with concentrations generally low and all within the SAC.

TRH was recorded in one sample, BH11/1.5-1.7, with detected medium and long chain (C_{15}-C_{28} – 120 mg/kg; C_{29}-C_{36} -100 mg/kg) hydrocarbons. Additionally, there were low concentrations of PAH recorded in 13 of the samples from the filling, with total PAH concentrations between 0.11 mg/kg and 35 mg/kg. These were all well below the HSL of 400 mg/kg. Sample TP11/1.5-1.7 recorded an elevated B(a)P TEQ concentration of 5.5 mg/kg which was above the health investigation level of 4 mg/kg. All other results were within the HSL for total PAH (400 mg/kg) and B(a)P TEQ (4 mg/kg).

The recorded TRH and PAH (including B(a)P) in sample TP11/1.5-1.7 is considered to be consistent with the presence of asphalt observed at the sample location. As Note 6 of Table 1A(1) of NEPC (2013) states, *'where B(a)P occurs in bitumen fragments it is relatively immobile and does not represent a significant health risk'*. Given this, the recorded B(a)P TEQ exceedence in sample TP11/1.5-1.7 was not considered significant. Asphalt was not recorded at any other locations.

Soil sample TP3/1.4-1.5 screened for the presence of asbestos confirmed the presence of matted chrysotile asbestos. No other soil samples recorded the presence of asbestos. The two material samples collected from TP2 and TP3 and which were suspected ACM, both confirmed the presence chrysotile and amosite asbestos. All of these locations with confirmed asbestos are in the north east of the site in the area of the deeper filling.

It is considered that, based on the available data that there is no unacceptable risk to human health or ecology from chemical contaminants in soil. However, asbestos has been confirmed to be present

within the filling in the north east of the site and hence poses a potential risk to human health if not managed appropriately.

Based on the field and analytical results it is considered the site can be made suitable for the proposed residential development, subject to the development of a remediation action plan prior to construction works commencing. The RAP is to include *inter alia*:

- An unexpected finds protocol;
- Surface inspection of the western, southern and central parts of the site (in the area of the shallower filling) following stripping of the grass coverage and removal of the sheds and fly tipping;
- The remediation of the asbestos impacted filling at the rear of the site; and
- Validation of remediation works by an appropriately qualified environmental consultant.

With respect to remediation works on the asbestos impacted filling, management measures where asbestos impacted filling is to remain on site will generally involve the construction of a physical barrier and marker layer between the filling and site users. Commonly this comprises hardstands (e.g. concrete slabs) or 500 mm thick virgin excavated natural material layers placed in landscaped and lawn areas. In this regard, such remediation approaches require ongoing long term management of the site so that the integrity of the mitigation measures is maintained.

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Report on Detailed Site (Contamination) Investigation
Lots 2 to 5, Stanley Street, Bathurst

1. Introduction

This report details the methodology and results of a detailed site (contamination) investigation (DSI) undertaken by Douglas Partners Pty Ltd (DP) on the unoccupied land identified as Lots 2 to 5 Deposited Plan 1089380, located on Stanley Street, Bathurst, as shown on Drawing 1 in Appendix A (the site). The current investigation was commissioned by Align Projects Pty Ltd (project manager) on behalf of Opal Aged Care Pty Ltd (the client) for the purpose of supporting a development application for the proposed construction of a two storey residential aged care facility.

The objectives of the DSI were to:

- Review current and historical information to gain an understanding of likely current and past landuses and hence site activities which may be potentially contaminating;
- Develop a preliminary conceptual site model (CSM) based on the available desktop information and site walkover;
- Assess potential contamination source – pathway – receptor linkages identified in the preliminary CSM and revise the CSM on the basis of the additional data; and
- Provide an opinion on the suitability of the site for the proposed development.

The DSI was conducted and reported in general accordance with the National Environment Protection Council (NEPC) *National Environment Protection (Assessment of Site Contamination) Measure 1999* (amended 2013) (NEPC, 2013) and DP's '*Sampling and Analysis Quality Plan, Proposed Aged Care Facility, Lots 2-5 Deposited Plan 1089380, Stanley Street, Bathurst'* (ref: 85164.00.R.001, 26 October 2015). Works included a review of desktop information, a site walkover, development of a CSM, drilling and excavation of 25 test bores and pits, installation of three groundwater monitoring wells, collection of soil and groundwater samples and analysis of selected samples for various contaminants of concern.

The site is subject to a site audit by Mr Andrew Kohlrusch of GHD. It is understood that this report will be used for the purpose of the site audit.

2. Scope of Works

The scope of works for the DSI was as follows:

- Review of previous reports undertaken on the site by others;
- Review current and historical land titles;
- Review of Section 149 Planning Certificates (provided by the Client);
- Review of NSW EPA online database for notices and protection licences in the area of the site;
- Review of published geological, soil landscape and acid sulphate soil maps;

- A site walkover to observe current and recent landuse and assess the potential for contamination;
- Development of a preliminary CSM;
- Service clearance for test pit and bore locations;
- Excavation of 22 test pits and auguring of three test bores using an excavator and drill rig respectively. Test locations were located based on the desktop review, site walkover and site limitations to provide general site coverage, investigate areas not previously assessed (namely Lot 5) and to target areas of environmental concern identified in the preliminary CSM;
- Soil samples were generally collected at the near surface and then at regular depth intervals to at least 0.5 m into natural soils (or prior refusal/plant limitations) and where signs of gross contamination were observed;
- Groundwater monitoring wells were installed in the three test bores to a depth of up to 10 m below ground level (bgl);
- Screening of all soil samples for volatile organic compounds using a photo-ionisation detector (PID);
- Analysis at an National Association of Testing Authorities (NATA) accredited laboratory of 20 selected soil samples, three groundwater samples and two material samples (plus QA/QC) for the following potential contaminants and properties:
    - Metals (total arsenic, cadmium, chromium, copper, lead, mercury, nickel, zinc);
    - Total recoverable hydrocarbons (TRH) as a screening test for total petroleum hydrocarbons (TPH);
    - Benzene, toluene, ethylbenzene and total xylenes (BTEX);
    - Polycyclic aromatic hydrocarbons (PAH);
    - Total phenols;
    - Organochlorine pesticides (OCP);
    - Organophosphorus pesticides (OPP);
    - Polychlorinated biphenyls (PCB);
    - Asbestos (40g and 500 mL soil samples for screening purposes and potential asbestos-containing material fragments);
    - Cation exchange capacity (CEC) and pH to assist calculation of site specific ecological investigation levels;
    - Total characteristic leaching procedure (TCLP) for waste classification purposes;
    - Quality control/quality assurance sampling and analysis, comprising:
        - Two laboratory replicate samples (one inter-laboratory and one intra-laboratory),
        - One water trip spike (BTEX); and
        - One water trip blank (TRH and BTEX).
- Preparation of an updated CSM; and
- Preparation of this report outlining the methodology and results of the DSI, discussion on the requirements for remediation and an assessment on the suitability of the site for the proposed development.

3. Site Identification and Description

3.1 Site Identification

The site is identified as Lots 2 to 5 Deposited Plan 1089380, located on Stanley Street, Bathurst, NSW. The site covers an irregular area of approximately 1.7 ha. The site boundaries are shown on the attached Drawing 1, Appendix A.

3.2 Site Description

A site walkover was undertaken by a DP environmental scientist on 2 November 2015. It is noted that the site had thick grass coverage at the time of the walkover and hence observations of the surface soils were limited. The following site features were observed:

- The site is bound by Peel Street and Stanley Streets south with residential properties beyond, a child care centre to the, a vacant lot which is being redeveloped to the north-west and vacant grassed areas and Macquarie River to the north and east. Note: Directions are based from the centre of the site;
- There was a sporadic coverage of mature trees across the site and a thick grass coverage;
- Several sheds were located adjacent to the boundary with the child care centre and a further shed was located on the north-western boundary. These were constructed of corrugated iron;
- There was scrap metal, car parts and corrugated iron sporadically located across the site;
- Temporary and permanent fences segregated the site from neighbouring sites;
- There were no observations of asbestos or building materials spread across the site surface;
- Sections of the former trotting track were still visible whilst other sections had been overgrown with grasses. The trotting track surface was generally covered with gravel. It was unclear if the gravel had been sourced from the site or elsewhere; and
- There were no visible signs of gross contamination evident during the site walkover.

Site photographs from the site walkover are included in Appendix B.

3.3 Proposed Development

Design of the proposed aged care residential facility is still being developed. It is understood that it will involve a two storey building with a paved car park area located in the western section of the site. The current proposed layout of the development is provided in Drawings 15491- DA-1110 Issue A, Appendix A.

4. Regional Topography, Geology and Hydrogeology

The majority of the site has been generally levelled, with local topography generally gradually falling in a north-easterly direction towards the Macquarie River. In this regard, it is also expected that local groundwater would flow in an north-easterly direction towards the river.

Reference to the Geological Survey of NSW, Statewide geodatabase 1:250 000 mapping indicates the geology underlying the site is Bathurst Granite from the Carboniferous period. The site is close to the geological boundary with alluvial sediments from the Quaternary period, which is consistent with its proximity to the Macquarie River. Mapped geological boundaries are not definitive and actual conditions may vary, hence, the alluvial sediments may extend onto the site, in particular in at the area of the site closest to Macquarie River. The geological setting is shown in Figure 1.

Figure 1: Showing the Geological Setting of the Site

5. Desktop Review

5.1 Previous Reports

The following reports provided by the client have been reviewed and are summarised in the following sections:

- Martens & Associates Pty Ltd *Due Diligence Study – Lots 2, 3 and 4 DP 1089380, Stanley Street, Bathurst*, February 2012, ref: P1304066JC02V03 (Martens, 2012);

- Martens & Associates Pty Ltd, *Stage 2 Environmental site Assessment, Lots 2, 3 and 4 DP 1089380, 81 and 105 Stanley Street, Bathurst, NSW*, April 2014, ref: P1304066JR01V01 (Martens, 2014); and
- Envirowest Consulting Pty Ltd, *Detailed Contamination Investigation, Aged Care Development, 105 Stanley Street, Bathurst, NSW*, 6 May 2014, ref: R13108c.2 (Envirowest, 2014).

5.1.1 Martens (2012 and 2014)

Martens (2012) was a due diligence desktop report for Lots 2, 3 and 4 D.P. 1089380 which reviewed aerial photographs, NSW EPA notices and Council records. It identified the site to have been initially paddocks in the 1950's before a trotting track and sheds were constructed on it (and adjacent sites). It is noted that the 1974 aerial photograph in the report indicated potential quarrying works being undertaken on the land between the site and Macquarie River with these operations potentially intruding onto the north-eastern section of the site. The 1989 photograph indicated that the quarrying operations were no longer being undertaken on the site as the trotting track now covered this part of the site.

Martens (2014) was an intrusive contamination investigation undertaken on Lots 2, 3 and 4 (no assessment of Lot 5 was undertaken). This included the auguring and sampling of seven boreholes using a drill rig or hand auger and the collection of surface samples at a further 19 locations. Soil samples were also collected from two stockpiles identified on the site with an additional two material samples (thought to potentially contain asbestos) collected. The sample locations have been replicated on Drawing 1, Appendix A.

Samples were analysed for the following contaminants: TRH (six samples), BTEX (six samples), PAH (six samples), heavy metals (arsenic cadmium, chromium, copper, lead, mercury, nickel and zinc) (15 samples), OCP (15 samples), OPP (15 samples) and asbestos (two soil samples and two material samples).

The deepest filling was observed in the northern corner where test bore 125 was terminated within filling at 1 m depth. Fill generally comprised grey and brown clayey sand, clay and silty clay with variable quantities of gravel. It is noted that filling in stockpiles over TP102, SP01 and SP02 consisted of clayey sand mixed with building rubble (including train and car parts, metal drums, PVC pipes, plastics, particle boards, concrete slabs, wood spray cans and old paint cans). Other stockpiles and areas of fill were considered to be consistent with alluvial soils. Fill was underlain by natural grey and brown clays.

The results recorded generally low concentrations of chemical contamination. Martens concluded that lead in the area of the sheds on Lot 3 and asbestos within a stockpile of dumped building waste (ASB 02, within Lot 3 towards Stanley Street) were areas of contaminant concern which needed to be addressed for the site to be considered suitable for use from a contamination perspective. No groundwater assessment was undertaken.

5.1.2 Envirowest (2014)

Envirowest (2014) comprised an intrusive contamination investigation on the property to the west of the site in May 2014 (105 Stanley Street - Lots 6, 7 and 108 to 110, Bathurst). Whilst the site investigated does not comprise that subject to DP's investigation, notably it identified an old quarry

that has been backfilled with filling (including building waste) approximately 2 m to - 4 m deep. It is unclear if the former quarry extends onto the aged care facility site, in particular Lot 5. Contaminants of concern identified in Envirowest (2014) included lead, PAH, TRH and asbestos. No groundwater assessment was undertaken as part of the investigation although DP understands that such an assessment has been undertaken.

Furthermore, DP also understands that this site is currently undergoing remediation due to the asbestos contamination with a cap and manage approach being implemented. Works on the site have tended to indicate that filling appears to be deeper towards the north of the site which is similar to what was encountered on the site subject to this investigation.

There are some data gaps in the provided reports which have been addressed herein. These gaps relate to in particular, the fill profile (especially across Lot 5), presence of asbestos and consideration to potential impacts on groundwater quality due to the lead, TRH and PAH recorded in the filling as part of these previous investigations.

5.2 Historical Land Titles

A historical title deeds search was used to obtain ownership and occupancy information including company names and the occupations of individuals. The title information can assist in the identification of previous land uses by the company names or the site owners and can, therefore, assist in establishing whether there were potentially contaminating activities occurring at the site. A summary of the title deeds and possible land uses (with reference to information in the previous reports) is presented in the tables below for the four lots which cover the site. A full copy of the search, including the cadastre map, is provided in Appendix C. This was not undertaken as part of previous investigations on the site.

Table 1: Lot 2 Deposited Plan 1089380

Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available	Potential Land Use
21.04.1915 (1915 to 1944)	Francis Curley (Milk Vendor)	Open space/ possibly grazing
27.11.1944 (1944 to 1947)	Mark Edward Falconer Evans (Carrier)	Open space/ possibly grazing
01.07.1947 (1947 to 1965)	Patrick Joseph Slattery (Shearer)	Open space/ possibly grazing
08.04.1965 (1965 to 1966)	Dulcie Alice Slattery (Home Duties)	Grazing/trotting track/ quarry (north-east of site)
14.10.1966 (1966 to 1989)	Alan Ray Mould (Carrier) Lorna May Mould (Married Woman)	Grazing/trotting track/ quarry (north-east of site)
26.10.1989 (1989 to 2006)	Bathurst Regional Council	Grazing/trotting track
14.06.2006 (2006 to 2015)	Hilton Henry Bonham (Carrier)	Grazing/trotting track/vacant land
22.01.2015 (2015 to 2015)	Stabosl Pty Limited	Vacant land

Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available	Potential Land Use
22.01.2015 (2015 to date)	# Principal Healthcare Finance Pty Limited	Vacant land

# Denotes current registered proprietor

Table 2: Lots 3 to 5 Deposited Plan 1089380

Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available	Potential Land Use
21.04.1915 (Lot 3) (1915 to 1939) 18.12.1912 (Lots 4 & 5) (1912 to 1939)	Francis Curley (Milk Vendor)	Open space/ possible grazing
23.05.1939 (1939 to 1961)	Charles Moss (Labourer)	Open space/ possible grazing
06.06.1961 (1961 to 1970)	Alfred John Berry (Carrier)	Grazing/trotting track/ quarry (rear of site)
03.03.1970 (1970 to 2015)	Hilton Henry Bonham (Carrier)	Grazing/trotting track/ quarry (rear of site)
22.01.2015 (2015 to 2015)	Stabosl Pty Limited	Vacant Land
22.01.2015 (2015 to date)	# Principal Healthcare Finance Pty Limited	Vacant Land

# Denotes current registered proprietor

5.3 Council Section 149 Planning Certificates

Section 149 Planning certificates provided to DP by the client were reviewed for the site. The review indicated that:

- The Lots 2 to 5 are zoned R1 General Residential;
- The land has not been identified as significantly contaminated land within the meaning of the *Contaminated Land Management Act 1997* (CLM Act);
- The land is not subject to a management order within the meaning of the CLM Act;
- The land is not the subject of an approved voluntary management proposal or maintenance order within the meaning of the CLM Act; and
- Council has not been provided with a site audit statement for this land.

Copies of the provided Section 149 Planning certificates are attached in Appendix C.

5.4 Regulatory Notice Search

The EPA publishes records of contaminated sites under section 58 of the *Contaminated Land Management Act* 1997 (CLM Act) on a public database accessed via the internet. The notices relate to investigation and/or remediation of site contamination considered to be significantly contaminated under the definition in the CLM Act. More specifically the notices cover the following:

- Actions taken by the EPA under sections 15, 17, 19, 21, 23, 26 or 28 of the CLM Act;
- Actions taken by the EPA under sections 35 or 36 of the Environmentally Hazardous Chemicals Act 1985; and
- Site audit statements provided to the EPA under section 52 of the CLM Act on sites subject to an in-force remediation order.

A search of the public database on 28 October 2015 indicated that neither the site nor any other properties within a 1 km radius were listed.

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

The NSW EPA also issues environmental protection licenses under section 308 of the *Protection of the Environment Operations Act* 1997 (POEO Act). The register contains:

- Environmental protection licenses;
- Applications for new licenses and to transfer or vary existing licenses;
- Environment protection and noise control licenses;
- Convictions in prosecutions under the POEO Act;
- The result of civil proceedings;
- License review information;
- Exemptions from provisions of the POEO Act or Regulations;
- Approvals granted under Clause 9 of the POEO (Control of Burning) Regulation; and
- Approvals granted under Clause 7a of the POEO (Clean Air) Regulation.

A search of the public register on 28 October 2015 indicated that no licenses were listed for the site or properties within 1 km.

6. Conceptual Site Model

6.1 Preliminary Site Conceptual Model

A CSM is a representation of site-related information regarding contamination sources, receptors and exposure pathways between those sources and receptors. The CSM provides the framework for identifying how the site became contaminated and how potential receptors may be exposed to

contamination either in the present or the future i.e. it enables an assessment of the potential source – pathway – receptor linkages (complete pathways).

6.2 Potential Contamination Sources

Potential sources of contamination are listed in Table 3 and are based on the site walkover and review of desktop information (Sections 3 to 5).

Table 3: Potential Contamination Sources and Contaminants of Concern

Potential Source	Description of Potential Contaminating Activity	Contaminants of Concern
Site structures	Demolition/deterioration of site structures	Asbestos, metals and/ or other hazardous building materials
Imported fill	The site has been filled to level the site, in particular at the rear in the area of the old quarry	Asbestos, heavy metals, TRH, BTEX, PAH, OCP, OPP, PCB and phenols
Fly tipping	Items either dumped on site or left over from previous site activities e.g. old car parts	Asbestos, metals, TRH, BTEX and PAH

For the purpose of developing a CSM, the potential sources of contamination can be defined as:

- S1 - Demolition and deterioration of buildings or structures;
- S2 - Contaminated imported fill; and
- S3 - Fly tipping.

6.3 Potential Contamination Migration Pathways

The pathways by which the potential sources of contamination could reach potential receptors are described below:

- P1 - Ingestion and dermal contact;
- P2 - Inhalation of dust and/or vapours;
- P3 - Surface run off;
- P4 - Leaching and vertical migration into groundwater;
- P5 - Lateral migration of groundwater; and
- P6 - Direct contact with terrestrial ecology.

6.4 Potential Receptors of Concern

The potential receptors of potential contamination sourced from the site are considered to be:

- R1 - Current users (vacant land);
- R2 - End users (aged care facility);
- R3 - Construction and maintenance workers;
- R4 - Adjacent site users (residential, child care, open space);
- R5 - Surface water (Macquarie River);
- R6 - Groundwater; and
- R7 - Terrestrial ecology.

6.5 Summary of Potential Complete Pathways

A 'source–pathway–receptor' approach has been used to assess the potential risks of harm being caused to human or environmental receptors from contamination sources on or in the vicinity of the site, via exposure pathways (potential complete pathways). The possible pathways between the above sources (S1 to S3) and receptors (R1 to R7) are provided in Table 4 below.

Table 4: Summary of Potential Complete Pathways

Potential Source and Contaminants of Concern	Pathway	Receptor	Risk Management Action Recommended
S1 – Demolition/deterioration of site structures -Asbestos, metals, and/ or other hazardous building materials	P1 – Ingestion and dermal contact	R1 - Current users R2 - End users R3 - Construction and maintenance workers	Assessment of the structures for hazardous materials and investigation of the surface soils for contaminants.
	P2 – Inhalation of dust and/or vapours	R1 - Current users R2 - End users R3 - Construction and maintenance workers R4 – Adjacent site users	

Potential Source and Contaminants of Concern	Pathway	Receptor	Risk Management Action Recommended
S2 - Contaminated imported fill -Metals, TRH, BTEX, PAH, PCB, OCP, OPP, phenols and asbestos S3 – Fly tipping -Asbestos, metals, TRH, BTEX, PAH	P1 – Ingestion and dermal contact	R1 - Current users R2 - End users R3 - Construction and maintenance workers	An intrusive investigation is recommended to assess possible contamination including chemical testing of the soils and groundwater.
	P2 – Inhalation of dust and/or vapours	R1 - Current users R2 - End users R3 - Construction and maintenance workers R4 – Adjacent site users	
	P3 – Surface run off P5 – Lateral migration of groundwater	R5 – Surface water	
	P4 – Leaching and vertical migration into groundwater	R6 –Groundwater	
	P6 – Direct contact with terrestrial ecology	R7 – Terrestrial ecology.	

7. Fieldwork and Analysis

7.1 Data Quality Objectives and Project Quality Procedures

The DSI has been devised broadly in accordance with the seven step data quality objective (DQO) process which is provided in Appendix B, Schedule B2 of NEPC (2013). The DQO process is outlined as follows:

- Stating the Problem;
- Identifying the Decision;
- Identifying Inputs to the Decision;
- Defining the Boundary of the Assessment;
- Developing a Decision Rule;
- Specifying Acceptable Limits on Decision Errors; and
- Optimising the Design for Obtaining Data.

Information for each of the seven steps is outlined in DP's SAQP, a copy of which has been included in Appendix D. Referenced sections for the respective DQOs listed above are presented in Table Q1, Appendix E.

7.2 Data Quality Indicators

The performance of the assessment in achieving the DQO was assessed through the application of Data Quality Indicators (DQI), defined as follows:

Precision: A quantitative measure of the variability (or reproducibility) of data;

Accuracy: A quantitative measure of the closeness of reported data to the "true" value;

Representativeness: The confidence (expressed qualitatively) that data are representative of each media present on the site;

Completeness: A measure of the amount of useable data from a data collection activity; and

Comparability: The confidence (expressed qualitatively) that data can be considered equivalent for each sampling and analytical event.

Further comments on the DQIs are presented in Appendix E.

7.3 Fieldwork Methods

The excavation of 22 test pits and drilling of tree test bores was undertaken using an excavator and drill rig respectively. The three test bores were drilled for groundwater well installation to between 9 m and 10 m bgl. Groundwater well installation is discussed further in Section 7.8.

The depths of each pit/bore and drilling methods are shown on the test pit and test bore logs provided in Appendix F. The work was undertaken on 2 and 3 November 2015.

7.4 Field Quality Assurance and Quality Control

The field QC procedures for sampling were as prescribed in Douglas Partners' *Field Procedures Manual*, and are outlined later in this section.

Field replicates were recovered and analysed for a limited suite of contaminants by means of intra- and inter-laboratory analysis. A water trip blank and trip spike were also taken into the field. This is in accordance with standard industry practice and guidelines.

7.5 Laboratory QA/QC

The analytical laboratories, accredited by NATA, are required to conduct in-house QA/QC procedures. These are normally incorporated into every analytical run and include reagent blanks, spike recovery,

surrogate recovery and duplicate samples. These results are included in the laboratory certificates in Appendix G.

The results of the DP assessment of laboratory QA/QC are shown in Appendix E with the full laboratory certificates of analysis included in Appendix G.

7.6 Sample Location and Rationale

The recommended minimum sampling density as stipulated in the NSW EPA's *Contaminated Sites: Sampling Design Guideline, 199*5 for a 1.7 ha site is 27 sampling points. Based on the observations from the site walkover and the results of previous investigations, a detailed intrusive investigation across Lot 5 to the recommended sampling density and a limited investigation across Lots 2, 3 and 4 to confirm the findings (or otherwise) of Martens (2014) which comprised 29 sample locations (including the two stockpiles) was undertaken. In this regard, eight test pits were undertaken on Lot 5 (which covers a 0.25 ha) and eight test pits across Lots 2 to 4. Following initial observations a further six test pits were undertaken to gain a better understanding of area where the deeper filling was present.

The bore and test pit locations are shown on Drawing 1, Appendix A.

7.7 Soil Sampling Procedure

All sample locations were cleared for services and underground pipes by a services locator and by review of dial-before-you-dig (DBYD) plans.

All sampling data was recorded on DP's test pit and test bore logs with essential information included in the chain-of-custody sheets. The general sampling procedure adopted for the collection of environmental samples is summarised below:

- Collection of disturbed soil samples directly from the excavator bucket, SPT tube and auger using disposable sampling equipment;
- Transfer of samples into laboratory-prepared glass jars, filled to the top to minimise the headspace within the sample jar and capping immediately to minimise loss of volatiles. Replicate samples were placed into snap lock plastic bags for asbestos analysis;
- Labelling of sample containers with individual and unique identification, including project number, sample location and sample depth; and
- Placement of the glass jars, with Teflon lined lid, into an ice cooled, insulated and sealed container for transport to the laboratory.

7.8 Well Installation Details

Groundwater monitoring wells were installed into test bores BH101, BH102 and BH103 as shown on Drawing 1, Appendix A. These bores were selected to assess groundwater conditions and were anticipated to be hydraulic up-gradient of the deep fill area at north-east of the site (BH102) and

across-gradient of the deep fill area/on the down-gradient site boundary (BH101 and BH103). Locations were also selected to assist with determining groundwater flow direction.

Field observations recorded the presence of free groundwater between 5.3 m and 7.5 m bgl during drilling of the test bores, which was within the natural clay and gravelly clay strata. Given this, the monitoring well screen was extended between 0.8 m and 1 m above the observed water level so groundwater within the natural profile could be intercepted for sampling. The remaining section of the well was completed with casing (solid PVC pipe).

The groundwater monitoring wells were constructed of 50 mm diameter acid washed class 18 PVC casing and machine slotted well screen intervals. Joints were screw threaded, thereby avoiding the use of glues and solvents which may contaminate the wells. Wells were backfilled with 2 mm gravel to 0.5 m above the top of the screen. A 1 m thick bentonite plug was installed above the gravel in each well, with the remaining annulus backfilled with gravel and clean natural soils. The top of each well sat approximately 1 m above the ground surface to assist with locating the wells on site. The well construction details and the ground surface levels were recorded on the test bore logs (Appendix F).

Following installation, the groundwater levels were measured using an interface meter and the wells were developed on 3 November 2015 by removing all groundwater using a submersible pump. The wells were allowed to recharge and groundwater levels re-measured including the measurement of phase separated hydrocarbons (PSH). No PSH were detected.

The wells were micro-purged on 4 November 2015 using a low flow pump (Geopump) until field parameters (pH, temperature, dissolved oxygen (DO), conductivity, total dissolved solids (TDS) and redox) readings stabilised. Once field parameters had stabilised, samples were collected using the low flow pump. Samples were placed with a minimum of aeration into appropriately preserved bottles. For analysis of metals the relevant sample fraction was filtered using an in-line disposable 0.45 µ filter that was changed between samples.

The sample pump and all non-disposable sampling equipment were decontaminated between samples via a “triple rinse” procedure i.e. a rinse of all particulates in tap water followed a decontamination using a 3% Decon 90 solution and a final rinse in deionised water.

The sample management comprised the following:

- Collection of 10% replicate samples for QA/QC purposes. In addition laboratory prepared trip spike and blank were taken into the field unopened on the day of sampling;
- Placement of samples in insulated coolers (through the use of ice; topped up as required) until transported to the analytical laboratory; and
- Chain of custody documentation was maintained at all times and countersigned by the receiving laboratory on transfer of samples.

7.9 Analytical Rationale

The analytical scheme was designed to obtain an indication of the potential presence and possible distribution of contaminants that may be attributable to past and present activities and features within the site, as discussed in Section 6. Additionally, based on the initial results (refer to Sections 9 and

10) which observed asbestos (confirmed by laboratory analysis) a conservative management approach of capping of any suspected asbestos impacted filling was a preferred option for the development. This management approach informed the asbestos assessment approach of screening using a presence/absence approach and was considered to avoid the need for a DSI with respect to asbestos contamination (refer to Section 11.3, Schedule B2 of the NEPC (2013)).

Envirolab Services Pty Ltd (Envirolab) was used for the primary analysis of soil and groundwater samples with Eurofin used as the secondary laboratory for inter-laboratory analysis of replicate samples. The laboratories are required to carry out routine in-house QC procedures.

Laboratory analytical methods as stated by Envirolab Services Pty Ltd and Eurofins are provided in the laboratory certificates of analysis in Appendix G and are summarised in the QA/QC section in Appendix E.

8. Site Assessment Criteria

It is understood that a development application is to be made to redevelop the site into a two storey residential aged care facility. No basement is proposed, with pavements for parking areas to cover the front section of the site (refer to Drawing 15491-DA-1110 Issue A, appendix A) .

The site assessment criteria (SAC) applied in the current investigation are informed by the CSM which identified human and environmental receptors to be exposed to potential contamination on the site. Analytical results were assessed (as a Tier 1 assessment) against the SAC comprising the investigation and screening levels of Schedule B1, NEPC (2013). The NEPC guidelines are endorsed by the NSW EPA under the CLM Act 1997.

The investigation and screening levels are applicable to generic land use settings and include consideration of, where relevant, the soil type and the depth of contamination. The investigation and screening levels are not intended to be used as clean up levels. Rather, they establish concentrations above which further appropriate investigation (e.g. Tier 2 assessment) should be undertaken. They are intentionally conservative and are based on a reasonable worst-case scenario.

The investigation and screening levels for soils applied in the current investigation comprise levels adopted for medium to high density residential land use scenario.

8.1 Soils

8.1.1 Health Investigation and Screening Levels

The Health Investigation Levels (HIL) and Health Screening Levels (HSL) are scientifically-based, generic assessment criteria designed to be used in the first stage (Tier 1) of an assessment of potential human health risk from chronic exposure to contaminants.

HILs are applicable to assessing health risk arising *via* all relevant pathways of exposure for a range of metals and organic substances. The HIL are generic to all soil types and apply generally to a depth of

3 m below the surface for residential use. Site-specific conditions may determine the depth to which HILs apply for other land uses.

HSLs are applicable to selected petroleum compounds and fractions to assess the risk to human health via inhalation and direct contact pathways. HSL have been developed for different land uses, soil types and depths to contamination. Petroleum based Health Screening Levels for direct contact have been adopted from the Cooperative Research Centre for Contamination Assessment and Remediation of the Environment (CRC CARE) *Technical Report no.10 Health screening levels for petroleum hydrocarbons in soil and groundwater* (2011) as referenced by NEPC (2013).

The generic HIL and HSL are considered to be appropriate for the assessment of contamination at the site. Given the proposed land use the adopted HIL and HSL are:

- **HIL-B** – Residential with minimal opportunities for soil access including high-rise and flats;
- **HSL-A & B (vapour intrusion)** – Low – high density residential; and
- **HSL-B (direct contact)** – High density residential.

Given that the HIL B and HSL B values apply to a relatively sensitive land use, it is considered that the values are also protective of construction and maintenance workers at the site.

In addition, the HSL adopted are predicated on the inputs summarised in Table 5.

Table 5: Inputs to the Derivation of HSLs

Variable	Input	Rationale
Potential exposure pathway	Soil vapour intrusion (inhalation) / Direct contact *	With the potential for vapour intrusion into new buildings, and direct contact with soils after construction, both pathways are considered viable.
Soil Type	Sand	In the absence of laboratory particle analysis sand HSLs have been adopted as an initial conservative screen; sand has been observed in some boreholes although it is noted that the majority of the material is predominantly clay.
Depth to contamination	0 m to <1 m	Fill – impacted soil recovered between 0 m and 3.2 m.

*Developed by CRC CARE (2011)

The adopted HILs and HSLs for the analytes included in the DSI are listed in the following Table 6.

Table 6: Health Investigation and Screening Levels (in mg/kg unless otherwise indicated)

Contaminants		HIL-B & HSL-B Direct Contact	HSL-A & B Vapour Intrusion
Metals	Arsenic	500	-
	Cadmium	150	-
	Chromium (VI)	500	-
	Copper	30 000	-
	Lead	1200	-
	Mercury (inorganic)	120	-
	Manganese	14000	-
	Nickel	1200	-
	Zinc	60 000	-
PAH	Benzo(a)pyrene TEQ[1]	4	-
	Naphthalene	2200 (HSL)	3
	Total PAH	400	-
TRH	C6 – C10 (less BTEX) [F1]	5600 (HSL)	45
	>C10-C16 (less Naphthalene) [F2]	4200 (HSL)	110
	>C16-C34 [F3]	5800 (HSL)	-
	>C34-C40 [F4]	8100 (HSL)	-
BTEX	Benzene	140 (HSL)	0.5
	Toluene	21 000 (HSL)	160
	Ethylbenzene	5900 (HSL)	55
	Xylenes	17 000 (HSL)	40
OCP	Aldrin + Dieldrin	10	-
	Chlordane	90	-
	DDT+DDE+DDD	600	-
	Endosulfan	400	-
	Endrin	20	-
	Heptachlor	10	-
	HCB	15	-
	Methoxychlor	500	-
PCB [2]		1	-

Notes to Table 6:

1. Sum of carcinogenic PAH
2. non dioxin-like PCBs only
3. NL – not limiting

8.1.2 Ecological Investigation Levels

Ecological Investigation Levels (EIL) have been derived for selected metals and organic compounds and are applicable for assessing risk to terrestrial ecosystems (NEPC, 2013). EIL depend on specific soil physiochemical properties and land use scenarios and generally apply to the top 2 m of soil, which corresponds to the root zone and habitation zone of many species. The EIL is determined for a contaminant based on the sum of the ambient background concentration (ABC) and an added contaminant limit (ACL). The ABC of a contaminant is the soil concentration in a specific locality that is the sum of naturally occurring background levels and the contaminants levels that have been introduced from diffuse or non-point sources (e.g. motor vehicle emissions). The ACL is the added concentration (above the ABC) of a contaminant above which further appropriate investigation and evaluation of the impact on ecological values is required.

The EIL is calculated using the following formula:

EIL = ABC + ACL.

The ABC is determined through direct measurement at an appropriate reference site (preferred) or through the use of methods defined by Olszowy et al *Trace element concentrations in soils from rural and urban areas of Australia*, Contaminated Sites monograph no. 4, South Australian Health Commission, Adelaide, Australia 1995 (Olszowy, 1995) or Hamon et al, *Geochemical indices allow estimation of heavy metal background concentrations in soils*, Global Biogeochemical Cycles, vol. 18, GB1014, (Hamon, 2004). ACL is based on the soil characteristics of pH, CEC and clay content.

EILs (and ACLs where appropriate) have been derived in NEPC (2013) for only a short list of contaminants comprising As, Cu, Cr (III), DDT, naphthalene, Ni, Pb and Zn. An *Interactive (Excel) Calculation Spreadsheet* may be used for calculating site-specific EIL for these contaminants, and has been provided in the ASC NEPM Toolbox available on the SCEW (Standing Council on Environment and Water) website (http://www.scew.gov.au/node/941).

The adopted EIL, derived from the *Interactive (Excel) Calculation Spreadsheet* are shown in the following Table 7. The following site specific data and assumptions have been used to determine the EILs:

- A protection level for urban residential/public open space;
- The EILs will apply to the top 2 m;
- Given the likely primary source of soil contaminants (i.e. historical filling) the contamination is considered as “aged” (>2 years);
- ABCs have been taken as the approximate average EPA background concentrations for NSW as published in Olszowy (1995); and
- Site specific pH and CEC have been tested whilst a conservative clay content has been assumed and as such these values have been used in the determination of EILs, where appropriate.

The adopted EILs are listed in the following Table 7.

Table 7: Ecological Investigation Levels (EIL) in mg/kg

Analyte		ABC[1]	ACL	EIL[2]	Comments
Metals	Arsenic	NA	NA	100	Adopted parameters: pH of 7.2 (average tested); CEC of 20 meq/100g (average tested); Conservative clay content composition of 1% used based on site observations Iron not tested as EIL aged criteria was adopted.
	Copper	30	200	230	
	Nickel	NA	270	270	
	Chromium III	10	180	190	
	Lead	NA	NA	1100	
	Zinc	80	690	770	
OCP	DDT	NA	NA	180	
PAH	Naphthalene	NA	NA	170	

Notes: 1. Taken from Olszowy (1995)
2. Urban residential and public open space

8.1.3 Ecological Screening Levels – Petroleum Hydrocarbons

Ecological Screening Levels (ESL) are used to assess the risk of selected petroleum hydrocarbon compounds, BTEX and benzo(a)pyrene to terrestrial ecosystems. ESL applies to the top 2 m of the soil profile as for EIL.

ESL has been derived in NEPC (2013) for petroleum fractions F1 to F4 as well as BTEX and Benzo(a)pyrene. Site specific data and assumptions as summarised in Table 8 have been used to determine the ESL. The adopted ESL, from Table 1B(6), Schedule B1 of NEPC (2013) are shown in Table 9

Table 8: Inputs to the derivation of ESL

Variable	Input	Rationale
Depth of ESL application	Top 2 m of the soil profile	The top 2 m depth below ground level corresponds to the root zone and habitation zone of many species.
Land use	Residential	Proposed future landuse
Soil Texture	Coarse	The most conservative values (soil profile sand, sand encountered in some of the filling, however predominately the filling was clay)

Table 9: Ecological Screening Levels (ESL) in mg/kg

Analyte		ESL	Comments
TRH	C6 – C10 (less BTEX) [F1]	180*	All ESLs are low reliability apart from those marked with * which are moderate reliability
	>C10-C16 (less Naphthalene) [F2]	120*	
	>C16-C34 [F3]	300	
	>C34-C40 [F4]	2800	

Analyte		ESL	Comments
BTEX	Benzene	50	
	Toluene	85	
	Ethylbenzene	70	
	Xylenes	105	
PAH	Benzo(a)pyrene	0.7	

8.1.4 Management Limits – Petroleum Hydrocarbons

In addition to appropriate consideration and application of the HSL and ESL, there are additional considerations which reflect the nature and properties of petroleum hydrocarbons, including:

- Formation of observable light non-aqueous phase liquids (LNAPL);
- Fire and explosion hazards; and
- Effects on buried infrastructure e.g. penetration of, or damage to, in-ground services.

Management Limits to avoid or minimise these potential effects have been adopted in NEPC (2013) as interim Tier 1 guidance. Management Limits have been derived in NEPC (2013) for the same four petroleum fractions as the HSL (F1 to F4). The adopted Management Limits, from Table 1B(7), Schedule B1 of NEPC (2013) are shown in the following Table 10. The following site specific data and assumptions have been used to determine the Management Limits:

- The Management Limits will apply to any depth within the soil profile;
- The Management Limits for residential, parkland and open space apply; and
- A “coarse” soil texture has been adopted to take a conservative approach.

Table 10: Management Limits in mg/kg

Analyte		Management Limit
TRH	$C_6 – C_{10}$ (F1) #	700
	$>C_{10}-C_{16}$ (F2) #	1,000
	$>C_{16}-C_{34}$ (F3)	2,500
	$>C_{34}-C_{40}$ (F4)	10,000

Separate management limits for BTEX and naphthalene are not available hence these have not been subtracted from the relevant fractions to obtain F1 and F2

8.1.5 Asbestos in Soil

Bonded asbestos-containing material (ACM) is the most common form of asbestos contamination across Australia, generally arising from:

- Inadequate removal and disposal practices during demolition of buildings containing asbestos products;
- Widespread dumping of asbestos products and asbestos containing fill on vacant land and development sites; and

- Commonly occurring in historical fill containing unsorted demolition materials.

Mining, manufacturing or distribution of asbestos products may result in sites being contaminated by friable asbestos including free fibres. Severe weathering or damage to bonded ACM may also result in the formation of friable asbestos comprising fibrous asbestos (FA) and/or asbestos fines (AF).

Asbestos only poses a risk to human health when asbestos fibres are made airborne and inhaled. If asbestos is bound in a matrix such as cement or resin, it is not readily made airborne except through substantial physical damage. Bonded ACM in sound condition represents a low human health risk, whilst both FA and AF materials have the potential to generate, or be associated with, free asbestos fibres. Consequently, FA and AF must be carefully managed to prevent the release of asbestos fibres into the air.

A detailed asbestos assessment as outlined in NEPC (2013) was not undertaken as part of the DSI. As such, asbestos was screened from replicate bag samples taken with each jar sample. Therefore the presence or absence of asbestos, generally with a limit of reporting of 0.1 g/kg, has been adopted for this assessment as an initial screen. It is noted that to supplement the screening, an additional five 500 mL bag samples were also analysed from selected test pit locations, with a limit of reporting for these samples of 0.001 g/kg

Where bonded materials were identified to be potentially ACM, these materials were analysed to confirm their ACM classification.

8.1.6 Waste Classification Criteria

To assess the waste classification of the material for off-site disposal purposes a preliminary waste classification assessment was undertaken in accordance with the six step process outlined in the NSW EPA *Waste Classification Guidelines 2014*. The soil results are assessed against the general solid waste (GSW) criteria outlined in Tables 1 and 2 of the guidelines.

With respect to the natural materials at the site, these are also assessed for their potential classification as Virgin Excavated Natural Material (VENM). In this regard the NSW EPA defines VENM as:

- *"natural material (such as clay, gravel, sand, soil or rock fines):*
- *that has been excavated or quarried from areas that are not contaminated with manufactured chemicals, or process residues, as a result of industrial, commercial, mining or agricultural activities; and*
- *that does not contain any sulfidic ores or soils or any other waste; and*
- *includes excavated natural material that meets such criteria for virgin excavated natural material as may be approved from time to time by a notice published in the NSW Government Gazette."*

For the purpose of providing a screening criteria to compare laboratory results against for assessing VENM Given this, DP have compared the results of the natural soils to published background concentrations in ANZECC/NHMRC (1992) *Australian and New Zealand Guidelines for the Assessment and Management of Contaminated Sites, Environmental Soil Quality Guidelines* Background A [ANZECC A] as a screening criteria. In the case of organics where no reference values exist the laboratory PQL has been adopted as the screening level.

8.2 Groundwater

The primary potential receptor of impacted groundwater is expected to be the Macquarie River to the north-east of the site.

8.2.1 Groundwater Investigation Levels

The Groundwater Investigation Levels (GIL) adopted in NEPC (2013) are based on:

- *Australian Drinking Water Guidelines* 2011 (ADWG);
- *Guidelines for Managing Risk in Recreational Waters* 2008 (GMRRW); and
- *National water quality management strategy. Australian and New Zealand guidelines for fresh and marine water quality* 2000 (ANZECC & ARMCANZ).

The adopted GIL for the analytes included in the assessment (where applicable), and the corresponding source documents, are shown in Table 11.

Table 11: Groundwater Investigation Levels (in µg/L unless otherwise stated)

Analyte		NEPC (2013) Fresh Waters [b]	NEPC (2013) Drinking Water
Metals	Arsenic (V)	13	10
	Cadmium	1.14 [c]	2
	Chromium (VI)	4.9 [c]	50
	Copper	7.3 [c]	2000
	Lead	40.1 [c]	10
	Mercury (total)	0.06	1
	Nickel	57.2 [c]	20
	Zinc	41.6 [c]	-
PAH	Naphthalene	16	-
	Benzo(a)pyrene	-	0.01
BTEX	Benzene	950	1
	Toluene	-	800
	Ethylbenzene	-	300
	Xylene (o)	350	-
	Xylene (p)	200	-
	Xylenes (Total)	-	600
Phenols	Phenol	320	-
OCP	Chlordane	0.03	2
	DDT	0.006	9
	Endosulfan	0.03	20
	Endrin	0.01	-
	Heptachlor	0.01	-
	Aldrin + Dieldrin	-	0.3
	Lindane	0.2	10
	Heptachlor Expoxide	-	0.3
PCB	Aroclor 1242	0.3	-
	Aroclor 1254	0.01	-

Notes:

a *In cases where no high reliability trigger values are provided, the low reliability trigger values provided in ANZECC & ARMCANZ (2000) have been used as screening levels*

b *Investigation levels apply to typically slightly-moderately disturbed systems*

c *Criteria for metals have been hardness adjusted for very hard water (hardness of samples between 210-240 mg/L as $CaCo_3$)*

8.2.2 Health Screening Levels – Petroleum Hydrocarbons

The generic HSL are considered to be appropriate for the assessment of contamination at the site. In addition, the HSL adopted is predicated on the following inputs prescribed in Table 12.

Table 12: Inputs to the Derivation of HSLs

Variable	Input	Rationale
Landuse	Residential	Proposed future landuse
Potential exposure pathway	Groundwater vapour intrusion (inhalation)	Potential for vapour intrusion into new dwellings
Soil Type	Sand	The most conservative values (soil profile sand, sand encountered in some of the filling, however, predominately the filling was clay)
Depth to contamination	4 m to < 8 m	Measured depths to groundwater post development were between 5.1 m and 6.5 m bgl. The 4 m to <8 m input has been adopted given these observations and no basement is proposed for the development

The site specific groundwater HSL for vapour intrusion, are shown in the following Table 13.

Table 13: Groundwater Health Screening Levels (HSL) for Vapour Intrusion (µg/L)

Analyte		HSL-A & HSL B 4-<8 m
TRH	$C_6 – C_{10}$ (less BTEX) [F1]	1000
	$>C_{10}-C_{16}$ (less Naphthalene) [F2]	1000
BTEX	Benzene	800
	Toluene	NL
	Ethylbenzene	NL
	Xylene	NL
PAH	Naphthalene	NL

Notes: NL -The solubility limit is defined as the groundwater concentration at which the water cannot dissolve any more of an individual chemical based on a petroleum mixture. The soil vapour which is in equilibrium with the groundwater will be at its maximum. If the derived groundwater HSL exceeds the water solubility limit, a soil-vapour source concentration for a petroleum

mixture could not exceed a level that would result in the maximum allowable vapour risk for a given scenario. For these scenarios no HSL is presented for these chemicals. These are denoted as not limiting 'NL'.

9. Fieldwork Results

9.1 Field Observations

Details of the subsurface conditions encountered in the investigation are given in the test pit and test bore logs in Appendix F, together with notes defining classification methods and descriptive terms.

The site can generally be split in to two areas: the north east of the site with the deeper filling where the old quarry has been backfilled; and the remainder of the site which has generally shallower filling.

For the north east section of the site, the sequence of subsurface materials encountered within the test pits and test bores, in increasing depth order, may be summarised as follows:

Topsoil/Filling: The depth of the fill varied between 1.4 m (TP22) and 3.2 m (BH101) bgl. Except for locations TP20, TP21 and TP22 there was generally an upper filling layer between 0.2 m and 0.8 m thick comprising a brown gravelly sand, silty sand, sandy gravelly clay, silty clay, sandy clay or clayey silt which did not appear to contain significant quantities of building/demolition waste. The filling underlying this contained significant building/demolition waste (concrete, brick, plastic, wood, tiles, lead flashing, asphalt, fibrous materials (possible asbestos- TP2, TP5, TP11, BH101) and a brown soil matrix comprising sandy clay, silty clay, silty gravelly clay and clay;

Natural Soils: Natural soils comprising a combination of brown clayey silts, sandy clays, silty clays, gravelly clays and clays were encountered at all sample locations (except TP1 due to refusal). The deeper test bore locations, BH101 and BH103, encountered natural soils to depths of between 9.4 m and 9.6 m bgl; and

Bedrock: Highly weathered orange-brown granite from 9.4 m to 10 m bgl.

For the remaining area of the site with the shallower fill, the sequence of subsurface materials encountered within the test pits and test bore, in increasing depth order, may be summarised as follows:

Topsoil/Filling: Filling comprised various compositions of brown clayey silt, silty clay, gravelly clay to depths of between 0.1 m and 0.8 m bgl. Brick was observed in the pits along the north-western boundary (TP6, TP7, TP8, TP19) and in TP14 ;

Natural Soils: Natural soils comprising brown and brown-orange silty clays and clayey silts to depths of between 0.5 m and 1.2 m bgl in the test pits. Brown and grey silty clays, clays and gravelly clays were encountered up to 8.7 m bgl in test bore BH102; and

Bedrock: Highly weathered orange-brown granite from 8.7 m to 9 m bgl was encountered in BH102.

There were no signs of gross chemical contamination (e.g. odours or staining) during the fieldwork. It is noted that potential ACM was only observed in the north east of the site, were there was notably deeper filling and more building/demolition waste present.

Free groundwater was observed in all three wells following development at levels between 669.4 m and 670.4 m AHD (refer to Table 14 below). Based on these results, the water table is considered to be generally level across the site, with no distinctive groundwater gradient. Longer term monitoring of the water table would be required to confirm the groundwater gradient. Given the relatively flat site topography and proximity to the Macquarie River, it is likely that the long term groundwater gradient would be in a north-easterly direction towards the Macquarie River.

The stabilised groundwater field parameters recorded prior to sampling are summarised in Table 14. Field sheets for the groundwater sampling are provided in Appendix H.

Table 14: Stabilised Groundwater Field Parameters

Groundwater Well	RL (m AHD)	Depth to Groundwater (m bgl)	Groundwater RL (m AHD)	pH	Electrical Conductivity µS/cm	Redox (mV)	Temperature (°C)	Dissolved Oxygen (ppm)
BH101	676.5	6.5	670.0	8.0	845	125	16.2	1.53
BH102	675.8	6.2	669.6	8.6	740	120	15.8	0.87
BH103	676.5	6.1	670.4	8.5	940	134	16.0	0.37

9.2 Field Testing Results

Replicate soil samples collected in plastic bags were allowed to equilibrate under ambient temperatures before screening for Total Photo-ionisable Compounds (TOPIC) using a calibrated photo-ionisation detector (PID). The PID readings were all <5 ppm, consistent with the field observations noted above (and the laboratory results (refer to Sections 9.3 and 10). Results are provided on the test pit and test bore logs in Appendix F.

9.3 Laboratory Results

The results of the soil and groundwater laboratory analysis undertaken are summarised and presented in Table G1: Summary of Soil Laboratory Results and Table G2: Summary of Groundwater Laboratory Results, in Appendix G.

The full laboratory certificates together with the chain of custody and sample receipt information are also presented in Appendix G.

10. Discussion of Results

10.1 Contaminants in Soil

The soil samples were generally free of field indicators for significant chemical contamination, with filling being variable in thickness across the site, ranging up to 3.2 m depth at the north east of the site.

Soil samples were analysed for a variety of potential contaminants including TRH, BTEX, PAH, OCP, OPP, PCB, phenols and asbestos. The concentrations of BTEX, PCB, OCP, OPP and phenols were all below the laboratory practical quantitation limits (PQL), and below the SAC, for all samples analysed.

TRH was recorded in one sample, BH11/1.5-1.7, with detected medium and long chain (C_{15}-C_{28} – 120 mg/kg; C_{29}-C_{36} -100 mg/kg) hydrocarbons.

There were low concentrations of PAH recorded in 13 of the samples from the filling, with total PAH concentrations between 0.11 mg/kg and 35 mg/kg. These were all well below the HSL of 400 mg/kg. Sample TP11/1.5-1.7 recorded an elevated B(a)P TEQ concentration of 5.5 mg/kg which was above the health investigation level of 4 mg/kg. All other results were within the HSL for total PAH (400 mg/kg) and B(a)P TEQ (4 mg/kg).

The recorded TRH and PAH (including B(a)P) in sample TP11/1.5-1.7 is considered to be consistent with the presence of asphalt observed at the sample location. As Note 6 of Table 1A(1) of NEPC (2013) states, *'where B(a)P occurs in bitumen fragments it is relatively immobile and does not represent a significant health risk'*. Given this, the recorded B(a)P TEQ exceedence in sample TP11/1.5-1.7 was not considered significant. Asphalt was not recorded at any other locations.

Heavy metals were recorded at all locations with concentrations generally low. All metal concentrations were below the SAC.

Soil sample TP3/1.4-1.5 screened for the presence of asbestos confirmed the presence of matted chrysotile asbestos. No other soil samples recorded the presence of asbestos. The two material samples collected from TP2 and TP3 and which were suspected ACM, both confirmed the presence chrysotile and amosite asbestos. All of these locations with confirmed asbestos are in the north east of the site in the area of the deeper filling.

Therefore it is considered that, based on the available data that there is no unacceptable risk to human health or ecology from chemical contaminants in soil. However, asbestos has been confirmed to be present within the filling in the north east of the site and hence poses a potential risk to human health if not managed appropriately.

10.2 Provisional Waste Classification

Chemical results for the filling were generally within the General Solid Waste (GSW) criteria without TCLP (CT1 criteria) with the exception of lead and mercury in samples TP2/0.9-1 and TP3/1.4-1.5 and B(a)P concentrations in TP3/.4-1.5, TP9/2-2.2 and TP11/1.5-1.7, all of which are within the filling in the north east of the site. The confirmed presence of asbestos within the selected samples analysed and

the observations of bonded ACM and building/demolition waste in other samples confirmed the filling in the north east of the site as special waste under the EPA *Waste Classification Guidelines* 2014.

Therefore, based on the field and laboratory results the filling in the north east of the site (area of deep filling) is provisionally classified as General Solid Waste (non-putrescible)- Asbestos Waste and the filling at the remainder of the site (shallower filling) is provisionally classified as General Solid Waste (non-putrescible).

The natural silts, sandy clays, silty clays, gravelly clays and bedrock similarly did not show any signs of gross contamination and the results were generally consistent with background ranges. On this basis and in conjunction with the filling not being mixed with the natural material, the natural silts, sandy clays, silty clays, gravelly clays and bedrock at the site have a provisional classification of Virgin Excavated Natural Material (VENM).

10.3 Groundwater Results

All groundwater results recorded low concentrations for the contaminants analysed. Results for all samples recorded concentrations for BTEX, TRH, PAH, OCP, PCB and phenols below laboratory PQL. Some samples recorded low concentrations for various metals including arsenic, nickel and zinc, although these were all within the respective GIL's. It is noted that the groundwater hardness was recorded between 210 mg$CaCo_3$/L and 240 mg$CaCo_3$/L.

11. Updated Conceptual Site Model

An updated CSM is presented in Table 15. It is a representation of site information regarding the potential contamination sources and associated exposure pathways and potential receptors identified from this investigation.

Table 15: Updated Conceptual Site Model

Potential Source and Contaminants of Concern	Pathway	Receptor	Risk Management Action Recommended
S1 - Demolition/deterioration of site structures (Asbestos)	P2 - Inhalation of dust/vapours	R1 - Current users R2 - End users R3 - Construction and maintenance workers R4 – Adjacent site	Sheds primarily comprising corrugated iron. Removal of sheds and inspection of footprints. Inclusion of an unexpected finds protocol during construction works.

Potential Source and Contaminants of Concern	Pathway	Receptor	Risk Management Action Recommended
S2 - Contaminated imported fill (Asbestos)	P2 - Inhalation of dust/vapours	R1 - Current users R2 - End users R3 - Construction and maintenance workers R4 – Adjacent site	Capping of asbestos impacted material in the north east of site. Inclusion of an unexpected finds protocol during construction works for the remainder of the site
S3 – Fly tipping (Asbestos)	P2 - Inhalation of dust/vapours	R1 - Current users R3 - Construction and maintenance workers R4 – Adjacent site	No asbestos detected during current DSI. Asbestos detected in stockpile of building material (ASB02) during Marterns 2014 assessment. Removal of fly tipping and inspection of footprints. Inclusion of an unexpected finds protocol during construction works.

The following summarises the inputs from the current investigation which have informed the above CSM.

The recorded concentrations of chemical contaminants in soil and groundwater during the current investigation were all within the relevant health and ecological criteria except for B(a)P exceedences in TP11/1.4-1.5, however, the exceedence was not considered significant. There is evidence of ACM sporadically spread both laterally and vertically through the filling in the north east of the site, although it is noted that the upper filling did not appear to have as high a risk for the presence of ACM. To mitigate against exposure pathways for end users, the asbestos impacted material needs to be managed, with the preferred option understood to be a 'cap and contain' strategy.

There was no asbestos observed in the shallower filling in the remainder of the site, although some building rubble and fly tipping was present. The stockpile of building materials at the Stanley Street end of Lot 3 that contained asbestos and was reported in the Martens 2014 was not observed during DP's current investigation, although the thick grass coverage may have prevented its observation. Additionally, the site sheds appeared to be primarily made of corrugated iron with no asbestos observed in the building materials. Given this, an unexpected finds protocol should be in place prior to commencing works and any asbestos materials (if encountered) are to be either removed from site or relocated to the rear of the site in the area of the asbestos contaminated filling which is to be capped.

12. Conclusion and Recommendations

Based on the field and analytical results presented in this report it is considered the site can be made suitable for the proposed residential development, subject to the development of a remediation action plan prior to construction works commencing. The RAP is to include *inter alia*:

- An unexpected finds protocol;
- Surface inspection of the western, southern and central parts of the site (in the area of the shallower filling) following stripping of the grass coverage and removal of the sheds and fly tipping;
- The remediation of the asbestos impacted filling at the rear of the site; and
- Validation of remediation works by an appropriately qualified environmental consultant.

With respect to remediation works on the asbestos impacted filling, management measures where asbestos impacted filling is to remain on site will generally involve the construction of a physical barrier and marker layer between the filling and site users. Commonly this comprises hardstands (e.g. concrete slabs) or 500 mm thick virgin excavated natural material layers placed in landscaped and lawn areas. In this regard, such remediation approaches require ongoing long term management of the site so that the integrity of the mitigation measures is maintained.

Furthermore, regarding the provisional waste classification for the filling and the underlying natural material, should material be identified during works which does not reflect those described herein or shows signs of contamination (e.g. odours, staining), this material is to be segregated and an appropriately qualified environmental consultant engaged to confirm the classification of the material.

13. Limitations

Douglas Partners (DP) has prepared this report for this project at Lots 2 to 5, Stanley Street, Bathurst in accordance with DP's proposals (SYD151045.P.001 Rev 3 and SYD15045.P.002) dated 15 October 2015 and an acceptance received from Align Projects Pty Ltd on behalf of Opal Aged Care Pty Ltd dated 29 October 2015. The work was carried out under DP's Conditions of Engagement. This report is provided for the use of Opal Aged Care Pty Ltd for this project only and for the purposes as described in the report. It should not be used by or relied upon for other projects or purposes on the same or other site or by a third party. Any party so relying upon this report beyond its exclusive use and purpose as stated above, and without the express written consent of DP, does so entirely at its own risk and without recourse to DP for any loss or damage. In preparing this report DP has necessarily relied upon information provided by the client and/or their agents.

The results provided in the report are indicative of the sub-surface conditions on the site only at the specific testing locations, and then only to the depths investigated and at the time the work was carried out. Sub-surface conditions can change abruptly due to variable geological processes and also as a result of human influences. Such changes may occur after DP's field testing has been completed.

DP's advice is based upon the conditions encountered during this investigation. The accuracy of the advice provided by DP in this report may be affected by undetected variations in ground conditions

across the site between and beyond the testing locations. The advice may also be limited by budget constraints imposed by others or by site accessibility.

This report must be read in conjunction with all of the attached notes and should be kept in its entirety without separation of individual pages or sections. DP cannot be held responsible for interpretations or conclusions made by others unless they are supported by an expressed statement, interpretation, outcome or conclusion stated in this report.

This report, or sections from this report, should not be used as part of a specification for a project, without review and agreement by DP. This is because this report has been written as advice and opinion rather than instructions for construction.

Douglas Partners Pty Ltd

Appendix A

Drawings

Notes About this Report

NOTE:
1: Base image from Nearmap.com
2: Test locations are approximate only and were located using hand-held GPS.

0 10 20 30 40 50 75 100m

1:1000 @ A3

APPROXIMATE INTERFACE BETWEEN AREAS OF DEEP FILL AND SHALLOWER FILL

LOT 5 LOT 4 LOT 3 LOT 2

BH101 BH102 BH103

BH25 BH26 BH34 BH33A BH33 BH32 BH31 BH30

ASB02

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22

101 102 103 104 105 106 107 108 110 111 112 113 114 115 116 117 118 119 120 122 123 124 125 126

LEGEND

DOUGLAS PARTNERS INVESTIGATION

- Test pit location
- Borehole location with groundwater monitoring well

MARTENS & ASSOCATES INVESTIGATION APRIL 2014

- Test pit location
- Borehole location

ENVIROWEST CONSULTING INVESTIGATION APRIL 2014

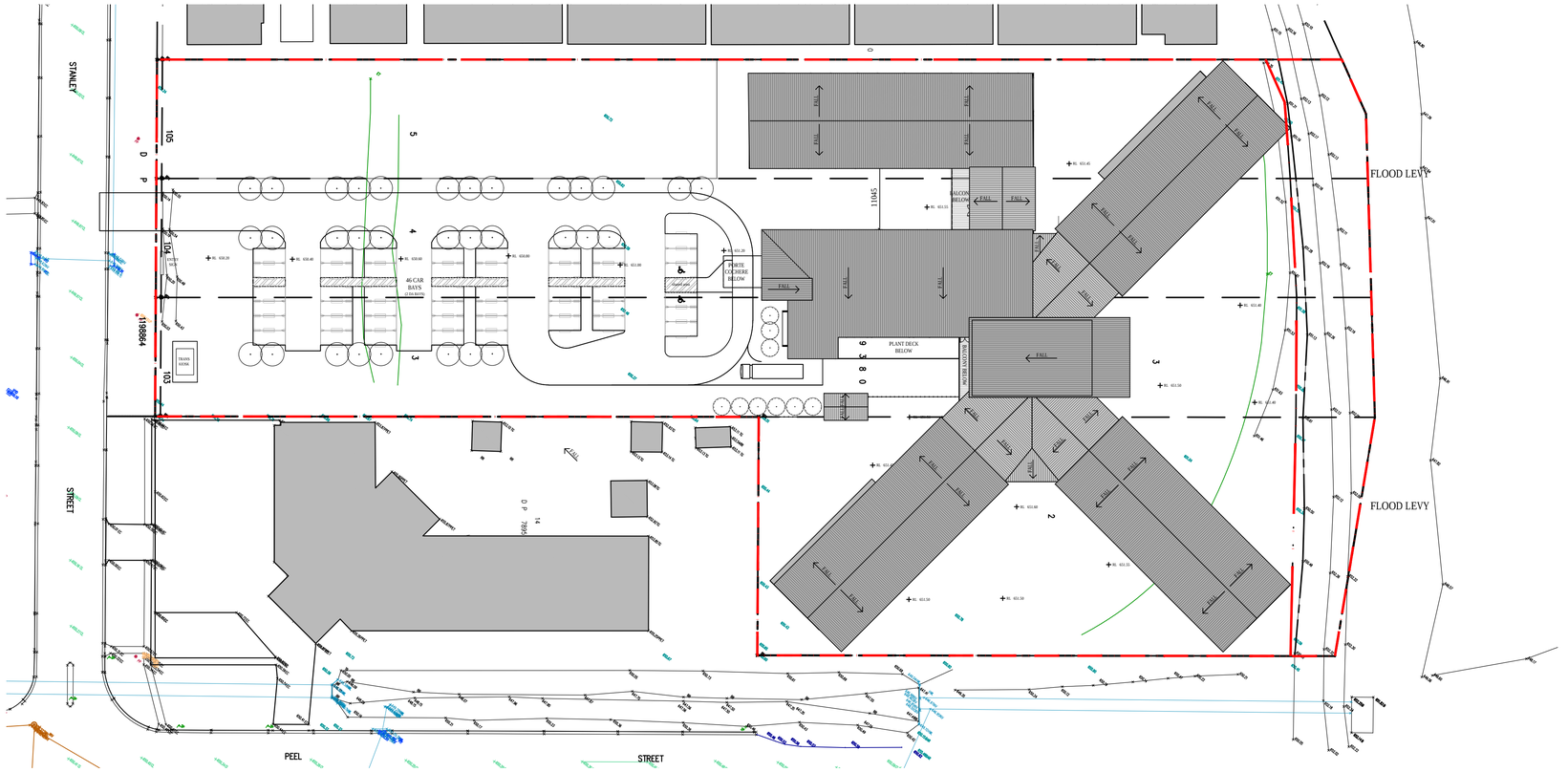
- Borehole location

Douglas Partners
Geotechnics / Environment / Groundwater

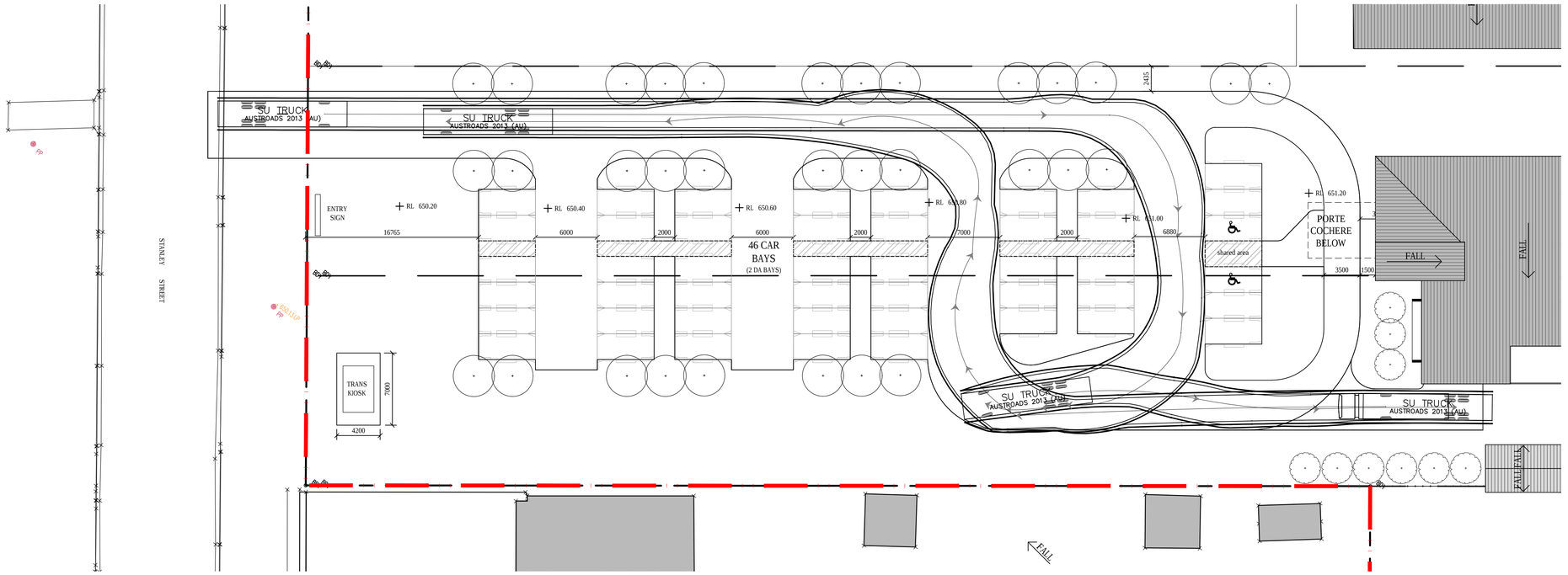
CLIENT: Opal Aged Care Pty Ltd		TITLE: **Location of Tests**	PROJECT No: 85164.00
OFFICE: Sydney	DRAWN BY: PSCH	**Proposed Aged Care Facility**	DRAWING No: 1
SCALE: 1:1000 @ A3	DATE: 20.11.2015	**Lots 2-5, Stanley Street, BATHURST**	REVISION: 0

N

P:\85164.00 - BATHURST- Environmental Investigation\7.0 Drawings\7.2 Out\85164.00-1.dwg, 2/12/2015 10:13:55 AM



01 SITE PLAN
1 : 500 @ A1



02 SITE PLAN
1 : 250 @ A1

Amendments

Issue	Description	Date
A	PRELIMINARY	08/12/2015

Landscape

TAYLOR BRAMMER
218 Oxford St
Woollahra NSW 2025
www.taylorbrammer.com.au/
Tel. 02 9387 8855
dmtaylor@taylorbrammer.com.au

Cost Consultant

WILDE AND WOOLLARD
Level 1, 815 Pacific Hwy
Chatswood NSW 2067
www.wildeandwoollard.com/
Tel. 02 9411 2777
Mob. 0422 880 982
williamt@wwsydney.com

Hydraulic Engineers

EWFW
Level 4, 362 Kent St
SYDNEY NSW 2000
www.ewfw.com.au/
Tel. 02 5732 7896
Mob. 0431 574 899
ewfw@ewfw.com.au

Civil Engineers

Henry & Hymas
Level 5, 79 Victoria Ave
CHATSWOOD NSW 2067
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afrancis@hhconsult.com.au

Planners

BBC CONSULTING PLANNERS
Level 2, 55 Mountain Street
BROADWAY NSW 2007
www.bbcplanners.com.au/
Tel. 02 9211 4099
Fax. 02 9211 2740
bbc.administration@bbcplanners.com.au

Structure Engineers

NORTHROP
Level 11, 345 George Street
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Mob. 0412 772 839
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ST LEONARDS NSW 2065
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Project Manager

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Client

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Opal specialist aged care

GROUP GSA

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architecture interior design urban design landscape
nom architect M. Sheldon 3990

Project Title

BATHURST AGED CARE
Stanley St, Bathurst NSW

Drawing Title

PROPOSED SITE PLAN
-
-

Scale	AS SHOWN @ A1
Drawing created (date)	08/12/2015
By	BP
Plotted and checked by	BP
Verified	MZ
Approved	MZ

Drawing No 15491 - DA-1110 Issue A

Revised by	Plot Date
BPramethawanich	08/12/2015

About this Report

Douglas Partners

Introduction

These notes have been provided to amplify DP's report in regard to classification methods, field procedures and the comments section. Not all are necessarily relevant to all reports.

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

Copyright

Borehole and Test Pit Logs

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

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

Groundwater

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

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

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

Reports

The report has been prepared by qualified personnel, is based on the information obtained from field and laboratory testing, and has been undertaken to current engineering standards of interpretation and analysis. Where the report has been prepared for a specific design proposal, the information and interpretation may not be relevant if the design proposal is changed. If this happens, DP will be pleased to review the report and the sufficiency of the investigation work.

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

- Unexpected variations in ground conditions. The potential for this will depend partly on borehole or pit spacing and sampling frequency;
- Changes in policy or interpretations of policy by statutory authorities; or
- The actions of contractors responding to commercial pressures.

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

About this Report

Site Anomalies

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

Information for Contractual Purposes

Where information obtained from this report is provided for tendering purposes, it is recommended that all information, including the written report and discussion, be made available. In circumstances where the discussion or comments section is not relevant to the contractual situation, it may be appropriate to prepare a specially edited document. DP would be pleased to assist in this regard and/or to make additional report copies available for contract purposes at a nominal charge.

Site Inspection

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

Appendix B

Site Photographs

Photo 1 - Looking at Site from Stanley Street

Photo 2 - Looking South-East Towards Sheds and Child Care Centre

Douglas Partners Geotechnics / Environment / Groundwater	**Site Photographs** **Proposed Aged Care Facility** **Lots 2-5, Stanley Street, Bathurst**	PROJECT No: 85164 PLATE No: B1 REV: A
	CLIENT: Opal Aged Care Pty Ltd	DATE: 11-Nov-15

Photo 3 - Looking South Across Site

Photo 4 - Looking East Across Rear Section of the Site

Douglas Partners Geotechnics | Environment | Groundwater	**Site Photographs** **Proposed Aged Care Facility** **Lots 2-5, Stanley Street, Bathurst**	PROJECT No: 85164 PLATE No: B2 REV: A
	CLIENT: Opal Aged Care Pty Ltd	DATE: 11-Nov-15

Photo 5 - Looking East Across Rear Section of the Site

Photo 6 - Looking South West Across Middle Section of the Site

Douglas Partners Geotechnics | Environment | Groundwater	**Site Photographs** **Proposed Aged Care Facility** **Lots 2-5, Stanley Street, Bathurst**	PROJECT No: 85164 PLATE No: B3 REV: A
	CLIENT: Opal Aged Care Pty Ltd	DATE: 11-Nov-15

Photo 7 - Looking East at Site Boundary (in the area of TP16)

Photo 8 - Site Sheds Primarily Comprising Corrugated Iron

Douglas Partners Geotechnics | Environment | Groundwater	**Site Photographs** **Proposed Aged Care Facility** **Lots 2-5, Stanley Street, Bathurst**	PROJECT No: 85164 PLATE No: B4 REV: A
	CLIENT: Opal Aged Care Pty Ltd	DATE: 11-Nov-15

Photo 9 - Site Sheds Primarily Comprising Corrugated Iron

Photo 10 - Fly Tipping of Car Parts

Douglas Partners Geotechnics | Environment | Groundwater	**Site Photographs** **Proposed Aged Care Facility** **Lots 2-5, Stanley Street, Bathurst**	PROJECT No: 85164 PLATE No: B5 REV: A
	CLIENT: Opal Aged Care Pty Ltd	DATE: 11-Nov-15

Photo 11 - General Fly Tipping

Photo 12 - Earthworks Being Undertaken on Adjacent Site to the North-West

Douglas Partners Geotechnics | Environment | Groundwater	**Site Photographs**	PROJECT No: 85164
	Proposed Aged Care Facility	PLATE No: B6
	Lots 2-5, Stanley Street, Bathurst	REV: A
	CLIENT: Opal Aged Care Pty Ltd	DATE: 11-Nov-15

Appendix C

Historical Titles and 149 Planning Certificates

Legal Liaison Searching Services

ABN: 52832569710
Ph: 02 9233 5800
Fax: 02 9221 2827

Level 4, 70 Castlereagh Street,
Sydney 2000
PO Box 2513 Sydney NSW 2001
DX 1019 Sydney

Summary of Owners Report

LPI **Sydney**

Address: - 105 Stanley Street, Bathurst

Description: - Lots 2, 3, 4 & 5 D.P. 1089380

As regards Lot 2 D.P. 1089380

Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available	Reference to Title at Acquisition and sale
21.04.1915 (1915 to 1944)	Francis Curley (Milk Vendor)	Book 1054 No. 870
27.11.1944 (1944 to 1947)	Mark Edward Falconer Evans (Carrier)	Book 1956 No. 820
01.07.1947 (1947 to 1965)	Patrick Joseph Slattery (Shearer)	Book 2023No. 346
08.04.1965 (1965 to 1966)	Dulcie Alice Slattery (Home Duties)	Book 2746 No. 132
14.10.1966 (1966 to 1989)	Alan Ray Mould (Carrier) Lorna May Mould (Married Woman)	Book 2824 No. 261 Now 13/789511
26.10.1989 (1989 to 2006)	Bathurst Regional Council	13/789511 Now 2/1089380
14.06.2006 (2006 to 2105)	Hilton Henry Bonham (Carrier)	2/1089380
22.01.2015 (2015 to 2015)	Stabosl Pty Limited	2/1089380
22.01.2015 (2015 to date)	# Principal Healthcare Finance Pty Limited	2/1089380

# Denotes current registered proprietor

Easements & Leases: - NIL

Legal Liaison Searching Services

ABN: 52832569710
Ph: 02 9233 5800
Fax: 02 9221 2827

Level 4, 70 Castlereagh Street,
Sydney 2000
PO Box 2513 Sydney NSW 2001
DX 1019 Sydney

As regards Lots 3, 4 & 5 D.P. 1089380

Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available	Reference to Title at Acquisition and sale
21.04.1915 (Lot 3) (1915 to 1939) 18.12.1912 (Lots 4 & 5) (1912 to 1939)	Francis Curley (Milk Vendor)	Book 1054 No. 870 (Lot 3) Book 985 No. 263 (Lots 4 & 5)
23.05.1939 (1939 to 1961)	Charles Moss (Labourer)	Book 1845 No. 946
06.06.1961 (1961 to 1970)	Alfred John Berry (Carrier)	Book 2573 No. 348
03.03.1970 (1970 to 2015)	Hilton Henry Bonham (Carrier)	Book 2968 No. 339 Now 3, 4 & 5/1089380
22.01.2015 (2015 to 2015)	Stabosl Pty Limited	3, 4 & 5/1089380
22.01.2015 (2015 to date)	# Principal Healthcare Finance Pty Limited	3, 4 & 5/1089380

# Denotes current registered proprietors

Easements & Leases: - NIL

Yours Sincerely
Mark Groll
12 November 2015
(Ph: 0412 199 304)

BATHURST REGIONAL COUNCIL

PLANNING CERTIFICATE

Issued pursuant to Section 149 of the Environmental Planning and Assessment Act, 1979

Issue Date: 10 September 2015

Application No: 14977
Certificate No: 149/10069

Applicant Reference: BATHURST 15/190

158 Russell Street
Private Mail Bag 17
BATHURST NSW 2795
Ph: 02 6333 6111
Fax: 02 6331 7211
council@bathurst.nsw.gov.au

Applicant:
BBC Consulting Planners
PO Box 438
BROADWAY NSW 2007

Property: **Peel Street BATHURST 2795**
Description: **Lot: 2 DP: 1089380**
Parcel No: **39072**

INFORMATION PROVIDED PURSUANT TO SECTION 149(2) OF THE ACT.

1. Names of relevant planning instruments and DCPs

The names of:

(1) each environmental planning instrument that applies to the carrying out of development on the land:

Bathurst Regional Local Environmental Plan 2014

A copy of the current Bathurst Regional Local Environmental Plan 2014 is available on the NSW Legislation website – www.legislation.nsw.gov.au

The following State Environmental Planning Policies (SEPP) apply to the Bathurst Regional LGA:

SEPP No. 15 - Rural Land-Sharing Communities

SEPP No. 21 - Caravan Parks

SEPP No. 30 - Intensive Agriculture

SEPP No. 32 - Urban Consolidation (Redevelopment of Urban Land)

SEPP No. 33 - Hazardous and Offensive Development

SEPP No. 36 - Manufactured Home Estates

SEPP No. 44 - Koala Habitat Protection

SEPP No. 50 - Canal Estates

SEPP No. 55 - Remediation of Land

SEPP No. 62 - Sustainable Aquaculture

SEPP No. 64 - Advertising and Signage

SEPP No. 65 - Design Quality of Residential Flat Development

SEPP (Affordable Rental Housing) 2009

SEPP (Building Sustainability Index: BASIX) 2004

SEPP (Housing for Seniors or People with a Disability) 2004

SEPP (Infrastructure) 2007

SEPP (Major Development) 2005

SEPP (Mining, Petroleum Production and Extractive Industries) 2007

SEPP (Rural Lands) 2008

SEPP (State and Regional Development) 2011

SEPP (Miscellaneous Consent Provisions) 2007

A full copy of the SEPPs are available on the NSW Legislation website – www.legislation.nsw.gov.au

(2) each proposed environmental planning instrument that will apply to the carrying out of development on the land and that is or has been the subject of community consultation or on public exhibition under the Act (unless the Director-General has notified the council that the making of the proposed instrument has been deferred indefinitely or has not been approved):

Nil.

(3) each development control plan that applies to the carrying out of development on the land:

Bathurst Regional Development Control Plan 2014

2. Zoning and land use under relevant LEPs

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

(a) the identity of the zone;

Zone R1 General Residential

Objectives of zone

- **To provide for the housing needs of the community.**
- **To provide for a variety of housing types and densities.**
- **To enable other land uses that provide facilities or services to meet the day to day needs of residents.**
- **To provide housing choice and affordability by enabling opportunities for medium density forms of housing in locations and at densities that complement the surrounding residential environment.**
- **To protect and conserve the historic significance and scenic quality of the urban villages of Eglinton, Raglan and Perthville.**

- **To enable commercial development that is compatible with the amenity of the area and does not prejudice the status and viability of the Bathurst central business district as the retail, commercial and administrative centre of Bathurst.**

(b) the purposes for which the instrument provides that development may be carried out within the zone without the need for development consent;

Environmental protection works; Extensive agriculture; Home-based child care; Home businesses; Home occupations; Roads

(c) the purposes for which the instrument provides that development may not be carried out within the zone except with development consent; and

Attached dwellings; Boarding houses; Child care centres; Community facilities; Dwelling houses; Food and drink premises; Garden centres; Group homes; Home industries; Hostels; Kiosks; Markets; Multi dwelling housing; Neighbourhood shops; Places of public worship; Plant nurseries; Residential flat buildings; Respite day care centres; Roadside stalls; Semi-detached dwellings; Seniors housing; Shop top housing; Waste or resource transfer stations; Any other development not otherwise specified in Item (b) or (d)

(d) the purposes for which the instrument provides that development is prohibited within the zone:

Air transport facilities; Amusement centres; Boat building and repair facilities; Correctional centres; Crematoria; Depots; Electricity generating works; Extractive industries; Forestry; Freight transport facilities; Heavy industrial storage establishments; Home occupations (sex services); Industrial training facilities; Industries; Intensive livestock agriculture; Open cut mining; Restricted premises; Retail premises; Rural industries; Sex services premises; Storage premises; Transport depots; Truck depots; Vehicle body repair workshops; Vehicle repair stations; Warehouse or distribution centres; Waste or resource management facilities; Wholesale supplies

(e) whether any development standards applying to the land fix minimum land dimensions for the erection of a dwelling-house on the land and, if so, the minimum land dimensions so fixed:

Yes, refer to the Bathurst Regional Development Control Plan 2014.

(f) whether the land includes or comprises critical habitat:

No.

(g) whether the land is in a conservation area (however described):

The land to which the certificate relates is not in a conservation area.

(h) whether an item of environmental heritage (however described) is situated on the land:

The land to which the certificate relates does not contain an item of environmental heritage.

2A. Zoning and land use under State Environmental Planning Policy (Sydney Region Growth Centres) 2006

Is the land to which the certificate relates land within any zone (however described) under:

(a) Part 3 of the State Environmental Planning Policy (Sydney Region Growth Centres)

2006 (the 2006 SEPP), or

(b) a Precinct Plan (within the meaning of the 2006 SEPP), or

(c) a proposed Precinct Plan that is or has been the subject of community consultation or on public exhibition under the Act,

the particulars referred to in clause 2 (a)–(h) in relation to that land (with a reference to "the instrument" in any of those paragraphs being read as a reference to Part 3 of the 2006 SEPP, or the Precinct Plan or proposed Precinct Plan, as the case requires).

No, the State Environmental Planning Policy (Sydney Region Growth Centres) 2006 does not apply to the Bathurst Regional LGA.

3. Complying development

Is the land to which the certificate relates land on which complying development may be carried out under each of the codes for complying development because of the provisions of clauses 1.17A (1) (c) to (e), (2), (3) and (4), 1.18 (1) (c3) and 1.19 of State Environmental Planning Policy (Exempt and Complying Development Codes) 2008?

Yes, Complying Development Certificates may be carried out pursuant to the State Environmental Planning Policy (Exempt and Complying Development Codes) 2008.

If complying development may not be carried out on that land because of the provisions of clauses 1.17A (1) (c) to (e), (2), (3) and (4), 1.18 (1) (c3) and 1.19 of that Policy, the reasons why it may not be carried out under that clause.

n/a.

4. Coastal protection

Is the land to which the certificate relates land which is affected by the operation of section 38 or 39 of the Coastal Protection Act 1979, but only to the extent that the council has been so notified by the Department of Services, Technology and Administration?

No.

4A. Certain information relating to beaches and coasts

In relation to a coastal council:

(1) whether an order has been made under Part 4D of the Coastal Protection Act 1979 in relation to emergency coastal protection works (within the meaning of that Act) on the land (or on public land adjacent to that land), except where the council is satisfied that such an order has been fully complied with.

(2)(a) whether the council has been notified under section 55X of the Coastal Protection Act 1979 that emergency coastal protection works (within the meaning of that Act) have been placed on the land (or on public land adjacent to that land), and

(b) if works have been so placed—whether the council is satisfied that the works have been removed and the land restored in accordance with that Act.

(3) such information (if any) as is required by the regulations under section 56B of the Coastal Protection Act 1979 to be included in the planning certificate and of which the council has been notified pursuant to those regulations.

Bathurst Regional Council is not a Coastal Council.

4B. Annual charges under Local Government Act 1993 for coastal protection services that relate to existing coastal protection works

In relation to a coastal council—whether the owner (or any previous owner) of the land has consented in writing to the land being subject to annual charges under section 496B of the Local Government Act 1993 for coastal protection services that relate to existing coastal protection works (within the meaning of section 553B of that Act).

Note. Existing coastal protection works are works to reduce the impact of coastal hazards on land (such as seawalls, revetments, groynes and beach nourishment) that existed before the commencement of section 553B of the Local Government Act 1993.

Bathurst Regional Council is not a Coastal Council.

5. Mine subsidence

Is the land to which the certificate relates land which is proclaimed to be a mine subsidence district within the meaning of section 15 of the Mine Subsidence Compensation Act 1961?

No.

6. Road widening and road realignment

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

(a) Division 2 of Part 3 of the Roads Act 1993; or

(b) any environmental planning instrument; or

(c) any resolution of the Council?

The land to which the certificate relates is not affected by road widening or realignment.

7. Council and other public authority policies on hazard risk restrictions

Whether or not the land is affected by a policy:

(a) adopted by the Council; or

(b) adopted by any other public authority and notified to the Council for the express purpose of its adoption by that authority being referred to in planning certificates issued by the Council;

that restricts the development of the land because of the likelihood of land slip, bushfire, tidal inundation, subsidence, acid sulphate soils or any other risk (other than flooding):

The land to which the certificate relates is not affected by any Council or other public authority's policy.

7A. Flood related development controls information

Whether or not development on that land or part of the land for the purposes of:

(a) dwelling houses, dual occupancies, multi dwelling housing or residential flat buildings (not including development for the purposes of group homes or seniors housing); or

(b) any other purpose:

is subject to flood related development controls.

The subject land is protected by a levee bank. Development standards relating to flood prone and flood protected land are contained within Chapter 9 of the Bathurst Regional Development Control Plan 2014 including relevant maps. Council's Floodplain Management Policy also applies to the subject land (See attachment).

8. Land reserved for acquisition

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

No, the land is not subject to land acquisition.

9. Contributions plans

The name of each contributions plan applying to the land:

Bathurst Regional Community Facilities

9A. Biodiversity certified land

Is the land to which the certificate relates, land which has been identified as biodiversity certified land under Part 7AA of the Threatened Species Conservation Act 1995?

No. The land is not identified as Biodiversity Certified Land.

10. Biobanking agreements

Is the land to which the certificate relates land to which a biobanking agreement under Part 7A of the Threatened Species Conservation Act 1995 relates (but only if the council has been notified of the existence of the plan by the Director-General of the Department of Environment, Climate Change and Water):

Council is not aware of any biobanking agreements affecting the land to which the certificate relates.

11. Bush fire prone land

Is the land (or part of the land) to which the certificate relates bush fire prone land (as defined in the Act)?

No, the land to which the certificate relates is not identified as bushfire prone.

12. Property vegetation plans

Is the land to which the certificate relates land to which a property vegetation plan under the Native Vegetation Act 2003 applies (but only if the council has been notified of the existence of the plan by the person or body that approved the plan under that Act):

Council is not aware of any property vegetation plans affecting the land to which the certificate relates.

13. Orders under Trees (Disputes Between Neighbours) Act 2006

Is the land to which the certificate relates the subject to an order (of which Council is aware) made

under the Trees (Disputes Between Neighbours) Act 2006?

No.

14. Directions under Part 3A

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

No.

15. Site compatibility certificates and conditions for seniors housing

(1) Is the land to which the certificate relates land to which a current site compatibility certificate (of which Council is aware) issued under State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004 in respect of the proposed development on the land?

No.

(2) The terms of any kind referred to in clause 18(2) of State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004 which have been imposed as a condition of consent to a Development Application granted on or after 11 October 2007 under with respect to the land to which this certificate relates?

n/a

16. Site compatibility certificates for infrastructure

Is the land to which the certificate relates land to which a valid site compatibility certificate (infrastructure) (of which Council is aware) issued under State Environmental Planning Policy (Infrastructure) 2007 in respect of proposed development on the land?

No.

17. Site compatibility certificates and conditions for affordable rental housing

(1) Is the land to which the certificate relates land to which a valid site compatibility certificate (affordable rental housing) (of which Council is aware) issued under State Environmental Planning Policy (Affordable Rental Housing) 2009 in respect of proposed development on the land?

No.

(2) A statement setting out any terms of a kind referred to in clause 17 (1) or 38 (1) of State Environmental Planning Policy (Affordable Rental Housing) 2009 that have been imposed as a condition of consent to a development application in respect of the land.

No.

18. Paper subdivision information

(1) The name of any development plan adopted by a relevant authority that applies to the land or that is proposed to be subject to a consent ballot.
(2) The date of any subdivision order that applies to the land.
(3) Words and expressions used in this clause have the same meaning as they have in Part

16C of this Regulation.

There are no paper subdivisions within the Bathurst Regional LGA.

19. Site verification certificates

A statement of whether there is a current site verification certificate, of which the council is aware, in respect of the land and, if there is a certificate, the statement is to include:
(a) the matter certified by the certificate, and
(b) the date on which the certificate ceases to be current (if any), and
(c) that a copy may be obtained from the head office of the Department of Planning and Infrastructure.

Council is not aware of any site verification certificates being issued for the land to which the certificate relates.

Note:

The following matters are prescribed by Section 59 (2) of the Contaminated Land Management Act 1997 as additional matters that are to be specified in a planning certificate:

(a) Is the land to which the certificate relates **significantly contaminated land** within the meaning of the Contaminated Land Management Act 1997?

No.

(b) Is the land to which the certificate relates subject to a **management order** within the meaning of the Contaminated Land Management Act 1997?

No.

(c) Is the land to which the certificate relates the subject of an **approved voluntary management proposal** within the meaning of the Contaminated Land Management Act 1997?

No.

(d) Is the land to which the certificate relates the subject to an **ongoing maintenance order** within the meaning of the Contaminated Land Management Act 1997?

No.

(e) Is the land to which the certificate relates the subject of a **site audit statement** within the meaning of the Contaminated Land Management Act 1979?

No.

The following matters are prescribed by Section 26 of the Nation Building and Jobs Plan (State Infrastructure Delivery) Act 2009 as additional matters that are to be specified in a planning certificate:

(a) Has the NSW Infractructure Co-ordinator General issued any exemption pursuant to Section 23 of the Nation Building and Jobs Plan (State Infrastructure Delivery) Act 2009 or an Authorisation pursuant to Section 24 of the Nation Building and Jobs Plan (State Infrastructure Delivery) Act 2009 (of which Council is aware)?

No.

D. Sherley
GENERAL MANAGER
Bathurst Regional Council

Per: Acutter Date: 11/12/15

ADDITIONAL INFORMATION PROVIDED PURSUANT TO SECTION 149(5) OF THE ACT.

101. Tree Preservation and Management Policy

Is an approval required to remove a tree or vegetation on the subject land?

No.

102. Heritage listings

Is the land to which the certificate relates subject to any additional heritage listings?

No.

D. Sherley
GENERAL MANAGER
Bathurst Regional Council

Per: _____ Date: 11/12/15

POLICY: FLOODPLAIN MANAGEMENT

DATE ADOPTED:

Director Environmental, Planning & Building Services' Report #7, Council 16 February 2011
Minute Book No. 11059

Director Engineering Services Report #1
Policy 4 November 2009
Council 18 November 2009
Minute Book No. 10808

Director Engineering Services Report #3
Council 4 February 2009
Minute Book No. 10585

Director Engineering Services Report #5, #6
Council 20 August 2008
Minute Book No. 10474

Director Environmental, Planning & Building Services' Report #10,
Council 30 March 2005
Minute Book No. 9495

ORIGINAL ADOPTION:

Director Corporate Services Report #1
Policy 1 December 2004, Council 8 December 2004
Minute Book No. 9416
(former BCC Policy)

FILE REFERENCE: 31.00002

OBJECTIVE: Implement and maintain a Floodplain Management Strategy which is the highest standard and condition that Council can reasonably afford in all of its circumstances and having regard to financial, economic, environmental, aesthetic, social or political factors or constraints and levee bank construction.

PART 1

SECTION 1

General Provisions Applying to all Parts and Sections

1. a) All matters and activities set out in all Parts and Sections of this Policy and any determination made pursuant thereto by a responsible person **SHALL ALWAYS** be subject to and limited by the funds and resources ("resource availability") voted and resolved by council.

   b) Subject to the provisions of Section 731 of the Local Government Act, 1993, a decision made by a responsible person in carrying out the functions of the Policy shall be a decision of the Council **PROVIDED ALWAYS** that a responsible person has acted in good faith for the purpose of executing this Policy.

   c) Expressions of words used in this Policy (or a particular provision of this Policy) which are defined in the dictionary at the end of this Policy have the meanings set out in the dictionary.

   d) A determination made by a responsible person in carrying out the functions of this Policy shall be recorded and maintained in such fashion as is determined by a responsible person. The manner and form of records as set out in Council's standard Risk Management procedure.

   e) Subject to a responsible person determining otherwise, "**Codes of Best Practice**", incorporating standard(s), method(s) and frequencies, shall be determined and implemented for all activities set out in this Policy and shall be reviewed on a continuing basis.

   f) **"Responsible person(s)"** shall be determined by the General Manager or his/her delegate.

   g) The determination of responsible persons as set out in Council's standard Risk Management procedures.

SECTION 2

Dictionary

2. **"as determined by a responsible person"** means:

   * a decision by a responsible person and

   * a decision made pursuant with the execution of this Policy and the functions, powers and duties set out therein.

"function" includes a power, authority and duty.

"month" means a calendar month.

"reasonably safe condition" means that in the ABSOLUTE OPINION of a responsible person:

* Safety measures were not required; or
* That safety measures taken were adequate and sufficient for a particular circumstance.
* Works carried out were in accordance with any Code of Best Practice or Standard determined pursuant with Section 1.e;

"responsible person" means the Council or an employee and/or a particular position as provided for in Council's standard Risk Management procedure.

"week" means the period Monday to Friday inclusive.

"working day" or **"day"** means Monday to Friday inclusive subject to the ordinary working hours" of Council.

"work site" means and includes any specific place or places at which construction or maintenance works are being carried out on by or under the actual direction and control of Council.

"year" means a calendar year.

SECTION 3

Instrument of Delegation

3. That subject to compliance with the requirements of the Local Government Act, 1993, and Ordinances thereunder and any express Policy or direction of Council, the Council pursuant to the provision of Section 377 of the Local Government Act, 1993, hereby delegates to the General Manager, authority to exercise and perform on behalf of Council, all functions, powers, authorities, duties and matters contained in this Policy.

SECTION 4

Implementation

4. That all recommendations in this Policy take operational effect from the date of Council Approval.

Having adopted a Floodplain Management Plan, Council's Plan Policy shall operate in conjunction with such.

1. INTRODUCTION:

The areas within the City of Bathurst which are affected by flooding, are those identified as inundated by 1% AEP flooding, as determined by the Bathurst Computer Based Floodplain Model, and such maps which may be updated from time to time, and are those identified as:

* Land which adjoins either the Macquarie River or the Queen Charlotte's Vale Creek;

* Have been identified as flood affected by the 1964, 1986 and/or 1990 floods;

* Are likely to be affected by inundation from a natural watercourse, or drainage channel; or

* All lands outside the designated flood line but contiguous to it, less than 0.5 metres above the designated flood level.

All land affected by flooding will be subject to this interim policy.

2. DESIGNATED FLOOD:

The designated flood or flood standard shall be defined by the following designated floods:

(a) 1% AEP Flood as determined by the Bathurst Computer Based Flood Model, as amended for the Macquarie River and the Queen Charlotte's Vale Creek, as detailed therein;

(b) For areas beyond the flood model, including natural creeks and drainage channels, the 1% AEP flood, as calculated by accepted engineering methods.

(c) 1% AEP Flood extents as determined by the Georges Plains Floodplain Risk Management Plan.

(d) 1% AEP Flood extents as determined by the Sofala Floodplain Risk Management Plan.

All land subject to inundation/flooding by the designated flood shall be defined as within the designated flood area.

3. DEVELOPMENT WITHIN THE DESIGNATED FLOOD AREA:

The criteria outlined in Appendix B of the NSW Government Floodplain Development Manual shall be used for the assessment of flood hazard of those properties which are affected by flooding from the Macquarie River and Queen Charlotte's Vale Creek, and are included in the study area of the computer based flood model, utilising the depth and velocity calculations generated by the Model.

For watercourses not included in the Bathurst Computer Based Flood Model, Council has resolved that low hazard flood areas are those areas effected by 0.5 metre of flood water, or less.

4. DEVELOPMENT OF LANDS AFFECTED BY A NATURAL WATERCOURSE

That all applications for flood levels be in writing and that a charge, as may be determined from time-to-time, apply for the supply of such information. (Formerly Policy No. 8).

5. RAGLAN CREEK

Council has adopted, as a matter of policy, for consistency of analysis, Council's calibrated RAFTS Model as the only method of assessing the hydrology of Raglan Creek. In this, all developments ultimately discharging into the Raglan Creek, will be subject to a Council charge, for the assessment of the effects of the development within the Raglan Creek Catchment, should such assessment be required.

6. VOLUNTARY PURCHASES

That Council agree to participate in the purchase of flood prone land, in conjunction with the New South Wales State Government and the Commonwealth Government on a voluntary basis in accordance with the following requirements, as stipulated by the Minister for Water Resources, namely:

1. That Council submit a proposal to the Department of Water Resources, giving details of the property to be purchased, including the purchase price and how this was arrived at;

2. Submit a detailed valuation of the property prepared and authenticated by the Valuer General's Department;

3. Submit a proposal for the future use of the land and that Council agree that it will:

(a) zone the land as open space, restricting all possible development, including the placement of fill or planting of trees;

(b) retain control of the land in perpetuity

(c) ensure that appropriate steps are taken to record its open-space zoning. (Formerly policy No. 26) or such other requirements, and practice which may be applicable, from time to time.

This Clause applies to the Kelso floodplain, as identified in the Floodplain Management Plan.

The priority of purchase is based on:

(a) occupied by owner;

(b) hazard rating for the 1% AEP flood;

(c) whether over floor flooding has been experienced previously;

(d) the level of adverse effects to the property as a result of other structural measures on the floodplain; notwithstanding that Council may purchase any property earmarked for voluntary purchase should it become available.

Land & Property Information

Cadastral Records Enquiry Report

Ref : surv:scim-grollm

Requested Parcel : Lot 3 DP 1089380

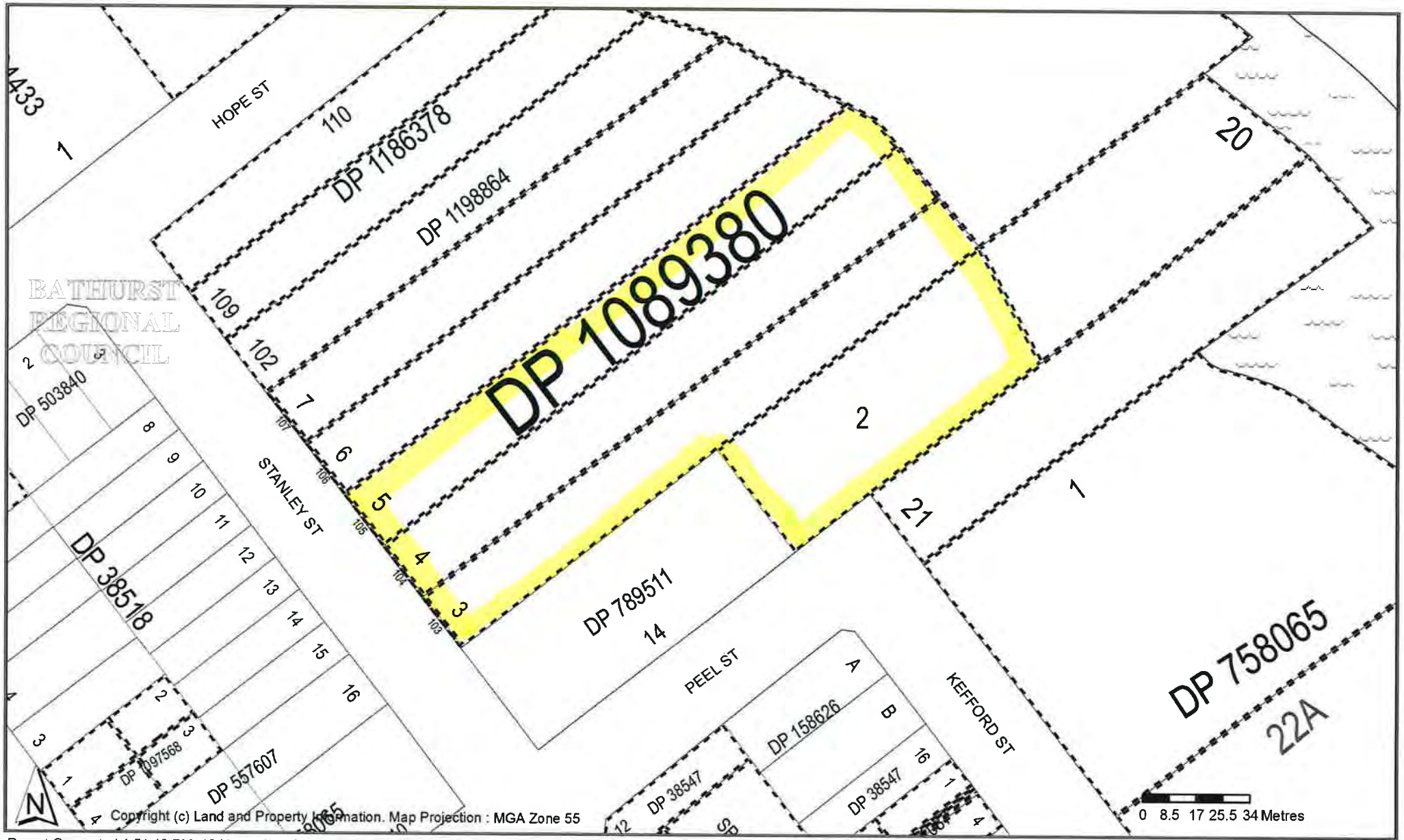
Identified Parcel : Lot 3 DP 1089380

Locality : BATHURST

LGA : BATHURST REGIONAL

Parish : BATHURST

County : BATHURST



Report Generated 1:51:48 PM, 10 November, 2015

This information is provided as a searching aid only. While every endeavour is made to ensure the current cadastral pattern is accurately reflected, the Registrar General cannot guarantee the information provided. For all ACTIVITY PRIOR to SEPT 2002 you must refer to the RGs Charting and Reference Maps.

PLAN FORM 3 To be used in conjunction with Plan Form 2 WARNING: CREASING OR FOLDING WILL LEAD TO REJECTION

DP1089380

Registered 28 12 2005

This is sheet 2 of my plan in 2 sheets dated 15th February, 2002.

D A Roots

Surveyor registered under Surveyors Act 1929

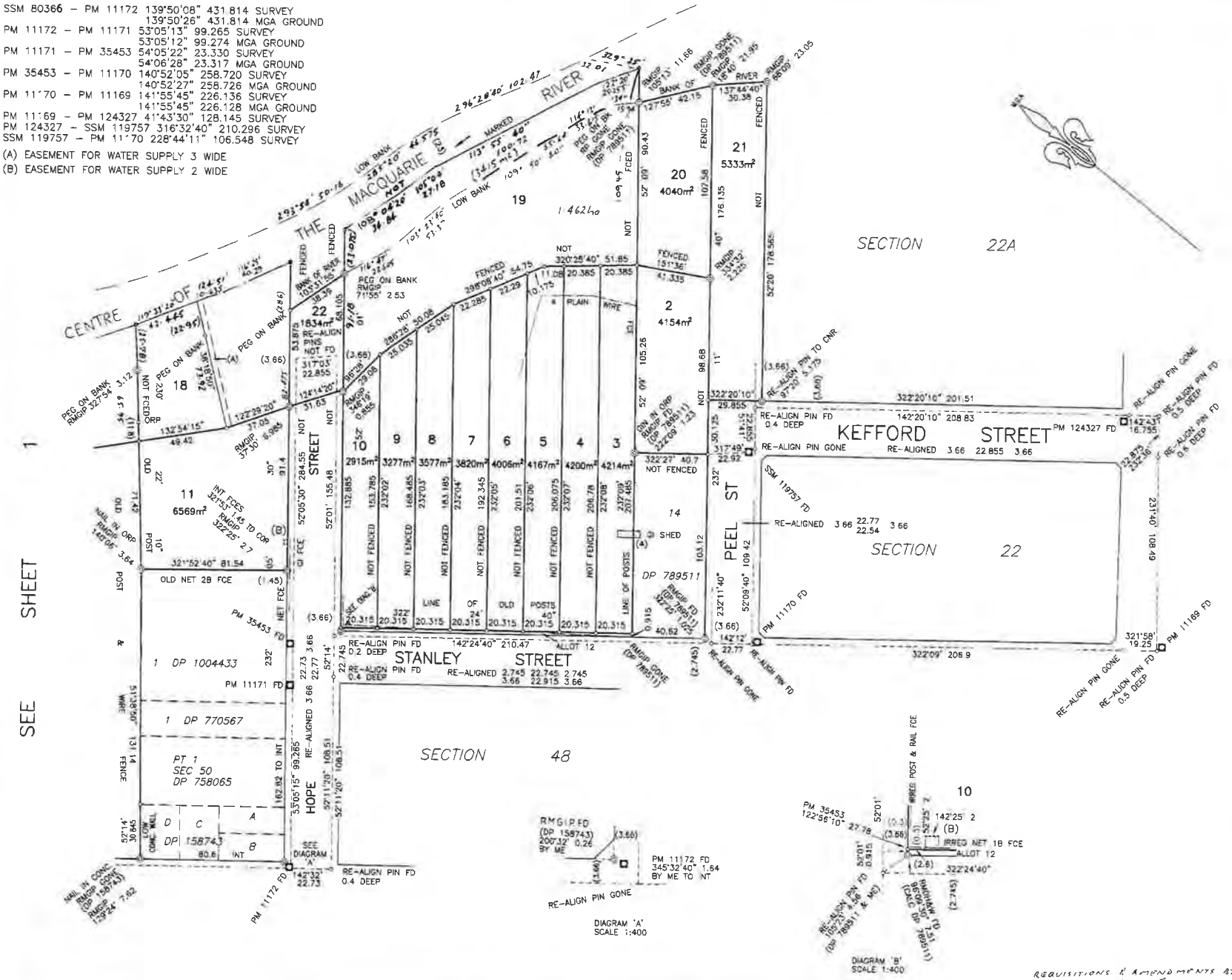
This is sheet 2 of the plan of 2 sheets covered by my Certificate No 42/02 of 14 March 2002

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

For use where space is insufficient in any panel on Plan Form 2

SSM 80366 – PM 11172 139°50'08" 431.814 SURVEY
139°50'26" 431.814 MGA GROUND
PM 11172 – PM 11171 53°05'13" 99.265 SURVEY
53°05'12" 99.274 MGA GROUND
PM 11171 – PM 35453 54°05'22" 23.330 SURVEY
54°06'28" 23.317 MGA GROUND
PM 35453 – PM 11170 140°52'05" 258.720 SURVEY
140°52'27" 258.726 MGA GROUND
PM 11170 – PM 11169 141°55'45" 226.136 SURVEY
141°55'45" 226.128 MGA GROUND
PM 11169 – PM 124327 41°43'30" 128.145 SURVEY
PM 124327 – SSM 119757 316°32'40" 210.296 SURVEY
SSM 119757 – PM 11170 228°44'11" 106.548 SURVEY

(A) EASEMENT FOR WATER SUPPLY 3 WIDE
(B) EASEMENT FOR WATER SUPPLY 2 WIDE



Reduction Ratio: 1:500

Plan Drawing only to appear in this space

SURVEYOR'S REFERENCE: 02/102

PLAN AMENDED BY A R MILLER 21 02 03

PLAN FORM 2 (APPROVED FORM 3)

Plan Drawing only to appear in this space

SIGNATURES, AND SEALS ONLY

Bradie McBrodie

H.H. Brodie

GLENYS CROSS
16-24 Elsie St Burwood NSW

Ian C NEIST
District Manager
Land NSW.
for & on behalf of the
Minister for L&WC.

Crown Lands Office Approval

PLAN APPROVED

Land District

Paper No.

Field Book pages

Subdivision Certificate

I hereby certify that the provisions of s.109J of the Environmental Planning and Assessment Act 1979 have been satisfied in relation to the proposed Subdivision set out hereon

* (Insert 'subdivision' or 'new road')

* Authorised Person/General Manager/Accredited Certifier

Consent Authority: Bathurst City Council

Date of Endorsement: 14 March 2002

Accreditation no:

Subdivision Certificate no: 42/02

File no: DA 2002/0383

* Strike out inapplicable words.

When the plan is lodged electronically in the Land Titles Office, I should included a signature in an electronic or digital form approved by it, in lieu whichever is inapplicable.

SURVEYOR'S REFERENCE: 02/102 LPI REF: FILE 3002M7100(B1)

SURVEYORS (PRACTICE) REGULATION 2001:CLAUSE 32(2)					
	M.G.A. CO-ORDINATES				
MARK	EASTING	NORTHING	ZONE	CLASS	ORDER
SSM 80366	739428.873	6301011.858	55	B	U
PM 11172	739707.414	6300681.575	55	B	U
PM 11171	739786.805	6300741.212	55	B	U
PM 35453	739805.699	6300754.885	55	B	U
PM 11170	739968.995	6300554.133	55	B	U
PM 11169	740108.462	6300376.077	55	B	U

COMBINED SCALE FACTOR = 1.000207

SOURCE:MGA COORDINATES ADOPTED FROM SCIMS 3/1/2002

DIAGRAM 'C'
SCALE 1:1000

SSM 80366 – PM 11172 139°50'08" 431.814 SURVEY
139°50'26" 431.814 MGA GROUND
PM 11172 – PM 11171 53°05'13" 99.265 SURVEY
53°05'12" 99.274 MGA GROUND
PM 11171 – PM 35453 54°05'22" 23.330 SURVEY
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PM 35453 – PM 11170 140°52'05" 258.720 SURVEY
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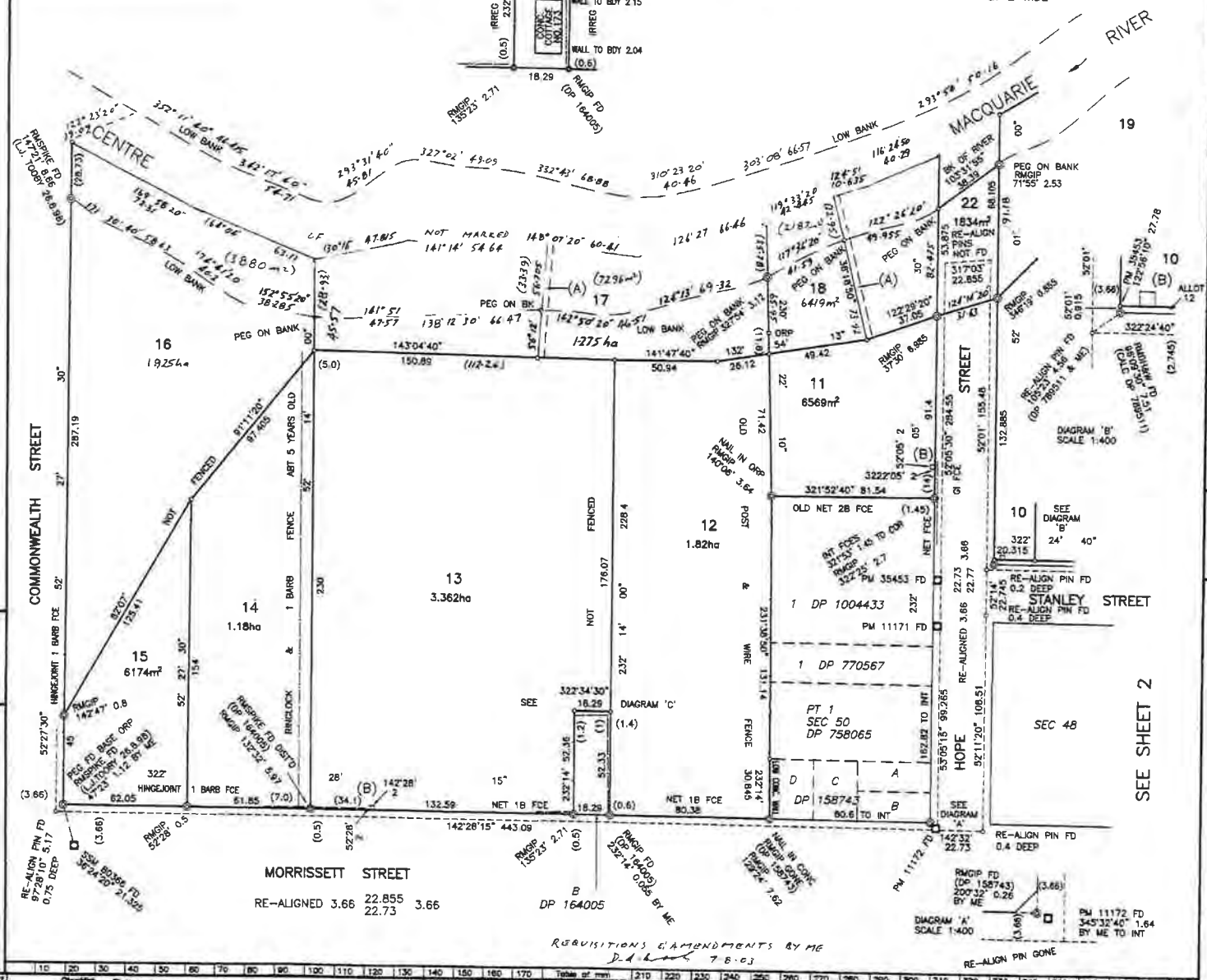
PM 124327 – SSM 119757 316°32'40" 210.296 SURVEY
SSM 119757 – PM 11170 228°44'11" 106.548 SURVEY
(A) EASEMENT FOR WATER SUPPLY 3 WIDE
(B) EASEMENT FOR WATER SUPPLY 2 WIDE



WARNING: CREASING OR FOLDING WILL LEAD TO REJECTION

DP1089380

Registered: 12 12 2005

C.A.: SEE CERTIFICATE

Title System: TORRENS AND OLD SYSTEM

Purpose: SUBDIVISION

Ref.Map: P4597-3, G2

Last Plan: DP1066005, DP789511, DP799786, GO-824, Gi-824, Pt: 824

PLAN OF SUBDIVISION OF LOTS 2, 5 & 6 SEC 50 DP 758065, LOT A DP 164005, LOT 1 DP 799786, LOT 13 DP 789511, LOTS 3 – 10 SEC 49 DP 758065 ~~BEING THE LAND COMPRISED IN CONVEYANCE NO 339 BOOK 2968~~ AND ROAD TO BE CLOSED UNDER THE ROADS ACT 1993 & LAND AD MEDIUM FILUM AQUAE

Lengths are in metres. Reduction Ratio 1:1500

LGA: BATHURST

Locality: BATHURST

Parish: BATHURST

County: BATHURST

This is sheet 1 of my plan in 2 sheets (Delete if inapplicable).

Surveyors (Practice) Regulation 2001

I, DAVID ALFRED BROOKS

of Tableland Surveyors Pty. Ltd. PO Box 1495, Bathurst, a surveyor registered under the Surveyors Act 1929, hereby certify that the survey represented in this plan is accurate, has been made in accordance with the Surveyors (Practice) Regulation 2001 and was completed on 15th FEBRUARY 2002

The survey relates to

Signature D.A.Brooks Dated 15.2.2002

Surveyor registered under the Surveyors Act 1929

Datum Line: PM 11170 – PM 11169
Type: Urban

Plans used in preparation of survey/compilation

DP 164005	DP 985206	B87–824
DP 799786	DP 985207	B91–824
DP 789511	DP 985208	B224–824
DP 158743	B11–793	Ma280–De
DP 770567	B60–824	PLAN BY L.J. TOOBY
DP 1004433	B61–824	DATED 25.8.1998

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

Pursuant to Sec 88B of the Conveyancing Act (1919–1964) as amended, it is intended to create:

1. EASEMENT FOR WATER SUPPLY 3 WIDE SHOWN (A)
2. EASEMENT FOR WATER SUPPLY 2 WIDE SHOWN (B)

Lots 21 and 22 are no longer required for road and will be closed

PLAN AMENDED BY A.R.MILLER 21.02.03

Req:R685626 /Doc:DP 1089380 P /Rev:14-Dec-2005 /Sts:SC.OK /Prt:10-Nov-2015 14:00 /Pgs:ALL /Seq:2 of 2
Ref:bathurst /Src:T

[redacted]FICATE OF TITLE

NEW SOUTH WALES

[redacted]EAL PROPERTY ACT, 1900

Vol. 12967 Fol. 239

CANCELLED W

IVA NO. 16843

Edition issued 15-1-1976.

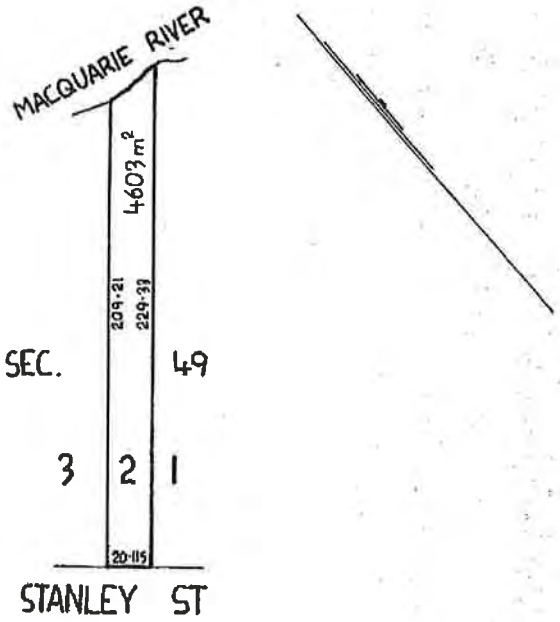
(Page 1) Vol. 12967 Fol. 239

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

Registrar General.

PLAN SHOWING LOCATION OF LAND

LENGTHS ARE IN METRES



IVA 16843 [redacted]

REDUCTION RATIO 1:1000

ESTATE AND LAND REFERRED TO

Estate in Fee Simple in Allotment 2 of Section 49 at Bathurst in the City of Bathurst Parish of Bathurst and County of Bathurst granted to Juliet Shine on 16-3-1846. EXCEPTING THEREOUT the mines of coal reserved by the Crown Grant.

FIRST SCHEDULE

~~TABLELANDS CO-OPERATIVE BUILDING SOCIETY NO.1 LIMITED.~~ Mortgagee

SECOND SCHEDULE

1. Reservations and conditions, if any, contained in the Crown Grant above referred to.
2. CAUTION. The land within described is held subject to any subsisting interest (as defined in Section 28A of the Real Property Act, 1900).
3. ~~Caveat No.P562406 by the Registrar General.~~ X997612

FIRST SCHEDULE (continued)

REGISTERED PROPRIETOR	INSTRUMENT NATURE	INSTRUMENT NUMBER	INSTRUMENT DATE	ENTERED	Signature of Registrar General
Alan Ray Mould and Lorna May Mould as joint tenants by Transfer X997612 Registered 1-3-1989					
DP 789511 Registered 31/8/1989 The folio is cancelled as to whole/part upon creation of computer folios for lots 13 & 14 in the abovementioned plan.					

R600898 Rex
T6434 p/tenk
T557779
X997610 W
X997612 T
X997613 M
Y55115 R
DP 789511 R

SECOND SCHEDULE (continued)

INSTRUMENT NATURE	INSTRUMENT NUMBER	INSTRUMENT DATE	PARTICULARS	ENTERED	Signature of Registrar General	CANCELLATION		
~~Caveat~~	~~R600898~~		~~by Australia and New Zealand Banking Group Limited~~	~~11-1-1980~~		Withdrawn	Y55115	
~~T6434 Caveat by Avco Financial Services Limited. Registered 22-4-1982.~~						Withdrawn	T557778	
~~T557779 Caveat by Avco Financial Services Limited. Registered 24-5-1983.~~						Withdrawn	X997610	
X997613 Mortgage to Australia and New Zealand Banking Group Limited Registered 1-3-1989								

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

[redacted]FICATE OF TITLE

NEW SOUTH WALES

[redacted]AL PROPERTY ACT, 1900

12967/240

Vol. 12967 Fol. 240

CANCELLED W

IVA NO. 16843

Edition issued 15-1-1976.

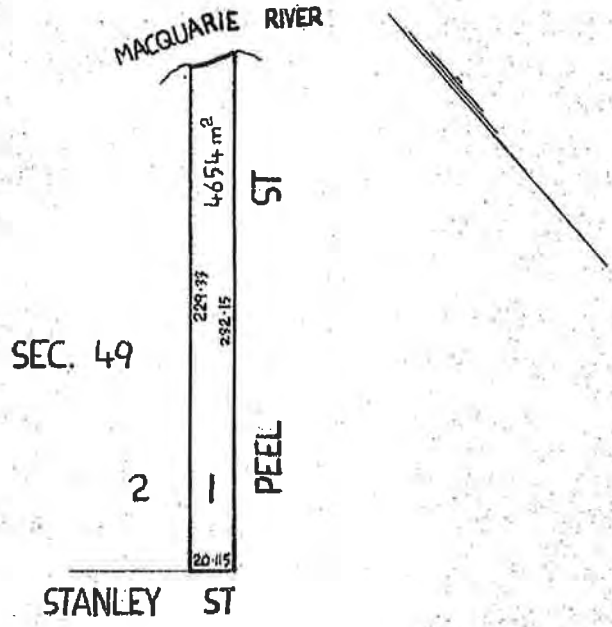
(Page 1) Vol. 12967 Fol. 240

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

Registrar General.

PLAN SHOWING LOCATION OF LAND

LENGTHS ARE IN METRES



IVA 16843

REDUCTION RATIO 1:1000

ESTATE AND LAND REFERRED TO

Estate in Fee Simple in Allotment 1 of Section 49 at Bathurst in the City of Bathurst Parish of Bathurst and County of Bathurst granted to William Edward Rogers on 16-3-1846. EXCEPTING THEREOUT the mines of coal reserved by the Crown Grant.

FIRST SCHEDULE

~~TABLELANDS CO-OPERATIVE BUILDING SOCIETY NO.1 LIMITED.~~ Mortgagee

SECOND SCHEDULE

1. Reservations and conditions, if any, contained in the Crown Grant above referred to.
2. CAUTION. The land within described is held subject to any subsisting interest (as defined in Section 28A of the Real Property Act, 1900).
3. ~~Caveat No.P562406 by the Registrar General.~~ X997612

Vol. 12967 Fol. 240

FIRST SCHEDULE (continued)

REGISTERED PROPRIETOR	INSTRUMENT NATURE	INSTRUMENT NUMBER	INSTRUMENT DATE	ENTERED	Signature of Registrar General
Alan Ray Mould and Lorna May Mould as joint tenants by Transfer X997612 Registered 1-3-1989					
DP/SP 789511 Registered 31/8/1989 This folio is cancelled as to whole/~~part~~ upon creation of computer folios for lots 13 & 14 in the abovementioned plan.					

R600898 ✓
T6434 ✓
T557779 ✓
X997610 ✓
X997612 ✓
X997613 ✓
Y55115 ✓
DP 789511 ✓

SECOND SCHEDULE (continued)

INSTRUMENT NATURE	INSTRUMENT NUMBER	INSTRUMENT DATE	PARTICULARS	ENTERED	Signature of Registrar General	CANCELLATION		
~~Caveat~~	~~R600898~~	~~---~~	~~by Australia and New Zealand Banking Group Limited~~	~~11-1-1960~~		Withdrawn	Y55115	
~~T6434~~	~~Caveat by Avco Financial Services Limited. Registered 22-4-1983~~					Withdrawn	T557778	
~~T557779~~	~~Caveat by Avco Financial Services Limited. Registered 24-5-1983.~~					Withdrawn	X997610	
X997613	Mortgage to Australia and New Zealand Banking Group Limited Registered 1-3-1989							

(Page 2 of 2 pages)

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

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - HISTORICAL SEARCH

SEARCH DATE
10/11/2015 1:56PM

FOLIO: 13/789511

First Title(s): OLD SYSTEM
Prior Title(s): VOL 12967 FOLS 239-240

Recorded	Number	Type of Instrument	C.T. Issue
4/9/1989	DP789511	DEPOSITED PLAN	FOLIO CREATED EDITION 1
26/10/1989	Y666943	DISCHARGE OF MORTGAGE	
26/10/1989	Y666944	TRANSFER	EDITION 2
27/2/2004	DP1046708	REJECTED - DEPOSITED PLAN	
27/2/2004	AA454982	DEPARTMENTAL DEALING	EDITION 3
12/12/2005	DP1089380	DEPOSITED PLAN	FOLIO CANCELLED

*** END OF SEARCH ***

bathurst PRINTED ON 10/11/2015

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

Legal Liaison Services

Legal Liaison Services hereby certifies that the information contained in this document has been provided electronically by the Registrar General.

Information provided through Tri-Search an approved LPI*NSW* Information Broker

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - HISTORICAL SEARCH

SEARCH DATE
10/11/2015 1:55PM

FOLIO: 2/1089380

First Title(s): OLD SYSTEM
Prior Title(s): 13/789511

Recorded	Number	Type of Instrument	C.T. Issue
12/12/2005	DP1089380	DEPOSITED PLAN	FOLIO CREATED EDITION 1
14/6/2006	AC375416	TRANSFER	EDITION 2
22/1/2015	AJ191330	TRANSFER	
22/1/2015	AJ191331	TRANSFER	EDITION 3

*** END OF SEARCH ***

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Form: 01T
Licence: 01-05-025
Licensee: King Cain

TRANSFER

New South Wales
Real Property Act 1900

AC375416U

PRIVACY NOTE: Section 31B of the Real Property Act 1900 (RP Act) authorises the Registrar General to collect the information required by this form for the establishment and maintenance of the Real Property Act Register. Section 96B RP Act requires that the Register is made available to any person for search upon payment of a fee, if any.

STAMP DUTY Office of State Revenue use only

Office of State Revenue
NSW Treasury
Client No: 2526689 35
Duty: $2 Trans No: 3502322
Asst details:

(A) **TORRENS TITLE** If appropriate, specify the part transferred
2/1089380

(B) **LODGED BY**

Delivery Box	Name, Address or DX and Telephone	CODES
BOX 30P	L J KANE & CO LLPN 123818G Reference (optional): MM - BONHAM	T TW (Sheriff)

(C) **TRANSFEROR** Bathurst Regional Council

(D) **CONSIDERATION** The transferor acknowledges receipt of the consideration of $3,300.00 and as regards
(E) **ESTATE** the land specified above transfers to the transferee an estate in fee simple.
(F) **SHARE TRANSFERRED**

(G) Encumbrances (if applicable):

(H) **TRANSFEREE** Hilton Henry Bonham

(I) **TENANCY:**

DATE 14/2/06

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

Signature of witness:

Name of witness:
Address of witness:

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

Signature of transferor:

See annexure hereto

Certified correct for the purposes of the Real Property Act 1900 by the person whose signature appears below.

Signature:

Signatory's name: Robert Ian Hood
Signatory's capacity: Solicitor for the Transferee

ALL HANDWRITING MUST BE IN BLOCK CAPITALS

ANNEXURE TO REAL PROPERTY ACT TRANSFER BETWEEN BATHURST REGIONAL COUNCIL (TRANSFEROR) AND HILTON HENRY BONHAM (TRANSFEREE) DATED THE 14th DAY OF February 2006

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

SIGNED for and on behalf of Bathurst Regional Council by
its Attorney being the person for the time being holding or fulfilling the duties of Acting General Manager of Bathurst Regional Council and the said Attorney states that at the date of execution of this present instrument he has received no notice of revocation of Power of Attorney Registered Book 4429 No 885 by virtue of which he has executed the within document and the said Attorney further states that this dealing is made pursuant to a resolution of Bathurst Regional Council made on the 12/12/2001 for the disposition of land in this instrument and this dealing does not contravene Section 377(1) of the Local Government 1993

BATHURST REGIONAL COUNCIL

.....
GENERAL MANAGER

.....

.....
Signature of Witness

RICK FOSTER
.....
Name of Witness (BLOCK LETTERS)

42 KURRAJONG AV
.....
Address of Witness

BATHURST NSW 2795

Req:R685569 /Doc:DL AJ191330 /Rev:29-Jan-2015 /Sts:NO.OK /Prt:10-Nov-2015 13:55 /Pgs:ALL /Seq:1 of 1
Ref:bathurst /Src:T

Form: 01T
Licence: 01-05-025
Licensee: LEAP Legal Software Pty Limited
Firm name: Steele+Co

TRANSFER

New South Wales
Real Property Act 1900

AJ191330E

PRIVACY NOTE: Section 31B of the Real Property Act 1900 (RP Act) authorises the Registrar General to collect the information required by this form for the establishment and maintenance of the Real Property Act Register. Section 96B RP Act requires that the Register is made available to any person for search upon payment of a fee, if any.

STAMP DUTY Office of State Revenue use only

Office of State Revenue
NSW Treasury
Client No: 3814281 $10.00 33
Duty: $25,970.00 Trans No: 7900907-001
Amt dist/fee:

(A) **TORRENS TITLE** 7 ✓ 4

2/1089380, 3/1089380, 4/1089380, 5/1089380, 103/1198864, 104/1198864, 105/1198864

(B) **LODGED BY**

Document Collection Box	Name, Address or DX, Telephone, and Customer Account Number if any	CODES
18SH	~~Steele+Co~~ Clayton Utz Lawyers ~~DX 3110 Bathurst~~ ~~Tel: 02 6331 4666~~ ~~Customer Account No: 129404K~~ 123111c. Reference: ~~PTTT:CS:149959~~ B.H. 80154516.	T TW

(C) **TRANSFEROR** Hilton Henry BONHAM

(D) **CONSIDERATION** The transferor acknowledges receipt of the consideration of $700,000.00 being the same consideration as in a Tranfser of lots 6 and 7 in DP 1089380 AND Lots 102,106 and 107 in DP 1198864 and as regards

(E) **ESTATE** the abovementioned land transfers to the transferee an estate in fee simple.

(F) **SHARE TRANSFERRED**

(G) Encumbrances (if applicable):

(H) **TRANSFEREE** Stabosl Pty Ltd ACN 155 967 043

(I) **TENANCY:**

DATE 4 December 2014

(J) I certify that I am an eligible witness and that the transferor signed this dealing in my presence. [See note* below]

Signature of witness:

Name of witness: PAUL ASHLEY CARVER
Address of witness: SOLICITOR
90 KEPPEL STREET
BATHURST NSW 2795

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

Signature of transferor: H.H. Bonham

Certified correct for the purposes of the Real Property Act 1900 by the person whose signature appears below.

Signature:

Signatory's name: Andrew Darryl Dunshea
Signatory's capacity: Solicitor for the Transferee

(K) The transferee's solicitor certifies that the eNOS data relevant to this dealing has been submitted and stored under eNOS ID No. ~~[illegible]~~ 745041 Full name: Andrew Darryl Dunshea Signature:

I am authorised to amend Catherine Bain letter 16-1-15

* *s 117 RP Act requires that you must have known the signatory for more than 12 months or have sighted identifying documentation.*

ALL HANDWRITING MUST BE IN BLOCK CAPITALS.

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - TITLE SEARCH

FOLIO: 2/1089380

SEARCH DATE	TIME	EDITION NO	DATE
10/11/2015	1:54 PM	3	22/1/2015

LAND

LOT 2 IN DEPOSITED PLAN 1089380
AT BATHURST
LOCAL GOVERNMENT AREA BATHURST REGIONAL
PARISH OF BATHURST COUNTY OF BATHURST
TITLE DIAGRAM DP1089380

FIRST SCHEDULE

PRINCIPAL HEALTHCARE FINANCE PTY LIMITED (T AJ191331)

SECOND SCHEDULE (1 NOTIFICATION)

1 RESERVATIONS AND CONDITIONS IN THE CROWN GRANT(S)

NOTATIONS

UNREGISTERED DEALINGS: PP DP1205690.

*** END OF SEARCH ***

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - HISTORICAL SEARCH

SEARCH DATE
10/11/2015 1:57PM

FOLIO: 3/49/758065

First Title(s): OLD SYSTEM
Prior Title(s): BK 2968 NO 339

Recorded	Number	Type of Instrument	C.T. Issue
13/7/2005	CA94834	CONVERSION ACTION	FOLIO CREATED CT NOT ISSUED
9/12/2005	AB973698	DEPARTMENTAL DEALING	
12/12/2005	DP1089380	DEPOSITED PLAN	FOLIO CANCELLED

*** END OF SEARCH ***

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LAND AND PROPERTY INFORMATION NEW SOUTH WALES - HISTORICAL SEARCH

SEARCH DATE
10/11/2015 1:56PM

FOLIO: 3/1089380

First Title(s): OLD SYSTEM
Prior Title(s): 3/49/758065

Recorded	Number	Type of Instrument	C.T. Issue
12/12/2005	DP1089380	DEPOSITED PLAN	FOLIO CREATED EDITION 1
22/1/2015	AJ191330	TRANSFER	
22/1/2015	AJ191331	TRANSFER	EDITION 2

*** END OF SEARCH ***

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LAND AND PROPERTY INFORMATION NEW SOUTH WALES - TITLE SEARCH

FOLIO: 3/1089380

SEARCH DATE	TIME	EDITION NO	DATE
10/11/2015	1:54 PM	2	22/1/2015

LAND

LOT 3 IN DEPOSITED PLAN 1089380
AT BATHURST
LOCAL GOVERNMENT AREA BATHURST REGIONAL
PARISH OF BATHURST COUNTY OF BATHURST
TITLE DIAGRAM DP1089380

FIRST SCHEDULE

PRINCIPAL HEALTHCARE FINANCE PTY LIMITED (T AJ191331)

SECOND SCHEDULE (2 NOTIFICATIONS)

1 RESERVATIONS AND CONDITIONS IN THE CROWN GRANT(S)
2 QUALIFIED TITLE. CAUTION PURSUANT TO SECTION 28J OF THE REAL PROPERTY ACT, 1900. ENTERED 13.7.2005 BK 2968 NO 339

NOTATIONS

UNREGISTERED DEALINGS: PP DP1205690.

*** END OF SEARCH ***

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - HISTORICAL SEARCH

SEARCH DATE
10/11/2015 1:57PM

FOLIO: 4/49/758065

First Title(s): OLD SYSTEM
Prior Title(s): BK 2968 NO 339

Recorded	Number	Type of Instrument	C.T. Issue
13/7/2005	CA94834	CONVERSION ACTION	FOLIO CREATED CT NOT ISSUED
9/12/2005	AB973698	DEPARTMENTAL DEALING	
12/12/2005	DP1089380	DEPOSITED PLAN	FOLIO CANCELLED

*** END OF SEARCH ***

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LAND AND PROPERTY INFORMATION NEW SOUTH WALES - HISTORICAL SEARCH

SEARCH DATE
10/11/2015 1:56PM

FOLIO: 4/1089380

First Title(s): OLD SYSTEM
Prior Title(s): 4/49/758065

Recorded	Number	Type of Instrument	C.T. Issue
12/12/2005	DP1089380	DEPOSITED PLAN	FOLIO CREATED EDITION 1
22/1/2015	AJ191330	TRANSFER	
22/1/2015	AJ191331	TRANSFER	EDITION 2

*** END OF SEARCH ***

bathurst PRINTED ON 10/11/2015

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LAND AND PROPERTY INFORMATION NEW SOUTH WALES - TITLE SEARCH

FOLIO: 4/1089380

SEARCH DATE	TIME	EDITION NO	DATE
10/11/2015	1:54 PM	2	22/1/2015

LAND

LOT 4 IN DEPOSITED PLAN 1089380
AT BATHURST
LOCAL GOVERNMENT AREA BATHURST REGIONAL
PARISH OF BATHURST COUNTY OF BATHURST
TITLE DIAGRAM DP1089380

FIRST SCHEDULE

PRINCIPAL HEALTHCARE FINANCE PTY LIMITED (T AJ191331)

SECOND SCHEDULE (2 NOTIFICATIONS)

1 RESERVATIONS AND CONDITIONS IN THE CROWN GRANT(S)
2 QUALIFIED TITLE. CAUTION PURSUANT TO SECTION 28J OF THE REAL PROPERTY ACT, 1900. ENTERED 13.7.2005 BK 2968 NO 339

NOTATIONS

UNREGISTERED DEALINGS: PP DP1205690.

*** END OF SEARCH ***

bathurst PRINTED ON 10/11/2015

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LAND AND PROPERTY INFORMATION NEW SOUTH WALES - HISTORICAL SEARCH

SEARCH DATE
10/11/2015 1:57PM

FOLIO: 5/49/758065

First Title(s): OLD SYSTEM
Prior Title(s): BK 2968 NO 339

Recorded	Number	Type of Instrument	C.T. Issue
13/7/2005	CA94834	CONVERSION ACTION	FOLIO CREATED CT NOT ISSUED
9/12/2005	AB973698	DEPARTMENTAL DEALING	
12/12/2005	DP1089380	DEPOSITED PLAN	FOLIO CANCELLED

*** END OF SEARCH ***

bathurst PRINTED ON 10/11/2015

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LAND AND PROPERTY INFORMATION NEW SOUTH WALES - HISTORICAL SEARCH

SEARCH DATE
10/11/2015 1:56PM

FOLIO: 5/1089380

First Title(s): OLD SYSTEM
Prior Title(s): 5/49/758065

Recorded	Number	Type of Instrument	C.T. Issue
12/12/2005	DP1089380	DEPOSITED PLAN	FOLIO CREATED EDITION 1
22/1/2015	AJ191330	TRANSFER	
22/1/2015	AJ191331	TRANSFER	EDITION 2

*** END OF SEARCH ***

bathurst PRINTED ON 10/11/2015

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LAND AND PROPERTY INFORMATION NEW SOUTH WALES - TITLE SEARCH

FOLIO: 5/1089380

SEARCH DATE	TIME	EDITION NO	DATE
10/11/2015	1:54 PM	2	22/1/2015

LAND

LOT 5 IN DEPOSITED PLAN 1089380
AT BATHURST
LOCAL GOVERNMENT AREA BATHURST REGIONAL
PARISH OF BATHURST COUNTY OF BATHURST
TITLE DIAGRAM DP1089380

FIRST SCHEDULE

PRINCIPAL HEALTHCARE FINANCE PTY LIMITED (T AJ191331)

SECOND SCHEDULE (2 NOTIFICATIONS)

1 RESERVATIONS AND CONDITIONS IN THE CROWN GRANT(S)
2 QUALIFIED TITLE. CAUTION PURSUANT TO SECTION 28J OF THE REAL PROPERTY ACT, 1900. ENTERED 13.7.2005 BK 2968 NO 339

NOTATIONS

UNREGISTERED DEALINGS: PP DP1205690.

*** END OF SEARCH ***

BATHURST REGIONAL COUNCIL

PLANNING CERTIFICATE

Issued pursuant to Section 149 of the Environmental Planning and Assessment Act, 1979

Issue Date: 10 September 2015

Application No: 14977
Certificate No: 149/10070

Applicant Reference: BATHURST 15/190

158 Russell Street
Private Mail Bag 17
BATHURST NSW 2795
Ph: 02 6333 6111
Fax: 02 6331 7211
council@bathurst.nsw.gov.au

Applicant:
BBC Consulting Planners
PO Box 438
BROADWAY NSW 2007

Property: **105 Stanley Street BATHURST 2795**
Description: **Lot: 3 DP: 1089380**
Parcel No: **39073**

INFORMATION PROVIDED PURSUANT TO SECTION 149(2) OF THE ACT.

1. Names of relevant planning instruments and DCPs

The names of:

(1) each environmental planning instrument that applies to the carrying out of development on the land:

Bathurst Regional Local Environmental Plan 2014

A copy of the current Bathurst Regional Local Environmental Plan 2014 is available on the NSW Legislation website – www.legislation.nsw.gov.au

The following State Environmental Planning Policies (SEPP) apply to the Bathurst Regional LGA:

SEPP No. 15 - Rural Land-Sharing Communities

SEPP No. 21 - Caravan Parks

SEPP No. 30 - Intensive Agriculture

SEPP No. 32 - Urban Consolidation (Redevelopment of Urban Land)

SEPP No. 33 - Hazardous and Offensive Development

SEPP No. 36 - Manufactured Home Estates

SEPP No. 44 - Koala Habitat Protection

SEPP No. 50 - Canal Estates

SEPP No. 55 - Remediation of Land

SEPP No. 62 - Sustainable Aquaculture

SEPP No. 64 - Advertising and Signage

SEPP No. 65 - Design Quality of Residential Flat Development

SEPP (Affordable Rental Housing) 2009

SEPP (Building Sustainability Index: BASIX) 2004

SEPP (Housing for Seniors or People with a Disability) 2004

SEPP (Infrastructure) 2007

SEPP (Major Development) 2005

SEPP (Mining, Petroleum Production and Extractive Industries) 2007

SEPP (Rural Lands) 2008

SEPP (State and Regional Development) 2011

SEPP (Miscellaneous Consent Provisions) 2007

A full copy of the SEPPs are available on the NSW Legislation website – www.legislation.nsw.gov.au

(2) each proposed environmental planning instrument that will apply to the carrying out of development on the land and that is or has been the subject of community consultation or on public exhibition under the Act (unless the Director-General has notified the council that the making of the proposed instrument has been deferred indefinitely or has not been approved):

Nil.

(3) each development control plan that applies to the carrying out of development on the land:

Bathurst Regional Development Control Plan 2014

2. Zoning and land use under relevant LEPs

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

(a) the identity of the zone;

Zone R1 General Residential

Objectives of zone

- **To provide for the housing needs of the community.**
- **To provide for a variety of housing types and densities.**
- **To enable other land uses that provide facilities or services to meet the day to day needs of residents.**
- **To provide housing choice and affordability by enabling opportunities for medium density forms of housing in locations and at densities that complement the surrounding residential environment.**
- **To protect and conserve the historic significance and scenic quality of the urban villages of Eglinton, Raglan and Perthville.**

- **To enable commercial development that is compatible with the amenity of the area and does not prejudice the status and viability of the Bathurst central business district as the retail, commercial and administrative centre of Bathurst.**

(b) the purposes for which the instrument provides that development may be carried out within the zone without the need for development consent;

Environmental protection works; Extensive agriculture; Home-based child care; Home businesses; Home occupations; Roads

(c) the purposes for which the instrument provides that development may not be carried out within the zone except with development consent; and

Attached dwellings; Boarding houses; Child care centres; Community facilities; Dwelling houses; Food and drink premises; Garden centres; Group homes; Home industries; Hostels; Kiosks; Markets; Multi dwelling housing; Neighbourhood shops; Places of public worship; Plant nurseries; Residential flat buildings; Respite day care centres; Roadside stalls; Semi-detached dwellings; Seniors housing; Shop top housing; Waste or resource transfer stations; Any other development not otherwise specified in Item (b) or (d)

(d) the purposes for which the instrument provides that development is prohibited within the zone:

Air transport facilities; Amusement centres; Boat building and repair facilities; Correctional centres; Crematoria; Depots; Electricity generating works; Extractive industries; Forestry; Freight transport facilities; Heavy industrial storage establishments; Home occupations (sex services); Industrial training facilities; Industries; Intensive livestock agriculture; Open cut mining; Restricted premises; Retail premises; Rural industries; Sex services premises; Storage premises; Transport depots; Truck depots; Vehicle body repair workshops; Vehicle repair stations; Warehouse or distribution centres; Waste or resource management facilities; Wholesale supplies

(e) whether any development standards applying to the land fix minimum land dimensions for the erection of a dwelling-house on the land and, if so, the minimum land dimensions so fixed:

Yes, refer to the Bathurst Regional Development Control Plan 2014.

(f) whether the land includes or comprises critical habitat:

No.

(g) whether the land is in a conservation area (however described):

The land to which the certificate relates is not in a conservation area.

(h) whether an item of environmental heritage (however described) is situated on the land:

The land to which the certificate relates does not contain an item of environmental heritage.

2A. Zoning and land use under State Environmental Planning Policy (Sydney Region Growth Centres) 2006

Is the land to which the certificate relates land within any zone (however described) under:

(a) Part 3 of the State Environmental Planning Policy (Sydney Region Growth Centres)

2006 (the 2006 SEPP), or

(b) a Precinct Plan (within the meaning of the 2006 SEPP), or

(c) a proposed Precinct Plan that is or has been the subject of community consultation or on public exhibition under the Act,

the particulars referred to in clause 2 (a)–(h) in relation to that land (with a reference to "the instrument" in any of those paragraphs being read as a reference to Part 3 of the 2006 SEPP, or the Precinct Plan or proposed Precinct Plan, as the case requires).

No, the State Environmental Planning Policy (Sydney Region Growth Centres) 2006 does not apply to the Bathurst Regional LGA.

3. Complying development

Is the land to which the certificate relates land on which complying development may be carried out under each of the codes for complying development because of the provisions of clauses 1.17A (1) (c) to (e), (2), (3) and (4), 1.18 (1) (c3) and 1.19 of State Environmental Planning Policy (Exempt and Complying Development Codes) 2008?

Yes, Complying Development Certificates may be carried out pursuant to the State Environmental Planning Policy (Exempt and Complying Development Codes) 2008.

If complying development may not be carried out on that land because of the provisions of clauses 1.17A (1) (c) to (e), (2), (3) and (4), 1.18 (1) (c3) and 1.19 of that Policy, the reasons why it may not be carried out under that clause.

n/a.

4. Coastal protection

Is the land to which the certificate relates land which is affected by the operation of section 38 or 39 of the Coastal Protection Act 1979, but only to the extent that the council has been so notified by the Department of Services, Technology and Administration?

No.

4A. Certain information relating to beaches and coasts

In relation to a coastal council:

(1) whether an order has been made under Part 4D of the Coastal Protection Act 1979 in relation to emergency coastal protection works (within the meaning of that Act) on the land (or on public land adjacent to that land), except where the council is satisfied that such an order has been fully complied with.

(2)(a) whether the council has been notified under section 55X of the Coastal Protection Act 1979 that emergency coastal protection works (within the meaning of that Act) have been placed on the land (or on public land adjacent to that land), and

(b) if works have been so placed—whether the council is satisfied that the works have been removed and the land restored in accordance with that Act.

(3) such information (if any) as is required by the regulations under section 56B of the Coastal Protection Act 1979 to be included in the planning certificate and of which the council has been notified pursuant to those regulations.

Bathurst Regional Council is not a Coastal Council.

4B. Annual charges under Local Government Act 1993 for coastal protection services that relate to existing coastal protection works

In relation to a coastal council—whether the owner (or any previous owner) of the land has consented in writing to the land being subject to annual charges under section 496B of the Local Government Act 1993 for coastal protection services that relate to existing coastal protection works (within the meaning of section 553B of that Act).

Note. Existing coastal protection works are works to reduce the impact of coastal hazards on land (such as seawalls, revetments, groynes and beach nourishment) that existed before the commencement of section 553B of the Local Government Act 1993.

Bathurst Regional Council is not a Coastal Council.

5. Mine subsidence

Is the land to which the certificate relates land which is proclaimed to be a mine subsidence district within the meaning of section 15 of the Mine Subsidence Compensation Act 1961?

No.

6. Road widening and road realignment

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

(a) Division 2 of Part 3 of the Roads Act 1993; or

(b) any environmental planning instrument; or

(c) any resolution of the Council?

The land to which the certificate relates is not affected by road widening or realignment.

7. Council and other public authority policies on hazard risk restrictions

Whether or not the land is affected by a policy:

(a) adopted by the Council; or

(b) adopted by any other public authority and notified to the Council for the express purpose of its adoption by that authority being referred to in planning certificates issued by the Council;

that restricts the development of the land because of the likelihood of land slip, bushfire, tidal inundation, subsidence, acid sulphate soils or any other risk (other than flooding):

The land to which the certificate relates is not affected by any Council or other public authority's policy.

7A. Flood related development controls information

Whether or not development on that land or part of the land for the purposes of:

(a) dwelling houses, dual occupancies, multi dwelling housing or residential flat buildings (not including development for the purposes of group homes or seniors housing); or

(b) any other purpose:

is subject to flood related development controls.

The subject land is protected by a levee bank. Development standards relating to flood prone and flood protected land are contained within Chapter 9 of the Bathurst Regional Development Control Plan 2014 including relevant maps. Council's Floodplain Management Policy also applies to the subject land (See attachment).

8. Land reserved for acquisition

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

No, the land is not subject to land acquisition.

9. Contributions plans

The name of each contributions plan applying to the land:

Bathurst Regional Community Facilities

9A. Biodiversity certified land

Is the land to which the certificate relates, land which has been identified as biodiversity certified land under Part 7AA of the Threatened Species Conservation Act 1995?

No. The land is not identified as Biodiversity Certified Land.

10. Biobanking agreements

Is the land to which the certificate relates land to which a biobanking agreement under Part 7A of the Threatened Species Conservation Act 1995 relates (but only if the council has been notified of the existence of the plan by the Director-General of the Department of Environment, Climate Change and Water):

Council is not aware of any biobanking agreements affecting the land to which the certificate relates.

11. Bush fire prone land

Is the land (or part of the land) to which the certificate relates bush fire prone land (as defined in the Act)?

No, the land to which the certificate relates is not identified as bushfire prone.

12. Property vegetation plans

Is the land to which the certificate relates land to which a property vegetation plan under the Native Vegetation Act 2003 applies (but only if the council has been notified of the existence of the plan by the person or body that approved the plan under that Act):

Council is not aware of any property vegetation plans affecting the land to which the certificate relates.

13. Orders under Trees (Disputes Between Neighbours) Act 2006

Is the land to which the certificate relates the subject to an order (of which Council is aware) made

under the Trees (Disputes Between Neighbours) Act 2006?

No.

14. Directions under Part 3A

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

No.

15. Site compatibility certificates and conditions for seniors housing

(1) Is the land to which the certificate relates land to which a current site compatibility certificate (of which Council is aware) issued under State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004 in respect of the proposed development on the land?

No.

(2) The terms of any kind referred to in clause 18(2) of State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004 which have been imposed as a condition of consent to a Development Application granted on or after 11 October 2007 under with respect to the land to which this certificate relates?

n/a

16. Site compatibility certificates for infrastructure

Is the land to which the certificate relates land to which a valid site compatibility certificate (infrastructure) (of which Council is aware) issued under State Environmental Planning Policy (Infrastructure) 2007 in respect of proposed development on the land?

No.

17. Site compatibility certificates and conditions for affordable rental housing

(1) Is the land to which the certificate relates land to which a valid site compatibility certificate (affordable rental housing) (of which Council is aware) issued under State Environmental Planning Policy (Affordable Rental Housing) 2009 in respect of proposed development on the land?

No.

(2) A statement setting out any terms of a kind referred to in clause 17 (1) or 38 (1) of State Environmental Planning Policy (Affordable Rental Housing) 2009 that have been imposed as a condition of consent to a development application in respect of the land.

No.

18. Paper subdivision information

(1) The name of any development plan adopted by a relevant authority that applies to the land or that is proposed to be subject to a consent ballot.
(2) The date of any subdivision order that applies to the land.
(3) Words and expressions used in this clause have the same meaning as they have in Part

16C of this Regulation.

There are no paper subdivisions within the Bathurst Regional LGA.

19. Site verification certificates

A statement of whether there is a current site verification certificate, of which the council is aware, in respect of the land and, if there is a certificate, the statement is to include:

(a) the matter certified by the certificate, and
(b) the date on which the certificate ceases to be current (if any), and
(c) that a copy may be obtained from the head office of the Department of Planning and Infrastructure.

Council is not aware of any site verification certificates being issued for the land to which the certificate relates.

Note:

The following matters are prescribed by Section 59 (2) of the Contaminated Land Management Act 1997 as additional matters that are to be specified in a planning certificate:

(a) Is the land to which the certificate relates **significantly contaminated land** within the meaning of the Contaminated Land Management Act 1997?

No.

(b) Is the land to which the certificate relates subject to a **management order** within the meaning of the Contaminated Land Management Act 1997?

No.

(c) Is the land to which the certificate relates the subject of an **approved voluntary management proposal** within the meaning of the Contaminated Land Management Act 1997?

No.

(d) Is the land to which the certificate relates the subject to an **ongoing maintenance order** within the meaning of the Contaminated Land Management Act 1997?

No.

(e) Is the land to which the certificate relates the subject of a **site audit statement** within the meaning of the Contaminated Land Management Act 1979?

No.

The following matters are prescribed by Section 26 of the Nation Building and Jobs Plan (State Infrastructure Delivery) Act 2009 as additional matters that are to be specified in a planning certificate:

(a) Has the NSW Infractructure Co-ordinator General issued any exemption pursuant to Section 23 of the Nation Building and Jobs Plan (State Infrastructure Delivery) Act 2009 or an Authorisation pursuant to Section 24 of the Nation Building and Jobs Plan (State Infrastructure Delivery) Act 2009 (of which Council is aware)?

No.

D. Sherley
GENERAL MANAGER
Bathurst Regional Council

Per: Acutter Date: 11/12/15

ADDITIONAL INFORMATION PROVIDED PURSUANT TO SECTION 149(5) OF THE ACT.

101. Tree Preservation and Management Policy

Is an approval required to remove a tree or vegetation on the subject land?

No.

102. Heritage listings

Is the land to which the certificate relates subject to any additional heritage listings?

No.

D. Sherley
GENERAL MANAGER
Bathurst Regional Council

Per: _____ Date: 11/12/15

POLICY: FLOODPLAIN MANAGEMENT

DATE ADOPTED:

Director Environmental, Planning & Building Services' Report #7, Council 16 February 2011
Minute Book No. 11059

Director Engineering Services Report #1
Policy 4 November 2009
Council 18 November 2009
Minute Book No. 10808

Director Engineering Services Report #3
Council 4 February 2009
Minute Book No. 10585

Director Engineering Services Report #5, #6
Council 20 August 2008
Minute Book No. 10474

Director Environmental, Planning & Building Services' Report #10,
Council 30 March 2005
Minute Book No. 9495

ORIGINAL ADOPTION:

Director Corporate Services Report #1
Policy 1 December 2004, Council 8 December 2004
Minute Book No. 9416
(former BCC Policy)

FILE REFERENCE: 31.00002

OBJECTIVE: Implement and maintain a Floodplain Management Strategy which is the highest standard and condition that Council can reasonably afford in all of its circumstances and having regard to financial, economic, environmental, aesthetic, social or political factors or constraints and levee bank construction.

PART 1

SECTION 1

General Provisions Applying to all Parts and Sections

1. a) All matters and activities set out in all Parts and Sections of this Policy and any determination made pursuant thereto by a responsible person **SHALL ALWAYS** be subject to and limited by the funds and resources ("resource availability") voted and resolved by council.

   b) Subject to the provisions of Section 731 of the Local Government Act, 1993, a decision made by a responsible person in carrying out the functions of the Policy shall be a decision of the Council **PROVIDED ALWAYS** that a responsible person has acted in good faith for the purpose of executing this Policy.

   c) Expressions of words used in this Policy (or a particular provision of this Policy) which are defined in the dictionary at the end of this Policy have the meanings set out in the dictionary.

   d) A determination made by a responsible person in carrying out the functions of this Policy shall be recorded and maintained in such fashion as is determined by a responsible person. The manner and form of records as set out in Council's standard Risk Management procedure.

   e) Subject to a responsible person determining otherwise, "**Codes of Best Practice**", incorporating standard(s), method(s) and frequencies, shall be determined and implemented for all activities set out in this Policy and shall be reviewed on a continuing basis.

   f) **"Responsible person(s)"** shall be determined by the General Manager or his/her delegate.

   g) The determination of responsible persons as set out in Council's standard Risk Management procedures.

SECTION 2

Dictionary

2. **"as determined by a responsible person"** means:

   * a decision by a responsible person and

   * a decision made pursuant with the execution of this Policy and the functions, powers and duties set out therein.

"function" includes a power, authority and duty.

"month" means a calendar month.

"reasonably safe condition" means that in the ABSOLUTE OPINION of a responsible person:

* Safety measures were not required; or
* That safety measures taken were adequate and sufficient for a particular circumstance.
* Works carried out were in accordance with any Code of Best Practice or Standard determined pursuant with Section 1.e;

"responsible person" means the Council or an employee and/or a particular position as provided for in Council's standard Risk Management procedure.

"week" means the period Monday to Friday inclusive.

"working day" or **"day"** means Monday to Friday inclusive subject to the ordinary working hours" of Council.

"work site" means and includes any specific place or places at which construction or maintenance works are being carried out on by or under the actual direction and control of Council.

"year" means a calendar year.

SECTION 3

Instrument of Delegation

3. That subject to compliance with the requirements of the Local Government Act, 1993, and Ordinances thereunder and any express Policy or direction of Council, the Council pursuant to the provision of Section 377 of the Local Government Act, 1993, hereby delegates to the General Manager, authority to exercise and perform on behalf of Council, all functions, powers, authorities, duties and matters contained in this Policy.

SECTION 4

Implementation

4. That all recommendations in this Policy take operational effect from the date of Council Approval.

Having adopted a Floodplain Management Plan, Council's Plan Policy shall operate in conjunction with such.

1. INTRODUCTION:

The areas within the City of Bathurst which are affected by flooding, are those identified as inundated by 1% AEP flooding, as determined by the Bathurst Computer Based Floodplain Model, and such maps which may be updated from time to time, and are those identified as:

* Land which adjoins either the Macquarie River or the Queen Charlotte's Vale Creek;

* Have been identified as flood affected by the 1964, 1986 and/or 1990 floods;

* Are likely to be affected by inundation from a natural watercourse, or drainage channel; or

* All lands outside the designated flood line but contiguous to it, less than 0.5 metres above the designated flood level.

All land affected by flooding will be subject to this interim policy.

2. DESIGNATED FLOOD:

The designated flood or flood standard shall be defined by the following designated floods:

(a) 1% AEP Flood as determined by the Bathurst Computer Based Flood Model, as amended for the Macquarie River and the Queen Charlotte's Vale Creek, as detailed therein;

(b) For areas beyond the flood model, including natural creeks and drainage channels, the 1% AEP flood, as calculated by accepted engineering methods.

(c) 1% AEP Flood extents as determined by the Georges Plains Floodplain Risk Management Plan.

(d) 1% AEP Flood extents as determined by the Sofala Floodplain Risk Management Plan.

All land subject to inundation/flooding by the designated flood shall be defined as within the designated flood area.

3. DEVELOPMENT WITHIN THE DESIGNATED FLOOD AREA:

The criteria outlined in Appendix B of the NSW Government Floodplain Development Manual shall be used for the assessment of flood hazard of those properties which are affected by flooding from the Macquarie River and Queen Charlotte's Vale Creek, and are included in the study area of the computer based flood model, utilising the depth and velocity calculations generated by the Model.

For watercourses not included in the Bathurst Computer Based Flood Model, Council has resolved that low hazard flood areas are those areas effected by 0.5 metre of flood water, or less.

4. DEVELOPMENT OF LANDS AFFECTED BY A NATURAL WATERCOURSE

That all applications for flood levels be in writing and that a charge, as may be determined from time-to-time, apply for the supply of such information. (Formerly Policy No. 8).

5. RAGLAN CREEK

Council has adopted, as a matter of policy, for consistency of analysis, Council's calibrated RAFTS Model as the only method of assessing the hydrology of Raglan Creek. In this, all developments ultimately discharging into the Raglan Creek, will be subject to a Council charge, for the assessment of the effects of the development within the Raglan Creek Catchment, should such assessment be required.

6. VOLUNTARY PURCHASES

That Council agree to participate in the purchase of flood prone land, in conjunction with the New South Wales State Government and the Commonwealth Government on a voluntary basis in accordance with the following requirements, as stipulated by the Minister for Water Resources, namely:

1. That Council submit a proposal to the Department of Water Resources, giving details of the property to be purchased, including the purchase price and how this was arrived at;

2. Submit a detailed valuation of the property prepared and authenticated by the Valuer General's Department;

3. Submit a proposal for the future use of the land and that Council agree that it will:

(a) zone the land as open space, restricting all possible development, including the placement of fill or planting of trees;

(b) retain control of the land in perpetuity

(c) ensure that appropriate steps are taken to record its open-space zoning. (Formerly policy No. 26) or such other requirements, and practice which may be applicable, from time to time.

This Clause applies to the Kelso floodplain, as identified in the Floodplain Management Plan.

The priority of purchase is based on:

(a) occupied by owner;

(b) hazard rating for the 1% AEP flood;

(c) whether over floor flooding has been experienced previously;

(d) the level of adverse effects to the property as a result of other structural measures on the floodplain; notwithstanding that Council may purchase any property earmarked for voluntary purchase should it become available.

BATHURST REGIONAL COUNCIL

PLANNING CERTIFICATE

Issued pursuant to Section 149 of the Environmental Planning and Assessment Act, 1979

Issue Date: 10 September 2015

Application No: 14977
Certificate No: 149/10071

Applicant Reference: BATHURST 15/190

158 Russell Street
Private Mail Bag 17
BATHURST NSW 2795
Ph: 02 6333 6111
Fax: 02 6331 7211
council@bathurst.nsw.gov.au

Applicant:
BBC Consulting Planners
PO Box 438
BROADWAY NSW 2007

Property: **105 Stanley Street BATHURST 2795**
Description: **Lot: 4 DP: 1089380**
Parcel No: **39074**

INFORMATION PROVIDED PURSUANT TO SECTION 149(2) OF THE ACT.

1. Names of relevant planning instruments and DCPs

The names of:

(1) each environmental planning instrument that applies to the carrying out of development on the land:

Bathurst Regional Local Environmental Plan 2014

A copy of the current Bathurst Regional Local Environmental Plan 2014 is available on the NSW Legislation website – www.legislation.nsw.gov.au

The following State Environmental Planning Policies (SEPP) apply to the Bathurst Regional LGA:

SEPP No. 15 - Rural Land-Sharing Communities

SEPP No. 21 - Caravan Parks

SEPP No. 30 - Intensive Agriculture

SEPP No. 32 - Urban Consolidation (Redevelopment of Urban Land)

SEPP No. 33 - Hazardous and Offensive Development

SEPP No. 36 - Manufactured Home Estates

SEPP No. 44 - Koala Habitat Protection

SEPP No. 50 - Canal Estates

SEPP No. 55 - Remediation of Land

SEPP No. 62 - Sustainable Aquaculture

SEPP No. 64 - Advertising and Signage

SEPP No. 65 - Design Quality of Residential Flat Development

SEPP (Affordable Rental Housing) 2009

SEPP (Building Sustainability Index: BASIX) 2004

SEPP (Housing for Seniors or People with a Disability) 2004

SEPP (Infrastructure) 2007

SEPP (Major Development) 2005

SEPP (Mining, Petroleum Production and Extractive Industries) 2007

SEPP (Rural Lands) 2008

SEPP (State and Regional Development) 2011

SEPP (Miscellaneous Consent Provisions) 2007

A full copy of the SEPPs are available on the NSW Legislation website – www.legislation.nsw.gov.au

(2) each proposed environmental planning instrument that will apply to the carrying out of development on the land and that is or has been the subject of community consultation or on public exhibition under the Act (unless the Director-General has notified the council that the making of the proposed instrument has been deferred indefinitely or has not been approved):

Nil.

(3) each development control plan that applies to the carrying out of development on the land:

Bathurst Regional Development Control Plan 2014

2. Zoning and land use under relevant LEPs

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

(a) the identity of the zone;

Zone R1 General Residential

Objectives of zone

- **To provide for the housing needs of the community.**
- **To provide for a variety of housing types and densities.**
- **To enable other land uses that provide facilities or services to meet the day to day needs of residents.**
- **To provide housing choice and affordability by enabling opportunities for medium density forms of housing in locations and at densities that complement the surrounding residential environment.**
- **To protect and conserve the historic significance and scenic quality of the urban villages of Eglinton, Raglan and Perthville.**

- **To enable commercial development that is compatible with the amenity of the area and does not prejudice the status and viability of the Bathurst central business district as the retail, commercial and administrative centre of Bathurst.**

(b) the purposes for which the instrument provides that development may be carried out within the zone without the need for development consent;

Environmental protection works; Extensive agriculture; Home-based child care; Home businesses; Home occupations; Roads

(c) the purposes for which the instrument provides that development may not be carried out within the zone except with development consent; and

Attached dwellings; Boarding houses; Child care centres; Community facilities; Dwelling houses; Food and drink premises; Garden centres; Group homes; Home industries; Hostels; Kiosks; Markets; Multi dwelling housing; Neighbourhood shops; Places of public worship; Plant nurseries; Residential flat buildings; Respite day care centres; Roadside stalls; Semi-detached dwellings; Seniors housing; Shop top housing; Waste or resource transfer stations; Any other development not otherwise specified in Item (b) or (d)

(d) the purposes for which the instrument provides that development is prohibited within the zone:

Air transport facilities; Amusement centres; Boat building and repair facilities; Correctional centres; Crematoria; Depots; Electricity generating works; Extractive industries; Forestry; Freight transport facilities; Heavy industrial storage establishments; Home occupations (sex services); Industrial training facilities; Industries; Intensive livestock agriculture; Open cut mining; Restricted premises; Retail premises; Rural industries; Sex services premises; Storage premises; Transport depots; Truck depots; Vehicle body repair workshops; Vehicle repair stations; Warehouse or distribution centres; Waste or resource management facilities; Wholesale supplies

(e) whether any development standards applying to the land fix minimum land dimensions for the erection of a dwelling-house on the land and, if so, the minimum land dimensions so fixed:

Yes, refer to the Bathurst Regional Development Control Plan 2014.

(f) whether the land includes or comprises critical habitat:

No.

(g) whether the land is in a conservation area (however described):

The land to which the certificate relates is not in a conservation area.

(h) whether an item of environmental heritage (however described) is situated on the land:

The land to which the certificate relates does not contain an item of environmental heritage.

2A. Zoning and land use under State Environmental Planning Policy (Sydney Region Growth Centres) 2006

Is the land to which the certificate relates land within any zone (however described) under:

(a) Part 3 of the State Environmental Planning Policy (Sydney Region Growth Centres)

2006 (the 2006 SEPP), or

(b) a Precinct Plan (within the meaning of the 2006 SEPP), or

(c) a proposed Precinct Plan that is or has been the subject of community consultation or on public exhibition under the Act,

the particulars referred to in clause 2 (a)–(h) in relation to that land (with a reference to "the instrument" in any of those paragraphs being read as a reference to Part 3 of the 2006 SEPP, or the Precinct Plan or proposed Precinct Plan, as the case requires).

No, the State Environmental Planning Policy (Sydney Region Growth Centres) 2006 does not apply to the Bathurst Regional LGA.

3. Complying development

Is the land to which the certificate relates land on which complying development may be carried out under each of the codes for complying development because of the provisions of clauses 1.17A (1) (c) to (e), (2), (3) and (4), 1.18 (1) (c3) and 1.19 of State Environmental Planning Policy (Exempt and Complying Development Codes) 2008?

Yes, Complying Development Certificates may be carried out pursuant to the State Environmental Planning Policy (Exempt and Complying Development Codes) 2008.

If complying development may not be carried out on that land because of the provisions of clauses 1.17A (1) (c) to (e), (2), (3) and (4), 1.18 (1) (c3) and 1.19 of that Policy, the reasons why it may not be carried out under that clause.

n/a.

4. Coastal protection

Is the land to which the certificate relates land which is affected by the operation of section 38 or 39 of the Coastal Protection Act 1979, but only to the extent that the council has been so notified by the Department of Services, Technology and Administration?

No.

4A. Certain information relating to beaches and coasts

In relation to a coastal council:

(1) whether an order has been made under Part 4D of the Coastal Protection Act 1979 in relation to emergency coastal protection works (within the meaning of that Act) on the land (or on public land adjacent to that land), except where the council is satisfied that such an order has been fully complied with.

(2)(a) whether the council has been notified under section 55X of the Coastal Protection Act 1979 that emergency coastal protection works (within the meaning of that Act) have been placed on the land (or on public land adjacent to that land), and

(b) if works have been so placed—whether the council is satisfied that the works have been removed and the land restored in accordance with that Act.

(3) such information (if any) as is required by the regulations under section 56B of the Coastal Protection Act 1979 to be included in the planning certificate and of which the council has been notified pursuant to those regulations.

Bathurst Regional Council is not a Coastal Council.

4B. Annual charges under Local Government Act 1993 for coastal protection services that relate to existing coastal protection works

In relation to a coastal council—whether the owner (or any previous owner) of the land has consented in writing to the land being subject to annual charges under section 496B of the Local Government Act 1993 for coastal protection services that relate to existing coastal protection works (within the meaning of section 553B of that Act).

Note. Existing coastal protection works are works to reduce the impact of coastal hazards on land (such as seawalls, revetments, groynes and beach nourishment) that existed before the commencement of section 553B of the Local Government Act 1993.

Bathurst Regional Council is not a Coastal Council.

5. Mine subsidence

Is the land to which the certificate relates land which is proclaimed to be a mine subsidence district within the meaning of section 15 of the Mine Subsidence Compensation Act 1961?

No.

6. Road widening and road realignment

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

(a) Division 2 of Part 3 of the Roads Act 1993; or

(b) any environmental planning instrument; or

(c) any resolution of the Council?

The land to which the certificate relates is not affected by road widening or realignment.

7. Council and other public authority policies on hazard risk restrictions

Whether or not the land is affected by a policy:

(a) adopted by the Council; or

(b) adopted by any other public authority and notified to the Council for the express purpose of its adoption by that authority being referred to in planning certificates issued by the Council;

that restricts the development of the land because of the likelihood of land slip, bushfire, tidal inundation, subsidence, acid sulphate soils or any other risk (other than flooding):

The land to which the certificate relates is not affected by any Council or other public authority's policy.

7A. Flood related development controls information

Whether or not development on that land or part of the land for the purposes of:

(a) dwelling houses, dual occupancies, multi dwelling housing or residential flat buildings (not including development for the purposes of group homes or seniors housing); or

(b) any other purpose:

is subject to flood related development controls.

The subject land is protected by a levee bank. Development standards relating to flood prone and flood protected land are contained within Chapter 9 of the Bathurst Regional Development Control Plan 2014 including relevant maps. Council's Floodplain Management Policy also applies to the subject land (See attachment).

8. Land reserved for acquisition

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

No, the land is not subject to land acquisition.

9. Contributions plans

The name of each contributions plan applying to the land:

Bathurst Regional Community Facilities

9A. Biodiversity certified land

Is the land to which the certificate relates, land which has been identified as biodiversity certified land under Part 7AA of the Threatened Species Conservation Act 1995?

No. The land is not identified as Biodiversity Certified Land.

10. Biobanking agreements

Is the land to which the certificate relates land to which a biobanking agreement under Part 7A of the Threatened Species Conservation Act 1995 relates (but only if the council has been notified of the existence of the plan by the Director-General of the Department of Environment, Climate Change and Water):

Council is not aware of any biobanking agreements affecting the land to which the certificate relates.

11. Bush fire prone land

Is the land (or part of the land) to which the certificate relates bush fire prone land (as defined in the Act)?

No, the land to which the certificate relates is not identified as bushfire prone.

12. Property vegetation plans

Is the land to which the certificate relates land to which a property vegetation plan under the Native Vegetation Act 2003 applies (but only if the council has been notified of the existence of the plan by the person or body that approved the plan under that Act):

Council is not aware of any property vegetation plans affecting the land to which the certificate relates.

13. Orders under Trees (Disputes Between Neighbours) Act 2006

Is the land to which the certificate relates the subject to an order (of which Council is aware) made

under the Trees (Disputes Between Neighbours) Act 2006?

No.

14. Directions under Part 3A

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

No.

15. Site compatibility certificates and conditions for seniors housing

(1) Is the land to which the certificate relates land to which a current site compatibility certificate (of which Council is aware) issued under State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004 in respect of the proposed development on the land?

No.

(2) The terms of any kind referred to in clause 18(2) of State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004 which have been imposed as a condition of consent to a Development Application granted on or after 11 October 2007 under with respect to the land to which this certificate relates?

n/a

16. Site compatibility certificates for infrastructure

Is the land to which the certificate relates land to which a valid site compatibility certificate (infrastructure) (of which Council is aware) issued under State Environmental Planning Policy (Infrastructure) 2007 in respect of proposed development on the land?

No.

17. Site compatibility certificates and conditions for affordable rental housing

(1) Is the land to which the certificate relates land to which a valid site compatibility certificate (affordable rental housing) (of which Council is aware) issued under State Environmental Planning Policy (Affordable Rental Housing) 2009 in respect of proposed development on the land?

No.

(2) A statement setting out any terms of a kind referred to in clause 17 (1) or 38 (1) of State Environmental Planning Policy (Affordable Rental Housing) 2009 that have been imposed as a condition of consent to a development application in respect of the land.

No.

18. Paper subdivision information

(1) The name of any development plan adopted by a relevant authority that applies to the land or that is proposed to be subject to a consent ballot.

(2) The date of any subdivision order that applies to the land.

(3) Words and expressions used in this clause have the same meaning as they have in Part

16C of this Regulation.

There are no paper subdivisions within the Bathurst Regional LGA.

19. Site verification certificates

A statement of whether there is a current site verification certificate, of which the council is aware, in respect of the land and, if there is a certificate, the statement is to include:
(a) the matter certified by the certificate, and
(b) the date on which the certificate ceases to be current (if any), and
(c) that a copy may be obtained from the head office of the Department of Planning and Infrastructure.

Council is not aware of any site verification certificates being issued for the land to which the certificate relates.

Note:

The following matters are prescribed by Section 59 (2) of the Contaminated Land Management Act 1997 as additional matters that are to be specified in a planning certificate:

(a) Is the land to which the certificate relates **significantly contaminated land** within the meaning of the Contaminated Land Management Act 1997?

No.

(b) Is the land to which the certificate relates subject to a **management order** within the meaning of the Contaminated Land Management Act 1997?

No.

(c) Is the land to which the certificate relates the subject of an **approved voluntary management proposal** within the meaning of the Contaminated Land Management Act 1997?

No.

(d) Is the land to which the certificate relates the subject to an **ongoing maintenance order** within the meaning of the Contaminated Land Management Act 1997?

No.

(e) Is the land to which the certificate relates the subject of a **site audit statement** within the meaning of the Contaminated Land Management Act 1979?

No.

The following matters are prescribed by Section 26 of the Nation Building and Jobs Plan (State Infrastructure Delivery) Act 2009 as additional matters that are to be specified in a planning certificate:

(a) Has the NSW Infractructure Co-ordinator General issued any exemption pursuant to Section 23 of the Nation Building and Jobs Plan (State Infrastructure Delivery) Act 2009 or an Authorisation pursuant to Section 24 of the Nation Building and Jobs Plan (State Infrastructure Delivery) Act 2009 (of which Council is aware)?

No.

D. Sherley
GENERAL MANAGER
Bathurst Regional Council

Per: Qcutter Date: 11/12/15

ADDITIONAL INFORMATION PROVIDED PURSUANT TO SECTION 149(5) OF THE ACT.

101. Tree Preservation and Management Policy

Is an approval required to remove a tree or vegetation on the subject land?

No.

102. Heritage listings

Is the land to which the certificate relates subject to any additional heritage listings?

No.

D. Sherley
GENERAL MANAGER
Bathurst Regional Council

Per: acutter Date: 11/12/15

POLICY: FLOODPLAIN MANAGEMENT

DATE ADOPTED:

Director Environmental, Planning & Building Services' Report #7, Council 16 February 2011
Minute Book No. 11059

Director Engineering Services Report #1
Policy 4 November 2009
Council 18 November 2009
Minute Book No. 10808

Director Engineering Services Report #3
Council 4 February 2009
Minute Book No. 10585

Director Engineering Services Report #5, #6
Council 20 August 2008
Minute Book No. 10474

Director Environmental, Planning & Building Services' Report #10,
Council 30 March 2005
Minute Book No. 9495

ORIGINAL ADOPTION:

Director Corporate Services Report #1
Policy 1 December 2004, Council 8 December 2004
Minute Book No. 9416
(former BCC Policy)

FILE REFERENCE: 31.00002

OBJECTIVE: Implement and maintain a Floodplain Management Strategy which is the highest standard and condition that Council can reasonably afford in all of its circumstances and having regard to financial, economic, environmental, aesthetic, social or political factors or constraints and levee bank construction.

PART 1

SECTION 1

General Provisions Applying to all Parts and Sections

1. a) All matters and activities set out in all Parts and Sections of this Policy and any determination made pursuant thereto by a responsible person **SHALL ALWAYS** be subject to and limited by the funds and resources ("resource availability") voted and resolved by council.

   b) Subject to the provisions of Section 731 of the Local Government Act, 1993, a decision made by a responsible person in carrying out the functions of the Policy shall be a decision of the Council **PROVIDED ALWAYS** that a responsible person has acted in good faith for the purpose of executing this Policy.

   c) Expressions of words used in this Policy (or a particular provision of this Policy) which are defined in the dictionary at the end of this Policy have the meanings set out in the dictionary.

   d) A determination made by a responsible person in carrying out the functions of this Policy shall be recorded and maintained in such fashion as is determined by a responsible person. The manner and form of records as set out in Council's standard Risk Management procedure.

   e) Subject to a responsible person determining otherwise, "**Codes of Best Practice",** incorporating standard(s), method(s) and frequencies, shall be determined and implemented for all activities set out in this Policy and shall be reviewed on a continuing basis.

   f) **"Responsible person(s)"** shall be determined by the General Manager or his/her delegate.

   g) The determination of responsible persons as set out in Council's standard Risk Management procedures.

SECTION 2

Dictionary

2. **"as determined by a responsible person"** means:

   * a decision by a responsible person and

   * a decision made pursuant with the execution of this Policy and the functions, powers and duties set out therein.

"function" includes a power, authority and duty.

"month" means a calendar month.

"reasonably safe condition" means that in the ABSOLUTE OPINION of a responsible person:

* Safety measures were not required; or
* That safety measures taken were adequate and sufficient for a particular circumstance.
* Works carried out were in accordance with any Code of Best Practice or Standard determined pursuant with Section 1.e;

"responsible person" means the Council or an employee and/or a particular position as provided for in Council's standard Risk Management procedure.

"week" means the period Monday to Friday inclusive.

"working day" or **"day"** means Monday to Friday inclusive subject to the ordinary working hours" of Council.

"work site" means and includes any specific place or places at which construction or maintenance works are being carried out on by or under the actual direction and control of Council.

"year" means a calendar year.

SECTION 3

Instrument of Delegation

3. That subject to compliance with the requirements of the Local Government Act, 1993, and Ordinances thereunder and any express Policy or direction of Council, the Council pursuant to the provision of Section 377 of the Local Government Act, 1993, hereby delegates to the General Manager, authority to exercise and perform on behalf of Council, all functions, powers, authorities, duties and matters contained in this Policy.

SECTION 4

Implementation

4. That all recommendations in this Policy take operational effect from the date of Council Approval.

Having adopted a Floodplain Management Plan, Council's Plan Policy shall operate in conjunction with such.

1. INTRODUCTION:

The areas within the City of Bathurst which are affected by flooding, are those identified as inundated by 1% AEP flooding, as determined by the Bathurst Computer Based Floodplain Model, and such maps which may be updated from time to time, and are those identified as:

* Land which adjoins either the Macquarie River or the Queen Charlotte's Vale Creek;

* Have been identified as flood affected by the 1964, 1986 and/or 1990 floods;

* Are likely to be affected by inundation from a natural watercourse, or drainage channel; or

* All lands outside the designated flood line but contiguous to it, less than 0.5 metres above the designated flood level.

All land affected by flooding will be subject to this interim policy.

2. DESIGNATED FLOOD:

The designated flood or flood standard shall be defined by the following designated floods:

(a) 1% AEP Flood as determined by the Bathurst Computer Based Flood Model, as amended for the Macquarie River and the Queen Charlotte's Vale Creek, as detailed therein;

(b) For areas beyond the flood model, including natural creeks and drainage channels, the 1% AEP flood, as calculated by accepted engineering methods.

(c) 1% AEP Flood extents as determined by the Georges Plains Floodplain Risk Management Plan.

(d) 1% AEP Flood extents as determined by the Sofala Floodplain Risk Management Plan.

All land subject to inundation/flooding by the designated flood shall be defined as within the designated flood area.

3. DEVELOPMENT WITHIN THE DESIGNATED FLOOD AREA:

The criteria outlined in Appendix B of the NSW Government Floodplain Development Manual shall be used for the assessment of flood hazard of those properties which are affected by flooding from the Macquarie River and Queen Charlotte's Vale Creek, and are included in the study area of the computer based flood model, utilising the depth and velocity calculations generated by the Model.

For watercourses not included in the Bathurst Computer Based Flood Model, Council has resolved that low hazard flood areas are those areas effected by 0.5 metre of flood water, or less.

4. DEVELOPMENT OF LANDS AFFECTED BY A NATURAL WATERCOURSE

That all applications for flood levels be in writing and that a charge, as may be determined from time-to-time, apply for the supply of such information. (Formerly Policy No. 8).

5. RAGLAN CREEK

Council has adopted, as a matter of policy, for consistency of analysis, Council's calibrated RAFTS Model as the only method of assessing the hydrology of Raglan Creek. In this, all developments ultimately discharging into the Raglan Creek, will be subject to a Council charge, for the assessment of the effects of the development within the Raglan Creek Catchment, should such assessment be required.

6. VOLUNTARY PURCHASES

That Council agree to participate in the purchase of flood prone land, in conjunction with the New South Wales State Government and the Commonwealth Government on a voluntary basis in accordance with the following requirements, as stipulated by the Minister for Water Resources, namely:

1. That Council submit a proposal to the Department of Water Resources, giving details of the property to be purchased, including the purchase price and how this was arrived at;

2. Submit a detailed valuation of the property prepared and authenticated by the Valuer General's Department;

3. Submit a proposal for the future use of the land and that Council agree that it will:

(a) zone the land as open space, restricting all possible development, including the placement of fill or planting of trees;

(b) retain control of the land in perpetuity

(c) ensure that appropriate steps are taken to record its open-space zoning. (Formerly policy No. 26) or such other requirements, and practice which may be applicable, from time to time.

This Clause applies to the Kelso floodplain, as identified in the Floodplain Management Plan.

The priority of purchase is based on:

(a) occupied by owner;

(b) hazard rating for the 1% AEP flood;

(c) whether over floor flooding has been experienced previously;

(d) the level of adverse effects to the property as a result of other structural measures on the floodplain; notwithstanding that Council may purchase any property earmarked for voluntary purchase should it become available.

BATHURST REGIONAL COUNCIL

PLANNING CERTIFICATE

Issued pursuant to Section 149 of the Environmental Planning and Assessment Act, 1979

Issue Date: 10 September 2015

Application No: 14977
Certificate No: 149/10072

Applicant Reference: BATHURST 15/190

158 Russell Street
Private Mail Bag 17
BATHURST NSW 2795
Ph: 02 6333 6111
Fax: 02 6331 7211
council@bathurst.nsw.gov.au

Applicant:
BBC Consulting Planners
PO Box 438
BROADWAY NSW 2007

Property: **105 Stanley Street BATHURST 2795**
Description: **Lot: 5 DP: 1089380**
Parcel No: **39075**

INFORMATION PROVIDED PURSUANT TO SECTION 149(2) OF THE ACT.

1. Names of relevant planning instruments and DCPs

The names of:

(1) each environmental planning instrument that applies to the carrying out of development on the land:

Bathurst Regional Local Environmental Plan 2014

A copy of the current Bathurst Regional Local Environmental Plan 2014 is available on the NSW Legislation website – www.legislation.nsw.gov.au

The following State Environmental Planning Policies (SEPP) apply to the Bathurst Regional LGA:

SEPP No. 15 - Rural Land-Sharing Communities

SEPP No. 21 - Caravan Parks

SEPP No. 30 - Intensive Agriculture

SEPP No. 32 - Urban Consolidation (Redevelopment of Urban Land)

SEPP No. 33 - Hazardous and Offensive Development

SEPP No. 36 - Manufactured Home Estates

SEPP No. 44 - Koala Habitat Protection

SEPP No. 50 - Canal Estates

SEPP No. 55 - Remediation of Land

SEPP No. 62 - Sustainable Aquaculture

SEPP No. 64 - Advertising and Signage

SEPP No. 65 - Design Quality of Residential Flat Development

SEPP (Affordable Rental Housing) 2009

SEPP (Building Sustainability Index: BASIX) 2004

SEPP (Housing for Seniors or People with a Disability) 2004

SEPP (Infrastructure) 2007

SEPP (Major Development) 2005

SEPP (Mining, Petroleum Production and Extractive Industries) 2007

SEPP (Rural Lands) 2008

SEPP (State and Regional Development) 2011

SEPP (Miscellaneous Consent Provisions) 2007

A full copy of the SEPPs are available on the NSW Legislation website – www.legislation.nsw.gov.au

(2) each proposed environmental planning instrument that will apply to the carrying out of development on the land and that is or has been the subject of community consultation or on public exhibition under the Act (unless the Director-General has notified the council that the making of the proposed instrument has been deferred indefinitely or has not been approved):

Nil.

(3) each development control plan that applies to the carrying out of development on the land:

Bathurst Regional Development Control Plan 2014

2. Zoning and land use under relevant LEPs

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

(a) the identity of the zone;

Zone R1 General Residential

Objectives of zone

- **To provide for the housing needs of the community.**
- **To provide for a variety of housing types and densities.**
- **To enable other land uses that provide facilities or services to meet the day to day needs of residents.**
- **To provide housing choice and affordability by enabling opportunities for medium density forms of housing in locations and at densities that complement the surrounding residential environment.**
- **To protect and conserve the historic significance and scenic quality of the urban villages of Eglinton, Raglan and Perthville.**

- **To enable commercial development that is compatible with the amenity of the area and does not prejudice the status and viability of the Bathurst central business district as the retail, commercial and administrative centre of Bathurst.**

(b) the purposes for which the instrument provides that development may be carried out within the zone without the need for development consent;

Environmental protection works; Extensive agriculture; Home-based child care; Home businesses; Home occupations; Roads

(c) the purposes for which the instrument provides that development may not be carried out within the zone except with development consent; and

Attached dwellings; Boarding houses; Child care centres; Community facilities; Dwelling houses; Food and drink premises; Garden centres; Group homes; Home industries; Hostels; Kiosks; Markets; Multi dwelling housing; Neighbourhood shops; Places of public worship; Plant nurseries; Residential flat buildings; Respite day care centres; Roadside stalls; Semi-detached dwellings; Seniors housing; Shop top housing; Waste or resource transfer stations; Any other development not otherwise specified in Item (b) or (d)

(d) the purposes for which the instrument provides that development is prohibited within the zone:

Air transport facilities; Amusement centres; Boat building and repair facilities; Correctional centres; Crematoria; Depots; Electricity generating works; Extractive industries; Forestry; Freight transport facilities; Heavy industrial storage establishments; Home occupations (sex services); Industrial training facilities; Industries; Intensive livestock agriculture; Open cut mining; Restricted premises; Retail premises; Rural industries; Sex services premises; Storage premises; Transport depots; Truck depots; Vehicle body repair workshops; Vehicle repair stations; Warehouse or distribution centres; Waste or resource management facilities; Wholesale supplies

(e) whether any development standards applying to the land fix minimum land dimensions for the erection of a dwelling-house on the land and, if so, the minimum land dimensions so fixed:

Yes, refer to the Bathurst Regional Development Control Plan 2014.

(f) whether the land includes or comprises critical habitat:

No.

(g) whether the land is in a conservation area (however described):

The land to which the certificate relates is not in a conservation area.

(h) whether an item of environmental heritage (however described) is situated on the land:

The land to which the certificate relates does not contain an item of environmental heritage.

2A. Zoning and land use under State Environmental Planning Policy (Sydney Region Growth Centres) 2006

Is the land to which the certificate relates land within any zone (however described) under:

(a) Part 3 of the State Environmental Planning Policy (Sydney Region Growth Centres)

2006 (the 2006 SEPP), or

(b) a Precinct Plan (within the meaning of the 2006 SEPP), or

(c) a proposed Precinct Plan that is or has been the subject of community consultation or on public exhibition under the Act,

the particulars referred to in clause 2 (a)–(h) in relation to that land (with a reference to "the instrument" in any of those paragraphs being read as a reference to Part 3 of the 2006 SEPP, or the Precinct Plan or proposed Precinct Plan, as the case requires).

No, the State Environmental Planning Policy (Sydney Region Growth Centres) 2006 does not apply to the Bathurst Regional LGA.

3. Complying development

Is the land to which the certificate relates land on which complying development may be carried out under each of the codes for complying development because of the provisions of clauses 1.17A (1) (c) to (e), (2), (3) and (4), 1.18 (1) (c3) and 1.19 of State Environmental Planning Policy (Exempt and Complying Development Codes) 2008?

Yes, Complying Development Certificates may be carried out pursuant to the State Environmental Planning Policy (Exempt and Complying Development Codes) 2008.

If complying development may not be carried out on that land because of the provisions of clauses 1.17A (1) (c) to (e), (2), (3) and (4), 1.18 (1) (c3) and 1.19 of that Policy, the reasons why it may not be carried out under that clause.

n/a.

4. Coastal protection

Is the land to which the certificate relates land which is affected by the operation of section 38 or 39 of the Coastal Protection Act 1979, but only to the extent that the council has been so notified by the Department of Services, Technology and Administration?

No.

4A. Certain information relating to beaches and coasts

In relation to a coastal council:

(1) whether an order has been made under Part 4D of the Coastal Protection Act 1979 in relation to emergency coastal protection works (within the meaning of that Act) on the land (or on public land adjacent to that land), except where the council is satisfied that such an order has been fully complied with.

(2)(a) whether the council has been notified under section 55X of the Coastal Protection Act 1979 that emergency coastal protection works (within the meaning of that Act) have been placed on the land (or on public land adjacent to that land), and

(b) if works have been so placed—whether the council is satisfied that the works have been removed and the land restored in accordance with that Act.

(3) such information (if any) as is required by the regulations under section 56B of the Coastal Protection Act 1979 to be included in the planning certificate and of which the council has been notified pursuant to those regulations.

Bathurst Regional Council is not a Coastal Council.

4B. Annual charges under Local Government Act 1993 for coastal protection services that relate to existing coastal protection works

In relation to a coastal council—whether the owner (or any previous owner) of the land has consented in writing to the land being subject to annual charges under section 496B of the Local Government Act 1993 for coastal protection services that relate to existing coastal protection works (within the meaning of section 553B of that Act).

Note. Existing coastal protection works are works to reduce the impact of coastal hazards on land (such as seawalls, revetments, groynes and beach nourishment) that existed before the commencement of section 553B of the Local Government Act 1993.

Bathurst Regional Council is not a Coastal Council.

5. Mine subsidence

Is the land to which the certificate relates land which is proclaimed to be a mine subsidence district within the meaning of section 15 of the Mine Subsidence Compensation Act 1961?

No.

6. Road widening and road realignment

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

(a) Division 2 of Part 3 of the Roads Act 1993; or

(b) any environmental planning instrument; or

(c) any resolution of the Council?

The land to which the certificate relates is not affected by road widening or realignment.

7. Council and other public authority policies on hazard risk restrictions

Whether or not the land is affected by a policy:

(a) adopted by the Council; or

(b) adopted by any other public authority and notified to the Council for the express purpose of its adoption by that authority being referred to in planning certificates issued by the Council;

that restricts the development of the land because of the likelihood of land slip, bushfire, tidal inundation, subsidence, acid sulphate soils or any other risk (other than flooding):

The land to which the certificate relates is not affected by any Council or other public authority's policy.

7A. Flood related development controls information

Whether or not development on that land or part of the land for the purposes of:

(a) dwelling houses, dual occupancies, multi dwelling housing or residential flat buildings (not including development for the purposes of group homes or seniors housing); or

(b) any other purpose:

is subject to flood related development controls.

The subject land is protected by a levee bank. Development standards relating to flood prone and flood protected land are contained within Chapter 9 of the Bathurst Regional Development Control Plan 2014 including relevant maps. Council's Floodplain Management Policy also applies to the subject land (See attachment).

8. Land reserved for acquisition

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

No, the land is not subject to land acquisition.

9. Contributions plans

The name of each contributions plan applying to the land:

Bathurst Regional Community Facilities

9A. Biodiversity certified land

Is the land to which the certificate relates, land which has been identified as biodiversity certified land under Part 7AA of the Threatened Species Conservation Act 1995?

No. The land is not identified as Biodiversity Certified Land.

10. Biobanking agreements

Is the land to which the certificate relates land to which a biobanking agreement under Part 7A of the Threatened Species Conservation Act 1995 relates (but only if the council has been notified of the existence of the plan by the Director-General of the Department of Environment, Climate Change and Water):

Council is not aware of any biobanking agreements affecting the land to which the certificate relates.

11. Bush fire prone land

Is the land (or part of the land) to which the certificate relates bush fire prone land (as defined in the Act)?

No, the land to which the certificate relates is not identified as bushfire prone.

12. Property vegetation plans

Is the land to which the certificate relates land to which a property vegetation plan under the Native Vegetation Act 2003 applies (but only if the council has been notified of the existence of the plan by the person or body that approved the plan under that Act):

Council is not aware of any property vegetation plans affecting the land to which the certificate relates.

13. Orders under Trees (Disputes Between Neighbours) Act 2006

Is the land to which the certificate relates the subject to an order (of which Council is aware) made

under the Trees (Disputes Between Neighbours) Act 2006?

No.

14. Directions under Part 3A

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

No.

15. Site compatibility certificates and conditions for seniors housing

(1) Is the land to which the certificate relates land to which a current site compatibility certificate (of which Council is aware) issued under State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004 in respect of the proposed development on the land?

No.

(2) The terms of any kind referred to in clause 18(2) of State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004 which have been imposed as a condition of consent to a Development Application granted on or after 11 October 2007 under with respect to the land to which this certificate relates?

n/a

16. Site compatibility certificates for infrastructure

Is the land to which the certificate relates land to which a valid site compatibility certificate (infrastructure) (of which Council is aware) issued under State Environmental Planning Policy (Infrastructure) 2007 in respect of proposed development on the land?

No.

17. Site compatibility certificates and conditions for affordable rental housing

(1) Is the land to which the certificate relates land to which a valid site compatibility certificate (affordable rental housing) (of which Council is aware) issued under State Environmental Planning Policy (Affordable Rental Housing) 2009 in respect of proposed development on the land?

No.

(2) A statement setting out any terms of a kind referred to in clause 17 (1) or 38 (1) of State Environmental Planning Policy (Affordable Rental Housing) 2009 that have been imposed as a condition of consent to a development application in respect of the land.

No.

18. Paper subdivision information

(1) The name of any development plan adopted by a relevant authority that applies to the land or that is proposed to be subject to a consent ballot.
(2) The date of any subdivision order that applies to the land.
(3) Words and expressions used in this clause have the same meaning as they have in Part

16C of this Regulation.

There are no paper subdivisions within the Bathurst Regional LGA.

19. Site verification certificates

A statement of whether there is a current site verification certificate, of which the council is aware, in respect of the land and, if there is a certificate, the statement is to include:

(a) the matter certified by the certificate, and
(b) the date on which the certificate ceases to be current (if any), and
(c) that a copy may be obtained from the head office of the Department of Planning and Infrastructure.

Council is not aware of any site verification certificates being issued for the land to which the certificate relates.

Note:

The following matters are prescribed by Section 59 (2) of the Contaminated Land Management Act 1997 as additional matters that are to be specified in a planning certificate:

(a) Is the land to which the certificate relates **significantly contaminated land** within the meaning of the Contaminated Land Management Act 1997?

No.

(b) Is the land to which the certificate relates subject to a **management order** within the meaning of the Contaminated Land Management Act 1997?

No.

(c) Is the land to which the certificate relates the subject of an **approved voluntary management proposal** within the meaning of the Contaminated Land Management Act 1997?

No.

(d) Is the land to which the certificate relates the subject to an **ongoing maintenance order** within the meaning of the Contaminated Land Management Act 1997?

No.

(e) Is the land to which the certificate relates the subject of a **site audit statement** within the meaning of the Contaminated Land Management Act 1979?

No.

The following matters are prescribed by Section 26 of the Nation Building and Jobs Plan (State Infrastructure Delivery) Act 2009 as additional matters that are to be specified in a planning certificate:

(a) Has the NSW Infractructure Co-ordinator General issued any exemption pursuant to Section 23 of the Nation Building and Jobs Plan (State Infrastructure Delivery) Act 2009 or an Authorisation pursuant to Section 24 of the Nation Building and Jobs Plan (State Infrastructure Delivery) Act 2009 (of which Council is aware)?

No.

D. Sherley
GENERAL MANAGER
Bathurst Regional Council

Per: Acutter Date: 11/12/15

ADDITIONAL INFORMATION PROVIDED PURSUANT TO SECTION 149(5) OF THE ACT.

101. Tree Preservation and Management Policy

Is an approval required to remove a tree or vegetation on the subject land?

No.

102. Heritage listings

Is the land to which the certificate relates subject to any additional heritage listings?

No.

D. Sherley
GENERAL MANAGER
Bathurst Regional Council

Per: _____ Date: 11/12/15

POLICY: FLOODPLAIN MANAGEMENT

DATE ADOPTED:

Director Environmental, Planning & Building Services' Report #7, Council 16 February 2011
Minute Book No. 11059

Director Engineering Services Report #1
Policy 4 November 2009
Council 18 November 2009
Minute Book No. 10808

Director Engineering Services Report #3
Council 4 February 2009
Minute Book No. 10585

Director Engineering Services Report #5, #6
Council 20 August 2008
Minute Book No. 10474

Director Environmental, Planning & Building Services' Report #10,
Council 30 March 2005
Minute Book No. 9495

ORIGINAL ADOPTION:

Director Corporate Services Report #1
Policy 1 December 2004, Council 8 December 2004
Minute Book No. 9416
(former BCC Policy)

FILE REFERENCE: 31.00002

OBJECTIVE: Implement and maintain a Floodplain Management Strategy which is the highest standard and condition that Council can reasonably afford in all of its circumstances and having regard to financial, economic, environmental, aesthetic, social or political factors or constraints and levee bank construction.

PART 1

SECTION 1

General Provisions Applying to all Parts and Sections

1. a) All matters and activities set out in all Parts and Sections of this Policy and any determination made pursuant thereto by a responsible person **SHALL ALWAYS** be subject to and limited by the funds and resources ("resource availability") voted and resolved by council.

   b) Subject to the provisions of Section 731 of the Local Government Act, 1993, a decision made by a responsible person in carrying out the functions of the Policy shall be a decision of the Council **PROVIDED ALWAYS** that a responsible person has acted in good faith for the purpose of executing this Policy.

   c) Expressions of words used in this Policy (or a particular provision of this Policy) which are defined in the dictionary at the end of this Policy have the meanings set out in the dictionary.

   d) A determination made by a responsible person in carrying out the functions of this Policy shall be recorded and maintained in such fashion as is determined by a responsible person. The manner and form of records as set out in Council's standard Risk Management procedure.

   e) Subject to a responsible person determining otherwise, "**Codes of Best Practice**", incorporating standard(s), method(s) and frequencies, shall be determined and implemented for all activities set out in this Policy and shall be reviewed on a continuing basis.

   f) **"Responsible person(s)"** shall be determined by the General Manager or his/her delegate.

   g) The determination of responsible persons as set out in Council's standard Risk Management procedures.

SECTION 2

Dictionary

2. **"as determined by a responsible person"** means:

   * a decision by a responsible person and

   * a decision made pursuant with the execution of this Policy and the functions, powers and duties set out therein.

"function" includes a power, authority and duty.

"month" means a calendar month.

"reasonably safe condition" means that in the ABSOLUTE OPINION of a responsible person:

* Safety measures were not required; or
* That safety measures taken were adequate and sufficient for a particular circumstance.
* Works carried out were in accordance with any Code of Best Practice or Standard determined pursuant with Section 1.e;

"responsible person" means the Council or an employee and/or a particular position as provided for in Council's standard Risk Management procedure.

"week" means the period Monday to Friday inclusive.

"working day" or **"day"** means Monday to Friday inclusive subject to the ordinary working hours" of Council.

"work site" means and includes any specific place or places at which construction or maintenance works are being carried out on by or under the actual direction and control of Council.

"year" means a calendar year.

SECTION 3

Instrument of Delegation

3. That subject to compliance with the requirements of the Local Government Act, 1993, and Ordinances thereunder and any express Policy or direction of Council, the Council pursuant to the provision of Section 377 of the Local Government Act, 1993, hereby delegates to the General Manager, authority to exercise and perform on behalf of Council, all functions, powers, authorities, duties and matters contained in this Policy.

SECTION 4

Implementation

4. That all recommendations in this Policy take operational effect from the date of Council Approval.

Having adopted a Floodplain Management Plan, Council's Plan Policy shall operate in conjunction with such.

1. INTRODUCTION:

The areas within the City of Bathurst which are affected by flooding, are those identified as inundated by 1% AEP flooding, as determined by the Bathurst Computer Based Floodplain Model, and such maps which may be updated from time to time, and are those identified as:

* Land which adjoins either the Macquarie River or the Queen Charlotte's Vale Creek;

* Have been identified as flood affected by the 1964, 1986 and/or 1990 floods;

* Are likely to be affected by inundation from a natural watercourse, or drainage channel; or

* All lands outside the designated flood line but contiguous to it, less than 0.5 metres above the designated flood level.

All land affected by flooding will be subject to this interim policy.

2. DESIGNATED FLOOD:

The designated flood or flood standard shall be defined by the following designated floods:

(a) 1% AEP Flood as determined by the Bathurst Computer Based Flood Model, as amended for the Macquarie River and the Queen Charlotte's Vale Creek, as detailed therein;

(b) For areas beyond the flood model, including natural creeks and drainage channels, the 1% AEP flood, as calculated by accepted engineering methods.

(c) 1% AEP Flood extents as determined by the Georges Plains Floodplain Risk Management Plan.

(d) 1% AEP Flood extents as determined by the Sofala Floodplain Risk Management Plan.

All land subject to inundation/flooding by the designated flood shall be defined as within the designated flood area.

3. DEVELOPMENT WITHIN THE DESIGNATED FLOOD AREA:

The criteria outlined in Appendix B of the NSW Government Floodplain Development Manual shall be used for the assessment of flood hazard of those properties which are affected by flooding from the Macquarie River and Queen Charlotte's Vale Creek, and are included in the study area of the computer based flood model, utilising the depth and velocity calculations generated by the Model.

For watercourses not included in the Bathurst Computer Based Flood Model, Council has resolved that low hazard flood areas are those areas effected by 0.5 metre of flood water, or less.

4. DEVELOPMENT OF LANDS AFFECTED BY A NATURAL WATERCOURSE

That all applications for flood levels be in writing and that a charge, as may be determined from time-to-time, apply for the supply of such information. (Formerly Policy No. 8).

5. RAGLAN CREEK

Council has adopted, as a matter of policy, for consistency of analysis, Council's calibrated RAFTS Model as the only method of assessing the hydrology of Raglan Creek. In this, all developments ultimately discharging into the Raglan Creek, will be subject to a Council charge, for the assessment of the effects of the development within the Raglan Creek Catchment, should such assessment be required.

6. VOLUNTARY PURCHASES

That Council agree to participate in the purchase of flood prone land, in conjunction with the New South Wales State Government and the Commonwealth Government on a voluntary basis in accordance with the following requirements, as stipulated by the Minister for Water Resources, namely:

1. That Council submit a proposal to the Department of Water Resources, giving details of the property to be purchased, including the purchase price and how this was arrived at;

2. Submit a detailed valuation of the property prepared and authenticated by the Valuer General's Department;

3. Submit a proposal for the future use of the land and that Council agree that it will:

(a) zone the land as open space, restricting all possible development, including the placement of fill or planting of trees;

(b) retain control of the land in perpetuity

(c) ensure that appropriate steps are taken to record its open-space zoning. (Formerly policy No. 26) or such other requirements, and practice which may be applicable, from time to time.

This Clause applies to the Kelso floodplain, as identified in the Floodplain Management Plan.

The priority of purchase is based on:

(a) occupied by owner;

(b) hazard rating for the 1% AEP flood;

(c) whether over floor flooding has been experienced previously;

(d) the level of adverse effects to the property as a result of other structural measures on the floodplain; notwithstanding that Council may purchase any property earmarked for voluntary purchase should it become available.

Appendix D

Douglas Partners SAQP

Douglas Partners Pty Ltd
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Project 85164.00.R.001
26 October 2015
DIH:jlb

Opal Aged Care Pty Ltd
C/- Align Projects Pty Ltd
GF 258 Stanmore Road
Stanmore NSW 2048

Attention: Mr Alex Soovoroff

Email: alex@alignprojects.com.au

Dear Sirs

Sampling and Analysis Quality Plan
Proposed Aged Care Facility
Lots 2-5 Deposited Plan 1089380, Stanley Street, Bathurst

1. Introduction

This Sampling and Analysis Quality Plan (SAQP) has been prepared for a contamination investigation to be undertaken on the site identified as Lots 2-5 in Deposited Plan 1089380, located on Stanley Street, Bathurst.

The work will be undertaken in accordance with Douglas Partners Pty Ltd (DP) proposal dated 15 October 2015 (Proposal ref: SYD151045.P.001 Rev 3 and SYD151045.P.002). The work was commissioned by Align Projects Pty Ltd on behalf of the client, Opal Aged Care Pty Ltd.

It is understood that Council has indicated during preliminary discussions with the client that a site audit statement (SAS) will be required as part of the consent conditions for the proposed residential aged care facility. Given this, an independent Site Auditor, Mr Andrew Kohlrusch of GHD Pty Ltd, has been appointed for this project and as such is required to review this SAQP.

2. Background- Previous Investigations

Lots 2, 3 and 4 in Deposited Plan 1089380

A due diligence desktop report for Lots 2, 3 and 4 which reviewed aerial photographs, NSW EPA notices and Council records was undertaken by Martens & Associates Pty Ltd (Martens) in February 2012.[1]

A further intrusive contamination investigation was undertaken by Martens in April 2014[2] on Lots 2, 3 and 4 (no assessment of Lot 5 was undertaken). This included the augering and sampling of seven

[1] Martens and Associates Pty Ltd, *'Due Diligence Study – Lots 2, 3 and 4 DP 1089380, Stanley Street, Bathurst'*, February 12 2014, ref: P1304066JC02V03
[2] Martens and Associates Pty Ltd, 'Stage 2 Environmental site Assessment, Lots 2, 3 and 4 DP 1089380, 81 and 105 Stanley Street, Bathurst, NSW', April 2014, ref: P1304066JR01V01

boreholes using a drill rig or hand auger and the collection of surface samples at a further 19 locations. Soil samples were also collected from two stockpiles identified on the site with an additional two material samples (thought to potentially contain asbestos) collected. The sample locations are shown on Martens Drawing SK001, extracted from Marten 2014.

Samples were analysed for the following contaminants: total recoverable hydrocarbons (TRH) (six samples), monocyclic aromatic hydrocarbons (benzene, toluene, ethylbenzene and xylene- BTEX) (six samples), polycyclic aromatic hydrocarbons (PAH) (six samples), heavy metals (arsenic cadmium, chromium, copper, lead, mercury, nickel and zinc) (15 samples), organochlorine pesticides (OCP) (15 samples), organophosphate pesticides (OPP) (15 samples) and asbestos (two soil samples and two material samples).

The deepest filling was observed in the northern corner where test bore 125 was terminated within filling at 1 m depth (see Martens Drawing SK001). Fill generally comprised grey and brown clayey sand and clay/silty clay with variable quantities of gravel. It is noted that filling in stockpiles over TP102, SP01 and SP02 consisted of a clayey sand mixed with building rubble (including train and car parts, metal drums, PVC pipes, plastics, particle boards, concrete slabs, wood spray cans and old paint cans). Other stockpiles and areas of fill were considered to be consistent with site alluvial soils. Fill was underlain by natural grey and brown clays.

The results recorded generally low concentrations of chemical contamination. Martens concluded that lead in the area of the sheds on Lot 3 and asbestos within a stockpile of dumped waste were areas of contaminant concern which needed to be addressed for the site to be considered suitable for use from a contamination perspective. No groundwater assessment was undertaken.

105 Stanley Street (Lots 6-7 and 108-110 Deposited Plan 1186378)

Envirowest Consulting Pty Ltd (Envirowest) undertook an intrusive contamination investigation on the property to the west of the subject site in May 2014 (105 Stanley Street, Bathurst).[3] Whilst the site investigated does not comprise that subject to DP's investigation, notably it identified an old quarry that has been backfilled with filling (including building waste) approximately 2 - 4 meters deep. It is unclear if this former quarry extends onto the aged care facility site, in particular Lot 5. Contaminants of concern identified in the Envirowest investigation included lead, polycyclic aromatic hydrocarbons (PAH), total petroleum hydrocarbons (TRH) and asbestos. No groundwater assessment was undertaken as part of the investigation although DP understands that such an assessment has or is currently being undertaken.

Sample locations are Shown on Envirowest Figure 3: Sample Locations, extracted from Envirowest 2014.

Furthermore, DP also understands that this site is currently undergoing remediation due to the asbestos contamination with a cap and manage approach being implemented. Works on the site have tended to indicate that filling appears to be deeper towards the north of the site and may be reflective of what is encountered on the aged care site (if the quarry extends across the site boundary).

[3] Envirowest Consulting Pty Ltd, 'Detailed Contamination Investigation, Aged Care Development, 105 Stanley Street, Bathurst, NSW', 6 May 2014, ref: R13108c.2

There are some data gaps in the provided reports which should be addressed to manage risk to the proposed development. These gaps relate to in particular, the fill profile (especially across Lot 5), presence of asbestos and consideration to potential impacts on groundwater quality due to the detected lead, TRH and PAH detected in the filling (as noted in the previous investigations).

3. Objectives

The scope of the contamination investigation has been designed to assess the suitability of the site for the proposed aged care development by assessing Lot 5 and addressing the data gaps identified in the previous investigations. The assessment is also designed to provide sufficient information to inform the remediation action plan (RAP) for the site, which is assumed will be required based on the information outlined in the previous reports.

4. Data Quality Objectives

This SAQP has been devised broadly in accordance with the seven step data quality objective (DQO) process which is provided in Appendix B, Schedule B2 of *National Environment Protection (Assessment of Site Contamination) Measure* 1999, as amended 2013 (NEPC, 2013). The DQO process is outlined as follows:

(1) State the Problem

The site is proposed to be developed for a two storey residential aged care facility, with minimal excavation required. Previous investigations have indicated the potential contamination is present as a result of the filling located on the site. The “problem” to be addressed is that additional information is required to inform the assessment on the sites suitability for its proposed landuse and the likely preparation of a detailed RAP for the proposed development.

(2) Identify the Decision/Goal of the Study

Based on the available site history and sample analysis from the site and adjacent property, it is considered that the contaminants of potential concern (COPC) are; metals, TRH (as a screening test for total petroleum hydrocarbons); BTEX; PAH; PCB, OCP, OPP, VOC, phenol and asbestos. The media affected is likely to be soil and possibly groundwater.

The analytical data will be compared to the health and ecological assessment criteria for residential land use in accordance with NEPC (2013) and the NSW EPA *Waste Classification Guidelines* (2014)

The suitability of the site for a residential land use will be based on a comparison of the analytical results for all COPC to the adopted site assessment criteria and, if necessary, compared to the 95% UCL of the mean concentrations.

The following specific decisions will be made, as appropriate:

- What is the conceptual site model (i.e. sources, receptors, migration pathways, exposure)?
- Do the existing fill materials and/or natural soils pose a potential risk to identified receptors?
- Does the existing groundwater beneath the site pose a potential risk to identified receptors?

- Is the data sufficient to make a decision regarding the abovementioned risks, the compatibility of the site for the proposed development or are additional investigations required?
- Does contamination at the site, if encountered, trigger the Duty to Report requirements under the CLM Act 1997?
- Are there any off-site migration issues that need to be considered?
- Is the data sufficient to enable the preparation of a RAP and/or Environmental Management Plan (EMP) should the data suggest these are required?

(3) Identify Information Inputs

Inputs into the decisions are as follows:

- Results of previous investigations (as discussed in Section 2 above);
- Historical land titles and Section 149 Planning Certificates (not included in previous investigations by Martens);
- Regional geology, topography and hydrogeology;
- Soil and groundwater samples collected for analysis;
- The lithology of the site as described in the test pit and test bore logs*;*
- If site conditions suggest additional COPC i.e. condition of subsurface material encountered during test bores and pits (odours, staining etc.), further analysis will be undertaken;
- Field and laboratory QA/QC data to assess the suitability of the environmental data for the assessment;
- All analysis will be undertaken at a NATA accredited laboratory; and
- The results will be compared with the NEPC (2013) criteria and the *Waste Classification Guidelines* (2014) discussed in DQO Item 2.

(4) Define the Study Boundaries

The site is identified as Lots 2-5 in Deposited Plan 1089380, Bathurst, NSW and is located on Stanley Street. The site covers an irregular area of approximately 1.7 ha. The approximate lateral site boundaries are defined on the attached Drawing 1. The soils investigation will be undertaken to the depth of the filling plus 0.5 m and a maximum 10 m depth or 2 m below groundwater level for the groundwater investigation component.

(5) Develop the Analytical Approach (or decision rule)

The information obtained during the assessment, in addition to the information in previous reports, will be used to characterise the site in terms of contamination issues and risk to human health and/or the environment. The decision rules used in characterising the site will be as follows:

- Laboratory test results will be assessed individually as an initial screen and statistically, if considered appropriate, to determine the 95% upper confidence level (UCL) of the mean concentration for each analyte or analyte group (of like materials);

- The adopted site criteria will be the NSW Environment Protection Authority (EPA) endorsed criteria.
- Where such criteria are not available, other recognised national or international standards will be used;
- Further investigation, remediation and/or management will be recommended if the adopted criteria are exceeded.

Field and laboratory test results will considered useable for the assessment after evaluation against the following data quality indicators (DQIs):

- Precision – a measure of variability or reproducibility of data;
- Accuracy – a measure of closeness of the data to the 'true' value;
- Representativeness – the confidence (qualitative) of data representativeness of media present on site;
- Completeness – a measure of the amount of usable data from a data collection activity; and
- Comparability – the confidence (qualitative) that data may be considered to be equivalent for each sampling and analytical event.

(6) Specify the Performance or Acceptable Criteria

Considering that the proposed development will comprise residential land use, decision errors for the respective COPC for fill/soil and groundwater are:

1. Deciding that the media on site exceeds the assessment criteria when they truly do not; and
2. Deciding that the media on site are within the assessment criteria when they are truly not.

Decision errors for the proposed assessment will be minimised and measured by the following:

- The soil sampling regime will target each stratum identified to account for site variability and where signs of contamination are identified. Sampling density for this assessment in combination with the previous data will be in accordance with the NSW EPA *Sampling Design Guidelines* 1995. Drawing 1 shows proposed sample locations which is to be confirmed on-site following the initial site inspection;
- The groundwater assessment will focus on up-gradient, across-gradient and down-gradient contaminant information;
- Sample collection and handling techniques will be in accordance with *DP's Field Procedures Manual;*
- Samples will be prepared and analysed by NATA-accredited laboratories with the acceptance limits for laboratory QA/QC parameters based on the laboratory reported acceptance limits and those stated in NEPC (2013);
- The analyte selection is based on the available site history, past site activities, site features and the findings of the previous investigations;
- The assessment criteria will be adopted from established and NSW EPA endorsed guidelines including NEPC (2013). Where not available, recognised national and international guidelines will be used. The assessment criteria have risk probabilities already incorporated;

- A significance level of 0.05 will be adopted for data with statistical analysis of 95% Upper Confidence Limit (95% UCL) of average concentrations where required; and
- Only NATA accredited laboratories using NATA endorsed methods will be used to perform laboratory analysis. Where NATA endorsed methods are not used, the reasons will be stated. The effect of using non-NATA methods on the decision making process will be explained.

(7) Optimise the design for obtaining data

Sampling design and procedures that will be implemented to optimise data collection for achieving the DQOs include the following:

- Only NATA accredited laboratories using NATA endorsed methods will be used to perform laboratory analysis whenever possible*;*
- To optimise the selection of soil samples for chemical analysis, all samples collected will be screened using a calibrated photo-ionisation detector (PID) allowing for site assessment and sample selection. In addition, additional soil samples will be collected but kept 'on hold' pending details of initial analysis and will be analysed if further delineation is required;
- To optimise the representativeness of groundwater samples, prior to sample collection groundwater wells will be monitored for free product (using an interface probe) and field parameters measured and allowed to stabilise (using low flow sample techniques and multiprobe); and
- Adequately experienced engineers and scientists will be chosen to conduct field work and sample analysis interpretation.

5. Proposed Scope of Works

Based on the observations and results of previous investigations, DP proposes to undertake a detailed intrusive investigation across Lot 5 and a limited investigation across Lots 2, 3 and 4 to confirm the findings (or otherwise) of Martens (2014), which comprised 29 sample locations (including the two stockpiles). For a 1.7 ha site the NSW EPA *Sampling Design Guidelines* 1995 recommends a minimum of twenty-seven sample locations. It is noted for a 0.25 ha site (the area of Lot 5) a minimum of eight sample locations is recommended. Given the potential depth of filling, allowance has also been made for a groundwater contamination assessment comprising three wells.

The proposed scope for the desktop component would be:

- Detailed review of available previous reports by Martens and Envirowest;
- Review of site 149 Planning Certificates;
- Review of historical land titles; and
- Review of published geological, soil landscape and acid sulphate soil maps.

The proposed scope of field work would be:

- Site walkover to identify any AEC's not previously identified in earlier investigations and confirm sample locations;

- Excavate sixteen test pits (eight in Lot 5 and eight across Lots 2, 3 and 4) using an excavator up to a maximum depth of 4 m, 0.5 m into natural soils or prior refusal (whichever is the lesser);
- Drill three test bores up to a maximum depth of 10 m or 2 m below groundwater (whichever is the lesser) and convert to groundwater monitoring wells. Wells will comprised class 18 PVC slotted pipe to 0.5 m above groundwater level with the annulus backfilled with a gravel pack to 0.5 m above slotted screen and sealed with a 1 m thick bentonite seal. Note that we have not allowed for core recovery and logging will be limited to observations from auger returns;
- Logging of each test pit/bore by an engineer or scientist;
- Collect soil samples (including 10% replicates) from each test pit and test bore at regular intervals and where signs of contamination are observed. Each sample will be screened for VOC using a PID;
- Develop each groundwater well by removing 3-5 well volumes of water or until the well is dry; and
- Collect groundwater samples from each well using low flow techniques following water level measurement with inter-face probe and stabilisation of field parameters.

The proposed analysis of soil samples testing comprises:

- Chemical analysis of 20 soil samples and three groundwater for a combination of the identified contaminants of concern and parameters;
  - Heavy metals (As, Cd, Cr, Cu, Fe, Pb, Hg, Ni, Zn) (HM) (20 soil and 3 groundwater samples);
  - TRH (a screening test for total petroleum hydrocarbons - TPH) (20 soil and 3 groundwater samples);
  - BTEX (25 soil and 3 groundwater samples);
  - PAH- Note: low level analysis for groundwater (20 soil and 3 groundwater samples);
  - Phenols (11 soil and 2 groundwater samples);
  - PCB- Note: trace level analysis for groundwater (11 soil and 2 groundwater samples);
  - OCP- Note: trace level analysis for groundwater (11 soil and 2 groundwater samples);
  - OPP- Note: trace level analysis for groundwater (11 soil and 2 groundwater samples);
  - Hardness (3 groundwater samples);
  - pH- for calculation of environmental investigation levels (4 soil samples);
  - Cation exchange capacity (CEC)- for calculation of environmental investigation levels (4 soil samples);
  - Asbestos (combination of 500g (5 samples) and 40g (14 samples) soil samples for initial screening purposes);

  Analysis of the following samples for QA/QC purposes will also be undertaken:
  - 5% Intra-laboratory replicate soil samples for heavy metals and TRH/BTEX (1 soil and 1 groundwater allowed);
  - 5% Inter-laboratory replicate soil samples for heavy metals and TRH/BTEX (1 soil allowed); and
  - Trip spike and blank for BTEX (1 pair of soil and 1 pair of water samples).
- TCLP analysis (PAH and metals) of four samples for waste classification purposes.

Field sampling and laboratory analysis in general accordance with standard environmental protocols, including a Quality Assurance/Quality Control (QA/QC) plan consisting of 5% intra-laboratory and 5% inter-laboratory replicate sampling, field blanks, trip spikes and appropriate Chain of Custody procedures and in–house laboratory QA/QC testing. Primary samples would be sent to Envirolab Services Pty Ltd and secondary samples to another laboratory to be confirmed (both will be NATA accredited laboratories).

Upon completion of sampling from the test pits, locations will be reinstated by returning the soil to the pit and tamping with the excavator bucket. The surface of the pits will be left slightly proud of the ground surface and may settle with time.

A detailed site (contamination) investigation report will be prepared detailing the methodology and results of the assessment. The report will include a conceptual site model, discussion of the field and analytical results including comment on the risk and nature of contamination at the site. Recommendations for further assessment may be included if a notable risk for contamination is identified. The report will include a provisional waste classification assessment.

6. Concluding Statement

Adherence to the SAQP will assist in providing suitable sampling and analysis data which can be confidently used to assess the condition of the fill/soil and groundwater at the site.

Upon completion of the field investigation DP will produce a report detailing the sampling methodology adopted, the results of field measurements and laboratory analysis and the field and laboratory QA/QC results.

The SAQP should be reviewed and agreed by the Site Auditor prior to implementation.

7. Limitations

Douglas Partners (DP) has prepared this report for this project at Lots 2-5 Deposited Plan 1089380, Stanley Street, Bathurst, in accordance with DP's proposal dated 15 October 2015 (Proposal No. SYD151045.P.001 Rev 3). This report is provided for the exclusive use of Opal Aged Care Pty Ltd for this project only and for the purposes as described in the report. It should not be used by or relied upon for other projects or purposes on the same or other site or by a third party. Any party so relying upon this report beyond its exclusive use and purpose as stated above, and without the express written consent of DP, does so entirely at its own risk and without recourse to DP for any loss or damage. In preparing this report DP has necessarily relied upon information provided by the client and/or their agents.

This report must be read in conjunction with all of the attached notes and should be kept in its entirety without separation of individual pages or sections. DP cannot be held responsible for interpretations or conclusions made by others unless they are supported by an expressed statement, interpretation, outcome or conclusion given in this report.

This report, or sections from this report, should not be used as part of a specification for a project, without review and agreement by DP. This is because this report has been written as advice and opinion rather than instructions for construction.

Please contact either of the undersigned for clarification of the above as necessary.

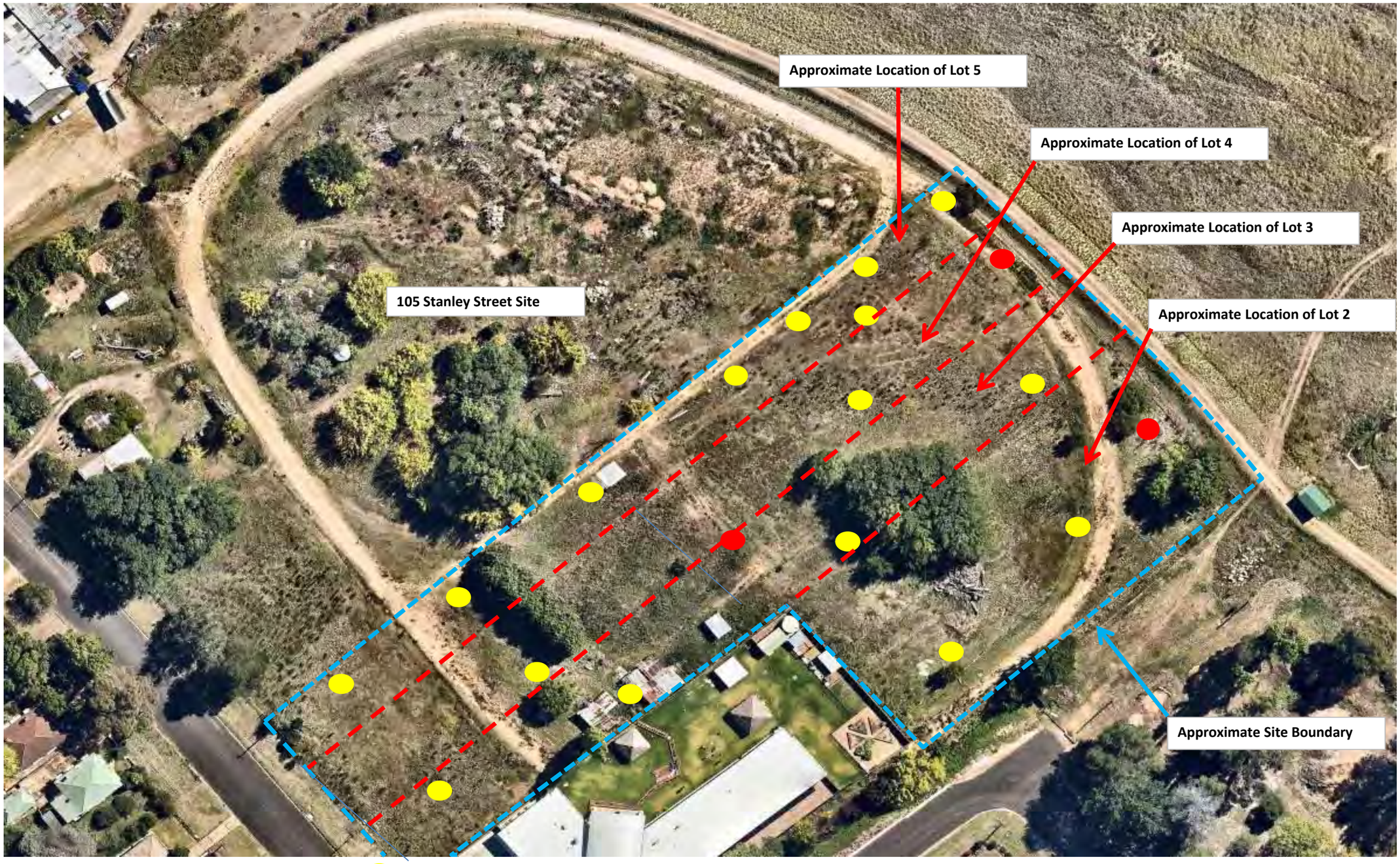
Yours faithfully
Douglas Partners Pty Ltd

Reviewed by

David Holden
Senior Associate

Paul Gorman
Senior Associate

Attachment: Drawing 1- Proposed Location of Test Pits and Groundwater Monitoring Wells
Site Survey Plan
Martens Drawing SK001 (extracted from Martens 2014)
Envirowest Figure 3: Sample Locations (extracted from Envirowest 2014)
Notes About this Report



Test Pits

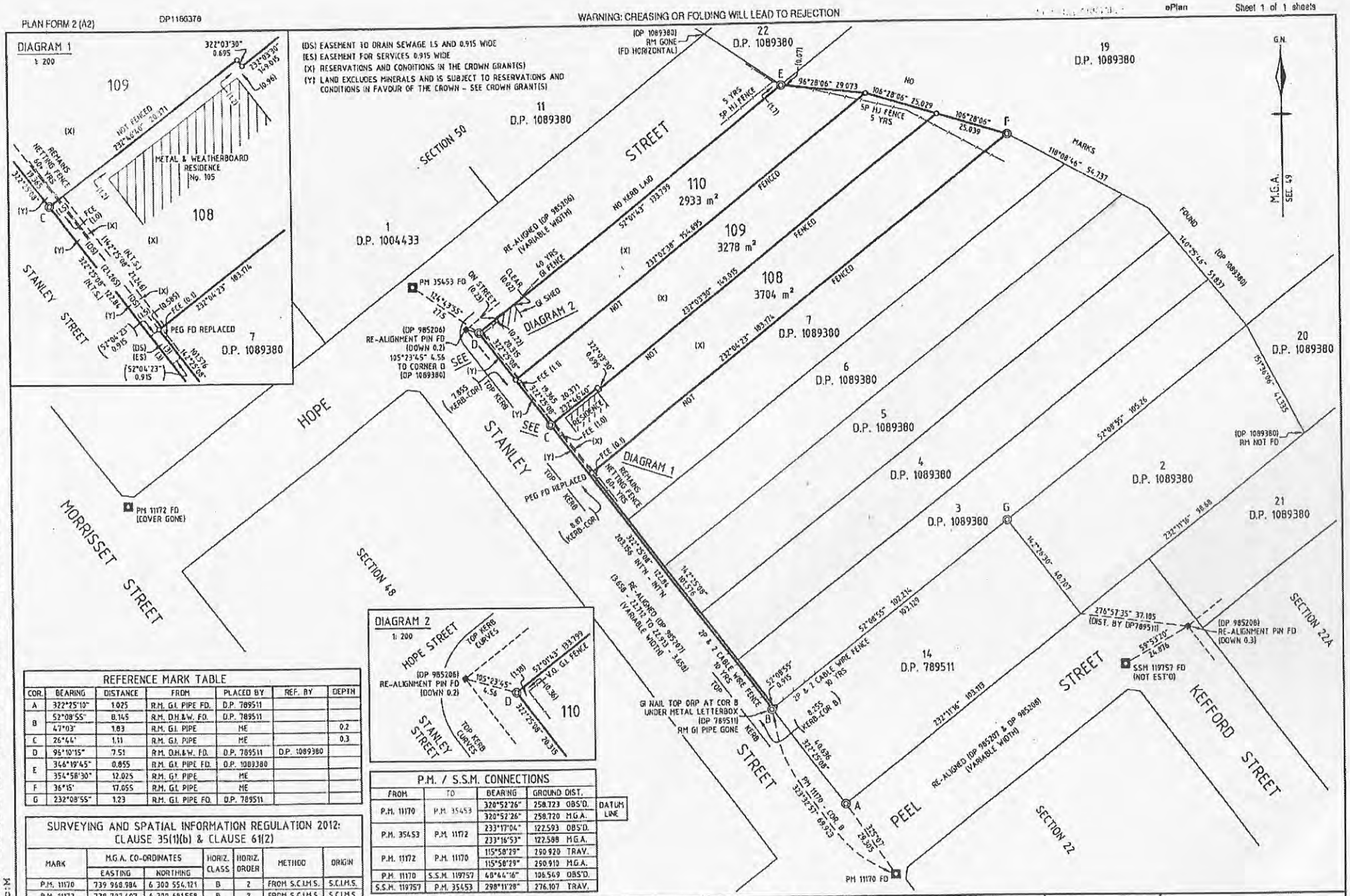
Groundwater Monitoring Wells

Douglas Partners
Geotechnics | Environment | Groundwater

CLIENT:	Opal Aged Care Pty Ltd			TITLE:	**Proposed Location of Test Pits and Groundwater Monitoring Wells**
OFFICE:	SYD	DRAWN BY:	DIH		**Proposed Aged Care Facility**
SCALE:	As shown	DATE:	22 Oct 2015		**Stanley Street, Bathurst**

PROJECT No:	85164
DRAWING No:	1
REVISION:	A

PLAN FORM 2 (A2) DP1186378 WARNING: CREASING OR FOLDING WILL LEAD TO REJECTION ePlan Sheet 1 of 1 sheets



REFERENCE MARK TABLE						
COR.	BEARING	DISTANCE	FROM	PLACED BY	REF. BY	DEPTH
A	322°25'10"	1.025	R.M. GI. PIPE FD.	D.P. 789511		
B	52°08'55"	8.145	R.M. D.H.&W. F.D.	D.P. 789511		
	47°03'	1.83	R.M. GI. PIPE	ME		0.2
C	26°44'	1.11	R.M. GI. PIPE	ME		0.3
D	95°10'15"	7.51	R.M. D.H.&W. F.D.	D.P. 789511	D.P. 1089380	
E	346°19'45"	0.855	R.M. GI. PIPE FD.	D.P. 1089380		
	354°58'30"	12.025	R.M. GI. PIPE	ME		
F	36°15'	17.055	R.M. GI. PIPE	ME		
G	232°08'55"	1.23	R.M. GI. PIPE FD.	D.P. 789511		

SURVEYING AND SPATIAL INFORMATION REGULATION 2012: CLAUSE 35(1)(b) & CLAUSE 61(2)						
MARK	M.G.A. CO-ORDINATES		HORIZ. CLASS	HORIZ. ORDER	METHOD	ORIGIN
	EASTING	NORTHING				
P.M. 11170	739 968.984	6 300 554.121	B	2	FROM S.C.I.M.S.	S.C.I.M.S.
P.M. 11172	739 707.407	6 300 691.558	B	2	FROM S.C.I.M.S.	S.C.I.M.S.
P.M. 35453	739 805.691	6 300 754.866	A	1	FROM S.C.I.M.S.	S.C.I.M.S.
S.S.M. 119757	740 056	6 300 619	U	U	FROM S.C.I.M.S.	S.C.I.M.S.

SOURCE: M.G.A. CO-ORDINATES SUPPLIED BY LAND AND PROPERTY INFORMATION S.C.I.M.S. DATED 19th APRIL 2013
COMBINED SCALE FACTOR = 1.000203 ZONE 55

P.M. / S.S.M. CONNECTIONS				
FROM	TO	BEARING	GROUND DIST.	
P.M. 11170	P.M. 35453	320°52'26"	258.723 OBS'D.	DATUM LINE
		320°52'26"	258.720 M.G.A.	
P.M. 35453	P.M. 11172	233°17'04"	122.593 OBS'D.	
		233°16'53"	122.588 M.G.A.	
P.M. 11172	P.M. 11170	115°58'29"	260.920 TRAV.	
		115°58'29"	260.910 M.G.A.	
P.M. 11170	S.S.M. 119757	60°44'16"	106.549 OBS'D.	
S.S.M. 119757	P.M. 35453	298°11'28"	276.107 TRAV.	

SURVEYOR: MARCUS ALEXANDER RATSEP of Voerman & Ratsep, P.O. Box 16, Bathurst N.S.W. 2795
DATE OF SURVEY: 2nd May 2013
SURVEYOR'S REFERENCE: 906901LTDH (V1)

PLAN OF: SUBDIVISION OF LOTS 8, 9 & 10 IN D.P. 1089380 AND LOT 12 OF SECTION 49 IN D.P. 758065

L.G.A: BATHURST REGIONAL
Locality: BATHURST
Subdivision No.: 2013/99
Lengths are in metres. Reduction Ratio 1: 800

Registered 25.6.2013

DP1186378

KEY

BOREHOLE LOCATION

TEST PIT LOCATION

STOCKPILE & ASB LOCATIONS

LOT BOUNDARY

0 10 20 30 40 50

UNITS - METRES

N W E S

Martens & Associates Pty Ltd ABN 85 070 240 890	**Environment | Water | Wastewater | Geotechnical | Civil | Management**
Drawn: KT	**CONTAMINATION ASSESSMENT LOCATIONS PLAN** **LOTS 2, 3 & 4 DP 1089380 STANLEY STREET, BATHURST**
Approved: GT	Drawing No./ID: **SK001**
Date: 09.04.14	
Scale @A3: 1:1000	

6/37 Leighton Place, Hornsby, NSW 2077 Australia Phone: (02) 9476 9999 Fax: (02) 9476 8767
Email: mail@martens.com.au Internet: http://www.martens.com.au

Project:	File:	Revision:
P1304066	JD01V01	A

Figure 3. Sample locations

105 Stanley Street, Bathurst NSW

Envirowest Consulting Pty Ltd

Job R13108c	Drawn by: DL	Date: 23/04/2014

About this Report

Douglas Partners

Introduction

These notes have been provided to amplify DP's report in regard to classification methods, field procedures and the comments section. Not all are necessarily relevant to all reports.

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

Copyright

Borehole and Test Pit Logs

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

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

Groundwater

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

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

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

Reports

The report has been prepared by qualified personnel, is based on the information obtained from field and laboratory testing, and has been undertaken to current engineering standards of interpretation and analysis. Where the report has been prepared for a specific design proposal, the information and interpretation may not be relevant if the design proposal is changed. If this happens, DP will be pleased to review the report and the sufficiency of the investigation work.

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

- Unexpected variations in ground conditions. The potential for this will depend partly on borehole or pit spacing and sampling frequency;
- Changes in policy or interpretations of policy by statutory authorities; or
- The actions of contractors responding to commercial pressures.

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

About this Report

Site Anomalies

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

Information for Contractual Purposes

Where information obtained from this report is provided for tendering purposes, it is recommended that all information, including the written report and discussion, be made available. In circumstances where the discussion or comments section is not relevant to the contractual situation, it may be appropriate to prepare a specially edited document. DP would be pleased to assist in this regard and/or to make additional report copies available for contract purposes at a nominal charge.

Site Inspection

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

Appendix E

Data Quality Assessment

DATA QUALITY ASSESSMENT

E1. Data Quality Objectives

The Detailed Site Investigation (DSI) was prepared with reference to the seven step data quality objective (DQO) process which is provided in Appendix B, Schedule B2 of the *National Environment Protection (Assessment of Site Contamination) Measure* 1999 as amended 2013 (NEPC, 2013). The DQO process is outlined as follows:

- Stating the Problem;
- Identifying the Decision;
- Identifying Inputs to the Decision;
- Defining the Boundary of the Assessment;
- Developing a Decision Rule;
- Specifying Acceptable Limits on Decision Errors; and
- Optimising the Design for Obtaining Data.

The DQOs have been addressed within the report as shown in Table E1. They are also expanded on in the SAQP which is in Appendix D.

Table E1: Data Quality Objectives

Data Quality Objective	Report Section where Addressed
State the Problem	S1 Introduction
Identify the Decision	S1 Introduction (objective) S10 Discussion of Results S11 Updated Conceptual Site Model S12 Conclusion and Recommendations
Identify Inputs to the Decision	S1 Introduction S2 Scope of Works S3 Site Identification and Description S4 Regional Topography, Geology and Hydrogeology S5 Desktop Review S6 Conceptual Site Model S8 Site Assessment Criteria S9 Fieldwork Results
Define the Boundary of the Assessment	S3.1 Site Identification Site Drawing1 – Appendix A
Develop a Decision Rule	S8 Site Assessment Criteria

Data Quality Objective	Report Section where Addressed
Specify Acceptable Limits on Decision Errors	S7 Fieldwork and Analysis S8 Site Assessment Criteria QA/QC Procedures and Results – Sections Q2, Q3
Optimise the Design for Obtaining Data	S2 Scope of Works S7.6 Sample Location and Rationale QA/QC Procedures and Results – Sections E2, E3

E2. FIELD AND LABORATORY QUALITY CONTROL

The field and laboratory quality control (QC) procedures and results are summarised in Tables E2 and E3. Reference should be made to the fieldwork and analysis procedures in Section 7 and the laboratory results certificates in Appendix G for further details.

Table E2: Field QC

Item	Frequency	Acceptance Criteria	Achievement
Intra-laboratory replicates	5% primary soil and groundwater samples	RPD <30% inorganics, <50% organics	yes[1]
Inter-laboratory replicates	5% primary soil samples	RPD <30% inorganics and organics	yes[2]
Trip Spikes	1 per field batch	60-140% recovery	yes
Trip Blanks	1 per field batch	<PQL/LOR	yes

NOTES: 1 qualitative assessment of RPD results overall; refer Section E2.1
2 qualitative assessment of RPD results overall; refer Section E2.2

Table E3: Laboratory QC

Item	Frequency	Acceptance Criteria	Achievement
Analytical laboratories used		NATA accreditation	yes
Holding times		In accordance with NEPC (2013) which references various Australian and international standards	yes
Laboratory / Reagant Blanks	1 per lab batch	<PQL	yes
Laboratory duplicates	10% primary samples	Laboratory specific [1]	
Matrix Spikes	1 per lab batch	70-130% recovery (inorganics); 60-140% (organics); 10-140% (SVOC, speciated phenols)	yes
Surrogate Spikes	organics by GC	70-130% recovery (inorganics); 60-140% (organics);	yes

Item	Frequency	Acceptance Criteria	Achievement
Control Samples	1 per lab batch	70-130% recovery (inorganics); 60-140% (organics); 10-140% (SVOC, speciated phenols)	yes

NOTES: 1 ELS: <5xPQL – any RPD; >5xPQL – 0-50%RPD

In summary, the QC data is considered to be of sufficient quality to be acceptable for the assessment.

E2.1 Intra-Laboratory Replicates

Intra-laboratory replicates were analysed as an internal check of the reproducibility within the primary laboratory ELS and as a measure of consistency of sampling techniques. The comparative results of analysis between original and intra-laboratory replicate samples are summarised in Table E4.

Note that, where both samples are below LOR/PQL the difference and RPD has been given as zero. Where one sample is reported below LOR/PQL, but a concentration is reported for the other, the LOR/PQL value has been used for calculation of the RPD for the less than LOR/PQL sample.

Table E4: Relative Percentage Difference Results – Intra-laboratory Replicates

Lab	Sample ID	Date Sampled	Media	Units	Metals								PAH				TRH				BTEX			
					As	Cd	Cr	Cu	Pb	Hg	Ni	Zn	total	BaP TEQ	BaP	Naphthalene	C6-C10	>C10-C16	>C16-C34	>C34-C40	Benzene	Toluene	Ethylbenzene	xylene
ELS	TP1/0.4-0.5	2/11/15	filling	mg/kg	<4	<0.4	18	13	14	0.2	13	25	0	<0.5	<0.05	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3
ELS	BD1A	2/11/15	filling	mg/kg	<4	<0.4	21	12	12	<0.1	14	26	0	<0.5	<0.05	<0.1	<25	<50	<100	<100	<0.1	<0.1	<1	<0.3
Difference				mg/kg	0	0	3	1	2	**0.1**	1	1	0	0	0	0	0	0	0	0	0	0	0	0
RPD				%	0	0	15	8	15	**66**	7	4	0	0	0	0	0	0	0	0	0	0	0	0
ELS	BH1	4/11/15	water	µg/L	<1	<1	<0.1	1	<1	<0.05	2	3	-	-	-	-	<10	<50	<100	<100	<1	<1	<1	<3
ELS	BD1A	4/11/15	Water	µg/L	<1	<1	<0.1	<1	<1	<0.05	2	4	-	-	-	-	<10	<50	<100	<100	<1	<1	<1	<3
Difference				mg/kg	0	0	0	0	0	0	0	1	-	-	-	-	0	0	0	0	0	0	0	0
RPD				%	0	0	0	0	0	0	0	29	-	-	-	-	0	0	0	0	0	0	0	0

Notes: - not applicable, not tested

The calculated RPD values were within the acceptable range of ± 30 for inorganic analytes and ± 50% for organics with the with the exception for mercury in the soil sample. However, this is not considered to be significant given the results are less than five times the PQL and the actual difference was low (i.e. 0.1 mg/kg).

Overall, the intra-laboratory replicate comparisons indicate that the sampling techniques were generally consistent and repeatable.

E2.2 Inter-Laboratory Analysis

Inter-laboratory replicates were conducted as a check of the reproducibility of results between the primary laboratory ELS and the secondary laboratory Eurofins and as a measure of consistency of sampling techniques.

The comparative results of analysis between original and inter-laboratory replicate samples are summarised in Table E5.

Note that, where both samples are below LOR/PQL the difference and RPD has been given as zero. Where one sample is reported below LOR/PQL, but a concentration is reported for the other, the LOR/PQL value has been used for calculation of the RPD for the less than LOR/PQL sample.

Table E5: Relative Percentage Difference Results – Inter-laboratory Replicates

Lab	Sample ID	Date Sampled	Media	Units	Metals								PAH				TRH				BTEX			
					As	Cd	Cr	Cu	Pb	Hg	Ni	Zn	total	BaP TEQ	BaP	Naphthalene	C6-C10	>C10-C14	>C15-C28	>C29-C36	Benzene	Toluene	Ethylbenzene	xylene
ELS	TP1/0.4-0.5	2/11/15	filling	mg/kg	<4	<0.4	18	13	14	0.2	13	25	0	<0.5	<0.05	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3
EUF	BD1B	2/11/15	filling	mg/kg	<2	<0.4	16	10	12	<0.05	10	19	0	0.6	<0.5	<0.5	<20	<20	<50	<50	<0.1	<0.1	<0.1	<0.3
Difference				mg/kg	0	-	2	3	2	**0.15**	3	6	0	0.1	0	0	-	-	-	-	-	-	-	-
RPD				%	0	-	12	26	15	**120**	26	27	0	18	0	0	-	-	-	-	-	-	-	-

Notes: - not applicable, not tested

The calculated RPD values were within the acceptable range of ± 30 for inorganic and organic analytes with the exception for mercury. However, this is not considered to be significant given the results are less than five times the PQL, the actual difference was low (i.e. 0.15 mg/kg).

The overall inter-laboratory replicate comparisons indicate that the sampling technique was generally consistent and repeatable and the two laboratory sampling handling and analytical methods are comparable.

E3. Data Quality Indicators

The reliability of field procedures and analytical results was assessed against the following data quality indicators (DQIs):

- Completeness – a measure of the amount of usable data from a data collection activity;
- Comparability – the confidence (qualitative) that data may be considered to be equivalent for each sampling and analytical event;
- Representativeness – the confidence (qualitative) of data representativeness of media present on-site;
- Precision – a measure of variability or reproducibility of data; and
- Accuracy – a measure of closeness of the data to the 'true' value.

The DQIs were assessed as outlined in the following Table E6.

Table E6: Data Quality Indicators

Data Quality Indicator	Method(s) of Achievement
Completeness	Planned systematic and selected target locations sampled; Preparation of field logs, sample location plan and chain of custody (COC) records; Preparation of field groundwater sampling sheets; Laboratory sample receipt information received confirming receipt of samples intact and appropriateness of the chain of custody; Samples analysed for contaminants of potential concern (COPC) identified in the Conceptual Site Model (CSM); Completion of COC documentation; NATA endorsed laboratory certificates provided by the laboratory; Satisfactory frequency and results for field and laboratory QC samples as discussed in Section E2.

Data Quality Indicator	Method(s) of Achievement
Comparability	Using appropriate techniques for sample recovery, storage and transportation, which were the same for the duration of the project; Works undertaken by appropriately experienced and trained DP scientist and engineer; Use of NATA registered laboratories, with test methods the same or similar between laboratories; Satisfactory results for field and laboratory QC samples.
Representativeness	Target media sampled; Spatial and temporal distribution of sample locations; Sample numbers recovered and analysed are considered to be representative of the target media and complying with DQOs; Samples were extracted and analysed within holding times; Samples were analysed in accordance with the analysis request.
Precision	Acceptable RPD between original samples and replicates; Satisfactory results for all other field and laboratory QC samples.
Accuracy	Satisfactory results for all field and laboratory QC samples.

Based on the above, it is considered that the DQIs have been complied with. As such, it is concluded that the field and laboratory test data obtained are reliable and useable for this assessment.

Appendix F

Test Pit and Bore Log Results

Sampling Methods

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Sampling

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

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

Undisturbed samples are taken by pushing a thin-walled sample tube into the soil and withdrawing it to obtain a sample of the soil in a relatively undisturbed state. Such samples yield information on structure and strength, and are necessary for laboratory determination of shear strength and compressibility. Undisturbed sampling is generally effective only in cohesive soils.

Test Pits

Test pits are usually excavated with a backhoe or an excavator, allowing close examination of the in-situ soil if it is safe to enter into the pit. The depth of excavation is limited to about 3 m for a backhoe and up to 6 m for a large excavator. A potential disadvantage of this investigation method is the larger area of disturbance to the site.

Large Diameter Augers

Boreholes can be drilled using a rotating plate or short spiral auger, generally 300 mm or larger in diameter commonly mounted on a standard piling rig. The cuttings are returned to the surface at intervals (generally not more than 0.5 m) and are disturbed but usually unchanged in moisture content. Identification of soil strata is generally much more reliable than with continuous spiral flight augers, and is usually supplemented by occasional undisturbed tube samples.

Continuous Spiral Flight Augers

The borehole is advanced using 90-115 mm diameter continuous spiral flight augers which are withdrawn at intervals to allow sampling or in-situ testing. This is a relatively economical means of drilling in clays and sands above the water table. Samples are returned to the surface, or may be collected after withdrawal of the auger flights, but they are disturbed and may be mixed with soils from the sides of the hole. Information from the drilling (as distinct from specific sampling by SPTs or undisturbed samples) is of relatively low reliability, due to the remoulding, possible mixing or softening of samples by groundwater.

Non-core Rotary Drilling

The borehole is advanced using a rotary bit, with water or drilling mud being pumped down the drill rods and returned up the annulus, carrying the drill cuttings. Only major changes in stratification can be determined from the cuttings, together with some information from the rate of penetration. Where drilling mud is used this can mask the cuttings and reliable identification is only possible from separate sampling such as SPTs.

Continuous Core Drilling

A continuous core sample can be obtained using a diamond tipped core barrel, usually with a 50 mm internal diameter. Provided full core recovery is achieved (which is not always possible in weak rocks and granular soils), this technique provides a very reliable method of investigation.

Standard Penetration Tests

Standard penetration tests (SPT) are used as a means of estimating the density or strength of soils and also of obtaining a relatively undisturbed sample. The test procedure is described in Australian Standard 1289, Methods of Testing Soils for Engineering Purposes - Test 6.3.1.

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

The test results are reported in the following form.

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

  4,6,7
  N=13

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

  15, 30/40 mm

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

Dynamic Cone Penetrometer Tests / Perth Sand Penetrometer Tests

Dynamic penetrometer tests (DCP or PSP) are carried out by driving a steel rod into the ground using a standard weight of hammer falling a specified distance. As the rod penetrates the soil the number of blows required to penetrate each successive 150 mm depth are recorded. Normally there is a depth limitation of 1.2 m, but this may be extended in certain conditions by the use of extension rods. Two types of penetrometer are commonly used.

- Perth sand penetrometer - a 16 mm diameter flat ended rod is driven using a 9 kg hammer dropping 600 mm (AS 1289, Test 6.3.3). This test was developed for testing the density of sands and is mainly used in granular soils and filling.
- Cone penetrometer - a 16 mm diameter rod with a 20 mm diameter cone end is driven using a 9 kg hammer dropping 510 mm (AS 1289, Test 6.3.2). This test was developed initially for pavement subgrade investigations, and correlations of the test results with California Bearing Ratio have been published by various road authorities.

Soil Descriptions

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Description and Classification Methods

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

Soil Types

Soil types are described according to the predominant particle size, qualified by the grading of other particles present:

Type	Particle size (mm)
Boulder	>200
Cobble	63 - 200
Gravel	2.36 - 63
Sand	0.075 - 2.36
Silt	0.002 - 0.075
Clay	<0.002

The sand and gravel sizes can be further subdivided as follows:

Type	Particle size (mm)
Coarse gravel	20 - 63
Medium gravel	6 - 20
Fine gravel	2.36 - 6
Coarse sand	0.6 - 2.36
Medium sand	0.2 - 0.6
Fine sand	0.075 - 0.2

The proportions of secondary constituents of soils are described as:

Term	Proportion	Example
And	Specify	Clay (60%) and Sand (40%)
Adjective	20 - 35%	Sandy Clay
Slightly	12 - 20%	Slightly Sandy Clay
With some	5 - 12%	Clay with some sand
With a trace of	0 - 5%	Clay with a trace of sand

Definitions of grading terms used are:

- Well graded - a good representation of all particle sizes
- Poorly graded - an excess or deficiency of particular sizes within the specified range
- Uniformly graded - an excess of a particular particle size
- Gap graded - a deficiency of a particular particle size with the range

Cohesive Soils

Cohesive soils, such as clays, are classified on the basis of undrained shear strength. The strength may be measured by laboratory testing, or estimated by field tests or engineering examination. The strength terms are defined as follows:

Description	Abbreviation	Undrained shear strength (kPa)
Very soft	vs	<12
Soft	s	12 - 25
Firm	f	25 - 50
Stiff	st	50 - 100
Very stiff	vst	100 - 200
Hard	h	>200

Cohesionless Soils

Cohesionless soils, such as clean sands, are classified on the basis of relative density, generally from the results of standard penetration tests (SPT), cone penetration tests (CPT) or dynamic penetrometers (PSP). The relative density terms are given below:

Relative Density	Abbreviation	SPT N value	CPT qc value (MPa)
Very loose	vl	<4	<2
Loose	l	4 - 10	2 -5
Medium dense	md	10 - 30	5 - 15
Dense	d	30 - 50	15 - 25
Very dense	vd	>50	>25

Soil Descriptions

Soil Origin

It is often difficult to accurately determine the origin of a soil. Soils can generally be classified as:

- Residual soil - derived from in-situ weathering of the underlying rock;
- Transported soils - formed somewhere else and transported by nature to the site; or
- Filling - moved by man.

Transported soils may be further subdivided into:

- Alluvium - river deposits
- Lacustrine - lake deposits
- Aeolian - wind deposits
- Littoral - beach deposits
- Estuarine - tidal river deposits
- Talus - scree or coarse colluvium
- Slopewash or Colluvium - transported downslope by gravity assisted by water. Often includes angular rock fragments and boulders.

Rock Strength

Rock strength is defined by the Point Load Strength Index ($Is_{(50)}$) and refers to the strength of the rock substance and not the strength of the overall rock mass, which may be considerably weaker due to defects. The test procedure is described by Australian Standard 4133.4.1 - 1993. The terms used to describe rock strength are as follows:

Term	Abbreviation	Point Load Index $Is_{(50)}$ MPa	Approx Unconfined Compressive Strength MPa*
Extremely low	EL	<0.03	<0.6
Very low	VL	0.03 - 0.1	0.6 - 2
Low	L	0.1 - 0.3	2 - 6
Medium	M	0.3 - 1.0	6 - 20
High	H	1 - 3	20 - 60
Very high	VH	3 - 10	60 - 200
Extremely high	EH	>10	>200

* Assumes a ratio of 20:1 for UCS to $Is_{(50)}$

Degree of Weathering

The degree of weathering of rock is classified as follows:

Term	Abbreviation	Description
Extremely weathered	EW	Rock substance has soil properties, i.e. it can be remoulded and classified as a soil but the texture of the original rock is still evident.
Highly weathered	HW	Limonite staining or bleaching affects whole of rock substance and other signs of decomposition are evident. Porosity and strength may be altered as a result of iron leaching or deposition. Colour and strength of original fresh rock is not recognisable
Moderately weathered	MW	Staining and discolouration of rock substance has taken place
Slightly weathered	SW	Rock substance is slightly discoloured but shows little or no change of strength from fresh rock
Fresh stained	Fs	Rock substance unaffected by weathering but staining visible along defects
Fresh	Fr	No signs of decomposition or staining

Degree of Fracturing

The following classification applies to the spacing of natural fractures in diamond drill cores. It includes bedding plane partings, joints and other defects, but excludes drilling breaks.

Term	Description
Fragmented	Fragments of <20 mm
Highly Fractured	Core lengths of 20-40 mm with some fragments
Fractured	Core lengths of 40-200 mm with some shorter and longer sections
Slightly Fractured	Core lengths of 200-1000 mm with some shorter and loner sections
Unbroken	Core lengths mostly > 1000 mm

Rock Descriptions

Rock Quality Designation

The quality of the cored rock can be measured using the Rock Quality Designation (RQD) index, defined as:

$$\text{RQD \%} = \frac{\text{cumulative length of 'sound' core sections} \geq \text{100 mm long}}{\text{total drilled length of section being assessed}}$$

where 'sound' rock is assessed to be rock of low strength or better. The RQD applies only to natural fractures. If the core is broken by drilling or handling (i.e. drilling breaks) then the broken pieces are fitted back together and are not included in the calculation of RQD.

Stratification Spacing

For sedimentary rocks the following terms may be used to describe the spacing of bedding partings:

Term	Separation of Stratification Planes
Thinly laminated	< 6 mm
Laminated	6 mm to 20 mm
Very thinly bedded	20 mm to 60 mm
Thinly bedded	60 mm to 0.2 m
Medium bedded	0.2 m to 0.6 m
Thickly bedded	0.6 m to 2 m
Very thickly bedded	> 2 m

Symbols & Abbreviations

Douglas Partners

Introduction

These notes summarise abbreviations commonly used on borehole logs and test pit reports.

Drilling or Excavation Methods

C	Core Drilling
R	Rotary drilling
SFA	Spiral flight augers
NMLC	Diamond core - 52 mm dia
NQ	Diamond core - 47 mm dia
HQ	Diamond core - 63 mm dia
PQ	Diamond core - 81 mm dia

Water

▷	Water seep
▽	Water level

Sampling and Testing

A	Auger sample
B	Bulk sample
D	Disturbed sample
E	Environmental sample
U_{50}	Undisturbed tube sample (50mm)
W	Water sample
pp	pocket penetrometer (kPa)
PID	Photo ionisation detector
PL	Point load strength Is(50) MPa
S	Standard Penetration Test
V	Shear vane (kPa)

Description of Defects in Rock

The abbreviated descriptions of the defects should be in the following order: Depth, Type, Orientation, Coating, Shape, Roughness and Other. Drilling and handling breaks are not usually included on the logs.

Defect Type

B	Bedding plane
Cs	Clay seam
Cv	Cleavage
Cz	Crushed zone
Ds	Decomposed seam
F	Fault
J	Joint
Lam	lamination
Pt	Parting
Sz	Sheared Zone
V	Vein

Orientation

The inclination of defects is always measured from the perpendicular to the core axis.

h	horizontal
v	vertical
sh	sub-horizontal
sv	sub-vertical

Coating or Infilling Term

cln	clean
co	coating
he	healed
inf	infilled
stn	stained
ti	tight
vn	veneer

Coating Descriptor

ca	calcite
cbs	carbonaceous
cly	clay
fe	iron oxide
mn	manganese
slt	silty

Shape

cu	curved
ir	irregular
pl	planar
st	stepped
un	undulating

Roughness

po	polished
ro	rough
sl	slickensided
sm	smooth
vr	very rough

Other

fg	fragmented
bnd	band
qtz	quartz

Symbols & Abbreviations

Graphic Symbols for Soil and Rock

General


Asphalt


Road base


Concrete


Filling

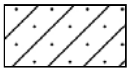
Soils


Topsoil

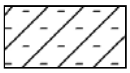

Peat


Clay

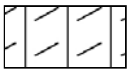

Silty clay

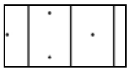

Sandy clay

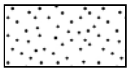

Gravelly clay

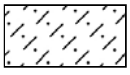

Shaly clay

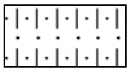

Silt


Clayey silt


Sandy silt

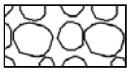

Sand

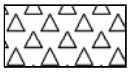

Clayey sand


Silty sand


Gravel


Sandy gravel


Cobbles, boulders

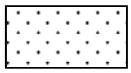

Talus

Sedimentary Rocks

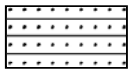

Boulder conglomerate

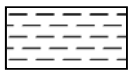

Conglomerate


Conglomeratic sandstone

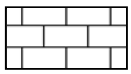

Sandstone


Siltstone


Laminite

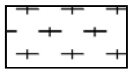

Mudstone, claystone, shale

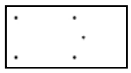

Coal


Limestone

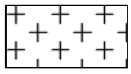
Metamorphic Rocks

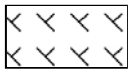

Slate, phyllite, schist

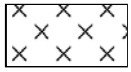

Gneiss

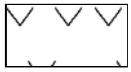

Quartzite

Igneous Rocks


Granite


Dolerite, basalt, andesite


Dacite, epidote


Tuff, breccia


Porphyry

TEST PIT LOG

CLIENT: Opal Aged Care
PROJECT: Proposed Aged Care Facility
LOCATION: Lots 2-5, DP1089380, Bathurst

SURFACE LEVEL: 676.4 AHD
EASTING: 182019
NORTHING: 6298519

PIT No: 1
PROJECT No: 85164.01
DATE: 2/11/2015
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 150mm)
676	0.25	FILLING - brown, gravelly sand filling, moist		D	0.1 0.2		PID<5		
		FILLING - brown, sandy clay filling and building rubble including concrete slabs over 1m x 1m, bricks, plastic piping, damp		D*	0.4 0.5		PID<5		
675	1			D	0.9 1.0		PID<5		
	2			D	1.5 1.6		PID<5		
674	2.2	Pit discontinued at 2.2m - refusal on large concrete blocks and continued pit collapse							
673	3								
672	4								

Dynamic Penetrometer Test (blows per 150mm): 5, 10, 15, 20

RIG: 32T Excavator

LOGGED: MW

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed

REMARKS: *BD1A/B taken from 0.4m to 0.5m

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

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

TEST PIT LOG

CLIENT: Opal Aged Care
PROJECT: Proposed Aged Care Facility
LOCATION: Lots 2-5, DP1089380, Bathurst

SURFACE LEVEL: 676.4 AHD
EASTING: 182006
NORTHING: 6298503

PIT No: 2
PROJECT No: 85164.01
DATE: 2/11/2015
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
676	0.3	FILLING - brown, sandy gravelly clay filling, moist		D	0.1 0.2		PID<5		
		FILLING - brown, gravelly (fine to coarse rounded quartz river gravel) sandy clay filling, damp		D	0.3 0.4 0.5		0.3-0.6m: Bulk sample PID<5		
	0.8	FILLING - brown, clay filling with some rounded coarse river gravel and some building rubble (brick, concrete, wood, tiles, possible ACM)		M D	0.8 0.9 1.0		ACM retrieved at 0.8m PID<5		
675	1			D	1.6 1.8		PID<5		1
	1.9	CLAYEY SILT - stiff, brown, clayey silt with trace fine gravel, damp		D	2.2		pp = 140 PID<5		
674	2 2.4	Pit discontinued at 2.4m - target depth reached			2.4				2
673	3								3
672	4								4

RIG: 32T Excavator

LOGGED: MW

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

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

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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Geotechnics / Environment / Groundwater

TEST PIT LOG

CLIENT: Opal Aged Care
PROJECT: Proposed Aged Care Facility
LOCATION: Lots 2-5, DP1089380, Bathurst

SURFACE LEVEL: 676.3 AHD
EASTING: 182008
NORTHING: 6298490

PIT No: 3
PROJECT No: 85164.01
DATE: 2/11/2015
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 150mm)
676	0.0	FILLING - light brown, silty clay filling with some sand and fine gravel, damp		D	0.0		PID<5		
					0.2				
	0.4	FILLING - brown, clay filling and building rubble (brick, concrete, lead flashing), damp		D	0.4		PID<5		
					0.5				
				D	0.9		PID<5		
675	1				1.0				1
				D	1.4		PID<5		
					1.5				
	1.8	SANDY CLAY - light brown, sandy, clay, damp		D	1.8		PID<5		
	2 2.0	Pit discontinued at 2.0m - target depth reached			2.0				2
674									
	3								3
673									
	4								4
672									

Dynamic Penetrometer Test (blows per 150mm): 5, 10, 15, 20

RIG: 32T Excavator

LOGGED: MW

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

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

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Opal Aged Care
PROJECT: Proposed Aged Care Facility
LOCATION: Lots 2-5, DP1089380, Bathurst

SURFACE LEVEL: 676.2 AHD
EASTING: 181987
NORTHING: 6298489

PIT No: 4
PROJECT No: 85164.01
DATE: 2/11/2015
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 150mm)
676	0.15	FILLING - brown, clayey silty sand topsoil filling, damp		D	0.0		PID<5		
		FILLING - brown, silty clay filling with some fine to medium gravel, damp			0.15				
				D	0.4		pp = 290 PID<5		
	0.6				0.5				
		FILLING - grey, silty clay filling with some gravel and building rubble (brick, concrete, tile), damp							
	1			D	0.9		pp = 500 PID<5		
675					1.0				1
				D	1.5		PID<5		
					1.7				
	2			D	2.0		PID<5		2
674					2.2				
	2.4	CLAYEY SILT - hard, brown, clayey silt and with a trace of fine gravel and sand		D	2.5		pp >600 PID<5		
	2.7	Pit discontinued at 2.7m - target depth reached			2.7				
	3								3
673									
	4								4
672									

RIG: 32T Excavator

LOGGED: MW

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

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

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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Geotechnics / Environment / Groundwater

TEST PIT LOG

CLIENT: Opal Aged Care
PROJECT: Proposed Aged Care Facility
LOCATION: Lots 2-5, DP1089380, Bathurst

SURFACE LEVEL: 676.1 AHD
EASTING: 181979
NORTHING: 6298478

PIT No: 5
PROJECT No: 85164.01
DATE: 2/11/2015
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 150mm)
676	0.0	FILLING - brown, silty sandy clay filling with some fine to coarse gravel, damp		D	0.0		pp = 220 PID<5		
					0.2				
	0.3	FILLING - brown, silty clay and building rubble (timber, brick, lead flashing, possible ACM, concrete, plastic and sheet metal) filling		D	0.4		pp >600 PID<5		
					0.5				
				D	0.9		PID<5		
675	1				1.0				1
				D	1.4		pp = 300 PID<5		
					1.5				
674	2								2
				D	2.2		PID<5		
					2.4				
	2.5	SANDY CLAY - hard, light brown, sandy clay with some fine subrounded quartz and ironstone gravel, damp		D	2.6		pp >600 PID<5		
	2.8				2.8				
673	3	Pit discontinued at 2.8m - target depth reached							3
672	4								4

RIG: 32T Excavator

LOGGED: MW

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

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

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Opal Aged Care
PROJECT: Proposed Aged Care Facility
LOCATION: Lots 2-5, DP1089380, Bathurst

SURFACE LEVEL: 676.0 AHD
EASTING: 181948
NORTHING: 6298450

PIT No: 6
PROJECT No: 85164.01
DATE: 2/11/2015
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 150mm)
676	0.2	FILLING - brown, clayey silt filling with some coarse gravel and brick fragments, damp		D	0.0		PID<5		
		SILTY CLAY - stiff to hard, brown, silty clay and with a trace of fine gravel, damp			0.2				
675	1			D	0.4 0.5		PID<5		
	1.7			D	1.4 1.5		PID<5		
674	2	Pit discontinued at 1.7m - target depth reached							
673	3								
672	4								

Dynamic Penetrometer Test (blows per 150mm): 5, 10, 15, 20

RIG: 32T Excavator

LOGGED: MW

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

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

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Opal Aged Care
PROJECT: Proposed Aged Care Facility
LOCATION: Lots 2-5, DP1089380, Bathurst

SURFACE LEVEL: 675.8 AHD
EASTING: 181921
NORTHING: 6298422

PIT No: 7
PROJECT No: 85164.01
DATE: 3/11/2015
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 150mm)
		FILLING - brown, silty clay filling with some coarse rounded gravel and brick fragments, damp		D	0.1		pp = 360 PID<5		
	0.5	SILTY CLAY - stiff to hard, brown, silty clay and with a trace of sand, damp		D	0.3 0.6		pp >600 PID<5		
675	0.8	Pit discontinued at 0.8m - target depth reached			0.8				
	1								1
674	2								2
673	3								3
672	4								4
671									

Dynamic Penetrometer Test (blows per 150mm): 5, 10, 15, 20

RIG: 32T Excavator

LOGGED: MW

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

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

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

TEST PIT LOG

CLIENT: Opal Aged Care
PROJECT: Proposed Aged Care Facility
LOCATION: Lots 2-5, DP1089380, Bathurst

SURFACE LEVEL: 675.9 AHD
EASTING: 181892
NORTHING: 6298409

PIT No: 8
PROJECT No: 85164.01
DATE: 3/11/2015
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 150mm)
675	0.0	FILLING - brown, gravelly silty clay filling		D	0.0		PID<5		
	0.2	FILLING - brown, silty clay filling with some gravel, whole bricks and brick fragments, damp			0.2				
				D	0.5		pp = 300 PID<5		
					0.7				
	1.0	SILTY CLAY - hard, brown, silty clay, damp		D	1.1		pp >600 PID<5		
	1.2	Pit discontinued at 1.2m - target depth reached			1.2				
674	2								
673	3								
672	4								
671									

Dynamic Penetrometer Test (blows per 150mm): 5, 10, 15, 20

RIG: 32T Excavator

LOGGED: MW

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

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

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

TEST PIT LOG

CLIENT: Opal Aged Care
PROJECT: Proposed Aged Care Facility
LOCATION: Lots 2-5, DP1089380, Bathurst

SURFACE LEVEL: 676.2 AHD
EASTING: 182012
NORTHING: 6298474

PIT No: 9
PROJECT No: 85164.01
DATE: 2/11/2015
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
676	0.0								
		FILLING - brown, gravelly (quartz, rounded river gravel), sandy clay filling, damp		D	0.0		PID<5		
	0.3				0.2				
		FILLING - brown, silty gravelly (fine to coarse, rounded gravel, some fine angular), clay filling with some rounded cobbles, damp		D	0.4		pp = 380 PID<5		
					0.5				
				D	0.9		PID<5		
675	1				1.0				1
				D	1.4		PID<5		
					1.5				
	2			D	2.0		PID<5		2
674					2.2				
	2.4	SILTY CLAY - brown, silty clay and with a trace of fine gravel		D	2.5		PID<5		
	2.7	Pit discontinued at 2.7m - target depth reached			2.7				
	3								3
673									
	4								4
672									

RIG: 32T Excavator

LOGGED: MW

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

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

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

TEST PIT LOG

CLIENT: Opal Aged Care
PROJECT: Proposed Aged Care Facility
LOCATION: Lots 2-5, DP1089380, Bathurst

SURFACE LEVEL: 675.6 AHD
EASTING: 181937
NORTHING: 6298408

PIT No: 10
PROJECT No: 85164.01
DATE: 3/11/2015
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 150mm)
675	0.0	FILLING - brown, fine to medium gravelly clay filling with some sand, damp		D	0.0		PID<5		
					0.2				
	0.4	SILTY CLAY - hard, grey, silty clay, damp, some rootlets			0.4		0.4-0.8m: Bulk sample		
				U_{50}	0.6		pp = 570 PID<5		
	0.8			D	0.75				
		Pit discontinued at 0.8m - target depth reached			0.8				
	1								1
674									
	2								2
673									
	3								3
672									
	4								4
671									

Dynamic Penetrometer Test (blows per 150mm): 5, 10, 15, 20

RIG: 32T Excavator

LOGGED: MW

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

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

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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Geotechnics / Environment / Groundwater

TEST PIT LOG

CLIENT: Opal Aged Care
PROJECT: Proposed Aged Care Facility
LOCATION: Lots 2-5, DP1089380, Bathurst

SURFACE LEVEL: 676.4 AHD
EASTING: 182039
NORTHING: 6298478

PIT No: 11
PROJECT No: 85164.01
DATE: 3/11/2015
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
676	0.2	FILLING - brown, silty sand (topsoil) filling, moist		D	0.0		PID<5		
		FILLING - brown, silty clay, building rubble (brick, concrete, asphalt, possible ACM) filling			0.2				
				D	0.4		PID<5		
					0.5				
				D	0.9		PID<5		
675	1			M	1.0				1
					1.5		PID<5		
				D*					
	2				1.7				
	2.0	GRAVELLY CLAY - hard, brown, fine to medium gravelly clay with trace sand, damp		D	2.0		pp >600 PID<5		2
	2.3				2.2				
674		Pit discontinued at 2.3m - target depth reached							
	3								3
673									
	4								4
672									

RIG: 32T Excavator

LOGGED: MW

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed

REMARKS: *BD2A/B taken from 1.5m to 1.7m

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

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

TEST PIT LOG

CLIENT: Opal Aged Care
PROJECT: Proposed Aged Care Facility
LOCATION: Lots 2-5, DP1089380, Bathurst

SURFACE LEVEL: 675.7 AHD
EASTING: 182006
NORTHING: 6298438

PIT No: 12
PROJECT No: 85164.01
DATE: 3/11/2015
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 150mm)
675	0.15	FILLING - brown, clayey silt (topsoil) filling, humid		D	0.0		PID<5		
		SILTY CLAY - very stiff, grey, silty clay and with a trace of rootlets and medium sand, damp			0.15				
					0.8		pp = 440 PID<5		
	1			D	1.0				
	1.1	Pit discontinued at 1.1m - target depth reached							

Dynamic Penetrometer Test (blows per 150mm): 5, 10, 15, 20

RL: 675, 674, 673, 672, 671
Depth (m): 1, 2, 3, 4

RIG: 32T Excavator

LOGGED: MW

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

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

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Opal Aged Care
PROJECT: Proposed Aged Care Facility
LOCATION: Lots 2-5, DP1089380, Bathurst

SURFACE LEVEL: 675.8 AHD
EASTING: 181953
NORTHING: 6298404

PIT No: 13
PROJECT No: 85164.01
DATE: 3/11/2015
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm) 5 10 15 20
675	0.1	FILLING - brown, fine to medium gravelly (quartz) clay filling, damp		D	0.1		pp >600 PID<5		
	0.3				0.3				
	0.4	SILTY CLAY - hard, grey, silty clay and with a trace of sand, damp		D	0.5		pp = 460 PID<5		
	0.7				0.7				
	0.8	Pit discontinued at 0.8m - target depth reached							
674	1								1
673	2								2
672	3								3
671	4								4

RIG: 32T Excavator

LOGGED: MW

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

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

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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Geotechnics / Environment / Groundwater

TEST PIT LOG

CLIENT: Opal Aged Care
PROJECT: Proposed Aged Care Facility
LOCATION: Lots 2-5, DP1089380, Bathurst

SURFACE LEVEL: 675.7 AHD
EASTING: 181918
NORTHING: 6298378

PIT No: 14
PROJECT No: 85164.01
DATE: 3/11/2015
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 150mm)
675	0.1	FILLING - light brown, sandy clay filling with some bricks and brick fragments, damp		D	0.1 0.2		PID<5		
	0.5	FILLING - light grey, ash filling with some white slag, damp		D	0.5 0.6		PID<5		
	0.6	SILTY CLAY - hard, brown, silty clay, damp		D	0.7		pp = 410 PID<5		
	0.8	Pit discontinued at 0.8m - target depth reached			0.8				
674	1								1
	2								2
673	3								3
672	4								4
671									

Dynamic Penetrometer Test (blows per 150mm): 5, 10, 15, 20

RIG: 32T Excavator

LOGGED: MW

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

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

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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Geotechnics / Environment / Groundwater

TEST PIT LOG

CLIENT: Opal Aged Care
PROJECT: Proposed Aged Care Facility
LOCATION: Lots 2-5, DP1089380, Bathurst

SURFACE LEVEL: 676.0 AHD
EASTING: 182050
NORTHING: 6298441

PIT No: 15
PROJECT No: 85164.01
DATE: 2/11/2015
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 150mm)
676	0.0	FILLING - brown, silty clay filling with some coarse gravel, brick and concrete, damp		D	0.0		pp = 200 PID<5		
					0.2				
				D	0.4		pp >600 PID<5		
					0.5				
	0.8	CLAYEY SILT - hard, dark grey, clayey silt, damp							
675	1			D	1.0		pp >600 PID<5		1
	1.1	Pit discontinued at 1.1m - target depth reached			1.1				
674	2								2
673	3								3
672	4								4

RIG: 32T Excavator

LOGGED: MW

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

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

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

TEST PIT LOG

CLIENT: Opal Aged Care
PROJECT: Proposed Aged Care Facility
LOCATION: Lots 2-5, DP1089380, Bathurst

SURFACE LEVEL: 675.8 AHD
EASTING: 182030
NORTHING: 6298418

PIT No: 16
PROJECT No: 85164.01
DATE: 2/11/2015
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 150mm)
675	0.2	FILLING - brown, silty clay filling with some rootlets, damp		D	0.0		pp = 400 PID<5		
		SILTY CLAY - very stiff to hard, dark grey, silty clay, damp		U_{50}	0.2		0.2-0.5m: Bulk sample		
					0.4				
				D	0.5		pp = 470 PID<5		
					0.7				
	1.0	Pit discontinued at 1.0m - target depth reached							

RIG: 32T Excavator

LOGGED: MW

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

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

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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Geotechnics / Environment / Groundwater

TEST PIT LOG

CLIENT: Opal Aged Care
PROJECT: Proposed Aged Care Facility
LOCATION: Lots 2-5, DP1089380, Bathurst

SURFACE LEVEL: 675.7 AHD
EASTING: 181978
NORTHING: 6298441

PIT No: 17
PROJECT No: 85164.01
DATE: 2/11/2015
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
675	0.0	FILLING - brown, clayey silt (topsoil) filling with rootlets		D	0.0 0.1		pp = 290 PID<5		
	0.3	SILTY CLAY - very stiff to hard, brown, silty clay with trace fine angular gravel, humid			0.3		0.3-0.5m: Bulk sample pp = 300 PID<5		
				D	0.4 0.5				
	1								1
				D	0.9 1.0		pp >600 PID<5		
	1.1	Pit discontinued at 1.1m - target depth reached							
674	2								2
673	3								3
672	4								4
671									

RIG: 32T Excavator

LOGGED: MW

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

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

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

TEST PIT LOG

CLIENT: Opal Aged Care
PROJECT: Proposed Aged Care Facility
LOCATION: Lots 2-5, DP1089380, Bathurst

SURFACE LEVEL: 676.0 AHD
EASTING: 181980
NORTHING: 6298464

PIT No: 18
PROJECT No: 85164.01
DATE: 3/11/2015
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 150mm)
676	0.1	FILLING- clayey silt (topsoil) filling with some rootlets, damp							
		SILTY CLAY - stiff to hard, brown, silty clay with some rootlets, damp		D	0.4		pp = 450 PID<5		
	0.5	Pit discontinued at 0.5m - target depth reached			0.5				
675	1								
674	2								
673	3								
672	4								

Dynamic Penetrometer Test (blows per 150mm): 5, 10, 15, 20

RIG: 32T Excavator

LOGGED: MW

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

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

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

TEST PIT LOG

CLIENT: Opal Aged Care
PROJECT: Proposed Aged Care Facility
LOCATION: Lots 2-5, DP1089380, Bathurst

SURFACE LEVEL: 676.1 AHD
EASTING: 181969
NORTHING: 6298467

PIT No: 19
PROJECT No: 85164.01
DATE: 3/11/2015
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 150mm)
676		FILLING - brown, silty clay filling with some gravel, concrete and brick, damp		D	0.0		PID<5		5 10 15 20
					0.2				
	0.8	SILTY CLAY - hard, brown, silty clay, damp		D	0.8		pp = 520 PID<5		
675	1 1.0	Pit discontinued at 1.0m - target depth reached			1.0				1
674	2								2
673	3								3
672	4								4

RIG: 32T Excavator

LOGGED: MW

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

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

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

TEST PIT LOG

CLIENT: Opal Aged Care
PROJECT: Proposed Aged Care Facility
LOCATION: Lots 2-5, DP1089380, Bathurst

SURFACE LEVEL: 676.0 AHD
EASTING: 182028
NORTHING: 6298461

PIT No: 20
PROJECT No: 85164.01
DATE: 3/11/2015
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
676	0	FILLING - brown, silty clay filling with some building rubble (brick, metal, timber, concrete), damp		D	0.0		PID<5		
					0.5				
675	1			D	0.9		PID<5		1
					1.0				
	1.5	SILTY CLAY - hard, brown, silty clay, damp			1.5		pp = 520		
	1.7	Pit discontinued at 1.7m - target depth reached							
674	2								2
673	3								3
672	4								4

RIG: 32T Excavator

LOGGED: MW

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

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

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

TEST PIT LOG

CLIENT: Opal Aged Care
PROJECT: Proposed Aged Care Facility
LOCATION: Lots 2-5, DP1089380, Bathurst

SURFACE LEVEL: 676.0 AHD
EASTING: 182040
NORTHING: 6298459

PIT No: 21
PROJECT No: 85164.01
DATE: 3/11/2015
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
676		FILLING - brown, silty clay filling with some building rubble (concrete, brick, wire), damp		D	0.9		PID<5		
675	1				1.0				1
	1.5	SILTY CLAY - hard, brown, silty clay, damp		D	1.6		pp >600 PID<5		
	1.7	Pit discontinued at 1.7m - target depth reached			1.7				
674	2								2
673	3								3
672	4								4

5 10 15 20

RIG: 32T Excavator

LOGGED: MW

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

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

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

TEST PIT LOG

CLIENT: Opal Aged Care
PROJECT: Proposed Aged Care Facility
LOCATION: Lots 2-5, DP1089380, Bathurst

SURFACE LEVEL: 676.4 AHD
EASTING: 182064
NORTHING: 6298449

PIT No: 22
PROJECT No: 85164.01
DATE: 3/11/2015
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
676	0	FILLING - brown, silty clay filling with some coarse gravel and cobbles, damp							
				D	0.9		PID<5		
	1				1.0				1
675	1.4	GRAVELLY CLAY - hard, brown, fine to medium gravelly clay with some sand							
				D	1.5		pp >600 PID<5		
					1.6				
	1.7	Pit discontinued at 1.7m - target depth reached							
	2								2
674									
	3								3
673									
	4								4
672									

RIG: 32T Excavator

LOGGED: MW

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

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

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Opal Aged Care
PROJECT: Proposed Aged Care Facility
LOCATION: Lots 2-5, DP1089380, Bathurst

SURFACE LEVEL: 676.5 AHD
EASTING: 182034
NORTHING: 6298508
DIP/AZIMUTH: 90°/--

BORE No: 101
PROJECT No: 85164.01
DATE: 2/11/2015
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
									1m stickup
676	0.25	FILLING - brown and red-brown, gravelly clay filling with some rootlets, humid		E	0.1 0.2		PID<5		
		FILLING - brown, silty clay filling with some gravel and a trace of sand, humid		E	0.5 0.6		PID<5		
	1			S/E	1.0 1.45		4,5,6 N = 11 PID<5		
675	1.7	FILLING - brown, silty clay filling with some gravel, crushed brick, fibrous material and ceramic tiles, damp		E	2.0 2.1		PID<5		Gravel and soil backfill 0.0-3.5m
	2								
674	2.5	FILLING - brown, silty clay filling with some gravel, damp		S/E	2.5 2.95		2,6,8 N = 14 PID<5		
	3								
	3.2	SILTY CLAY - firm, brown, silty clay with some sand and gravel (possibly filling)		E	3.5 3.6		PID<5		
673	4			S/E	4.0 4.45		3,3,3 N = 6 PID<5		Bentonite 3.5-5.0m
672	5.0	SILTY CLAY - stiff, brown, silty clay with some gravel, MC<PL		E	5.0 5.1		PID<5		
	5.5	GRAVELLY CLAY - stiff, brown, gravelly clay, MC~PL		S/E	5.5 5.95		5,6,5 N = 11 PID<5		
671	6								Gravel 5.0-10.0m
670		- saturated at 6.6m		A	6.5 6.6			▼	
	7			S	7.0 7.45		3,5,6 N = 11		
669	8	- becoming clayey gravel at 7.8m with some cobbles (up to 75mm)							Machine slotted PVC screen 5.5-10.0m
668	9			S	8.5 8.95		Hole collapse at 8.0m		
667	9.4	GRANITE - highly weathered, orange-brown granite		A	9.5				
	10.0	Bore discontinued at 10.0m							End cap

RIG: Scout 4 **DRILLER:** RKE **LOGGED:** JS **CASING:** HQ to 10.0m

TYPE OF BORING: Solid flight auger (TC-bit) to 10.0m; Roller bit 8.0m to 10.0m (collapsing gravel)

WATER OBSERVATIONS: Free groundwater observed at 6.6m

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Opal Aged Care
PROJECT: Proposed Aged Care Facility
LOCATION: Lots 2-5, DP1089380, Bathurst

SURFACE LEVEL: 675.8 AHD
EASTING: 181974
NORTHING: 6298443
DIP/AZIMUTH: 90°/--

BORE No: 102
PROJECT No: 85164.01
DATE: 3/11/2015
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
675.8	0.2	FILLING - brown, silty clay (topsoil) filling with some rootlets, humid		E	0.1 0.2		PID<5		1m stickup
		SILTY CLAY - firm to stiff, brown, silty clay, MC<PL		E	0.5 0.6		PID<5		
675	1			S/E	1.0		3,4,4 N = 8 PID<5		
		- becoming brown and grey at 1.3m			1.45				Gravel and soil backfill 0.0-3.0m
674	2	- stiff to very stiff from 2.0m							
				S/E	2.5		4,7,9 N = 16 PID<5		
673	3				2.95				
									Bentonite 3.0-4.0m
672	4			S	4.0		4,7,9 N = 16		
					4.45				
671	5								Gravel 4.0-9.0m
	5.2	CLAY - soft, grey mottled brown clay, MC>PL						▼	
				S	5.5		0,2,2 N = 4		
670	6				5.95				
	6.4	GRAVELLY CLAY - stiff, grey, gravelly clay with some cobbles (up to 70mm), MC>PL)							
669	7	- becoming clayey gravel at 7.0m		S	7.0		5,5,4 N = 9 (no sample recovery)		Machine slotted PVC screen 4.5-9.0m
					7.45				
668	8								
				S	8.5		7,10,15/100mm refusal		
667	8.7	GRANITE - highly weathered, orange-brown granite			8.85				
	9.0	Bore discontinued at 9.0m - limit of investigation							End cap
666									

RIG: Scout 4 **DRILLER:** RKE **LOGGED:** JS **CASING:** HQ to 8.5m

TYPE OF BORING: Solid flight auger (TC-bit) to 9.0m; Roller bit 6.5 to 9.0m

WATER OBSERVATIONS: Free groundwater observed at 5.3m

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Opal Aged Care
PROJECT: Proposed Aged Care Facility
LOCATION: Lots 2-5, DP1089380, Bathurst

SURFACE LEVEL: 676.5 AHD
EASTING: 182062
NORTHING: 6298459
DIP/AZIMUTH: 90°/--

BORE No: 103
PROJECT No: 85164.01
DATE: 2/11/2015
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
									1m stickup
676	0.25	FILLING - brown, silty clay filling with some rootlets, humid		E*	0.1 0.2		PID<5		
		FILLING - brown, silty clay filling with some gravel and a trace of concrete rubble, humid		E	0.5 0.6		PID<5		
675	1			S/E	1.0 1.45		7,10,13 N = 23 PID<5		
674	2			E	2.0 2.1		PID<5		Gravel and soil backfill 0.0-5.0m
	2.7	SILTY CLAY - stiff, brown, silty clay		S/E	2.5 2.95		3,7,6 N = 13 PID<5		
673	3			E*	3.5 3.6		PID<5		
672	4			S	4.0 4.45		2,5,10 N = 15		
	5	- becoming brown and grey at 0.5m, MC<PL							
671	5.5			S	5.5 5.95		4,7,10 N = 17		Bentonite 5.0-6.0m
	6								
670	6.3	CLAY - very soft, grey mottled brown clay, MC>PL		A	6.5				Gravel 6.0-10.0m
	7	- with some sand from 7.0m		S	7.0		0,0,0 N = 0		
669		- becoming sandy clay from 7.35m			7.45			▼	
	8								
	8.1	GRAVELLY CLAY - very stiff, grey, gravelly clay with some cobbles (up to 70mm), MC>PL							Machine slotted PVC screen 6.5-10.0m
668		- becoming clayey gravel at 8.5m, saturated		S	8.5 8.95		14,17,13 N = 30		
	9								
667	9.6	GRANITE - highly weathered, orange-brown granite							
	10.0	Bore discontinued at 10.0m - limit of investigation							End cap

RIG: Scout 4 **DRILLER:** RKE **LOGGED:** JS **CASING:** HQ to 9.0m

TYPE OF BORING: Solid flight auger (TC-bit) to 10.0m; Roller bit 9.0m to 10.0m

WATER OBSERVATIONS: Free groundwater observed at 7.5m

REMARKS: *BD1 taken at 0.1m to 0.2m. BD2 taken at 3.5m to 3.6m

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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Photo 1: TP 1

Photo 2: TP1 Stockpile

Douglas Partners Geotechnics / Environment / Groundwater	**Site Photographs**	PROJECT No: 85164
	Proposed Aged Care Facility	PLATE No: 1
	Lots 2-5 StanleyStreet, Bathurst	REV: A
	CLIENT: Opal Aged Care Pty Ltd	DATE: 11-Nov-15

Photo 3: TP2

Photo 4: TP2 Stockpile

Douglas Partners Geotechnics / Environment / Groundwater	**Site Photographs**	PROJECT No: 85164
	Proposed Aged Care Facility	PLATE No: 2
	Lots 2-5 StanleyStreet, Bathurst	REV: A
	CLIENT: Opal Aged Care Pty Ltd	DATE: 11-Nov-15

Photo 5: TP3

Photo 6: TP3 Stockpile

Douglas Partners Geotechnics / Environment / Groundwater	**Site Photographs**	PROJECT No: 85164
	Proposed Aged Care Facility	PLATE No: 3
	Lots 2-5 StanleyStreet, Bathurst	REV: A
	CLIENT: Opal Aged Care Pty Ltd	DATE: 11-Nov-15

Photo 7: TP4

Photo 8: TP4 Stockpile

Douglas Partners Geotechnics / Environment / Groundwater	**Site Photographs**	PROJECT No: 85164
	Proposed Aged Care Facility	PLATE No: 4
	Lots 2-5 StanleyStreet, Bathurst	REV: A
	CLIENT: Opal Aged Care Pty Ltd	DATE: 11-Nov-15

Photo 9: TP5

Photo 10: TP5 Stockpile

Douglas Partners Geotechnics / Environment / Groundwater	**Site Photographs**	PROJECT No: 85164
	Proposed Aged Care Facility	PLATE No: 5
	Lots 2-5 StanleyStreet, Bathurst	REV: A
	CLIENT: Opal Aged Care Pty Ltd	DATE: 11-Nov-15

Photo 11: TP6

Photo 12: TP6 Stockpile

Douglas Partners Geotechnics / Environment / Groundwater	**Site Photographs**	PROJECT No: 85164
	Proposed Aged Care Facility	PLATE No: 6
	Lots 2-5 StanleyStreet, Bathurst	REV: A
	CLIENT: Opal Aged Care Pty Ltd	DATE: 11-Nov-15

Photo 13: TP7

Photo 14: TP7 Stockpile

Douglas Partners Geotechnics / Environment / Groundwater	**Site Photographs**	PROJECT No: 85164
	Proposed Aged Care Facility	PLATE No: 7
	Lots 2-5 StanleyStreet, Bathurst	REV: A
	CLIENT: Opal Aged Care Pty Ltd	DATE: 11-Nov-15

Photo 15: TP8

Douglas Partners Geotechnics / Environment / Groundwater	**Site Photographs** **Proposed Aged Care Facility** **Lots 2-5 StanleyStreet, Bathurst**	PROJECT No: 85164 PLATE No: 8 REV: A
	CLIENT: Opal Aged Care Pty Ltd	DATE: 11-Nov-15

Photo 16: TP9 and Stockpile

Douglas Partners Geotechnics / Environment / Groundwater	**Site Photographs**	PROJECT No: 85164
	Proposed Aged Care Facility	PLATE No: 9
	Lots 2-5 StanleyStreet, Bathurst	REV: A
	CLIENT: Opal Aged Care Pty Ltd	DATE: 11-Nov-15

Photo 17: TP10

Douglas Partners Geotechnics / Environment / Groundwater	**Site Photographs**	PROJECT No: 85164
	Proposed Aged Care Facility	PLATE No: 10
	Lots 2-5 StanleyStreet, Bathurst	REV: A
	CLIENT: Opal Aged Care Pty Ltd	DATE: 11-Nov-15

Photo 18: TP11

Photo 19: TP11 Stockpile

Douglas Partners Geotechnics / Environment / Groundwater	**Site Photographs**	PROJECT No: 85164
	Proposed Aged Care Facility	PLATE No: 11
	Lots 2-5 StanleyStreet, Bathurst	REV: A
	CLIENT: Opal Aged Care Pty Ltd	DATE: 11-Nov-15

Photo 20: TP12

Douglas Partners Geotechnics / Environment / Groundwater	**Site Photographs** **Proposed Aged Care Facility** **Lots 2-5 StanleyStreet, Bathurst**	PROJECT No: 85164 PLATE No: 12 REV: A
	CLIENT: Opal Aged Care Pty Ltd	DATE: 11-Nov-15

Photo 21: TP 13

Photo 22: TP14

Douglas Partners Geotechnics / Environment / Groundwater	**Site Photographs**	PROJECT No: 85164
	Proposed Aged Care Facility	PLATE No: 13
	Lots 2-5 StanleyStreet, Bathurst	REV: A
	CLIENT: Opal Aged Care Pty Ltd	DATE: 11-Nov-15

Photo 23: TP15

Photo 24: TP15 Stockpile

Douglas Partners Geotechnics / Environment / Groundwater	**Site Photographs**	PROJECT No: 85164
	Proposed Aged Care Facility	PLATE No: 14
	Lots 2-5 StanleyStreet, Bathurst	REV: A
	CLIENT: Opal Aged Care Pty Ltd	DATE: 11-Nov-15

Photo 25: TP17 Stockpile

Douglas Partners Geotechnics / Environment / Groundwater	**Site Photographs**	PROJECT No: 85164
	Proposed Aged Care Facility	PLATE No: 15
	Lots 2-5 StanleyStreet, Bathurst	REV: A
	CLIENT: Opal Aged Care Pty Ltd	DATE: 11-Nov-15

Photo 26: TP18

Photo 27: TP18 Stockpile

Douglas Partners Geotechnics / Environment / Groundwater	**Site Photographs**	PROJECT No: 85164
	Proposed Aged Care Facility	PLATE No: 16
	Lots 2-5 StanleyStreet, Bathurst	REV: A
	CLIENT: Opal Aged Care Pty Ltd	DATE: 11-Nov-15

Photo 28: TP19

Photo 29: TP19 Stockpile

Douglas Partners Geotechnics / Environment / Groundwater	**Site Photographs**	PROJECT No: 85164
	Proposed Aged Care Facility	PLATE No: 17
	Lots 2-5 StanleyStreet, Bathurst	REV: A
	CLIENT: Opal Aged Care Pty Ltd	DATE: 11-Nov-15

Photo 30: TP20

Photo 31: TP20 Stockpile

Douglas Partners Geotechnics / Environment / Groundwater	**Site Photographs**	PROJECT No: 85164
	Proposed Aged Care Facility	PLATE No: 18
	Lots 2-5 StanleyStreet, Bathurst	REV: A
	CLIENT: Opal Aged Care Pty Ltd	DATE: 11-Nov-15

Appendix G

Laboratory Summary Results Tables

Laboratory Certificates of Analysis

and Chain of Custody Documentation

Table G1: Summary of Soil Laboratory Results

					BTEX								Lead		Metals							Organochlorine Pesticides											
				B(a)P Total Potency Equivalent	Benzene	Ethylbenzene	Toluene	Xylene (m & p)	Xylene (o)	Xylene Total #4	C6-C10 less BTEX (F1)	pH (aqueous extract)	Cation Exchange Capacity	Lead	Lead (TCLP)	Arsenic	Cadmium	Chromium (III+VI)	Copper	Mercury	Mercury (TCLP)	Nickel	Zinc	4,4-DDE	a-BHC	Aldrin	Aldrin + Dieldrin #4	b-BHC	Chlordane (cis)	Chlordane (trans)	d-BHC	DDD	DDT	DDT+DDE+DDD #2	Dieldrin
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	pH_Units	meq/100g	mg/kg	mg/L	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/L	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL				0.5	0.2	1	0.5	2	1	3	25	0.1	0.1	1	0.03	4	0.4	1	1	0.1	0.0005	1	1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1		0.1
NEPM 2013 HILs/HSLs Res B Soil				4	140	5900	21,000			17,000	5600			1200		500	150		30,000	120		1200	60,000				10						600	
NEPM 2013 Res A/B Soil HSL for Vapour Intrusion, Sand 0-1m					0.5	55	160			40	45																							
NEPM 2013 EILs/ESLs for Urban Residential, Coarse/Sand 0-2m					50	70	85			105				1100		100		190	230			270	770									180		
NEPM 2013 Management Limits in Res / Parkland, Coarse Soil																																		
NSW 2014 General Solid Waste (CT1)					10	600	288			1000				100		100	20	100		4		40												
NSW 2014 General Solid Waste (SCC1 and TCLP1)														1500	5			1900		50	0.2	1050												
ANZECC (1992) - For Natural Material					0.05-1		0.1-1							<2-200		0.2-30	0.04-2	0.5-110	1-190	0.001-0.1		2-400	2-180											
Location	**Sample Depth**	**Sample Date**	**Srtata**																															
TP1	0.4-0.5	2/11/2015	Filling	<0.5	<0.2	<1	<0.5	<2	<1	<3	<25	-	-	14	-	<4	<0.4	18	13	0.2	-	13	25	-	-	-	-	-	-	-	-	-	-	-
BD1A (intra)		2/11/2015	Filling	<0.5	<0.2	<1	<0.5	<2	<1	<3	<25	-	-	12	-	<4	<0.4	21	12	<0.1	-	14	26	-	-	-	-	-	-	-	-	-	-	-	-
BD1B (inter)		2/11/2015	Filling	0.6	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<20	-	-	12	-	<2	<0.4	16	9.9	<0.05	-	10	19	-	-	-	-	-	-	-	-	-	-	-	-
TP1	1.5-1.6	2/11/2015	Filling	<0.5	<0.2	<1	<0.5	<2	<1	<3	<25	-	-	15	-	<4	<0.4	25	15	<0.1	-	13	33	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.3	<0.1
TP2	0.9-1.0	2/11/2015	Filling	1	<0.2	<1	<0.5	<2	<1	<3	<25	-	-	180	0.05	<4	<0.4	19	39	6	<0.0005	9	180	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.3	<0.1
TP3	1.4-1.5	2/11/2015	Filling	2.2	<0.2	<1	<0.5	<2	<1	<3	<25	-	-	370	0.2	<4	<0.4	27	100	16	<0.0005	28	240	-	-	-	-	-	-	-	-	-	-	-	-
TP4	0.4-0.5	2/11/2015	Filling	<0.5	<0.2	<1	<0.5	<2	<1	<3	<25	-	-	29	-	<4	<0.4	14	9	0.1	-	6	37	-	-	-	-	-	-	-	-	-	-	-	-
TP5	0.9-1.0	2/11/2015	Filling	<0.5	<0.2	<1	<0.5	<2	<1	<3	<25	-	-	190	-	<4	<0.4	16	24	0.9	-	6	57	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.3	<0.1
TP6	0.4-0.5	2/11/2015	Natural	<0.5	<0.2	<1	<0.5	<2	<1	<3	<25	19	7.8	14	-	5	<0.4	50	27	<0.1	-	26	56	-	-	-	-	-	-	-	-	-	-	-	-
TP7	0.1-0.3	3/11/2015	Filling	<0.5	<0.2	<1	<0.5	<2	<1	<3	<25	-	-	44	-	<4	<0.4	15	10	0.6	-	6	56	-	-	-	-	-	-	-	-	-	-	-	-
TP8	0.5-0.7	3/11/2015	Filling	0.5	<0.2	<1	<0.5	<2	<1	<3	<25	-	-	35	-	<4	<0.4	19	13	0.1	-	10	73	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.3	<0.1
TP9	2-2.2	2/11/2015	Filling	2.2	<0.2	<1	<0.5	<2	<1	<3	<25	-	-	64	-	6	<0.4	17	13	0.4	-	10	98	-	-	-	-	-	-	-	-	-	-	-	-
TP10	0.6-0.8	3/11/2015	Natural	<0.5	<0.2	<1	<0.5	<2	<1	<3	<25	19	6.7	13	-	4	<0.4	48	24	<0.1	-	23	50	-	-	-	-	-	-	-	-	-	-	-	-
TP11	1.5-1.7	3/11/2015	Filling	**5.5**	<0.2	<1	<0.5	<2	<1	<3	<25	-	-	92	-	5	<0.4	18	16	0.3	-	7	120	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.3	<0.1
TP12	0-0.15	3/11/2015	Filling	<0.5	<0.2	<1	<0.5	<2	<1	<3	<25	-	-	23	-	4	<0.4	50	31	<0.1	-	23	70	-	-	-	-	-	-	-	-	-	-	-	-
TP13	0.1-0.3	3/11/2015	Filling	0.7	<0.2	<1	<0.5	<2	<1	<3	<25	-	-	18	-	4	<0.4	23	11	<0.1	-	10	290	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.3	<0.1
TP14	0.5-0.6	3/11/2015	Filling	<0.5	<0.2	<1	<0.5	<2	<1	<3	<25	-	-	14	-	<4	<0.4	11	7	<0.1	-	7	43	-	-	-	-	-	-	-	-	-	-	-	-
TP15	0-0.2	2/11/2015	Filling	0.6	<0.2	<1	<0.5	<2	<1	<3	<25	-	-	69	-	<4	<0.4	17	14	0.3	-	7	150	-	-	-	-	-	-	-	-	-	-	-	-
TP16	0.5-0.7	3/11/2015	Natural	<0.5	<0.2	<1	<0.5	<2	<1	<3	<25	19	7.5	13	-	<4	<0.4	46	22	<0.1	-	20	47	-	-	-	-	-	-	-	-	-	-	-	-
TP17	0.4-0.5	2/11/2015	Natural	0.7	<0.2	<1	<0.5	<2	<1	<3	<25	22	6.9	14	-	5	<0.4	53	30	<0.1	-	25	60	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.3	<0.1
TP20	0.9-1.0	3/11/2015	Filling	<0.5	<0.2	<1	<0.5	<2	<1	<3	<25	-	-	41	-	<4	<0.4	22	15	0.1	-	9	130	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.3	<0.1
TP22	0.9-1.0	3/11/2015	Filling	<0.5	<0.2	<1	<0.5	<2	<1	<3	<25	-	-	32	-	<4	<0.4	18	13	0.1	-	7	60	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.3	<0.1
TP2	-	2/11/2015	Material	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP11	-	3/11/2015	Material	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Data Comments

#1 ESDAT Combined with Non-Detect Multiplier of 0.5. Some Analytes are missing from this Combined Compound.
#2 ESDAT Combined. Some Analytes are missing from this Combined Compound.
#3 ESDAT Combined with Non-Detect Multiplier of 0.5.
#4 ESDAT Combined.
#5 NIL (+)VE

Table G1: Summary of Soil Laboratory Results

Location	Sample Depth	Sample Date	Srtata	Endosulfan I	Endosulfan II	Endosulfan sulphate	Endrin	Endrin aldehyde	g-BHC (Lindane)	Heptachlor	Heptachlor epoxide	Methoxychlor	Organophosphorous Pesticides: Bromophos-ethyl	Chlorpyrifos	Chlorpyrifos-methyl	Diazinon	Dimethoate	Ethion	Fenitrothion	Ronnel
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL				0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
NEPM 2013 HILs/HSLs Res B Soil							20			10		500		340						
NEPM 2013 Res A/B Soil HSL for Vapour Intrusion, Sand 0-1m																				
NEPM 2013 EILs/ESLs for Urban Residential, Coarse/Sand 0-2m																				
NEPM 2013 Management Limits in Res / Parkland, Coarse Soil																				
NSW 2014 General Solid Waste (CT1)														4						
NSW 2014 General Solid Waste (SCC1 and TCLP1)																				
ANZECC (1992) - For Natural Material																				
TP1	0.4-0.5	2/11/2015	Filling	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BD1A (intra)		2/11/2015	Filling	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BD1B (inter)		2/11/2015	Filling	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP1	1.5-1.6	2/11/2015	Filling	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TP2	0.9-1.0	2/11/2015	Filling	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TP3	1.4-1.5	2/11/2015	Filling	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP4	0.4-0.5	2/11/2015	Filling	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP5	0.9-1.0	2/11/2015	Filling	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TP6	0.4-0.5	2/11/2015	Natural	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP7	0.1-0.3	3/11/2015	Filling	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP8	0.5-0.7	3/11/2015	Filling	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TP9	2-2.2	2/11/2015	Filling	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP10	0.6-0.8	3/11/2015	Natural	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP11	1.5-1.7	3/11/2015	Filling	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TP12	0-0.15	3/11/2015	Filling	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP13	0.1-0.3	3/11/2015	Filling	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TP14	0.5-0.6	3/11/2015	Filling	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP15	0-0.2	2/11/2015	Filling	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP16	0.5-0.7	3/11/2015	Natural	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP17	0.4-0.5	2/11/2015	Natural	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TP20	0.9-1.0	3/11/2015	Filling	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TP22	0.9-1.0	3/11/2015	Filling	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TP2	-	2/11/2015	Material	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP11	-	3/11/2015	Material	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

PAH/Phenols

Location	Sample Depth	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a) pyrene	Benzo(a) pyrene (TCLP)	Benzo(b)&(k)fluoranthene	Benzo(g,h,i)perylene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene	PAHs (Sum of total)	Phenanthrene	Phenolics Total	Pyrene
		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/L	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL		0.1	0.1	0.1	0.1	0.05	0.001	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	-	0.1	5	0.1
NEPM 2013 HILs/HSLs Res B Soil															2200	400			
NEPM 2013 Res A/B Soil HSL for Vapour Intrusion, Sand 0-1m															3				
NEPM 2013 EILs/ESLs for Urban Residential, Coarse/Sand 0-2m						0.7									170				
NEPM 2013 Management Limits in Res / Parkland, Coarse Soil																			
NSW 2014 General Solid Waste (CT1)						0.8													
NSW 2014 General Solid Waste (SCC1 and TCLP1)						10	0.04												
ANZECC (1992) - For Natural Material																0.95-5		0.03-0.5	
TP1	0.4-0.5	<0.1	<0.1	<0.1	<0.1	<0.05	-	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0[#5]	<0.1	-	<0.1
BD1A (intra)		<0.1	<0.1	<0.1	<0.1	<0.05	-	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0[#5]	<0.1	-	<0.1
BD1B (inter)		<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0[#5]	<0.5	-	<0.5
TP1	1.5-1.6	<0.1	<0.1	<0.1	<0.1	<0.05	-	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0[#5]	<0.1	<5	<0.1
TP2	0.9-1.0	<0.1	0.1	0.1	0.6	0.73	-	1	0.4	0.8	<0.1	1.1	<0.1	0.4	<0.1	7	0.4	<5	1.1
TP3	1.4-1.5	<0.1	0.2	0.2	1.2	1.5	<0.001	2.4	0.9	1.7	0.2	2.3	<0.1	0.9	<0.1	15	0.9	-	2.3
TP4	0.4-0.5	<0.1	<0.1	<0.1	<0.1	0.07	-	<0.2	<0.1	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	0.28	<0.1	-	0.1
TP5	0.9-1.0	<0.1	<0.1	<0.1	0.1	0.1	-	0.2	<0.1	0.2	<0.1	0.2	<0.1	<0.1	<0.1	1	<0.1	<5	0.2
TP6	0.4-0.5	<0.1	<0.1	<0.1	<0.1	<0.05	-	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0[#5]	<0.1	-	<0.1
TP7	0.1-0.3	<0.1	<0.1	<0.1	<0.1	0.1	-	<0.2	<0.1	0.1	<0.1	0.2	<0.1	<0.1	<0.1	0.55	<0.1	-	0.2
TP8	0.5-0.7	<0.1	<0.1	<0.1	0.4	0.4	-	0.6	<0.1	0.5	<0.1	0.6	<0.1	0.2	<0.1	3.8	0.3	<5	0.6
TP9	2-2.2	<0.1	0.2	0.1	1.4	1.5	<0.001	2.3	0.7	1.6	0.2	1.9	<0.1	0.8	<0.1	14	0.4	-	2.4
TP10	0.6-0.8	<0.1	<0.1	<0.1	<0.1	<0.05	-	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0[#5]	<0.1	-	<0.1
TP11	1.5-1.7	0.1	0.3	0.9	3.1	3.8	<0.001	5.3	2.3	3.6	0.5	4.9	0.2	2.4	0.1	35	2.5	<5	5.3
TP12	0-0.15	<0.1	<0.1	<0.1	<0.1	<0.05	-	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0[#5]	<0.1	-	<0.1
TP13	0.1-0.3	<0.1	<0.1	<0.1	0.4	0.5	-	0.7	0.2	0.5	<0.1	0.7	<0.1	0.2	<0.1	4.4	0.2	<5	0.8
TP14	0.5-0.6	<0.1	<0.1	<0.1	<0.1	<0.05	-	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.11	0.1	-	<0.1
TP15	0-0.2	<0.1	<0.1	<0.1	0.4	0.4	-	0.7	0.2	0.5	<0.1	0.7	<0.1	0.2	<0.1	4.2	0.3	-	0.7
TP16	0.5-0.7	<0.1	<0.1	<0.1	<0.1	<0.05	-	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0[#5]	<0.1	-	<0.1
TP17	0.4-0.5	<0.1	<0.1	<0.1	<0.1	<0.05	-	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0[#5]	<0.1	<5	<0.1
TP20	0.9-1.0	<0.1	<0.1	<0.1	0.2	0.2	-	0.3	0.1	0.2	<0.1	0.3	<0.1	0.1	<0.1	1.9	0.1	<5	0.3
TP22	0.9-1.0	<0.1	<0.1	<0.1	<0.1	0.09	-	<0.2	<0.1	0.1	<0.1	0.1	<0.1	<0.1	<0.1	0.45	<0.1	<5	0.1
TP2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Data Comments

#1 ESDAT Combined with Non-Detect Multiplier of 0.5. Some Analytes are

#2 ESDAT Combined. Some Analytes are missing from this Combined Com

#3 ESDAT Combined with Non-Detect Multiplier of 0.5.

#4 ESDAT Combined.

#5 NIL (+)VE

Table G1: Summary of Soil Laboratory Results

				Polychlorinated Biphenyls							TRH										
				Arochlor 1016	Arochlor 1221	Arochlor 1232	Arochlor 1242	Arochlor 1248	Arochlor 1254	Arochlor 1260	C10-C16	C16-C34	C34-C40	F2-NAPHTHALENE	C6 - C9	C10 - C14	C15 - C28	C29-C36	+C10 - C36 (Sum of total)	C6-C10	Asbestos
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	g/kg
EQL				0.1	0.1	0.1	0.1	0.1	0.1	0.1	50	100	100	50	25	50	100	100	250	25	0.1
NEPM 2013 HILs/HSLs Res B Soil												5800	8100	4200							
NEPM 2013 Res A/B Soil HSL for Vapour Intrusion, Sand 0-1m														110							
NEPM 2013 EILs/ESLs for Urban Residential, Coarse/Sand 0-2m											120	300	2800							180	
NEPM 2013 Management Limits in Res / Parkland, Coarse Soil											1000	3500	10,000							800	
NSW 2014 General Solid Waste (CT1)															650				10,000		
NSW 2014 General Solid Waste (SCC1 and TCLP1)																					
ANZECC (1992) - For Natural Material																					
Location	**Sample Depth**	**Sample Date**	**Srtata**																		
TP1	0.4-0.5	2/11/2015	Filling	-	-	-	-	-	-	-	<50	<100	<100	<50	<25	<50	<100	<100	<250[#4]	<25	<0.1
BD1A (intra)		2/11/2015	Filling	-	-	-	-	-	-	-	<50	<100	<100	<50	<25	<50	<100	<100	<250[#4]	<25	-
BD1B (inter)		2/11/2015	Filling	-	-	-	-	-	-	-	-	-	-	<50	<20	<20	<50	<50	<140[#4]	<20	-
TP1	1.5-1.6	2/11/2015	Filling	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<50	<100	<100	<50	<25	<50	<100	<100	<250[#4]	<25	<0.1
TP2	0.9-1.0	2/11/2015	Filling	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<50	<100	<100	<50	<25	<50	<100	<100	<250[#4]	<25	<0.001
TP3	1.4-1.5	2/11/2015	Filling	-	-	-	-	-	-	-	<50	<100	<100	<50	<25	<50	<100	<100	<250[#4]	<25	**AD**
TP4	0.4-0.5	2/11/2015	Filling	-	-	-	-	-	-	-	<50	<100	<100	<50	<25	<50	<100	<100	<250[#4]	<25	<0.1
TP5	0.9-1.0	2/11/2015	Filling	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<50	<100	<100	<50	<25	<50	<100	<100	<250[#4]	<25	<0.001
TP6	0.4-0.5	2/11/2015	Natural	-	-	-	-	-	-	-	<50	<100	<100	<50	<25	<50	<100	<100	<250[#4]	<25	-
TP7	0.1-0.3	3/11/2015	Filling	-	-	-	-	-	-	-	<50	<100	<100	<50	<25	<50	<100	<100	<250[#4]	<25	<0.1
TP8	0.5-0.7	3/11/2015	Filling	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<50	<100	130	<50	<25	<50	<100	<100	<250[#4]	<25	<0.001
TP9	2-2.2	2/11/2015	Filling	-	-	-	-	-	-	-	<50	<100	<100	<50	<25	<50	<100	<100	<250[#4]	<25	<0.1
TP10	0.6-0.8	3/11/2015	Natural	-	-	-	-	-	-	-	<50	<100	<100	<50	<25	<50	<100	<100	<250[#4]	<25	-
TP11	1.5-1.7	3/11/2015	Filling	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<50	200	<100	<50	<25	<50	120	100	270[#4]	<25	<0.001
TP12	0-0.15	3/11/2015	Filling	-	-	-	-	-	-	-	<50	<100	<100	<50	<25	<50	<100	<100	<250[#4]	<25	<0.1
TP13	0.1-0.3	3/11/2015	Filling	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<50	<100	<100	<50	<25	<50	<100	<100	<250[#4]	<25	<0.1
TP14	0.5-0.6	3/11/2015	Filling	-	-	-	-	-	-	-	<50	<100	<100	<50	<25	<50	<100	<100	<250[#4]	<25	<0.1
TP15	0-0.2	2/11/2015	Filling	-	-	-	-		-	-	<50	<100	<100	<50	<25	<50	<100	<100	<250[#4]	<25	<0.1
TP16	0.5-0.7	3/11/2015	Natural	-	-	-	-	-	-	-	<50	<100	<100	<50	<25	<50	<100	<100	<250[#4]	<25	-
TP17	0.4-0.5	2/11/2015	Natural	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<50	<100	<100	<50	<25	<50	<100	<100	<250[#4]	<25	<0.1
TP20	0.9-1.0	3/11/2015	Filling	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<50	<100	<100	<50	<25	<50	<100	<100	<250[#4]	<25	<0.1
TP22	0.9-1.0	3/11/2015	Filling	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<50	<100	<100	<50	<25	<50	<100	<100	<250[#4]	<25	<0.001
TP2	-	2/11/2015	Material	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**AD**
TP11	-	3/11/2015	Material	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**AD**

Data Comments

#1 ESDAT Combined with Non-Detect Multiplier of 0.5. Some Analytes are
#2 ESDAT Combined. Some Analytes are missing from this Combined Com
#3 ESDAT Combined with Non-Detect Multiplier of 0.5.
#4 ESDAT Combined.
#5 NIL (+)VE

Table G2: Summary of Groundwater Laboratory Results

			BTEX						Lead	Metals						
			Benzene	Ethylbenzene	Toluene	Xylene (m & p)	Xylene (o)	C6-C10 less BTEX (F1)	Hardness	Lead (Filtered)	Arsenic (Filtered)	Cadmium (Filtered)	Chromium (III+VI) (Filtered)	Copper (Filtered)	Mercury (Filtered)	Nickel (Filtered)	Zinc (Filtered)
			µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mgCaCO$_3$/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
EQL			1	1	1	2	1	0.01	3	0.001	0.001	0.0001	0.001	0.001	0.00005	0.001	0.001
NEPM 2013 Res HSL A & B GW for Vapour Intrusion, Sand 4-8m			800	NL	NL			1	3								
NEPM 2013 GILs, Fresh Waters			950				350			0.0401	0.013	0.00114	0.0049	0.0073	0.00006	0.0572	0.0416
ADWG 2011			1	300	800	600				0.01	0.01	0.002	0.05	20	0.001	0.02	
Location	**Sample Depth**	**Sample Date**															
BH1	5m	4/11/2015	<1	<1	<1	<2	<1	<0.01	220	<0.001	<0.001	<0.0001	<0.001	0.001	<0.00005	0.002	0.003
BD1A (inter)	5m	4/11/2015	<1	<1	<1	<2	<1	<0.01	-	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.00005	0.002	0.004
BH2	5m	4/11/2015	<1	<1	<1	<2	<1	<0.01	210	<0.001	0.001	<0.0001	<0.001	<0.001	<0.00005	0.001	0.002
BH3	5m	4/11/2015	<1	<1	<1	<2	<1	<0.01	240	<0.001	0.004	<0.0001	<0.001	<0.001	<0.00005	0.003	0.006
Trip Blank	Trip Blank	4/11/2015	<1	<1	<1	<2	<1	<0.01	-	-	-	-	-	-	-	-	-
Trip Spike	Trip Spike	4/11/2015	90%	88%	98%	95%	95%	-	-	-	-	-	-	-	-	-	-

			Organochlorine Pesticides																				
			4,4-DDE	a-BHC	Aldrin	b-BHC	Chlordane (cis)	Chlordane (trans)	d-BHC	DDD	DDT	Dieldrin	Dicofol	Endosulfan I	Endosulfan II	Endosulfan sulphate	Endrin	g-BHC (Lindane)	HCB	Heptachlor	Heptachlor epoxide	Mirex	Methoxychlor
			µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL			0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	<0.1	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.001
NEPM 2013 Res HSL A & B GW for Vapour Intrusion, Sand 4-8m																							
NEPM 2013 GILs, Fresh Waters							0.03				0.006						0.01	0.2		0.01			
ADWG 2011							2				9										0.3		
Location	**Sample Depth**	**Sample Date**																					
BH1	5m	4/11/2015	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.1	<0.1	<0.1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001
BD1A (inter)	5m	4/11/2015	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-		-	-		-
BH2	5m	4/11/2015	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.1	<0.1	<0.1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001
BH3	5m	4/11/2015	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-		-	-		-
Trip Blank	Trip Blank	4/11/2015	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-		-	-		-
Trip Spike	Trip Spike	4/11/2015	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-		-	-		-

Note: Criteria for metals adjusted for very hard water

Table G2: Summary of Groundwater Laboratory Results

			PAH/Phenols																	Polychlorinated Biphenyls							TRH							
			Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a) pyrene	Benzo(b)&(k)fluoranthene	Benzo(g,h,i)perylene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene	PAHs (Sum of total +'ve)	Phenanthrene	Total Phenolics	Pyrene	Arochlor 1016	Arochlor 1221	Arochlor 1232	Arochlor 1242	Arochlor 1248	Arochlor 1254	Arochlor 1260	C10-C16	C16-C34	C34-C40	F2-NAPHTHALENE	C6 - C9	C10 - C14	C15 - C28	C29-C36
			µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL			0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1		0.1	0.05	0.1	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.05	0.1	0.1	0.05	10	50	100	100
NEPM 2013 Res HSL A & B GW for Vapour Intrusion, Sand 4-8m															NL															1				
NEPM 2013 GILs, Fresh Waters															16								0.3		0.01									
ADWG 2011							0.01																											
Location	**Sample Depth**	**Sample Date**																																
BH1	5m	4/11/2015	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	0	<0.1	<0.05	<0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<50	<100	<100	<50	<10	<50	<100	<100
BD1A (inter)	5m	4/11/2015	-	-	-	-	-	-	-	-	-	-	-	-	<1	-	-		-	-	-	-	-	-	-	-	<50	<100	<100	<50	<10	<50	<100	<100
BH2	5m	4/11/2015	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	0	<0.1	<0.05	<0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<50	<100	<100	<50	<10	<50	<100	<100
BH3	5m	4/11/2015	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	0	<0.1	<0.05	<0.1	-	-	-	-	-	-	-	<50	<100	<100	<50	<10	<50	<100	<100
Trip Blank	Trip Blank	4/11/2015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	<10	-	-	-
Trip Spike	Trip Spike	4/11/2015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Note: Criteria for metals adjusted for very hard water

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CERTIFICATE OF ANALYSIS 137111

Client:

Douglas Partners Pty Ltd
96 Hermitage Rd
West Ryde
NSW 2114

Attention: Matt West, David Holden

Sample log in details:

Your Reference:	**85164, Bathurst**
No. of samples:	21 Soils, 2 Waters, 2 Materials
Date samples received / completed instructions received	09/11/15 / 09/11/15

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: / Issue Date:	16/11/15 / 13/11/15
Date of Preliminary Report:	Not Issued

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Results Approved By:

Jacinta Hurst
Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil						
Our Reference:	UNITS	137111-3	137111-6	137111-7	137111-8	137111-9
Your Reference	----------	BD1A	TP1	TP1	TP2	TP3
Depth	----------	-	0.4-0.5	1.5-1.6	0.9-1.0	1.4-1.5
Date Sampled		02/11/2015	02/11/2015	02/11/2015	02/11/2015	02/11/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	10/11/2015	10/11/2015	10/11/2015	10/11/2015	10/11/2015
Date analysed	-	11/11/2015	11/11/2015	11/11/2015	11/11/2015	11/11/2015
TRHC$_6$ - C$_9$	mg/kg	<25	<25	<25	<25	<25
TRHC$_6$ - C$_{10}$	mg/kg	<25	<25	<25	<25	<25
vTPHC$_6$ - 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
Surrogate aaa-Trifluorotoluene	%	87	93	86	94	88

vTRH(C6-C10)/BTEXN in Soil						
Our Reference:	UNITS	137111-10	137111-11	137111-12	137111-13	137111-14
Your Reference	----------	TP4	TP5	TP6	TP7	TP8
Depth	----------	0.4-0.5	0.9-1.0	0.4-0.5	0.1-0.3	0.5-0.7
Date Sampled		02/11/2015	02/11/2015	02/11/2015	03/11/2015	03/11/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	10/11/2015	10/11/2015	10/11/2015	10/11/2015	10/11/2015
Date analysed	-	11/11/2015	11/11/2015	11/11/2015	11/11/2015	11/11/2015
TRHC$_6$ - C$_9$	mg/kg	<25	<25	<25	<25	<25
TRHC$_6$ - C$_{10}$	mg/kg	<25	<25	<25	<25	<25
vTPHC$_6$ - 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
Surrogate aaa-Trifluorotoluene	%	99	95	88	102	94

vTRH(C6-C10)/BTEXN in Soil						
Our Reference:	UNITS	137111-15	137111-16	137111-17	137111-18	137111-19
Your Reference	----------	TP9	TP10	TP11	TP12	TP13
Depth	----------	2.0-2.2	0.6-0.8	1.5-1.7	0-0.15	0.1-0.3
Date Sampled		02/11/2015	03/11/2015	03/11/2015	03/11/2015	03/11/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	10/11/2015	10/11/2015	10/11/2015	10/11/2015	10/11/2015
Date analysed	-	11/11/2015	11/11/2015	11/11/2015	11/11/2015	11/11/2015
TRHC$_6$ - C$_9$	mg/kg	<25	<25	<25	<25	<25
TRHC$_6$ - C$_{10}$	mg/kg	<25	<25	<25	<25	<25
vTPHC$_6$ - 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
Surrogate aaa-Trifluorotoluene	%	96	86	94	91	95

vTRH(C6-C10)/BTEXN in Soil						
Our Reference:	UNITS	137111-20	137111-21	137111-22	137111-23	137111-24
Your Reference	----------	TP14	TP15	TP16	TP17	TP20
Depth	----------	0.5-0.6	0-0.2	0.5-0.7	0.4-0.5	0.9-1.0
Date Sampled		03/11/2015	02/11/2015	03/11/2015	02/11/2015	03/11/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	10/11/2015	10/11/2015	10/11/2015	10/11/2015	10/11/2015
Date analysed	-	11/11/2015	11/11/2015	11/11/2015	11/11/2015	11/11/2015
TRHC$_6$ - C$_9$	mg/kg	<25	<25	<25	<25	<25
TRHC$_6$ - C$_{10}$	mg/kg	<25	<25	<25	<25	<25
vTPHC$_6$ - 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
Surrogate aaa-Trifluorotoluene	%	88	92	91	90	90

vTRH(C6-C10)/BTEXN in Soil		
Our Reference:	UNITS	137111-25
Your Reference	----------	TP22
Depth	----------	0.9-1.0
Date Sampled		03/11/2015
Type of sample		Soil
Date extracted	-	10/11/2015
Date analysed	-	11/11/2015
TRHC$_6$ - C$_9$	mg/kg	<25
TRHC$_6$ - C$_{10}$	mg/kg	<25
vTPHC$_6$ - C$_{10}$ less BTEX (F1)	mg/kg	<25
Benzene	mg/kg	<0.2
Toluene	mg/kg	<0.5
Ethylbenzene	mg/kg	<1
m+p-xylene	mg/kg	<2
o-Xylene	mg/kg	<1
naphthalene	mg/kg	<1
Surrogate aaa-Trifluorotoluene	%	91

svTRH (C10-C40) in Soil						
Our Reference:	UNITS	137111-3	137111-6	137111-7	137111-8	137111-9
Your Reference	----------	BD1A	TP1	TP1	TP2	TP3
Depth	----------	-	0.4-0.5	1.5-1.6	0.9-1.0	1.4-1.5
Date Sampled		02/11/2015	02/11/2015	02/11/2015	02/11/2015	02/11/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	10/11/2015	10/11/2015	10/11/2015	10/11/2015	10/11/2015
Date analysed	-	10/11/2015	10/11/2015	10/11/2015	10/11/2015	10/11/2015
TRHC$_{10}$ - C$_{14}$	mg/kg	<50	<50	<50	<50	<50
TRHC$_{15}$ - C$_{28}$	mg/kg	<100	<100	<100	<100	<100
TRHC$_{29}$ - 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
Surrogate o-Terphenyl	%	82	82	81	83	84

svTRH (C10-C40) in Soil						
Our Reference:	UNITS	137111-10	137111-11	137111-12	137111-13	137111-14
Your Reference	----------	TP4	TP5	TP6	TP7	TP8
Depth	----------	0.4-0.5	0.9-1.0	0.4-0.5	0.1-0.3	0.5-0.7
Date Sampled		02/11/2015	02/11/2015	02/11/2015	03/11/2015	03/11/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	10/11/2015	10/11/2015	10/11/2015	10/11/2015	10/11/2015
Date analysed	-	10/11/2015	10/11/2015	10/11/2015	10/11/2015	10/11/2015
TRHC$_{10}$ - C$_{14}$	mg/kg	<50	<50	<50	<50	<50
TRHC$_{15}$ - C$_{28}$	mg/kg	<100	<100	<100	<100	<100
TRHC$_{29}$ - 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	130
Surrogate o-Terphenyl	%	85	84	79	82	82

svTRH (C10-C40) in Soil						
Our Reference:	UNITS	137111-15	137111-16	137111-17	137111-18	137111-19
Your Reference	----------	TP9	TP10	TP11	TP12	TP13
Depth	----------	2.0-2.2	0.6-0.8	1.5-1.7	0-0.15	0.1-0.3
Date Sampled		02/11/2015	03/11/2015	03/11/2015	03/11/2015	03/11/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	10/11/2015	10/11/2015	10/11/2015	10/11/2015	10/11/2015
Date analysed	-	11/11/2015	11/11/2015	11/11/2015	11/11/2015	11/11/2015
TRHC$_{10}$ - C$_{14}$	mg/kg	<50	<50	<50	<50	<50
TRHC$_{15}$ - C$_{28}$	mg/kg	<100	<100	120	<100	<100
TRHC$_{29}$ - 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	200	<100	<100
TRH>C$_{34}$-C$_{40}$	mg/kg	<100	<100	<100	<100	<100
Surrogate o-Terphenyl	%	84	82	85	82	83

svTRH (C10-C40) in Soil						
Our Reference:	UNITS	137111-20	137111-21	137111-22	137111-23	137111-24
Your Reference	----------	TP14	TP15	TP16	TP17	TP20
Depth	----------	0.5-0.6	0-0.2	0.5-0.7	0.4-0.5	0.9-1.0
Date Sampled		03/11/2015	02/11/2015	03/11/2015	02/11/2015	03/11/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	10/11/2015	10/11/2015	10/11/2015	10/11/2015	10/11/2015
Date analysed	-	11/11/2015	11/11/2015	11/11/2015	11/11/2015	11/11/2015
TRHC$_{10}$ - C$_{14}$	mg/kg	<50	<50	<50	<50	<50
TRHC$_{15}$ - C$_{28}$	mg/kg	<100	<100	<100	<100	<100
TRHC$_{29}$ - 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
Surrogate o-Terphenyl	%	85	84	81	82	81

svTRH (C10-C40) in Soil		
Our Reference:	UNITS	137111-25
Your Reference	----------	TP22
Depth	----------	0.9-1.0
Date Sampled		03/11/2015
Type of sample		Soil
Date extracted	-	10/11/2015
Date analysed	-	11/11/2015
TRHC$_{10}$ - C$_{14}$	mg/kg	<50
TRHC$_{15}$ - C$_{28}$	mg/kg	<100
TRHC$_{29}$ - C$_{36}$	mg/kg	<100
TRH>C$_{10}$-C$_{16}$	mg/kg	<50
TRH>C$_{10}$ - C$_{16}$ less Naphthalene (F2)	mg/kg	<50
TRH>C$_{16}$-C$_{34}$	mg/kg	<100
TRH>C$_{34}$-C$_{40}$	mg/kg	<100
Surrogate o-Terphenyl	%	81

PAHs in Soil						
Our Reference:	UNITS	137111-3	137111-6	137111-7	137111-8	137111-9
Your Reference	----------	BD1A	TP1	TP1	TP2	TP3
Depth	----------	-	0.4-0.5	1.5-1.6	0.9-1.0	1.4-1.5
Date Sampled		02/11/2015	02/11/2015	02/11/2015	02/11/2015	02/11/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	10/11/2015	10/11/2015	10/11/2015	10/11/2015	10/11/2015
Date analysed	-	10/11/2015	10/11/2015	10/11/2015	10/11/2015	10/11/2015
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	0.1	0.2
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	0.4	0.9
Anthracene	mg/kg	<0.1	<0.1	<0.1	0.1	0.2
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	1.1	2.3
Pyrene	mg/kg	<0.1	<0.1	<0.1	1.1	2.3
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	0.6	1.2
Chrysene	mg/kg	<0.1	<0.1	<0.1	0.8	1.7
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	1	2.4
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	0.73	1.5
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	0.4	0.9
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.2
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	0.4	0.9
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	1	2.2
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	1.0	2.2
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	1.1	2.2
Total Positive PAHs	mg/kg	NIL (+)VE	NIL (+)VE	NIL (+)VE	7.0	15
Surrogate p-Terphenyl-d14	%	107	101	100	100	102

PAHs in Soil						
Our Reference:	UNITS	137111-10	137111-11	137111-12	137111-13	137111-14
Your Reference	----------	TP4	TP5	TP6	TP7	TP8
Depth	----------	0.4-0.5	0.9-1.0	0.4-0.5	0.1-0.3	0.5-0.7
Date Sampled		02/11/2015	02/11/2015	02/11/2015	03/11/2015	03/11/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	10/11/2015	10/11/2015	10/11/2015	10/11/2015	10/11/2015
Date analysed	-	10/11/2015	10/11/2015	10/11/2015	10/11/2015	10/11/2015
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	0.3
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.1	0.2	<0.1	0.2	0.6
Pyrene	mg/kg	0.1	0.2	<0.1	0.2	0.6
Benzo(a)anthracene	mg/kg	<0.1	0.1	<0.1	<0.1	0.4
Chrysene	mg/kg	<0.1	0.2	<0.1	0.1	0.5
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	0.2	<0.2	<0.2	0.6
Benzo(a)pyrene	mg/kg	0.07	0.1	<0.05	0.1	0.4
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.2
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.2
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	0.6
Total Positive PAHs	mg/kg	0.28	1.0	NIL (+)VE	0.55	3.8
Surrogate p-Terphenyl-d14	%	100	88	98	100	103

PAHs in Soil						
Our Reference:	UNITS	137111-15	137111-16	137111-17	137111-18	137111-19
Your Reference	----------	TP9	TP10	TP11	TP12	TP13
Depth	----------	2.0-2.2	0.6-0.8	1.5-1.7	0-0.15	0.1-0.3
Date Sampled		02/11/2015	03/11/2015	03/11/2015	03/11/2015	03/11/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	10/11/2015	10/11/2015	10/11/2015	10/11/2015	10/11/2015
Date analysed	-	10/11/2015	10/11/2015	10/11/2015	10/11/2015	10/11/2015
Naphthalene	mg/kg	<0.1	<0.1	0.1	<0.1	<0.1
Acenaphthylene	mg/kg	0.2	<0.1	0.3	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	0.2	<0.1	<0.1
Phenanthrene	mg/kg	0.4	<0.1	2.5	<0.1	0.2
Anthracene	mg/kg	0.1	<0.1	0.9	<0.1	<0.1
Fluoranthene	mg/kg	1.9	<0.1	4.9	<0.1	0.7
Pyrene	mg/kg	2.4	<0.1	5.3	<0.1	0.8
Benzo(a)anthracene	mg/kg	1.4	<0.1	3.1	<0.1	0.4
Chrysene	mg/kg	1.6	<0.1	3.6	<0.1	0.5
Benzo(b,j+k)fluoranthene	mg/kg	2.3	<0.2	5.3	<0.2	0.7
Benzo(a)pyrene	mg/kg	1.5	<0.05	3.8	<0.05	0.5
Indeno(1,2,3-c,d)pyrene	mg/kg	0.8	<0.1	2.4	<0.1	0.2
Dibenzo(a,h)anthracene	mg/kg	0.2	<0.1	0.5	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	0.7	<0.1	2.3	<0.1	0.2
Benzo(a)pyrene TEQ calc (zero)	mg/kg	2.2	<0.5	5.5	<0.5	0.6
Benzo(a)pyrene TEQ calc(half)	mg/kg	2.2	<0.5	5.5	<0.5	0.7
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	2.2	<0.5	5.5	<0.5	0.7
Total Positive PAHs	mg/kg	14	NIL (+)VE	35	NIL (+)VE	4.4
Surrogate p-Terphenyl-d14	%	104	101	104	100	102

PAHs in Soil						
Our Reference:	UNITS	137111-20	137111-21	137111-22	137111-23	137111-24
Your Reference	----------	TP14	TP15	TP16	TP17	TP20
Depth	----------	0.5-0.6	0-0.2	0.5-0.7	0.4-0.5	0.9-1.0
Date Sampled		03/11/2015	02/11/2015	03/11/2015	02/11/2015	03/11/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	10/11/2015	10/11/2015	10/11/2015	10/11/2015	10/11/2015
Date analysed	-	10/11/2015	10/11/2015	10/11/2015	10/11/2015	10/11/2015
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	0.7	<0.1	<0.1	0.3
Pyrene	mg/kg	<0.1	0.7	<0.1	<0.1	0.3
Benzo(a)anthracene	mg/kg	<0.1	0.4	<0.1	<0.1	0.2
Chrysene	mg/kg	<0.1	0.5	<0.1	<0.1	0.2
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	0.7	<0.2	<0.2	0.3
Benzo(a)pyrene	mg/kg	<0.05	0.4	<0.05	<0.05	0.2
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	0.2	<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	0.2	<0.1	<0.1	0.1
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	0.6	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	0.6	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	0.7	<0.5	<0.5	<0.5
Total Positive PAHs	mg/kg	0.11	4.2	NIL (+)VE	NIL (+)VE	1.9
Surrogate p-Terphenyl-d14	%	87	103	100	101	101

PAHs in Soil		
Our Reference:	UNITS	137111-25
Your Reference	----------	TP22
Depth	----------	0.9-1.0
Date Sampled		03/11/2015
Type of sample		Soil
Date extracted	-	10/11/2015
Date analysed	-	10/11/2015
Naphthalene	mg/kg	<0.1
Acenaphthylene	mg/kg	<0.1
Acenaphthene	mg/kg	<0.1
Fluorene	mg/kg	<0.1
Phenanthrene	mg/kg	<0.1
Anthracene	mg/kg	<0.1
Fluoranthene	mg/kg	0.1
Pyrene	mg/kg	0.1
Benzo(a)anthracene	mg/kg	<0.1
Chrysene	mg/kg	0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2
Benzo(a)pyrene	mg/kg	0.09
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5
Total Positive PAHs	mg/kg	0.45
Surrogate p-Terphenyl-d14	%	100

Organochlorine Pesticides in soil						
Our Reference:	UNITS	137111-7	137111-8	137111-11	137111-14	137111-17
Your Reference	----------	TP1	TP2	TP5	TP8	TP11
Depth	----------	1.5-1.6	0.9-1.0	0.9-1.0	0.5-0.7	1.5-1.7
Date Sampled		02/11/2015	02/11/2015	02/11/2015	03/11/2015	03/11/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	10/11/2015	10/11/2015	10/11/2015	10/11/2015	10/11/2015
Date analysed	-	10/11/2015	10/11/2015	10/11/2015	10/11/2015	10/11/2015
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	96	95	98	98	96

Organochlorine Pesticides in soil					
Our Reference:	UNITS	137111-19	137111-23	137111-24	137111-25
Your Reference	----------	TP13	TP17	TP20	TP22
Depth	----------	0.1-0.3	0.4-0.5	0.9-1.0	0.9-1.0
Date Sampled		03/11/2015	02/11/2015	03/11/2015	03/11/2015
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	10/11/2015	10/11/2015	10/11/2015	10/11/2015
Date analysed	-	10/11/2015	10/11/2015	10/11/2015	10/11/2015
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	98	97	98	96

Organophosphorus Pesticides						
Our Reference:	UNITS	137111-7	137111-8	137111-11	137111-14	137111-17
Your Reference	----------	TP1	TP2	TP5	TP8	TP11
Depth	----------	1.5-1.6	0.9-1.0	0.9-1.0	0.5-0.7	1.5-1.7
Date Sampled		02/11/2015	02/11/2015	02/11/2015	03/11/2015	03/11/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	10/11/2015	10/11/2015	10/11/2015	10/11/2015	10/11/2015
Date analysed	-	10/11/2015	10/11/2015	10/11/2015	10/11/2015	10/11/2015
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	96	95	98	98	96

Organophosphorus Pesticides					
Our Reference:	UNITS	137111-19	137111-23	137111-24	137111-25
Your Reference	----------	TP13	TP17	TP20	TP22
Depth	----------	0.1-0.3	0.4-0.5	0.9-1.0	0.9-1.0
Date Sampled		03/11/2015	02/11/2015	03/11/2015	03/11/2015
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	10/11/2015	10/11/2015	10/11/2015	10/11/2015
Date analysed	-	10/11/2015	10/11/2015	10/11/2015	10/11/2015
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	98	97	98	96

PCBs in Soil						
Our Reference:	UNITS	137111-7	137111-8	137111-11	137111-14	137111-17
Your Reference	----------	TP1	TP2	TP5	TP8	TP11
Depth	----------	1.5-1.6	0.9-1.0	0.9-1.0	0.5-0.7	1.5-1.7
Date Sampled		02/11/2015	02/11/2015	02/11/2015	03/11/2015	03/11/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	10/11/2015	10/11/2015	10/11/2015	10/11/2015	10/11/2015
Date analysed	-	10/11/2015	10/11/2015	10/11/2015	10/11/2015	10/11/2015
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
Surrogate TCLMX	%	96	95	98	98	96

PCBs in Soil					
Our Reference:	UNITS	137111-19	137111-23	137111-24	137111-25
Your Reference	----------	TP13	TP17	TP20	TP22
Depth	----------	0.1-0.3	0.4-0.5	0.9-1.0	0.9-1.0
Date Sampled		03/11/2015	02/11/2015	03/11/2015	03/11/2015
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	10/11/2015	10/11/2015	10/11/2015	10/11/2015
Date analysed	-	10/11/2015	10/11/2015	10/11/2015	10/11/2015
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	98	97	98	96

Misc Soil - Inorg						
Our Reference:	UNITS	137111-7	137111-8	137111-11	137111-14	137111-17
Your Reference	----------	TP1	TP2	TP5	TP8	TP11
Depth	----------	1.5-1.6	0.9-1.0	0.9-1.0	0.5-0.7	1.5-1.7
Date Sampled		02/11/2015	02/11/2015	02/11/2015	03/11/2015	03/11/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	10/11/2015	10/11/2015	10/11/2015	10/11/2015	10/11/2015
Date analysed	-	10/11/2015	10/11/2015	10/11/2015	10/11/2015	10/11/2015
Total Phenolics (as Phenol)	mg/kg	<5	<5	<5	<5	<5

Misc Soil - Inorg					
Our Reference:	UNITS	137111-19	137111-23	137111-24	137111-25
Your Reference	----------	TP13	TP17	TP20	TP22
Depth	----------	0.1-0.3	0.4-0.5	0.9-1.0	0.9-1.0
Date Sampled		03/11/2015	02/11/2015	03/11/2015	03/11/2015
Type of sample		Soil	Soil	Soil	Soil
Date prepared	-	10/11/2015	10/11/2015	10/11/2015	10/11/2015
Date analysed	-	10/11/2015	10/11/2015	10/11/2015	10/11/2015
Total Phenolics (as Phenol)	mg/kg	<5	<5	<5	<5

Acid Extractable metals in soil						
Our Reference:	UNITS	137111-3	137111-6	137111-7	137111-8	137111-9
Your Reference	----------	BD1A	TP1	TP1	TP2	TP3
Depth	----------	-	0.4-0.5	1.5-1.6	0.9-1.0	1.4-1.5
Date Sampled		02/11/2015	02/11/2015	02/11/2015	02/11/2015	02/11/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	10/11/2015	10/11/2015	10/11/2015	10/11/2015	10/11/2015
Date analysed	-	10/11/2015	10/11/2015	10/11/2015	10/11/2015	10/11/2015
Arsenic	mg/kg	<4	<4	<4	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	21	18	25	19	27
Copper	mg/kg	12	13	15	39	100
Lead	mg/kg	12	14	15	180	370
Mercury	mg/kg	<0.1	0.2	<0.1	6.0	16
Nickel	mg/kg	14	13	13	9	28
Zinc	mg/kg	26	25	33	180	240

Acid Extractable metals in soil						
Our Reference:	UNITS	137111-10	137111-11	137111-12	137111-13	137111-14
Your Reference	----------	TP4	TP5	TP6	TP7	TP8
Depth	----------	0.4-0.5	0.9-1.0	0.4-0.5	0.1-0.3	0.5-0.7
Date Sampled		02/11/2015	02/11/2015	02/11/2015	03/11/2015	03/11/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	10/11/2015	10/11/2015	10/11/2015	10/11/2015	10/11/2015
Date analysed	-	10/11/2015	10/11/2015	10/11/2015	10/11/2015	10/11/2015
Arsenic	mg/kg	<4	<4	5	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	14	16	50	15	19
Copper	mg/kg	9	24	27	10	13
Lead	mg/kg	29	190	14	44	35
Mercury	mg/kg	0.1	0.9	<0.1	0.6	0.1
Nickel	mg/kg	6	6	26	6	10
Zinc	mg/kg	37	57	56	56	73

Acid Extractable metals in soil						
Our Reference:	UNITS	137111-15	137111-16	137111-17	137111-18	137111-19
Your Reference	----------	TP9	TP10	TP11	TP12	TP13
Depth	----------	2.0-2.2	0.6-0.8	1.5-1.7	0-0.15	0.1-0.3
Date Sampled		02/11/2015	03/11/2015	03/11/2015	03/11/2015	03/11/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	10/11/2015	10/11/2015	10/11/2015	10/11/2015	10/11/2015
Date analysed	-	10/11/2015	10/11/2015	10/11/2015	10/11/2015	10/11/2015
Arsenic	mg/kg	6	4	5	4	4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	17	48	18	50	23
Copper	mg/kg	13	24	16	31	11
Lead	mg/kg	64	13	92	23	18
Mercury	mg/kg	0.4	<0.1	0.3	<0.1	<0.1
Nickel	mg/kg	10	23	7	23	10
Zinc	mg/kg	98	50	120	70	290

Acid Extractable metals in soil						
Our Reference:	UNITS	137111-20	137111-21	137111-22	137111-23	137111-24
Your Reference	----------	TP14	TP15	TP16	TP17	TP20
Depth	----------	0.5-0.6	0-0.2	0.5-0.7	0.4-0.5	0.9-1.0
Date Sampled		03/11/2015	02/11/2015	03/11/2015	02/11/2015	03/11/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	10/11/2015	10/11/2015	10/11/2015	10/11/2015	10/11/2015
Date analysed	-	10/11/2015	10/11/2015	10/11/2015	10/11/2015	10/11/2015
Arsenic	mg/kg	<4	<4	<4	5	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	11	17	46	53	22
Copper	mg/kg	7	14	22	30	15
Lead	mg/kg	14	69	13	14	41
Mercury	mg/kg	<0.1	0.3	<0.1	<0.1	0.1
Nickel	mg/kg	7	7	20	25	9
Zinc	mg/kg	43	150	47	60	130

Acid Extractable metals in soil		
Our Reference:	UNITS	137111-25
Your Reference	----------	TP22
Depth	----------	0.9-1.0
Date Sampled		03/11/2015
Type of sample		Soil
Date prepared	-	10/11/2015
Date analysed	-	10/11/2015
Arsenic	mg/kg	<4
Cadmium	mg/kg	<0.4
Chromium	mg/kg	18
Copper	mg/kg	13
Lead	mg/kg	32
Mercury	mg/kg	0.1
Nickel	mg/kg	7
Zinc	mg/kg	60

Moisture						
Our Reference:	UNITS	137111-3	137111-6	137111-7	137111-8	137111-9
Your Reference	----------	BD1A	TP1	TP1	TP2	TP3
Depth	----------	-	0.4-0.5	1.5-1.6	0.9-1.0	1.4-1.5
Date Sampled		02/11/2015	02/11/2015	02/11/2015	02/11/2015	02/11/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	10/11/2015	10/11/2015	10/11/2015	10/11/2015	10/11/2015
Date analysed	-	11/11/2015	11/11/2015	11/11/2015	11/11/2015	11/11/2015
Moisture	%	19	18	17	12	8.7

Moisture						
Our Reference:	UNITS	137111-10	137111-11	137111-12	137111-13	137111-14
Your Reference	----------	TP4	TP5	TP6	TP7	TP8
Depth	----------	0.4-0.5	0.9-1.0	0.4-0.5	0.1-0.3	0.5-0.7
Date Sampled		02/11/2015	02/11/2015	02/11/2015	03/11/2015	03/11/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	10/11/2015	10/11/2015	10/11/2015	10/11/2015	10/11/2015
Date analysed	-	11/11/2015	11/11/2015	11/11/2015	11/11/2015	11/11/2015
Moisture	%	7.5	12	16	8.7	9.1

Moisture						
Our Reference:	UNITS	137111-15	137111-16	137111-17	137111-18	137111-19
Your Reference	----------	TP9	TP10	TP11	TP12	TP13
Depth	----------	2.0-2.2	0.6-0.8	1.5-1.7	0-0.15	0.1-0.3
Date Sampled		02/11/2015	03/11/2015	03/11/2015	03/11/2015	03/11/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	10/11/2015	10/11/2015	10/11/2015	10/11/2015	10/11/2015
Date analysed	-	11/11/2015	11/11/2015	11/11/2015	11/11/2015	11/11/2015
Moisture	%	7.0	10	7.4	14	7.3

Moisture						
Our Reference:	UNITS	137111-20	137111-21	137111-22	137111-23	137111-24
Your Reference	----------	TP14	TP15	TP16	TP17	TP20
Depth	----------	0.5-0.6	0-0.2	0.5-0.7	0.4-0.5	0.9-1.0
Date Sampled		03/11/2015	02/11/2015	03/11/2015	02/11/2015	03/11/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	10/11/2015	10/11/2015	10/11/2015	10/11/2015	10/11/2015
Date analysed	-	11/11/2015	11/11/2015	11/11/2015	11/11/2015	11/11/2015
Moisture	%	5.3	7.3	8.2	11	9.1

Moisture		
Our Reference:	UNITS	137111-25
Your Reference	----------	TP22
Depth	----------	0.9-1.0
Date Sampled		03/11/2015
Type of sample		Soil
Date prepared	-	10/11/2015
Date analysed	-	11/11/2015
Moisture	%	11

Asbestos ID - soils						
Our Reference:	UNITS	137111-6	137111-7	137111-9	137111-10	137111-13
Your Reference	----------	TP1	TP1	TP3	TP4	TP7
Depth	----------	0.4-0.5	1.5-1.6	1.4-1.5	0.4-0.5	0.1-0.3
Date Sampled		02/11/2015	02/11/2015	02/11/2015	02/11/2015	03/11/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	11/11/2015	11/11/2015	11/11/2015	11/11/2015	11/11/2015
Sample mass tested	g	Approx. 35g	Approx. 30g	41.53g	Approx. 35g	Approx. 35g
Sample Description	-	Brown coarse grain soil & rocks	Brown coarse grain soil & rocks	Brown coarse grain soil & rocks	Brown coarse grain soil & rocks	Brown coarse grain soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	Chrysotile asbestos detected Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

Asbestos ID - soils						
Our Reference:	UNITS	137111-15	137111-18	137111-19	137111-20	137111-21
Your Reference	----------	TP9	TP12	TP13	TP14	TP15
Depth	----------	2.0-2.2	0-0.15	0.1-0.3	0.5-0.6	0-0.2
Date Sampled		02/11/2015	03/11/2015	03/11/2015	03/11/2015	02/11/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	11/11/2015	11/11/2015	11/11/2015	11/11/2015	11/11/2015
Sample mass tested	g	Approx. 40g	Approx. 30g	Approx. 45g	Approx. 35g	Approx. 40g
Sample Description	-	Brown coarse grain soil & rocks	Brown coarse grain soil & rocks	Brown coarse grain soil & rocks	Brown coarse grain soil & rocks	Brown coarse grain soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

Asbestos ID - soils			
Our Reference:	UNITS	137111-23	137111-24
Your Reference	----------	TP17	TP20
Depth	----------	0.4-0.5	0.9-1.0
Date Sampled		02/11/2015	03/11/2015
Type of sample		Soil	Soil
Date analysed	-	11/11/2015	11/11/2015
Sample mass tested	g	Approx. 40g	Approx. 35g
Sample Description	-	Brown coarse grain soil & rocks	Brown coarse grain soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected

Asbestos ID - soils NEPM - ASB-001						
Our Reference:	UNITS	137111-8	137111-11	137111-14	137111-17	137111-25
Your Reference	----------	TP2	TP5	TP8	TP11	TP22
Depth	----------	0.9-1.0	0.9-1.0	0.5-0.7	1.5-1.7	0.9-1.0
Date Sampled		02/11/2015	02/11/2015	03/11/2015	03/11/2015	03/11/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	11/11/2015	11/11/2015	11/11/2015	11/11/2015	11/11/2015
Sample mass tested	g	818.44g	634.64g	633.70g	881.17g	664.61g
Sample Description	-	Grey coarse grain soil & rocks	Grey coarse grain soil & rocks	Grey coarse grain soil & rocks	Grey coarse grain soil & rocks	Grey coarse grain soil & rocks
Asbestos ID in soil (as per AS4964)	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected
ACM >7mm Estimation*	g	--	--	--	--	--
ACM<7mm Estimation*	g	--	--	--	--	--
FA and AF Estimation*	g	--	--	--	--	--
Total Asbestos[#1]	g/kg	<0.1	<0.1	<0.1	<0.1	<0.1
ACM>7mm Estimation*	%(w/w)	<0.01	<0.01	<0.01	<0.01	<0.01
ACM<7mm Estimation*[#2]	%(w/w)	<0.001	<0.001	<0.001	<0.001	<0.001
FA and AF Estimation*[#2]	%(w/w)	<0.001	<0.001	<0.001	<0.001	<0.001
Total Asb Est w/w* Note[#]	%	<0.001	<0.001	<0.001	<0.001	<0.001

Asbestos ID - materials			
Our Reference:	UNITS	137111-4	137111-5
Your Reference	----------	TP2 ACM	TP11 ACM
Depth	----------	-	-
Date Sampled		02/11/2015	03/11/2015
Type of sample		Material	Material
Date analysed	-	12/11/2015	12/11/2015
Mass / Dimension of Sample	-	45x35x7mm	48x30x10mm
Sample Description	-	Grey compressed fibre cement material	Brown compressed fibre cement material
Asbestos ID in materials	-	Chrysotile asbestos detected Amosite asbestos detected	Chrysotile asbestos detected Amosite asbestos detected

Misc Inorg - Soil					
Our Reference:	UNITS	137111-12	137111-16	137111-22	137111-23
Your Reference	----------	TP6	TP10	TP16	TP17
Depth	----------	0.4-0.5	0.6-0.8	0.5-0.7	0.4-0.5
Date Sampled		02/11/2015	03/11/2015	03/11/2015	02/11/2015
Type of sample		Soil	Soil	Soil	Soil
Date prepared	-	11/11/2015	11/11/2015	11/11/2015	11/11/2015
Date analysed	-	12/11/2015	12/11/2015	12/11/2015	12/11/2015
pH 1:5 soil:water	pH Units	7.8	6.7	7.5	6.9

CEC					
Our Reference:	UNITS	137111-12	137111-16	137111-22	137111-23
Your Reference	----------	TP6	TP10	TP16	TP17
Depth	----------	0.4-0.5	0.6-0.8	0.5-0.7	0.4-0.5
Date Sampled		02/11/2015	03/11/2015	03/11/2015	02/11/2015
Type of sample		Soil	Soil	Soil	Soil
Date prepared	-	12/11/2015	12/11/2015	12/11/2015	12/11/2015
Date analysed	-	12/11/2015	12/11/2015	12/11/2015	12/11/2015
Exchangeable Ca	meq/100g	13	13	12	15
Exchangeable K	meq/100g	0.1	0.2	0.3	0.2
Exchangeable Mg	meq/100g	5.7	5.1	6.8	6.4
Exchangeable Na	meq/100g	0.17	0.16	0.12	0.15
Cation Exchange Capacity	meq/100g	19	19	19	22

vTRH(C6-C10)/BTEXN in Water			
Our Reference:	UNITS	137111-1	137111-2
Your Reference	----------	TS	TB
Depth	----------	-	-
Date Sampled		2/11/2015	2/11/2015
Type of sample		Water	Water
Date extracted	-	10/11/2015	10/11/2015
Date analysed	-	11/11/2015	11/11/2015
$TRHC_6$ - C_9	µg/L	[NA]	<10
$TRHC_6$ - C_{10}	µg/L	[NA]	<10
$TRHC_6$ - C_{10} less BTEX (F1)	µg/L	[NA]	<10
Benzene	µg/L	98%	<1
Toluene	µg/L	95%	<1
Ethylbenzene	µg/L	93%	<1
m+p-xylene	µg/L	92%	<2
o-xylene	µg/L	93%	<1
Naphthalene	µg/L	[NA]	<1
Surrogate Dibromofluoromethane	%	102	102
Surrogate toluene-d8	%	100	101
Surrogate 4-BFB	%	99	99

Method ID	Methodology Summary
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.
Org-014	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-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. For soil results:- 1. 'TEQ 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. 'TEQ 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. 'TEQ 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. 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.
Org-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Org-008	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Inorg-031	Total Phenolics by segmented flow analyser (in line distillation with colourimetric finish). Solids are extracted in a caustic media prior to analysis.
Metals-020 ICP-AES	Determination of various metals by ICP-AES.
Metals-021 CV-AAS	Determination of Mercury by Cold Vapour AAS.
Inorg-008	Moisture content determined by heating at 105+/-5 deg C for a minimum of 12 hours.
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)

Method ID	Methodology Summary
	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.
Metals-009	Determination of exchangeable cations and cation exchange capacity in soil based on Rayment and Lyons 2011.
Org-013	Water samples are analysed directly by purge and trap GC-MS.

QUALITY CONTROL vTRH(C6-C10)/BTEXN in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base || Duplicate || %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			10/11/2015	137111-3	10/11/2015 || 10/11/2015	LCS-2	10/11/2015
Date analysed	-			11/11/2015	137111-3	11/11/2015 || 11/11/2015	LCS-2	11/11/2015
TRHC$_6$ - C$_9$	mg/kg	25	Org-016	<25	137111-3	<25 || <25	LCS-2	93%
TRHC$_6$ - C$_{10}$	mg/kg	25	Org-016	<25	137111-3	<25 || <25	LCS-2	93%
Benzene	mg/kg	0.2	Org-016	<0.2	137111-3	<0.2 || <0.2	LCS-2	83%
Toluene	mg/kg	0.5	Org-016	<0.5	137111-3	<0.5 || <0.5	LCS-2	89%
Ethylbenzene	mg/kg	1	Org-016	<1	137111-3	<1 || <1	LCS-2	93%
m+p-xylene	mg/kg	2	Org-016	<2	137111-3	<2 || <2	LCS-2	99%
o-Xylene	mg/kg	1	Org-016	<1	137111-3	<1 || <1	LCS-2	99%
naphthalene	mg/kg	1	Org-014	<1	137111-3	<1 || <1	[NR]	[NR]
Surrogate aaa-Trifluorotoluene	%		Org-016	92	137111-3	87 || 95 || RPD: 9	LCS-2	94%

QUALITY CONTROL svTRH (C10-C40) in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base || Duplicate || %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			10/11/2015	137111-3	10/11/2015 || 10/11/2015	LCS-2	10/11/2015
Date analysed	-			10/11/2015	137111-3	10/11/2015 || 10/11/2015	LCS-2	10/11/2015
TRHC$_{10}$ - C$_{14}$	mg/kg	50	Org-003	<50	137111-3	<50 || <50	LCS-2	111%
TRHC$_{15}$ - C$_{28}$	mg/kg	100	Org-003	<100	137111-3	<100 || <100	LCS-2	106%
TRHC$_{29}$ - C$_{36}$	mg/kg	100	Org-003	<100	137111-3	<100 || <100	LCS-2	107%
TRH>C$_{10}$-C$_{16}$	mg/kg	50	Org-003	<50	137111-3	<50 || <50	LCS-2	111%
TRH>C$_{16}$-C$_{34}$	mg/kg	100	Org-003	<100	137111-3	<100 || <100	LCS-2	106%
TRH>C$_{34}$-C$_{40}$	mg/kg	100	Org-003	<100	137111-3	<100 || <100	LCS-2	107%
Surrogate o-Terphenyl	%		Org-003	82	137111-3	82 || 81 || RPD: 1	LCS-2	99%

QUALITY CONTROL PAHs in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base || Duplicate || %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			10/11/2015	137111-3	10/11/2015 || 10/11/2015	LCS-2	10/11/2015
Date analysed	-			10/11/2015	137111-3	10/11/2015 || 10/11/2015	LCS-2	10/11/2015
Naphthalene	mg/kg	0.1	Org-012	<0.1	137111-3	<0.1 || <0.1	LCS-2	119%
Acenaphthylene	mg/kg	0.1	Org-012	<0.1	137111-3	<0.1 || <0.1	[NR]	[NR]
Acenaphthene	mg/kg	0.1	Org-012	<0.1	137111-3	<0.1 || <0.1	[NR]	[NR]
Fluorene	mg/kg	0.1	Org-012	<0.1	137111-3	<0.1 || <0.1	LCS-2	123%
Phenanthrene	mg/kg	0.1	Org-012	<0.1	137111-3	<0.1 || <0.1	LCS-2	101%
Anthracene	mg/kg	0.1	Org-012	<0.1	137111-3	<0.1 || <0.1	[NR]	[NR]
Fluoranthene	mg/kg	0.1	Org-012	<0.1	137111-3	<0.1 || <0.1	LCS-2	104%
Pyrene	mg/kg	0.1	Org-012	<0.1	137111-3	<0.1 || <0.1	LCS-2	108%
Benzo(a)anthracene	mg/kg	0.1	Org-012	<0.1	137111-3	<0.1 || <0.1	[NR]	[NR]
Chrysene	mg/kg	0.1	Org-012	<0.1	137111-3	<0.1 || <0.1	LCS-2	128%
Benzo(b,j+k) fluoranthene	mg/kg	0.2	Org-012	<0.2	137111-3	<0.2 || <0.2	[NR]	[NR]

QUALITY CONTROL PAHs in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Benzo(a)pyrene	mg/kg	0.05	Org-012	<0.05	137111-3	<0.05 || <0.05	LCS-2	117%
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012	<0.1	137111-3	<0.1 || <0.1	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012	<0.1	137111-3	<0.1 || <0.1	[NR]	[NR]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012	<0.1	137111-3	<0.1 || <0.1	[NR]	[NR]
Surrogate p-Terphenyl-d14	%		Org-012	79	137111-3	107 || 102 || RPD: 5	LCS-2	109%
QUALITY CONTROL Organochlorine Pesticides in soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			10/11/2015	137111-14	10/11/2015 || 10/11/2015	LCS-2	10/11/2015
Date analysed	-			10/11/2015	137111-14	10/11/2015 || 10/11/2015	LCS-2	10/11/2015
HCB	mg/kg	0.1	Org-005	<0.1	137111-14	<0.1 || <0.1	[NR]	[NR]
alpha-BHC	mg/kg	0.1	Org-005	<0.1	137111-14	<0.1 || <0.1	LCS-2	82%
gamma-BHC	mg/kg	0.1	Org-005	<0.1	137111-14	<0.1 || <0.1	[NR]	[NR]
beta-BHC	mg/kg	0.1	Org-005	<0.1	137111-14	<0.1 || <0.1	LCS-2	83%
Heptachlor	mg/kg	0.1	Org-005	<0.1	137111-14	<0.1 || <0.1	LCS-2	85%
delta-BHC	mg/kg	0.1	Org-005	<0.1	137111-14	<0.1 || <0.1	[NR]	[NR]
Aldrin	mg/kg	0.1	Org-005	<0.1	137111-14	<0.1 || <0.1	LCS-2	88%
Heptachlor Epoxide	mg/kg	0.1	Org-005	<0.1	137111-14	<0.1 || <0.1	LCS-2	87%
gamma-Chlordane	mg/kg	0.1	Org-005	<0.1	137111-14	<0.1 || <0.1	[NR]	[NR]
alpha-chlordane	mg/kg	0.1	Org-005	<0.1	137111-14	<0.1 || <0.1	[NR]	[NR]
Endosulfan I	mg/kg	0.1	Org-005	<0.1	137111-14	<0.1 || <0.1	[NR]	[NR]
pp-DDE	mg/kg	0.1	Org-005	<0.1	137111-14	<0.1 || <0.1	LCS-2	89%
Dieldrin	mg/kg	0.1	Org-005	<0.1	137111-14	<0.1 || <0.1	LCS-2	90%
Endrin	mg/kg	0.1	Org-005	<0.1	137111-14	<0.1 || <0.1	LCS-2	88%
pp-DDD	mg/kg	0.1	Org-005	<0.1	137111-14	<0.1 || <0.1	LCS-2	86%
Endosulfan II	mg/kg	0.1	Org-005	<0.1	137111-14	<0.1 || <0.1	[NR]	[NR]
pp-DDT	mg/kg	0.1	Org-005	<0.1	137111-14	<0.1 || <0.1	[NR]	[NR]
Endrin Aldehyde	mg/kg	0.1	Org-005	<0.1	137111-14	<0.1 || <0.1	[NR]	[NR]
Endosulfan Sulphate	mg/kg	0.1	Org-005	<0.1	137111-14	<0.1 || <0.1	LCS-2	82%
Methoxychlor	mg/kg	0.1	Org-005	<0.1	137111-14	<0.1 || <0.1	[NR]	[NR]
Surrogate TCMX	%		Org-005	98	137111-14	98 || 96 || RPD: 2	LCS-2	122%

QUALITY CONTROL Organophosphorus Pesticides	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			10/11/2015	137111-14	10/11/2015 || 10/11/2015	LCS-2	10/11/2015
Date analysed	-			10/11/2015	137111-14	10/11/2015 || 10/11/2015	LCS-2	10/11/2015
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-008	<0.1	137111-14	<0.1 || <0.1	LCS-2	108%
Bromophos-ethyl	mg/kg	0.1	Org-008	<0.1	137111-14	<0.1 || <0.1	[NR]	[NR]
Chlorpyriphos	mg/kg	0.1	Org-008	<0.1	137111-14	<0.1 || <0.1	LCS-2	94%
Chlorpyriphos-methyl	mg/kg	0.1	Org-008	<0.1	137111-14	<0.1 || <0.1	[NR]	[NR]
Diazinon	mg/kg	0.1	Org-008	<0.1	137111-14	<0.1 || <0.1	[NR]	[NR]
Dichlorvos	mg/kg	0.1	Org-008	<0.1	137111-14	<0.1 || <0.1	LCS-2	91%
Dimethoate	mg/kg	0.1	Org-008	<0.1	137111-14	<0.1 || <0.1	[NR]	[NR]
Ethion	mg/kg	0.1	Org-008	<0.1	137111-14	<0.1 || <0.1	LCS-2	104%
Fenitrothion	mg/kg	0.1	Org-008	<0.1	137111-14	<0.1 || <0.1	LCS-2	110%
Malathion	mg/kg	0.1	Org-008	<0.1	137111-14	<0.1 || <0.1	LCS-2	88%
Parathion	mg/kg	0.1	Org-008	<0.1	137111-14	<0.1 || <0.1	LCS-2	103%
Ronnel	mg/kg	0.1	Org-008	<0.1	137111-14	<0.1 || <0.1	[NR]	[NR]
Surrogate TCMX	%		Org-008	98	137111-14	98 || 96 || RPD: 2	LCS-2	122%

QUALITY CONTROL PCBs in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			10/11/2015	137111-14	10/11/2015 || 10/11/2015	LCS-2	10/11/2015
Date analysed	-			10/11/2015	137111-14	10/11/2015 || 10/11/2015	LCS-2	10/11/2015
Aroclor 1016	mg/kg	0.1	Org-006	<0.1	137111-14	<0.1 || <0.1	[NR]	[NR]
Aroclor 1221	mg/kg	0.1	Org-006	<0.1	137111-14	<0.1 || <0.1	[NR]	[NR]
Aroclor 1232	mg/kg	0.1	Org-006	<0.1	137111-14	<0.1 || <0.1	[NR]	[NR]
Aroclor 1242	mg/kg	0.1	Org-006	<0.1	137111-14	<0.1 || <0.1	[NR]	[NR]
Aroclor 1248	mg/kg	0.1	Org-006	<0.1	137111-14	<0.1 || <0.1	[NR]	[NR]
Aroclor 1254	mg/kg	0.1	Org-006	<0.1	137111-14	<0.1 || <0.1	LCS-2	105%
Aroclor 1260	mg/kg	0.1	Org-006	<0.1	137111-14	<0.1 || <0.1	[NR]	[NR]
Surrogate TCLMX	%		Org-006	98	137111-14	98 || 96 || RPD: 2	LCS-2	122%

QUALITY CONTROL Misc Soil - Inorg	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date prepared	-			10/11/2015	137111-7	10/11/2015 || 10/11/2015	LCS-1	10/11/2015
Date analysed	-			10/11/2015	137111-7	10/11/2015 || 10/11/2015	LCS-1	10/11/2015
Total Phenolics (as Phenol)	mg/kg	5	Inorg-031	<5	137111-7	<5 || <5	LCS-1	104%
QUALITY CONTROL Acid Extractable metals in soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date prepared	-			10/11/2015	137111-3	10/11/2015 || 10/11/2015	LCS-1	10/11/2015
Date analysed	-			10/11/2015	137111-3	10/11/2015 || 10/11/2015	LCS-1	10/11/2015
Arsenic	mg/kg	4	Metals-020 ICP-AES	<4	137111-3	<4 || <4	LCS-1	120%
Cadmium	mg/kg	0.4	Metals-020 ICP-AES	<0.4	137111-3	<0.4 || <0.4	LCS-1	113%
Chromium	mg/kg	1	Metals-020 ICP-AES	<1	137111-3	21 || 20 || RPD: 5	LCS-1	116%
Copper	mg/kg	1	Metals-020 ICP-AES	<1	137111-3	12 || 12 || RPD: 0	LCS-1	113%
Lead	mg/kg	1	Metals-020 ICP-AES	<1	137111-3	12 || 12 || RPD: 0	LCS-1	112%
Mercury	mg/kg	0.1	Metals-021 CV-AAS	<0.1	137111-3	<0.1 || <0.1	LCS-1	89%
Nickel	mg/kg	1	Metals-020 ICP-AES	<1	137111-3	14 || 12 || RPD: 15	LCS-1	111%
Zinc	mg/kg	1	Metals-020 ICP-AES	<1	137111-3	26 || 25 || RPD: 4	LCS-1	113%

QUALITY CONTROL Misc Inorg - Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date prepared	-			[NT]	137111-12	11/11/2015 || 11/11/2015	LCS-1	11/11/2015
Date analysed	-			[NT]	137111-12	12/11/2015 || 12/11/2015	LCS-1	12/11/2015
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	137111-12	7.8 || 7.9 || RPD: 1	LCS-1	100%
QUALITY CONTROL CEC	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date prepared	-			11/11/2015	137111-12	12/11/2015 || 12/11/2015	LCS-1	11/11/2015
Date analysed	-			11/11/2015	137111-12	12/11/2015 || 12/11/2015	LCS-1	11/11/2015
Exchangeable Ca	meq/100g	0.1	Metals-009	<0.1	137111-12	13 || 13 || RPD: 0	LCS-1	107%
Exchangeable K	meq/100g	0.1	Metals-009	<0.1	137111-12	0.1 || 0.1 || RPD: 0	LCS-1	102%
Exchangeable Mg	meq/100g	0.1	Metals-009	<0.1	137111-12	5.7 || 5.7 || RPD: 0	LCS-1	102%
Exchangeable Na	meq/100g	0.1	Metals-009	<0.1	137111-12	0.17 || 0.15 || RPD: 13	LCS-1	93%
Cation Exchange Capacity	meq/100g	1	Metals-009	[NT]	137111-12	19 || 19 || RPD: 0	[NR]	[NR]
QUALITY CONTROL vTRH(C6-C10)/BTEXN in Water	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			10/11/2015	[NT]	[NT]	LCS-W3	10/11/2015
Date analysed	-			11/11/2015	[NT]	[NT]	LCS-W3	11/11/2015
TRHC$_6$ - C$_9$	µg/L	10	Org-016	<10	[NT]	[NT]	LCS-W3	98%
TRHC$_6$ - C$_{10}$	µg/L	10	Org-016	<10	[NT]	[NT]	LCS-W3	98%
Benzene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W3	101%
Toluene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W3	99%
Ethylbenzene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W3	97%
m+p-xylene	µg/L	2	Org-016	<2	[NT]	[NT]	LCS-W3	97%
o-xylene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W3	98%
Naphthalene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Surrogate Dibromofluoromethane	%		Org-016	101	[NT]	[NT]	LCS-W3	102%
Surrogate toluene-d8	%		Org-016	101	[NT]	[NT]	LCS-W3	100%
Surrogate 4-BFB	%		Org-016	100	[NT]	[NT]	LCS-W3	99%

QUALITY CONTROL vTRH(C6-C10)/BTEXN in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	137111-14	10/11/2015 || 10/11/2015	137111-7	10/11/2015
Date analysed	-	137111-14	11/11/2015 || 11/11/2015	137111-7	11/11/2015
TRHC$_6$ - C$_9$	mg/kg	137111-14	<25 || <25	137111-7	97%
TRHC$_6$ - C$_{10}$	mg/kg	137111-14	<25 || <25	137111-7	97%
Benzene	mg/kg	137111-14	<0.2 || <0.2	137111-7	86%

QUALITY CONTROL vTRH(C6-C10)/BTEXN in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Toluene	mg/kg	137111-14	<0.5 || <0.5	137111-7	93%
Ethylbenzene	mg/kg	137111-14	<1 || <1	137111-7	98%
m+p-xylene	mg/kg	137111-14	<2 || <2	137111-7	104%
o-Xylene	mg/kg	137111-14	<1 || <1	137111-7	105%
naphthalene	mg/kg	137111-14	<1 || <1	[NR]	[NR]
Surrogate aaa-Trifluorotoluene	%	137111-14	94 || 97 || RPD: 3	137111-7	94%
QUALITY CONTROL svTRH (C10-C40) in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	137111-14	10/11/2015 || 10/11/2015	137111-7	10/11/2015
Date analysed	-	137111-14	10/11/2015 || 11/11/2015	137111-7	10/11/2015
$TRHC_{10}$ - C_{14}	mg/kg	137111-14	<50 || <50	137111-7	106%
$TRHC_{15}$ - C_{28}	mg/kg	137111-14	<100 || <100	137111-7	106%
$TRHC_{29}$ - C_{36}	mg/kg	137111-14	100 || <100	137111-7	104%
$TRH>C_{10}$-C_{16}	mg/kg	137111-14	<50 || <50	137111-7	106%
$TRH>C_{16}$-C_{34}	mg/kg	137111-14	<100 || <100	137111-7	106%
$TRH>C_{34}$-C_{40}	mg/kg	137111-14	130 || <100	137111-7	104%
Surrogate o-Terphenyl	%	137111-14	82 || 83 || RPD: 1	137111-7	81%
QUALITY CONTROL PAHs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	137111-14	10/11/2015 || 10/11/2015	137111-7	10/11/2015
Date analysed	-	137111-14	10/11/2015 || 10/11/2015	137111-7	10/11/2015
Naphthalene	mg/kg	137111-14	<0.1 || <0.1	137111-7	116%
Acenaphthylene	mg/kg	137111-14	<0.1 || 0.1	[NR]	[NR]
Acenaphthene	mg/kg	137111-14	<0.1 || <0.1	[NR]	[NR]
Fluorene	mg/kg	137111-14	<0.1 || <0.1	137111-7	123%
Phenanthrene	mg/kg	137111-14	0.3 || 0.5 || RPD: 50	137111-7	102%
Anthracene	mg/kg	137111-14	<0.1 || 0.1	[NR]	[NR]
Fluoranthene	mg/kg	137111-14	0.6 || 0.9 || RPD: 40	137111-7	106%
Pyrene	mg/kg	137111-14	0.6 || 0.9 || RPD: 40	137111-7	111%
Benzo(a)anthracene	mg/kg	137111-14	0.4 || 0.5 || RPD: 22	[NR]	[NR]
Chrysene	mg/kg	137111-14	0.5 || 0.6 || RPD: 18	137111-7	129%
Benzo(b,j+k)fluoranthene	mg/kg	137111-14	0.6 || 0.7 || RPD: 15	[NR]	[NR]
Benzo(a)pyrene	mg/kg	137111-14	0.4 || 0.4 || RPD: 0	137111-7	111%
Indeno(1,2,3-c,d)pyrene	mg/kg	137111-14	0.2 || 0.2 || RPD: 0	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	137111-14	<0.1 || <0.1	[NR]	[NR]
Benzo(g,h,i)perylene	mg/kg	137111-14	0.2 || 0.2 || RPD: 0	[NR]	[NR]
Surrogate p-Terphenyl-d14	%	137111-14	103 || 105 || RPD: 2	137111-7	108%

QUALITY CONTROL Organochlorine Pesticides in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	[NT]	[NT]	137111-7	10/11/2015
Date analysed	-	[NT]	[NT]	137111-7	10/11/2015
HCB	mg/kg	[NT]	[NT]	[NR]	[NR]
alpha-BHC	mg/kg	[NT]	[NT]	137111-7	89%
gamma-BHC	mg/kg	[NT]	[NT]	[NR]	[NR]
beta-BHC	mg/kg	[NT]	[NT]	137111-7	88%
Heptachlor	mg/kg	[NT]	[NT]	137111-7	91%
delta-BHC	mg/kg	[NT]	[NT]	[NR]	[NR]
Aldrin	mg/kg	[NT]	[NT]	137111-7	91%
Heptachlor Epoxide	mg/kg	[NT]	[NT]	137111-7	90%
gamma-Chlordane	mg/kg	[NT]	[NT]	[NR]	[NR]
alpha-chlordane	mg/kg	[NT]	[NT]	[NR]	[NR]
Endosulfan I	mg/kg	[NT]	[NT]	[NR]	[NR]
pp-DDE	mg/kg	[NT]	[NT]	137111-7	92%
Dieldrin	mg/kg	[NT]	[NT]	137111-7	93%
Endrin	mg/kg	[NT]	[NT]	137111-7	92%
pp-DDD	mg/kg	[NT]	[NT]	137111-7	100%
Endosulfan II	mg/kg	[NT]	[NT]	[NR]	[NR]
pp-DDT	mg/kg	[NT]	[NT]	[NR]	[NR]
Endrin Aldehyde	mg/kg	[NT]	[NT]	[NR]	[NR]
Endosulfan Sulphate	mg/kg	[NT]	[NT]	137111-7	91%
Methoxychlor	mg/kg	[NT]	[NT]	[NR]	[NR]
Surrogate TCMX	%	[NT]	[NT]	137111-7	96%

QUALITY CONTROL Organophosphorus Pesticides	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	[NT]	[NT]	137111-7	10/11/2015
Date analysed	-	[NT]	[NT]	137111-7	10/11/2015
Azinphos-methyl (Guthion)	mg/kg	[NT]	[NT]	137111-7	75%
Bromophos-ethyl	mg/kg	[NT]	[NT]	[NR]	[NR]
Chlorpyriphos	mg/kg	[NT]	[NT]	137111-7	98%
Chlorpyriphos-methyl	mg/kg	[NT]	[NT]	[NR]	[NR]
Diazinon	mg/kg	[NT]	[NT]	[NR]	[NR]
Dichlorvos	mg/kg	[NT]	[NT]	137111-7	78%
Dimethoate	mg/kg	[NT]	[NT]	[NR]	[NR]
Ethion	mg/kg	[NT]	[NT]	137111-7	92%
Fenitrothion	mg/kg	[NT]	[NT]	137111-7	114%
Malathion	mg/kg	[NT]	[NT]	137111-7	90%
Parathion	mg/kg	[NT]	[NT]	137111-7	104%
Ronnel	mg/kg	[NT]	[NT]	[NR]	[NR]
Surrogate TCMX	%	[NT]	[NT]	137111-7	96%
QUALITY CONTROL PCBs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	[NT]	[NT]	137111-7	10/11/2015
Date analysed	-	[NT]	[NT]	137111-7	10/11/2015
Aroclor 1016	mg/kg	[NT]	[NT]	[NR]	[NR]
Aroclor 1221	mg/kg	[NT]	[NT]	[NR]	[NR]
Aroclor 1232	mg/kg	[NT]	[NT]	[NR]	[NR]
Aroclor 1242	mg/kg	[NT]	[NT]	[NR]	[NR]
Aroclor 1248	mg/kg	[NT]	[NT]	[NR]	[NR]
Aroclor 1254	mg/kg	[NT]	[NT]	137111-7	102%
Aroclor 1260	mg/kg	[NT]	[NT]	[NR]	[NR]
Surrogate TCLMX	%	[NT]	[NT]	137111-7	96%
QUALITY CONTROL Misc Soil - Inorg	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date prepared	-	[NT]	[NT]	137111-8	10/11/2015
Date analysed	-	[NT]	[NT]	137111-8	10/11/2015
Total Phenolics (as Phenol)	mg/kg	[NT]	[NT]	137111-8	95%
QUALITY CONTROL Acid Extractable metals in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date prepared	-	137111-14	10/11/2015 || 10/11/2015	137111-7	10/11/2015
Date analysed	-	137111-14	10/11/2015 || 10/11/2015	137111-7	10/11/2015
Arsenic	mg/kg	137111-14	<4 || <4	137111-7	82%
Cadmium	mg/kg	137111-14	<0.4 || <0.4	137111-7	100%
Chromium	mg/kg	137111-14	19 || 16 || RPD: 17	137111-7	109%
Copper	mg/kg	137111-14	13 || 11 || RPD: 17	137111-7	105%

QUALITY CONTROL Acid Extractable metals in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Lead	mg/kg	137111-14	35 || 29 || RPD: 19	137111-7	97%
Mercury	mg/kg	137111-14	0.1 || <0.1	137111-7	97%
Nickel	mg/kg	137111-14	10 || 10 || RPD: 0	137111-7	98%
Zinc	mg/kg	137111-14	73 || 57 || RPD: 25	137111-7	107%

QUALITY CONTROL vTRH(C6-C10)/BTEXN in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD
Date extracted	-	137111-22	10/11/2015 || 10/11/2015
Date analysed	-	137111-22	11/11/2015 || 11/11/2015
$TRHC_6$ - C_9	mg/kg	137111-22	<25 || <25
$TRHC_6$ - C_{10}	mg/kg	137111-22	<25 || <25
Benzene	mg/kg	137111-22	<0.2 || <0.2
Toluene	mg/kg	137111-22	<0.5 || <0.5
Ethylbenzene	mg/kg	137111-22	<1 || <1
m+p-xylene	mg/kg	137111-22	<2 || <2
o-Xylene	mg/kg	137111-22	<1 || <1
naphthalene	mg/kg	137111-22	<1 || <1
Surrogate aaa-Trifluorotoluene	%	137111-22	91 || 95 || RPD: 4

QUALITY CONTROL svTRH (C10-C40) in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD
Date extracted	-	137111-22	10/11/2015 || 10/11/2015
Date analysed	-	137111-22	11/11/2015 || 11/11/2015
$TRHC_{10}$ - C_{14}	mg/kg	137111-22	<50 || <50
$TRHC_{15}$ - C_{28}	mg/kg	137111-22	<100 || <100
$TRHC_{29}$ - C_{36}	mg/kg	137111-22	<100 || <100
$TRH>C_{10}$-C_{16}	mg/kg	137111-22	<50 || <50
$TRH>C_{16}$-C_{34}	mg/kg	137111-22	<100 || <100
$TRH>C_{34}$-C_{40}	mg/kg	137111-22	<100 || <100
Surrogate o-Terphenyl	%	137111-22	81 || 82 || RPD: 1

QUALITY CONTROL PAHs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD
Date extracted	-	137111-22	10/11/2015 || 10/11/2015
Date analysed	-	137111-22	10/11/2015 || 10/11/2015
Naphthalene	mg/kg	137111-22	<0.1 || <0.1
Acenaphthylene	mg/kg	137111-22	<0.1 || <0.1
Acenaphthene	mg/kg	137111-22	<0.1 || <0.1
Fluorene	mg/kg	137111-22	<0.1 || <0.1
Phenanthrene	mg/kg	137111-22	<0.1 || <0.1
Anthracene	mg/kg	137111-22	<0.1 || <0.1
Fluoranthene	mg/kg	137111-22	<0.1 || <0.1
Pyrene	mg/kg	137111-22	<0.1 || <0.1

QUALITY CONTROL PAHs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD
Benzo(a)anthracene	mg/kg	137111-22	<0.1 || <0.1
Chrysene	mg/kg	137111-22	<0.1 || <0.1
Benzo(b,j+k)fluoranthene	mg/kg	137111-22	<0.2 || <0.2
Benzo(a)pyrene	mg/kg	137111-22	<0.05 || <0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	137111-22	<0.1 || <0.1
Dibenzo(a,h)anthracene	mg/kg	137111-22	<0.1 || <0.1
Benzo(g,h,i)perylene	mg/kg	137111-22	<0.1 || <0.1
Surrogate p-Terphenyl-d14	%	137111-22	100 || 103 || RPD: 3

QUALITY CONTROL Acid Extractable metals in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date prepared	-	137111-22	10/11/2015 || 10/11/2015	LCS-2	10/11/2015
Date analysed	-	137111-22	10/11/2015 || 10/11/2015	LCS-2	10/11/2015
Arsenic	mg/kg	137111-22	<4 || <4	LCS-2	111%
Cadmium	mg/kg	137111-22	<0.4 || <0.4	LCS-2	105%
Chromium	mg/kg	137111-22	46 || 44 || RPD: 4	LCS-2	107%
Copper	mg/kg	137111-22	22 || 21 || RPD: 5	LCS-2	106%
Lead	mg/kg	137111-22	13 || 12 || RPD: 8	LCS-2	105%
Mercury	mg/kg	137111-22	<0.1 || <0.1	LCS-2	95%
Nickel	mg/kg	137111-22	20 || 18 || RPD: 11	LCS-2	102%
Zinc	mg/kg	137111-22	47 || 45 || RPD: 4	LCS-2	105%

Report Comments:

Asbestos ID-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.

Asbestos: A portion of the supplied samples were sub-sampled for asbestos analysis according to Envirolab procedures. We cannot guarantee that these sub-samples are indicative of the entire sample. Envirolab recommends supplying 40-50g of sample in its own container.
Note: Samples requested for asbestos testing were sub-sampled from jars provided by the client.

Sample 137111-9; Chrysotile asbestos identified in matted material, it is estimated to be 0.40g/kg in 41.53g of soil (i.e. > reporting limit for the method of 0.1g/kg).

Asbestos ID was analysed by Approved Identifier:	Paul Ching
Asbestos ID was authorised by Approved Signatory:	Paul Ching

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

Quality Control Definitions

Blank: This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.

Duplicate: This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.

Matrix Spike : A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

LCS (Laboratory Control Sample) : This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

Surrogate Spike: Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in 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.

CHAIN OF CUSTODY

Douglas Partners
Geotechnics | Environment | Groundwater

Client: Douglas Partners	**Project Number** 85164	**To:**	Envirolab Services
Contact Person: Matthew WEST	**Project Name:** Bathurst	**Contact Person:**	Aileen Hie
Project Mgr: David Holden	**PO No.:**	**Address:**	12 Ashley Street
	lab Quote No. :		Chatswood NSW 2068
Address: 96 Hermitage Road West Ryde NSW 2114	**Date results required:** STANDARD *Note: Inform lab in advance if urgent turnaround is required - surcharges apply*	**Phone:**	02 9910 6200
		Fax:	02 9910 6201
Phone: 9809 0666 **Mob:** 0412 985 938	**Report format:** Esdat/PDF / Excel	**Email:**	ahie@envirolab.com.au
Email: Matt.West@douglaspartners.com.au David.Holden@douglaspartners.com.au	**Comments:**	**Laboratory Report No:**	
		Lab Comments:	

Sample information						Tests Required											Comments
Lab Sample ID	**Field Sample ID**	**Depth**	**Date sampled**	**Container Type**	**Type of sample**	COMBO 8A	COMBO 3A	COMBO 3	pH	CEC	TRH/BTEX	heavy metals	Asbestos (500g) WA method	ASBESTOS		**Combo**	**Provide as much information about the sample as you can**
1	TS	-	-	Glass	Soil						x						
2	TB	-	-	Glass	Soil						x						
	~~Rinsate~~	~~-~~	~~3/11/2015~~	~~Glass~~	~~Water~~							x					
3	BD1A	-	2/11/2015	Glass	Soil			x									
-	BD1B	-	3/11/2015	Glass	Soil			x	Forward to Eurofins								
4	TP2 ACM	0.8	2/11/2015	PLASTIC	MATERIAL									x			
5	TP11 ACM	1	3/11/2015	PLASTIC	MATERIAL									X			
6	TP1	0.4-0.5	2/11/2015	Glass	Soil		x										
7	TP1	1.5-1.6	2/11/2015	Glass	Soil	x											
8	TP2	0.9-1.0	2/11/2015	Glass	Soil	x							x				
9	TP3	1.4-1.5	2/11/2015	Glass	Soil		x										
10	TP4	0.4-0.5	2/11/2015	Glass	Soil		x										
11	TP5	0.9-1.0	2/11/2015	Glass	Soil	x							x				
12	TP6	0.4-0.5	2/11/2015	Glass	Soil			x	x	x							
13	TP7	0.1-0.3	3/11/2015	Glass	Soil		x										
14	TP8	0.5-0.7	3/11/2015	Glass	Soil	x							x				
15	TP9	2.0-2.2	2/11/2015	Glass	Soil		x										
16	TP10	0.6-0.8	3/11/2015	Glass	Soil			x	x	x							
17	TP11	1.5-1.7	3/11/2015	Glass	Soil	x							x				
18	TP12	0-0.15	3/11/2015	Glass	Soil		x										
19	TP13	0.1-0.3	3/11/2015	Glass	Soil	x											
20	TP14	0.5-0.6	3/11/2015	Glass	Soil		x										
21	TP15	0-0.2	2/11/2015	Glass	Soil		x										
22	TP16	0.5-0.7	3/11/2015	Glass	Soil			x	x	x							
23	TP17	0.4-0.5	2/11/2015	Glass	Soil	x			x	x							
24	TP20	0.9-1.0	3/11/2015	Glass	Soil	x											
25	TP22	0.9-1.0	3/11/2015	Glass	Soil	x							x				

Relinquished by: Douglas Partners	**Sample Receipt**	***Lab use only:***
Courier (by whom)	**Received by (Company):** ES	**Samples Received: Cool or Ambient (circle one)**
Condition of Sample at dispatch Cool or Ambient (circle)	**Print Name:** P.Ray	**Temperature Received at:** (if applicable)
Temperature (if Applicable):	**Date & Time:** 9/11/2015 17.15	**Transported by: Hand delivered / courier**
Print Name MATTHEW WEST	**Signature:**	
Date & Time: 9/11/2015		
Signature:		

ENVIROLAB

Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

Job No: 137111
Date Received: 9/11/2015
Time Received: 17.15
Received by: R
Temp: Cool/Ambient
Cooling: Ice/Icepacks 18.2
Security: Intact/Broken/None

12 Ashley Street, Chatswood, NSW 2067
tel: +61 2 9910 6200

email: sydney@envirolab.com.au
envirolab.com.au

Envirolab Services Pty Ltd - Sydney | ABN 37 112 535 645

CERTIFICATE OF ANALYSIS 137111-A

Client:

Douglas Partners Pty Ltd
96 Hermitage Rd
West Ryde
NSW 2114

Attention: Matt West, David Holden

Sample log in details:

Your Reference:	**85164, Bathurst**
No. of samples:	Additional testing on soils
Date samples received / completed instructions received	09/11/15 / 13/11/15

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: / Issue Date:	20/11/15 / 19/11/15
Date of Preliminary Report:	Not Issued

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

Results Approved By:

Jacinta Hurst
Laboratory Manager

Metals in TCLP USEPA1311						
Our Reference:	UNITS	137111-A-8	137111-A-9	137111-A-11	137111-A-15	137111-A-17
Your Reference	----------	TP2	TP3	TP5	TP9	TP11
Depth	----------	0.9-1.0	1.4-1.5	0.9-1.0	2.0-2.2	1.5-1.7
Date Sampled		02/11/2015	02/11/2015	02/11/2015	02/11/2015	03/11/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	16/11/2015	16/11/2015	16/11/2015	16/11/2015	16/11/2015
Date analysed	-	16/11/2015	16/11/2015	16/11/2015	16/11/2015	16/11/2015
pH of soil for fluid# determ.	pH units	9.0	9.4	9.2	9.2	9.4
pH of soil TCLP (after HCl)	pH units	1.6	1.6	1.6	1.6	1.6
Extraction fluid used	-	1	1	1	1	1
pH of final Leachate	pH units	5.2	5.3	5.1	5.0	5.4
Lead in TCLP	mg/L	0.05	0.2	0.06	[NA]	[NA]

PAHs in TCLP (USEPA 1311)				
Our Reference:	UNITS	137111-A-9	137111-A-15	137111-A-17
Your Reference	----------	TP3	TP9	TP11
Depth	----------	1.4-1.5	2.0-2.2	1.5-1.7
Date Sampled		02/11/2015	02/11/2015	03/11/2015
Type of sample		Soil	Soil	Soil
Date extracted	-	17/11/2015	17/11/2015	17/11/2015
Date analysed	-	17/11/2015	17/11/2015	17/11/2015
Naphthalene in TCLP	mg/L	<0.001	<0.001	<0.001
Acenaphthylene in TCLP	mg/L	<0.001	<0.001	<0.001
Acenaphthene in TCLP	mg/L	<0.001	<0.001	<0.001
Fluorene in TCLP	mg/L	<0.001	<0.001	<0.001
Phenanthrene in TCLP	mg/L	<0.001	<0.001	<0.001
Anthracene in TCLP	mg/L	<0.001	<0.001	<0.001
Fluoranthene in TCLP	mg/L	<0.001	<0.001	<0.001
Pyrene in TCLP	mg/L	<0.001	<0.001	<0.001
Benzo(a)anthracene in TCLP	mg/L	<0.001	<0.001	<0.001
Chrysene in TCLP	mg/L	<0.001	<0.001	<0.001
Benzo(bjk)fluoranthene in TCLP	mg/L	<0.002	<0.002	<0.002
Benzo(a)pyrene in TCLP	mg/L	<0.001	<0.001	<0.001
Indeno(1,2,3-c,d)pyrene - TCLP	mg/L	<0.001	<0.001	<0.001
Dibenzo(a,h)anthracene in TCLP	mg/L	<0.001	<0.001	<0.001
Benzo(g,h,i)perylene in TCLP	mg/L	<0.001	<0.001	<0.001
Total +ve PAH's	mg/L	NIL (+)VE	NIL (+)VE	NIL (+)VE
Surrogate p-Terphenyl-d14	%	110	120	102

Method ID	Methodology Summary
Inorg-004	Toxicity Characteristic Leaching Procedure (TCLP) using in house method INORG-004.
EXTRACT.7	Toxicity Characteristic Leaching Procedure (TCLP).
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.
Metals-020 ICP-AES	Determination of various metals by ICP-AES.
Org-012	Leachates are extracted with Dichloromethane and analysed by GC-MS.
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-012	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS.

QUALITY CONTROL Metals in TCLP USEPA1311	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			16/11/2015	[NT]	[NT]	LCS-W1	16/11/2015
Date analysed	-			16/11/2015	[NT]	[NT]	LCS-W1	16/11/2015
Lead in TCLP	mg/L	0.03	Metals-020 ICP-AES	<0.03	[NT]	[NT]	LCS-W1	102%
QUALITY CONTROL PAHs in TCLP (USEPA 1311)	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			17/11/2015	[NT]	[NT]	LCS-W2	17/11/2015
Date analysed	-			17/11/2015	[NT]	[NT]	LCS-W2	17/11/2015
Naphthalene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	LCS-W2	113%
Acenaphthylene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NR]	[NR]
Acenaphthene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NR]	[NR]
Fluorene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	LCS-W2	132%
Phenanthrene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	LCS-W2	112%
Anthracene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NR]	[NR]
Fluoranthene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	LCS-W2	112%
Pyrene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	LCS-W2	117%
Benzo(a)anthracene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NR]	[NR]
Chrysene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	LCS-W2	131%
Benzo(bjk)fluoranthene in TCLP	mg/L	0.002	Org-012	<0.002	[NT]	[NT]	[NR]	[NR]
Benzo(a)pyrene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	LCS-W2	111%
Indeno(1,2,3-c,d)pyrene -TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NR]	[NR]
Dibenzo(a,h)anthracene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NR]	[NR]
Benzo(g,h,i)perylene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NR]	[NR]
Surrogate p-Terphenyl-d14	%		Org-012	88	[NT]	[NT]	LCS-W2	104%

Report Comments:

Asbestos ID was analysed by Approved Identifier:	Not applicable for this job
Asbestos ID was authorised by Approved Signatory:	Not applicable for this job

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

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Matrix Spike : A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

LCS (Laboratory Control Sample) : This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

Surrogate Spike: Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Laboratory Acceptance Criteria

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

Aileen Hie

From: David Holden <David.Holden@douglaspartners.com.au>
Sent: Friday, 13 November 2015 12:42 PM
To: Aileen Hie
Subject: 137111 85164, Bathurst - Additional TCLP testing

Hi Aileen,

Could you please undertake TCLP testing on the following samples for 137111, 85164- Bathurst.

Samples:
137111-9 (TP3/1.4-1.5) – TCLP (PAH)
137111-8 (TP2/0.9-1.0) – TCLP (lead)
137111-9 (TP3/ 1.4-1.5)- TCLP (lead)
137111-11 (TP5/0.9-1.0) – TCLP (lead)
137111-15 (TP9/2-2.2)- TCLP (PAH)
137111-17 (TP11/1.5-1.7)- TCLP (PAH)

137111 A
std T/A
due 20/11

Could you please extract PAH samples by Monday due to holding times. Reporting on standard turnaround is fine.

Thanks

Dave

David Holden | Associate/Environmental Scientist
Douglas Partners Pty Ltd | ABN 75 053 980 117 | www.douglaspartners.com.au
96 Hermitage Road West Ryde NSW 2114 | PO Box 472 West Ryde NSW 1685
P: 02 8878 0652 | F: 02 9809 4095 | M: 0414 768 997 | E: David.Holden@douglaspartners.com.au

From: Alexander Maclean [mailto:AMaclean@envirolab.com.au]
Sent: Friday, 13 November 2015 9:37 AM
To: David Holden; Matt West
Subject: Results for Registration 137111 85164, Bathurst

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

Please note that a hard copy will not be posted.

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

12 Ashley Street, Chatswood, NSW 2067
tel: +61 2 9910 6200

email: sydney@envirolab.com.au
envirolab.com.au

Envirolab Services Pty Ltd - Sydney | ABN 37 112 535 645

CERTIFICATE OF ANALYSIS 137111-B

Client:

Douglas Partners Pty Ltd
96 Hermitage Rd
West Ryde
NSW 2114

Attention: David Holden

Sample log in details:

Your Reference:	**85164, Bathurst**
No. of samples:	Additional testing on soils
Date samples received / completed instructions received	09/11/15 / 19/11/15

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: / Issue Date:	26/11/15 / 26/11/15
Date of Preliminary Report:	Not Issued

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Results Approved By:

Jacinta Hurst
Laboratory Manager

Metals in TCLP USEPA1311			
Our Reference:	UNITS	137111-B-8	137111-B-9
Your Reference	----------	TP2	TP3
Depth	----------	0.9-1.0	1.4-1.5
Date Sampled		02/11/2015	02/11/2015
Type of sample		Soil	Soil
Date extracted	-	20/11/2015	20/11/2015
Date analysed	-	20/11/2015	20/11/2015
pH of soil for fluid# determ.	pH units	9.1	9.1
pH of soil TCLP (after HCl)	pH units	1.5	1.6
Extraction fluid used	-	1	1
pH of final Leachate	pH units	5.1	5.4
Mercury in TCLP	mg/L	<0.0005	<0.0005

Method ID	Methodology Summary
Inorg-004	Toxicity Characteristic Leaching Procedure (TCLP) using in house method INORG-004.
EXTRACT.7	Toxicity Characteristic Leaching Procedure (TCLP).
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.
Metals-021 CV-AAS	Determination of Mercury by Cold Vapour AAS.

QUALITY CONTROL Metals in TCLP USEPA1311	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			20/11/2015	[NT]	[NT]	LCS-W1	20/11/2015
Date analysed	-			20/11/2015	[NT]	[NT]	LCS-W1	20/11/2015
Mercury in TCLP	mg/L	0.0005	Metals-021 CV-AAS	<0.0005	[NT]	[NT]	LCS-W1	96%

Report Comments:

Asbestos ID was analysed by Approved Identifier:	Not applicable for this job
Asbestos ID was authorised by Approved Signatory:	Not applicable for this job

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

Quality Control Definitions

Blank: This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.

Duplicate: This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.

Matrix Spike : A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

LCS (Laboratory Control Sample) : This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

Surrogate Spike: Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in 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.

Aileen Hie

From: David Holden <David.Holden@douglaspartners.com.au>
Sent: Thursday, 19 November 2015 9:03 AM
To: Aileen Hie
Subject: Additional Analysis for 137111-A 85164, Bathurst

Hi Aileen,

Further to the TCLP testing already being undertaken could I request that you also analyse/report the following samples for TCLP-mercury

- 137111-8 (TP2/0.9-1.0) – TCLP Mercury
- 137111-9 (TP3/1.4-1.5) – TCLP Mercury

137111-B
Std TAT
Due: 26/11/15

Thanks

Dave

David Holden | Environmental Scientist
Douglas Partners Pty Ltd | ABN 75 053 980 117 | www.douglaspartners.com.au
96 Hermitage Road West Ryde NSW 2114 | PO Box 472 West Ryde NSW 1685
P: 02 8878 0652 | F: 02 9809 4095 | M: 0414 768 997 | E: David.Holden@douglaspartners.com.au

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From: Aileen Hie [mailto:AHie@envirolab.com.au]
Sent: Friday, 13 November 2015 7:34 PM
To: David Holden
Subject: Additional Analysis Receipt for 137111-A 85164, Bathurst

Please refer to attached for a copy of your Additional Analysis Request Form.
Please let the lab know immediately if there are any issues.

Results will be available by 6.30pm on the date indicated.

PLEASE NOTE COMBO PRICES WILL ONLY APPLY IF COMBOS ARE SELECTED ON COC.

The current pricing schedule came into effect on 1/1/13.

Please note that subcontracted testing or non routine testing may take significantly longer than just the std 5 day TAT, contact the lab

to get an approximate due date

Enquiries should be made directly to:
Aileen Hie on ahie@envirolab.com.au

12 Ashley Street, Chatswood, NSW 2067
tel: +61 2 9910 6200

email: sydney@envirolab.com.au
envirolab.com.au

Envirolab Services Pty Ltd - Sydney | ABN 37 112 535 645

CERTIFICATE OF ANALYSIS 136963

Client:

Douglas Partners Pty Ltd
96 Hermitage Rd
West Ryde
NSW 2114

Attention: Matt West, David Holden

Sample log in details:

Your Reference:	**85164, Bathurst**		
No. of samples:	6 waters		
Date samples received / completed instructions received	05/11/15	/	05/11/15

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: / Issue Date:	12/11/15	/	12/11/15
Date of Preliminary Report:	Not Issued		

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Results Approved By:

Jacinta Hurst
Laboratory Manager

vTRH(C6-C10)/BTEXN in Water						
Our Reference:	UNITS	136963-1	136963-2	136963-3	136963-4	136963-5
Your Reference	----------	BH1	BH2	BH3	BD1A	TS
Date Sampled	----------	04/11/2015	04/11/2015	04/11/2015	04/11/2015	04/11/2015
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	06/11/2015	06/11/2015	06/11/2015	06/11/2015	06/11/2015
Date analysed	-	07/11/2015	07/11/2015	07/11/2015	07/11/2015	07/11/2015
TRHC$_6$ - C$_9$	µg/L	<10	<10	<10	<10	[NA]
TRHC$_6$ - C$_{10}$	µg/L	<10	<10	<10	<10	[NA]
TRHC$_6$ - C$_{10}$ less BTEX (F1)	µg/L	<10	<10	<10	<10	[NA]
Benzene	µg/L	<1	<1	<1	<1	90%
Toluene	µg/L	<1	<1	<1	<1	98%
Ethylbenzene	µg/L	<1	<1	<1	<1	88%
m+p-xylene	µg/L	<2	<2	<2	<2	95%
o-xylene	µg/L	<1	<1	<1	<1	95%
Naphthalene	µg/L	<1	<1	<1	<1	[NA]
Surrogate Dibromofluoromethane	%	111	113	114	114	100
Surrogate toluene-d8	%	107	111	115	113	98
Surrogate 4-BFB	%	94	87	88	88	107

vTRH(C6-C10)/BTEXN in Water		
Our Reference:	UNITS	136963-6
Your Reference	----------	TB
Date Sampled	----------	04/11/2015
Type of sample		Water
Date extracted	-	06/11/2015
Date analysed	-	07/11/2015
TRHC$_6$ - C$_9$	µg/L	<10
TRHC$_6$ - C$_{10}$	µg/L	<10
TRHC$_6$ - C$_{10}$ less BTEX (F1)	µg/L	<10
Benzene	µg/L	<1
Toluene	µg/L	<1
Ethylbenzene	µg/L	<1
m+p-xylene	µg/L	<2
o-xylene	µg/L	<1
Naphthalene	µg/L	<1
Surrogate Dibromofluoromethane	%	108
Surrogate toluene-d8	%	103
Surrogate 4-BFB	%	92

svTRH (C10-C40) in Water Our Reference: Your Reference Date Sampled Type of sample	UNITS ---------- ----------	136963-1 BH1 04/11/2015 Water	136963-2 BH2 04/11/2015 Water	136963-3 BH3 04/11/2015 Water	136963-4 BD1A 04/11/2015 Water
Date extracted	-	06/11/2015	06/11/2015	06/11/2015	06/11/2015
Date analysed	-	06/11/2015	06/11/2015	06/11/2015	06/11/2015
TRHC$_{10}$ - C$_{14}$	µg/L	<50	<50	<50	<50
TRHC$_{15}$ - C$_{28}$	µg/L	<100	<100	<100	<100
TRHC$_{29}$ - C$_{36}$	µg/L	<100	<100	<100	<100
TRH>C$_{10}$ - C$_{16}$	µg/L	<50	<50	<50	<50
TRH>C$_{10}$ - C$_{16}$ less Naphthalene (F2)	µg/L	<50	<50	<50	<50
TRH>C$_{16}$ - C$_{34}$	µg/L	<100	<100	<100	<100
TRH>C$_{34}$ - C$_{40}$	µg/L	<100	<100	<100	<100
Surrogate o-Terphenyl	%	91	95	95	86

PAHs in Water - Low Level Our Reference: Your Reference Date Sampled Type of sample	UNITS ---------- ----------	136963-1 BH1 04/11/2015 Water	136963-2 BH2 04/11/2015 Water	136963-3 BH3 04/11/2015 Water
Date extracted	-	06/11/2015	06/11/2015	06/11/2015
Date analysed	-	06/11/2015	06/11/2015	06/11/2015
Naphthalene	µg/L	<0.2	<0.2	<0.2
Acenaphthylene	µg/L	<0.1	<0.1	<0.1
Acenaphthene	µg/L	<0.1	<0.1	<0.1
Fluorene	µg/L	<0.1	<0.1	<0.1
Phenanthrene	µg/L	<0.1	<0.1	<0.1
Anthracene	µg/L	<0.1	<0.1	<0.1
Fluoranthene	µg/L	<0.1	<0.1	<0.1
Pyrene	µg/L	<0.1	<0.1	<0.1
Benzo(a)anthracene	µg/L	<0.1	<0.1	<0.1
Chrysene	µg/L	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	µg/L	<0.2	<0.2	<0.2
Benzo(a)pyrene	µg/L	<0.1	<0.1	<0.1
Indeno(1,2,3-c,d)pyrene	µg/L	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	µg/L	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	µg/L	<0.1	<0.1	<0.1
Benzo(a)pyrene TEQ	µg/L	<0.5	<0.5	<0.5
Total +ve PAH's	µg/L	NIL (+)VE	NIL (+)VE	NIL (+)VE
Surrogate p-Terphenyl-d14	%	77	76	82

HM in water - dissolved					
Our Reference:	UNITS	136963-1	136963-2	136963-3	136963-4
Your Reference	----------	BH1	BH2	BH3	BD1A
Date Sampled	----------	04/11/2015	04/11/2015	04/11/2015	04/11/2015
Type of sample		Water	Water	Water	Water
Date prepared	-	06/11/2015	06/11/2015	06/11/2015	06/11/2015
Date analysed	-	06/11/2015	06/11/2015	06/11/2015	06/11/2015
Arsenic-Dissolved	µg/L	<1	1	4	<1
Cadmium-Dissolved	µg/L	<0.1	<0.1	<0.1	<0.1
Chromium-Dissolved	µg/L	<1	<1	<1	<1
Copper-Dissolved	µg/L	1	<1	<1	<1
Lead-Dissolved	µg/L	<1	<1	<1	<1
Mercury-Dissolved	µg/L	<0.05	<0.05	<0.05	<0.05
Nickel-Dissolved	µg/L	2	1	3	2
Zinc-Dissolved	µg/L	3	2	6	4

Total Phenolics in Water			
Our Reference:	UNITS	136963-1	136963-2
Your Reference	----------	BH1	BH2
Date Sampled	----------	04/11/2015	04/11/2015
Type of sample		Water	Water
Date extracted	-	05/11/2015	05/11/2015
Date analysed	-	05/11/2015	05/11/2015
Total Phenolics (as Phenol)	mg/L	<0.05	<0.05

Miscellaneous Inorganics				
Our Reference:	UNITS	136963-1	136963-2	136963-3
Your Reference	----------	BH1	BH2	BH3
Date Sampled	----------	04/11/2015	04/11/2015	04/11/2015
Type of sample		Water	Water	Water
Date prepared	-	06/11/2015	06/11/2015	06/11/2015
Date analysed	-	06/11/2015	06/11/2015	06/11/2015
Hardness	mgCaCO3 /L	220	210	240
Calcium - Dissolved	mg/L	47	44	45
Magnesium - Dissolved	mg/L	25	23	30

OCP in water - Trace level Our Reference: Your Reference Date Sampled Type of sample	UNITS ---------- ----------	136963-1 BH1 04/11/2015 Water	136963-2 BH2 04/11/2015 Water
Date extracted	-	06/11/2015	06/11/2015
Date analysed	-	09/11/2015	09/11/2015
HCB	µg/L	<0.001	<0.001
alpha-BHC	µg/L	<0.001	<0.001
gamma-BHC	µg/L	<0.001	<0.001
beta-BHC	µg/L	<0.001	<0.001
Heptachlor	µg/L	<0.001	<0.001
delta-BHC	µg/L	<0.001	<0.001
Aldrin	µg/L	<0.001	<0.001
Heptachlor Epoxide	µg/L	<0.001	<0.001
gamma-Chlordane	µg/L	<0.001	<0.001
alpha-Chlordane	µg/L	<0.001	<0.001
Endosulfan I	µg/L	<0.002	<0.002
pp-DDE	µg/L	<0.001	<0.001
Dieldrin	µg/L	<0.001	<0.001
Endrin	µg/L	<0.001	<0.001
pp-DDD	µg/L	<0.001	<0.001
Endosulfan II	µg/L	<0.002	<0.002
DDT	µg/L	<0.001	<0.001
Endosulfan Sulphate	µg/L	<0.001	<0.001
Methoxychlor	µg/L	<0.001	<0.001
Dicofol	µg/L	<0.1	<0.1
Mirex	µg/L	<0.002	<0.002

PCB in water - trace level Aroclors			
Our Reference:	UNITS	136963-1	136963-2
Your Reference	----------	BH1	BH2
Date Sampled	----------	04/11/2015	04/11/2015
Type of sample		Water	Water
Date prepared	-	06/11/2015	06/11/2015
Date analysed	-	09/11/2015	09/11/2015
Aroclor 1016	µg/L	<0.01	<0.01
Aroclor 1221	µg/L	<0.01	<0.01
Aroclor 1232	µg/L	<0.01	<0.01
Aroclor 1242	µg/L	<0.01	<0.01
Aroclor 1248	µg/L	<0.01	<0.01
Aroclor 1254	µg/L	<0.01	<0.01
Aroclor 1260	µg/L	<0.01	<0.01

Method ID	Methodology Summary
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.
Org-013	Water samples are analysed directly by purge and trap GC-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.
Metals-022 ICP-MS	Determination of various metals by ICP-MS.
Metals-021 CV-AAS	Determination of Mercury by Cold Vapour AAS.
Inorg-031	Total Phenolics by segmented flow analyser (in line distillation with colourimetric finish). Solids are extracted in a caustic media prior to analysis.
Metals-020 ICP-AES	Determination of various metals by ICP-AES.
Org-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Org-012	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS.
Org-012/017	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS and/or GC-MS/MS.

QUALITY CONTROL vTRH(C6-C10)/BTEXN in Water	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			06/11/2015	136963-1	06/11/2015 || 06/11/2015	LCS-W4	06/11/2015
Date analysed	-			07/11/2015	136963-1	07/11/2015 || 07/11/2015	LCS-W4	07/11/2015
TRH C_6 - C_9	µg/L	10	Org-016	<10	136963-1	<10 || <10	LCS-W4	97%
TRH C_6 - C_{10}	µg/L	10	Org-016	<10	136963-1	<10 || <10	LCS-W4	97%
Benzene	µg/L	1	Org-016	<1	136963-1	<1 || <1	LCS-W4	94%
Toluene	µg/L	1	Org-016	<1	136963-1	<1 || <1	LCS-W4	104%
Ethylbenzene	µg/L	1	Org-016	<1	136963-1	<1 || <1	LCS-W4	93%
m+p-xylene	µg/L	2	Org-016	<2	136963-1	<2 || <2	LCS-W4	98%
o-xylene	µg/L	1	Org-016	<1	136963-1	<1 || <1	LCS-W4	100%
Naphthalene	µg/L	1	Org-013	<1	136963-1	<1 || <1	[NR]	[NR]
Surrogate Dibromofluoromethane	%		Org-016	106	136963-1	111 || 118 || RPD: 6	LCS-W4	98%
Surrogate toluene-d8	%		Org-016	103	136963-1	107 || 106 || RPD: 1	LCS-W4	105%
Surrogate 4-BFB	%		Org-016	98	136963-1	94 || 101 || RPD: 7	LCS-W4	107%

QUALITY CONTROL svTRH (C10-C40) in Water	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			06/11/2015	[NT]	[NT]	LCS-W1	06/11/2015
Date analysed	-			06/11/2015	[NT]	[NT]	LCS-W1	06/11/2015
TRH C_{10} - C_{14}	µg/L	50	Org-003	<50	[NT]	[NT]	LCS-W1	113%
TRH C_{15} - C_{28}	µg/L	100	Org-003	<100	[NT]	[NT]	LCS-W1	99%
TRH C_{29} - C_{36}	µg/L	100	Org-003	<100	[NT]	[NT]	LCS-W1	88%
TRH>C_{10} - C_{16}	µg/L	50	Org-003	<50	[NT]	[NT]	LCS-W1	113%
TRH>C_{16} - C_{34}	µg/L	100	Org-003	<100	[NT]	[NT]	LCS-W1	99%
TRH>C_{34} - C_{40}	µg/L	100	Org-003	<100	[NT]	[NT]	LCS-W1	88%
Surrogate o-Terphenyl	%		Org-003	78	[NT]	[NT]	LCS-W1	110%

QUALITY CONTROL PAHs in Water - Low Level	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			06/11/2015	[NT]	[NT]	LCS-W1	06/11/2015
Date analysed	-			06/11/2015	[NT]	[NT]	LCS-W1	06/11/2015
Naphthalene	µg/L	0.2	Org-012	<0.2	[NT]	[NT]	LCS-W1	77%
Acenaphthylene	µg/L	0.1	Org-012	<0.1	[NT]	[NT]	[NR]	[NR]
Acenaphthene	µg/L	0.1	Org-012	<0.1	[NT]	[NT]	[NR]	[NR]
Fluorene	µg/L	0.1	Org-012	<0.1	[NT]	[NT]	LCS-W1	71%
Phenanthrene	µg/L	0.1	Org-012	<0.1	[NT]	[NT]	LCS-W1	75%
Anthracene	µg/L	0.1	Org-012	<0.1	[NT]	[NT]	[NR]	[NR]
Fluoranthene	µg/L	0.1	Org-012	<0.1	[NT]	[NT]	LCS-W1	72%
Pyrene	µg/L	0.1	Org-012	<0.1	[NT]	[NT]	LCS-W1	72%

QUALITY CONTROL PAHs in Water - Low Level	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Benzo(a)anthracene	µg/L	0.1	Org-012	<0.1	[NT]	[NT]	[NR]	[NR]
Chrysene	µg/L	0.1	Org-012	<0.1	[NT]	[NT]	LCS-W1	71%
Benzo(b,j+k) fluoranthene	µg/L	0.2	Org-012	<0.2	[NT]	[NT]	[NR]	[NR]
Benzo(a)pyrene	µg/L	0.1	Org-012	<0.1	[NT]	[NT]	LCS-W1	75%
Indeno(1,2,3-c,d)pyrene	µg/L	0.1	Org-012	<0.1	[NT]	[NT]	[NR]	[NR]
Dibenzo(a,h)anthracene	µg/L	0.1	Org-012	<0.1	[NT]	[NT]	[NR]	[NR]
Benzo(g,h,i)perylene	µg/L	0.1	Org-012	<0.1	[NT]	[NT]	[NR]	[NR]
Surrogate p-Terphenyl-d14	%		Org-012	80	[NT]	[NT]	LCS-W1	78%
QUALITY CONTROL HM in water - dissolved	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date prepared	-			06/11/2015	136963-1	06/11/2015 II 06/11/2015	LCS-W1	06/11/2015
Date analysed	-			06/11/2015	136963-1	06/11/2015 II 06/11/2015	LCS-W1	06/11/2015
Arsenic-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	136963-1	<1 II [N/T]	LCS-W1	98%
Cadmium-Dissolved	µg/L	0.1	Metals-022 ICP-MS	<0.1	136963-1	<0.1 II [N/T]	LCS-W1	101%
Chromium-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	136963-1	<1 II [N/T]	LCS-W1	99%
Copper-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	136963-1	1 II [N/T]	LCS-W1	99%
Lead-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	136963-1	<1 II [N/T]	LCS-W1	98%
Mercury-Dissolved	µg/L	0.05	Metals-021 CV-AAS	<0.05	136963-1	<0.05 II <0.05	LCS-W1	92%
Nickel-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	136963-1	2 II [N/T]	LCS-W1	95%
Zinc-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	136963-1	3 II [N/T]	LCS-W1	98%

QUALITY CONTROL Total Phenolics in Water	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			05/11/2015	[NT]	[NT]	LCS-1	05/11/2015
Date analysed	-			05/11/2015	[NT]	[NT]	LCS-1	05/11/2015
Total Phenolics (as Phenol)	mg/L	0.05	Inorg-031	<0.05	[NT]	[NT]	LCS-1	102%
QUALITY CONTROL Miscellaneous Inorganics	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date prepared	-			06/11/2015	136963-1	06/11/2015 || 06/11/2015	LCS-W1	06/11/2015
Date analysed	-			06/11/2015	136963-1	06/11/2015 || 06/11/2015	LCS-W1	06/11/2015
Hardness	mgCaCO3/L	3		[NT]	136963-1	220 || 220 || RPD: 0	[NR]	[NR]
Calcium - Dissolved	mg/L	0.5	Metals-020 ICP-AES	<0.5	136963-1	47 || 48 || RPD: 2	LCS-W1	93%
Magnesium - Dissolved	mg/L	0.5	Metals-020 ICP-AES	<0.5	136963-1	25 || 25 || RPD: 0	LCS-W1	93%
QUALITY CONTROL OCP in water - Trace level	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			06/11/2015	[NT]	[NT]	LCS-W1	06/11/2015
Date analysed	-			09/11/2015	[NT]	[NT]	LCS-W1	09/11/2015
HCB	µg/L	0.001	Org-005	<0.001	[NT]	[NT]	[NR]	[NR]
alpha-BHC	µg/L	0.001	Org-005	<0.001	[NT]	[NT]	LCS-W1	100%
gamma-BHC	µg/L	0.001	Org-005	<0.001	[NT]	[NT]	[NR]	[NR]
beta-BHC	µg/L	0.001	Org-005	<0.001	[NT]	[NT]	LCS-W1	96%
Heptachlor	µg/L	0.001	Org-005	<0.001	[NT]	[NT]	LCS-W1	96%
delta-BHC	µg/L	0.001	Org-005	<0.001	[NT]	[NT]	[NR]	[NR]
Aldrin	µg/L	0.001	Org-005	<0.001	[NT]	[NT]	LCS-W1	89%
Heptachlor Epoxide	µg/L	0.001	Org-005	<0.001	[NT]	[NT]	LCS-W1	105%
gamma-Chlordane	µg/L	0.001	Org-005	<0.001	[NT]	[NT]	[NR]	[NR]
alpha-Chlordane	µg/L	0.001	Org-005	<0.001	[NT]	[NT]	[NR]	[NR]
Endosulfan I	µg/L	0.002	Org-005	<0.002	[NT]	[NT]	[NR]	[NR]
pp-DDE	µg/L	0.001	Org-005	<0.001	[NT]	[NT]	LCS-W1	106%
Dieldrin	µg/L	0.001	Org-005	<0.001	[NT]	[NT]	LCS-W1	101%
Endrin	µg/L	0.001	Org-005	<0.001	[NT]	[NT]	[NR]	[NR]
pp-DDD	µg/L	0.001	Org-005	<0.001	[NT]	[NT]	LCS-W1	98%
Endosulfan II	µg/L	0.002	Org-005	<0.002	[NT]	[NT]	[NR]	[NR]
DDT	µg/L	0.001	Org-005	<0.001	[NT]	[NT]	[NR]	[NR]
Endosulfan Sulphate	µg/L	0.001	Org-005	<0.001	[NT]	[NT]	LCS-W1	92%
Methoxychlor	µg/L	0.001	Org-005	<0.001	[NT]	[NT]	[NR]	[NR]
Dicofol	µg/L	0.1	Org-012	<0.1	[NT]	[NT]	[NR]	[NR]
Mirex	µg/L	0.002	Org-012	<0.002	[NT]	[NT]	[NR]	[NR]

QUALITY CONTROL PCB in water - trace level Aroclors	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date prepared	-			06/11/2015	[NT]	[NT]	LCS-W1	06/11/2015
Date analysed	-			09/11/2015	[NT]	[NT]	LCS-W1	09/11/2015
Aroclor 1016	µg/L	0.01	Org-012/017	<0.01	[NT]	[NT]	[NR]	[NR]
Aroclor 1221	µg/L	0.01	Org-012/017	<0.01	[NT]	[NT]	[NR]	[NR]
Aroclor 1232	µg/L	0.01	Org-012/017	<0.01	[NT]	[NT]	[NR]	[NR]
Aroclor 1242	µg/L	0.01	Org-012/017	<0.01	[NT]	[NT]	[NR]	[NR]
Aroclor 1248	µg/L	0.01	Org-012/017	<0.01	[NT]	[NT]	[NR]	[NR]
Aroclor 1254	µg/L	0.01	Org-012/017	<0.01	[NT]	[NT]	LCS-W1	103%
Aroclor 1260	µg/L	0.01	Org-012/017	<0.01	[NT]	[NT]	[NR]	[NR]

Report Comments:

OCP & PCB analysed by MPL Laboratories. Report No.173178.

Asbestos ID was analysed by Approved Identifier:	Not applicable for this job
Asbestos ID was authorised by Approved Signatory:	Not applicable for this job

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

Quality Control Definitions

Blank: This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.

Duplicate: This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.

Matrix Spike : A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

LCS (Laboratory Control Sample) : This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

Surrogate Spike: Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in 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.

CHAIN OF CUSTODY

Douglas Partners
Geotechnics / Environment / Groundwater

Client: Douglas Partners	**Project Number** 85164	**To:**	Envirolab Services
Contact Person: Matthew WEST	**Project Name:** Bathurst	**Contact Person:**	Aileen Hie
Project Mgr: David Holden	**PO No.:**	**Address:**	12 Ashley Street
	lab Quote No. :		Chatswood NSW 2068
Address: 96 Hermitage Road	**Date results required:** Standard	**Phone:**	02 9910 6200
West Ryde NSW 2114	*Note: Inform lab in advance if urgent turnaround is required - surcharges apply*	**Fax:**	02 9910 6201
		Email:	ahie@envirolab.com.au
Phone: 9809 0666 **Mob:** 0412 985 938	**Report format:** Esdat/PDF / Excel	**Laboratory Report No:**	
Email: Matt.West@douglaspartners.com.au	**Comments:**	**Lab Comments:**	
David.Holden@douglaspartners.com.au			

Sample information						Tests Required										Comments
Lab Sample ID	Field Sample ID	Depth	Date sampled	Container Type	Type of sample	Combo 3L (Metals, TRH, BTEX, PAH (low))	PCB/OCP (trace)	Hardness	Phenols	TRH/BTEX	Heavy Metals	TRH/BTEX				Provide as much information about the sample as you can
1	BH1	-	4/11/2015	P/G	Water	X	X	X	X							
2	BH2	-	4/11/2015	P/G	Water	X	X	X	X							
3	BH3	-	4/11/2015	P/G	Water	X		X								
4	BD1A	-	4/11/2015	P/G	Water						X	X				
5	TS	-	4/11/2015	G	Water					X						
6	TB	-	4/11/2015	G	Water					X						

ENVIROLAB

Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 5200

Job No: 136463

Date Received: 5/11/15
Time Received: 11:00
Received by: D.P
Temp: ~~Cool~~/Ambient
Cooling: ~~Ice/Icepack~~
Security: ~~Intact/Broken/None~~

Relinquished by: Douglas Partners	**Sample Receipt**	***Lab use only:***
Courier (by whom)	**Received by (Company):** ES	**Samples Received: Cool or Ambient (circle one)**
Condition of Sample at dispatch Cool or Ambient (circle)	**Print Name:** Daniel Fear	**Temperature Received at:** (if applicable)
Temperature (if Applicable):	**Date & Time:** 5/11/15 11:00	**Transported by: Hand delivered / courier**
Print Name MATTHEW WEST	**Signature:**	
Date & Time: 5/11/2015		
Signature:		

Certificate of Analysis

Douglas Partners (Syd)
96 Hermitage Road
West Ryde
NSW 2114

NATA Accredited
Accreditation Number 1261
Site Number 1254

Accredited for compliance with ISO/IEC 17025.
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Attention: **Matt West**

Report **479031-S**
Project name BATHURST
Project ID 85164
Received Date Nov 11, 2015

Client Sample ID			**BD1B**
Sample Matrix			**Soil**
Eurofins | mgt Sample No.			**S15-No08154**
Date Sampled			**Nov 03, 2015**
Test/Reference	LOR	Unit	
Total Recoverable Hydrocarbons - 1999 NEPM Fractions			
TRH C6-C9	20	mg/kg	< 20
TRH C10-C14	20	mg/kg	< 20
TRH C15-C28	50	mg/kg	< 50
TRH C29-C36	50	mg/kg	< 50
TRH C10-36 (Total)	50	mg/kg	< 50
BTEX			
Benzene	0.1	mg/kg	< 0.1
Toluene	0.1	mg/kg	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2
o-Xylene	0.1	mg/kg	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3
4-Bromofluorobenzene (surr.)	1	%	88
Total Recoverable Hydrocarbons - 2013 NEPM Fractions			
Naphthalene[N02]	0.5	mg/kg	< 0.5
TRH C6-C10	20	mg/kg	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50
Polycyclic Aromatic Hydrocarbons			
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2
Acenaphthene	0.5	mg/kg	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5
Anthracene	0.5	mg/kg	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5
Chrysene	0.5	mg/kg	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5
Fluorene	0.5	mg/kg	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5

Client Sample ID			BD1B
Sample Matrix			**Soil**
Eurofins | mgt Sample No.			**S15-No08154**
Date Sampled			**Nov 03, 2015**
Test/Reference	LOR	Unit	
Polycyclic Aromatic Hydrocarbons			
Naphthalene	0.5	mg/kg	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5
Pyrene	0.5	mg/kg	< 0.5
Total PAH*	0.5	mg/kg	< 0.5
2-Fluorobiphenyl (surr.)	1	%	88
p-Terphenyl-d14 (surr.)	1	%	86
Total Recoverable Hydrocarbons - 2013 NEPM Fractions			
TRH >C10-C16	50	mg/kg	< 50
TRH >C16-C34	100	mg/kg	< 100
TRH >C34-C40	100	mg/kg	< 100
Heavy Metals			
Arsenic	2	mg/kg	< 2
Cadmium	0.4	mg/kg	< 0.4
Chromium	5	mg/kg	16
Copper	5	mg/kg	9.9
Lead	5	mg/kg	12
Mercury	0.05	mg/kg	< 0.05
Nickel	5	mg/kg	10
Zinc	5	mg/kg	19
% Moisture	0.1	%	18

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Sydney	Nov 13, 2015	14 Day
- Method: TRH C6-C36 - LTM-ORG-2010			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Nov 13, 2015	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Nov 13, 2015	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
BTEX	Sydney	Nov 13, 2015	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Polycyclic Aromatic Hydrocarbons	Sydney	Nov 13, 2015	14 Day
- Method: E007 Polyaromatic Hydrocarbons (PAH)			
Metals M8	Sydney	Nov 13, 2015	28 Day
- Method: LTM-MET-3040_R0 TOTAL AND DISSOLVED METALS AND MERCURY IN WATERS BY ICP-MS			
% Moisture	Sydney	Nov 11, 2015	14 Day
- Method: LTM-GEN-7080 Moisture			

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NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Company Name:	Douglas Partners (Syd)	**Order No.:**		**Received:**	Nov 11, 2015 2:41 PM
Address:	96 Hermitage Road West Ryde NSW 2114	**Report #:** **Phone:** **Fax:**	479031 02 9809 0666	**Due:** **Priority:** **Contact Name:**	Nov 18, 2015 5 Day Matt West
Project Name:	BATHURST				
Project ID:	85164				

Eurofins | mgt Client Manager: Charl Du Preez

Sample Detail					Polycyclic Aromatic Hydrocarbons	Metals M8	BTEX	Moisture Set	Total Recoverable Hydrocarbons
Laboratory where analysis is conducted									
Melbourne Laboratory - NATA Site # 1254 & 14271									
Sydney Laboratory - NATA Site # 18217					X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794									
External Laboratory									
Sample ID	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**					
BD1B	Nov 03, 2015		Soil	S15-No08154	X	X	X	X	X

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
4. Results are uncorrected for matrix spikes or surrogate recoveries.
5. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
6. Samples were analysed on an 'as received' basis. 7. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Advice.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per Kilogram

ug/l: micrograms per litre

ppb: Parts per billion

org/100ml: Organisms per 100 millilitres

MPN/100mL: Most Probable Number of organisms per 100 millilitres

mg/l: milligrams per litre

ppm: Parts per million

%: Percentage

NTU: Nephelometric Turbidity Units

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery
CRM	Certified Reference Material - reported as percent recovery
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands. In the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
Batch Duplicate	A second piece of analysis from a sample outside of the clients batch of samples but run within the laboratory batch of analysis.
Batch SPIKE	Spike recovery reported on a sample from outside of the clients batch of samples but run within the laboratory batch of analysis.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
ASLP	Australian Standard Leaching Procedure (AS4439.3)
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries : Recoveries must lie between 50-150% - Phenols 20-130%.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxophene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxophene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Arochlor 1260 in Matrix Spikes and LCS's.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPD's are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/kg	< 20			20	Pass	
TRH C10-C14	mg/kg	< 20			20	Pass	
TRH C15-C28	mg/kg	< 50			50	Pass	
TRH C29-C36	mg/kg	< 50			50	Pass	
Method Blank							
BTEX							
Benzene	mg/kg	< 0.1			0.1	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Xylenes - Total	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Benzo(g.h.i)perylene	mg/kg	< 0.5			0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a.h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1.2.3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	mg/kg	< 50			50	Pass	
TRH >C16-C34	mg/kg	< 100			100	Pass	
TRH >C34-C40	mg/kg	< 100			100	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.05			0.05	Pass	
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	82			70-130	Pass	
TRH C10-C14	%	128			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	96			70-130	Pass	
Toluene	%	92			70-130	Pass	
Ethylbenzene	%	89			70-130	Pass	
m&p-Xylenes	%	92			70-130	Pass	
o-Xylene	%	92			70-130	Pass	
Xylenes - Total	%	92			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	90			70-130	Pass	
TRH C6-C10	%	84			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	91			70-130	Pass	
Acenaphthylene	%	89			70-130	Pass	
Anthracene	%	93			70-130	Pass	
Benz(a)anthracene	%	83			70-130	Pass	
Benzo(a)pyrene	%	94			70-130	Pass	
Benzo(b&j)fluoranthene	%	86			70-130	Pass	
Benzo(g.h.i)perylene	%	99			70-130	Pass	
Benzo(k)fluoranthene	%	85			70-130	Pass	
Chrysene	%	94			70-130	Pass	
Dibenz(a.h)anthracene	%	88			70-130	Pass	
Fluoranthene	%	88			70-130	Pass	
Fluorene	%	91			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	90			70-130	Pass	
Naphthalene	%	90			70-130	Pass	
Phenanthrene	%	90			70-130	Pass	
Pyrene	%	91			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	%	82			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	90			70-130	Pass	
Cadmium	%	93			70-130	Pass	
Chromium	%	91			70-130	Pass	
Copper	%	90			70-130	Pass	
Lead	%	91			70-130	Pass	
Mercury	%	96			70-130	Pass	
Nickel	%	91			70-130	Pass	
Zinc	%	90			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	S15-No10068	NCP	%	71			70-130	Pass	
TRH C10-C14	S15-No07675	NCP	%	85			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	S15-No10068	NCP	%	93			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Toluene	S15-No10068	NCP	%	88			70-130	Pass	
Ethylbenzene	S15-No10068	NCP	%	83			70-130	Pass	
m&p-Xylenes	S15-No10068	NCP	%	87			70-130	Pass	
o-Xylene	S15-No10068	NCP	%	86			70-130	Pass	
Xylenes - Total	S15-No10068	NCP	%	87			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	S15-No10068	NCP	%	79			70-130	Pass	
TRH C6-C10	S15-No10068	NCP	%	74			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	S15-No07668	NCP	%	90			70-130	Pass	
Acenaphthylene	S15-No07668	NCP	%	88			70-130	Pass	
Anthracene	S15-No07668	NCP	%	92			70-130	Pass	
Benz(a)anthracene	S15-No07668	NCP	%	85			70-130	Pass	
Benzo(a)pyrene	S15-No07668	NCP	%	88			70-130	Pass	
Benzo(b&j)fluoranthene	S15-No07668	NCP	%	91			70-130	Pass	
Benzo(g.h.i)perylene	S15-No07668	NCP	%	100			70-130	Pass	
Benzo(k)fluoranthene	S15-No07668	NCP	%	88			70-130	Pass	
Chrysene	S15-No07668	NCP	%	92			70-130	Pass	
Dibenz(a.h)anthracene	S15-No07668	NCP	%	89			70-130	Pass	
Fluoranthene	S15-No07668	NCP	%	90			70-130	Pass	
Fluorene	S15-No07668	NCP	%	90			70-130	Pass	
Indeno(1.2.3-cd)pyrene	S15-No07668	NCP	%	92			70-130	Pass	
Naphthalene	S15-No07668	NCP	%	89			70-130	Pass	
Phenanthrene	S15-No07668	NCP	%	92			70-130	Pass	
Pyrene	S15-No07668	NCP	%	93			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	S15-No07675	NCP	%	85			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S15-No08598	NCP	%	73			70-130	Pass	
Cadmium	S15-No08598	NCP	%	89			70-130	Pass	
Chromium	S15-No08598	NCP	%	72			70-130	Pass	
Copper	S15-No08598	NCP	%	82			70-130	Pass	
Lead	S15-No07673	NCP	%	96			70-130	Pass	
Mercury	S15-No08598	NCP	%	93			70-130	Pass	
Nickel	S15-No08598	NCP	%	80			70-130	Pass	
Zinc	S15-No08598	NCP	%	84			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	S15-No08449	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	S15-No07674	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	S15-No07674	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	S15-No07674	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S15-No08449	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S15-No08449	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S15-No08449	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S15-No08449	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	S15-No08449	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	S15-No08449	NCP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	

Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S15-No08449	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	S15-No08449	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S15-No08154	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	S15-No08154	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	S15-No08154	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	S15-No08154	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	S15-No08154	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	S15-No08154	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	S15-No08154	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	S15-No08154	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	S15-No08154	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	S15-No08154	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	S15-No08154	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	S15-No08154	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	S15-No08154	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	S15-No08154	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	S15-No08154	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	S15-No08154	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	S15-No07674	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	S15-No07674	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	S15-No07674	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S15-No07672	NCP	mg/kg	17	16	4.0	30%	Pass	
Cadmium	S15-No07672	NCP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S15-No07672	NCP	mg/kg	28	30	5.0	30%	Pass	
Copper	S15-No07672	NCP	mg/kg	24	24	2.0	30%	Pass	
Lead	S15-No07672	NCP	mg/kg	27	27	1.0	30%	Pass	
Mercury	S15-No07672	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Nickel	S15-No07672	NCP	mg/kg	< 5	< 5	<1	30%	Pass	
Zinc	S15-No07672	NCP	mg/kg	19	19	4.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S15-No08373	NCP	%	16	16	3.0	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs

Authorised By

Charl Du Preez	Analytical Services Manager
Bob Symons	Senior Analyst-Inorganic (NSW)
Ivan Taylor	Senior Analyst-Metal (NSW)
Ryan Hamilton	Senior Analyst-Organic (NSW)
Ryan Hamilton	Senior Analyst-Volatile (NSW)

Glenn Jackson

National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Uncertainty data is available on request

CHAIN OF CUSTODY

Douglas Partners
Geotechnics | Environment | Groundwater

Client: Douglas Partners
Contact Person: Matthew WEST
Project Mgr: David Holden

Address: 96 Hermitage Road
West Ryde NSW 2114

Phone: 9809 0666 Mob: 0412 983 938
Email: Matt.West@douglaspartners.com.au
David.Holden@douglaspartners.com.au

Project Number: 85164
Project Name: Bathurst
PO No.:
Sub Quote No.:
Date results required: STANDARD

Note. Inform lab in advance if urgent turnaround is required - surcharges apply

Report format: Edat/PDF / Excel
Comments:

To: Envirolab Services
Contact Person: Alison Ho
Address: 12 Ashley Street
Chatswood NSW 2068
Phone: 02 9910 6200
Fax: 02 9910 6201
Email: ahe@envirolab.com.au
Laboratory Report No:
Lab Comments:

Sample Information | Tests Required | Comments

Lab Sample ID	Field Sample ID	Depth	Date sampled	Container Type	Type of sample	COMBO 8A	COMBO 3A	COMBO 3	pH	CEC	TRH/BTEX	heavy metals	Asbestos (500g) WA	ASBESTOS		Combo	Provide as much information about the samples as you can
	TS	-	-	Glass	Soil						x						
	TB	-	-	Glass	Soil						x						
	~~Rinsate~~		~~3/11/2015~~	~~Glass~~	~~Water~~												
	BD1A	-	2/11/2015	Glass	Soil			x				x					
	BD1B	-	3/11/2015	Glass	Soil			x	FORWARD TO Eurofins								
	TP2 ACM	0.8	2/11/2015	PLASTIC	MATERIAL									x			
	TP11 ACM	1	3/11/2015	PLASTIC	MATERIAL									x			
	TP1	0.4-0.5	2/11/2015	Glass	Soil		x										
	TP1	1.5-1.6	2/11/2015	Glass	Soil	x											
	TP2	0.9-1.0	2/11/2015	Glass	Soil	x											
	TP3	1.4-1.5	2/11/2015	Glass	Soil		x						x				
	TP4	0.4-0.5	2/11/2015	Glass	Soil		x										
	TP5	0.9-1.0	2/11/2015	Glass	Soil	x											
	TP6	0.4-0.5	2/11/2015	Glass	Soil			x	x	x			x				
	TP7	0.1-0.3	3/11/2015	Glass	Soil		x										
	TP8	0.5-0.7	3/11/2015	Glass	Soil	x											
	TP9	2.0-2.2	2/11/2015	Glass	Soil		x						x				
	TP10	0.6-0.8	3/11/2015	Glass	Soil			x	x	x							
	TP11	1.5-1.7	3/11/2015	Glass	Soil	x											
	TP12	0-0.15	3/11/2015	Glass	Soil		x						x				
	TP13	0.1-0.3	3/11/2015	Glass	Soil	x											
	TP14	0.5-0.6	3/11/2015	Glass	Soil		x										
	TP15	0-0.2	2/11/2015	Glass	Soil		x										
	TP16	0.5-0.7	3/11/2015	Glass	Soil			x	x	x							
	TP17	0.4-0.5	2/11/2015	Glass	Soil	x			x	x							
	TP20	0.9-1.0	3/11/2015	Glass	Soil	x											
	TP22	0.9-1.0	3/11/2015	Glass	Soil	x							x				

Relinquished by: Douglas Partners
Courier (by whom):
Condition of Samples at dispatch Cool or Ambient (circle)
Temperature (if Applicable):
Print Name: MATTHEW WEST
Date & Time: 9/11/2015
Signature:

Samples Received
Received by (Company): Env
Print Name: V Xu
Date & Time: 9/11/15 17:15
Signature:

Lab use only:
Samples Received: Cool or Ambient (circle one)
Temperature Received at: (if applicable)
Transported by: Hand delivered / courier

Page 1 of 1

Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

Received
Received
by:
emp: Cool/Ambient
: Ice/Icepack
Intact/Broken/None

Relinquished: ELS
Daniel Ford.
11/11/15 @ 12:00

Siamak EFMGT
11/11/15 14:41 470031

Appendix H

Field Sheets and Calibration Certificates

Douglas Partners
Geotechnics | Environment | Groundwater

GROUNDWATER SAMPLING FORM

Project: BATHURST - PROPOSED AGED CARE	**Project No:** 85164
Client: OPAL AGED CARE P/L	
Location: LOTS 2-5, 1 Stanley St, BATHURST	
Sampling Method: LOW FLOW TECHNIQUES.	

Bore No.	BH101	BH102	BH103		
Purging Date	3/11/15	3/11/15	3/11/15		
Bore Casing Diameter (mm)	50	50	50		
SWL (m below top of casing)	7	7.1	7.1		
Height of Casing (m above GL*)	1	1	1		
SWL (m below GL*)	6	6.1	6.5		
Total Bore Depth (m below GL*)	9	10	10		
Well Volume (L) **[which for 50mm casing is 2L approx. per metre depth]	6	8	7		
Purged Volume (L) (≈ well vol x 3)	55L	40L	75L		
Sampling Date	4/11/15	4/11/15	4/11/15		
Sampling Time	8:00am	8:40am	9:10am		
Temperature (°C)	16.2	15.8	16		
pH (record to one decimal place)	8	8.6	8.5		
EC (µS/cm)	845	740	940		
Dissolved Oxygen (% Sat)	15.8	9	6.8		
Dissolved Oxygen (mg/L)	1.53	0.87	0.37		
Turbidity (NTU)	—	—	—		
Redox (mV)	125	120	134		
TDS (mg/L)	546	481	600		
Odour	None	None	None		
Colour	Clear	Clear	Clear		
Recharge Rate	—	—	—		
Observations	—	—	—		

Notes: GWL @ Sampling: BH101 - 6.5 BH102 - 6.25 BH3 - 6.1m bgl

Supervisor: Matt West **Date:** 4/11/15

Water quality meter calibration details (please tick calibration liquids used):

Meter ID							
Buffer (pH 4)	☑	Use-by Date		Conductivity Standard (2.76 mS/cm)	☐	Use-by Date	
Buffer (pH 6.88)	☑	Use-by Date		Total Dissolved Solids Standard (2 parts per thousand)	☐	Use-by Date	
Buffer (pH 9)	☐	Use-by Date		Rapid Cal Solution	☐	Use-by Date	

*GL – denotes ground level **Well Volume = πr^2 x depth of water, where r is internal casing radius

AirMet Scientific P/L
7-11 Ceylon Street
Nunawading
Victoria 3131, Australia

Calibration Certificate

This document hereby certifies that this instrument detailed has been calibrated to the parameters listed below.

Certificate Print Date: 17 July, 2015
Calibration Date: 17 July, 2015
Next Calibration Due: 17 January, 2016

Call ID: **00178383**

Arrow Job Code: *211368*

Customer:	DOUGLAS PARTNERS PTY LTD	**Type:**	Water Meter
Model:	WATERMETER	**Serial No:**	11K100287
Description:	YSI Pro Plus		

Sensor	Serial No	Standard Solutions	Certified	Solution # (Bottle #)	Instrument Reading	Units
Dissolved Oxygen				2810	0.0	%
EC		Electro solution		LH1691	2762	ms
[illegible]		Rowe Scientific Ph4		MD1859	4.18	Ph
Ph		Rowe Scientific Ph7		LE1048	7.20	Ph
Ph		Rowe Scientific Ph10		MH1685	9.80	Ph
Redox		Zobell 231		MG1080/MG1081	234	mV

Completed by: *Timothy Harmer* **Signed:**

Australian Standard Alarm Levels ☐

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Calibration and Service Report – PID

Company:	Douglas Partners Pty Ltd (NSW)	**Manufacturer:**	-	**Serial #:**	590-000221
Contact:	Veronika Ku	**Instrument:**	MiniRAE Lite - 590-000221	**Asset #:**	
Address:	PO Box 472 WEST RYDE, NSW	**Model:**	MiniRAE Lite	**Part #:**	059-A110-00
		Configuration:		**Sold:**	03.06.2008
		Wireless:		**Last Cal:**	17.03.2014
Phone:	02 9809 0666	**Network ID:**		**Job #:**	14757
Fax:		**Unit ID:**		**Cal Spec:**	
Email:	veronica.ku@douglaspartners.c	**Details:**		**Order #:**	123181

Item	Test	Pass/Fail	Comments	Serial Number
Battery	NiCd, NiMH, Dry cell, LiIon	P		
Charger	Power Supply	-		
	Cradle, Travel Charger	-		
Pump	Flow	X	Flowrate > 500ml/min	
Filter	Filter, fitting, etc	X	Fitted new Filter	002-3022-001
Alarms	Audible, visual, vibration	P		
Display	Operation	P		
Switches	Operation	P		
PCB	Operation	P		
Connectors	Condition	P		
Firmware	Version	P		
Datalogger	Operation	P		
Monitor Housing	Condition	P		
Case	Condition / Type	P		
Sensors				
PID	Lamp	P		
PID	Sensor	P		
THP	Sensor	P		

Engineer's Report

Checked unit settings, PC configuration and data download.
Unit serviced and calibrated.

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Calibration Certificate

Sensor	Type	Serial No.	Span Gas	Concentration	Traceability Lot #	CF	Reading	
							Zero	Span
PID	10.6 eV Lamp	106H820556	Isobutylene	100 ppm	S21306		0	100

Calibrated/Repaired by: AMEND ROSHAN KUMAR Date: 09.09.2015 Next Due: 09.03.2016

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