Appendix E

Historical Aerial Photographs

Aerial Imagery 2019

31 Cowper Street, Glebe, NSW 2037

Data Sources: Aerial Imagery © Aerometrex Pty Ltd

Coordinate System:
GDA 1994 MGA Zone 56

Date: 17 January 2020

Aerial Imagery 2018

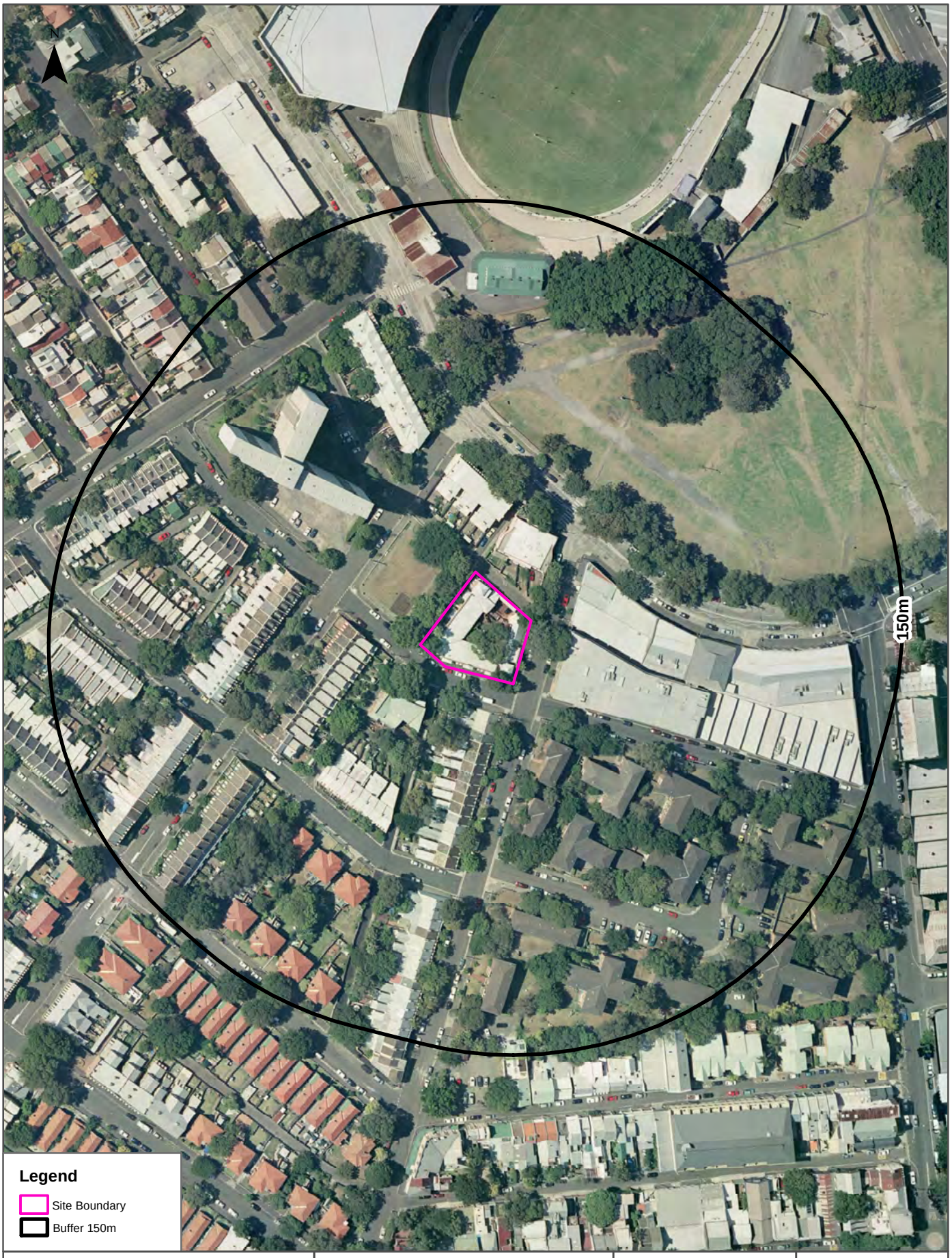
31 Cowper Street, Glebe, NSW 2037

Aerial Imagery 2014

31 Cowper Street, Glebe, NSW 2037

Aerial Imagery 2007

31 Cowper Street, Glebe, NSW 2037



Scale:
0 20 40 60 80
Meters

Data Sources: Aerial Imagery © Aerometrex Pty Ltd

Coordinate System:
GDA 1994 MGA Zone 56

Date: 17 January 2020

Aerial Imagery 2000

31 Cowper Street, Glebe, NSW 2037

Scale: 0 20 40 60 80 Meters	Data Sources: Aerial Imagery © Aerometrex Pty Ltd	Coordinate System: GDA 1994 MGA Zone 56	Date: 17 January 2020

Aerial Imagery 1991

31 Cowper Street, Glebe, NSW 2037

Scale: 0 20 40 60 80 Meters	Data Sources: Aerial Imagery © Department of Finance, Services & Innovation	Coordinate System: GDA 1994 MGA Zone 56	Date: 17 January 2020

Aerial Imagery 1982

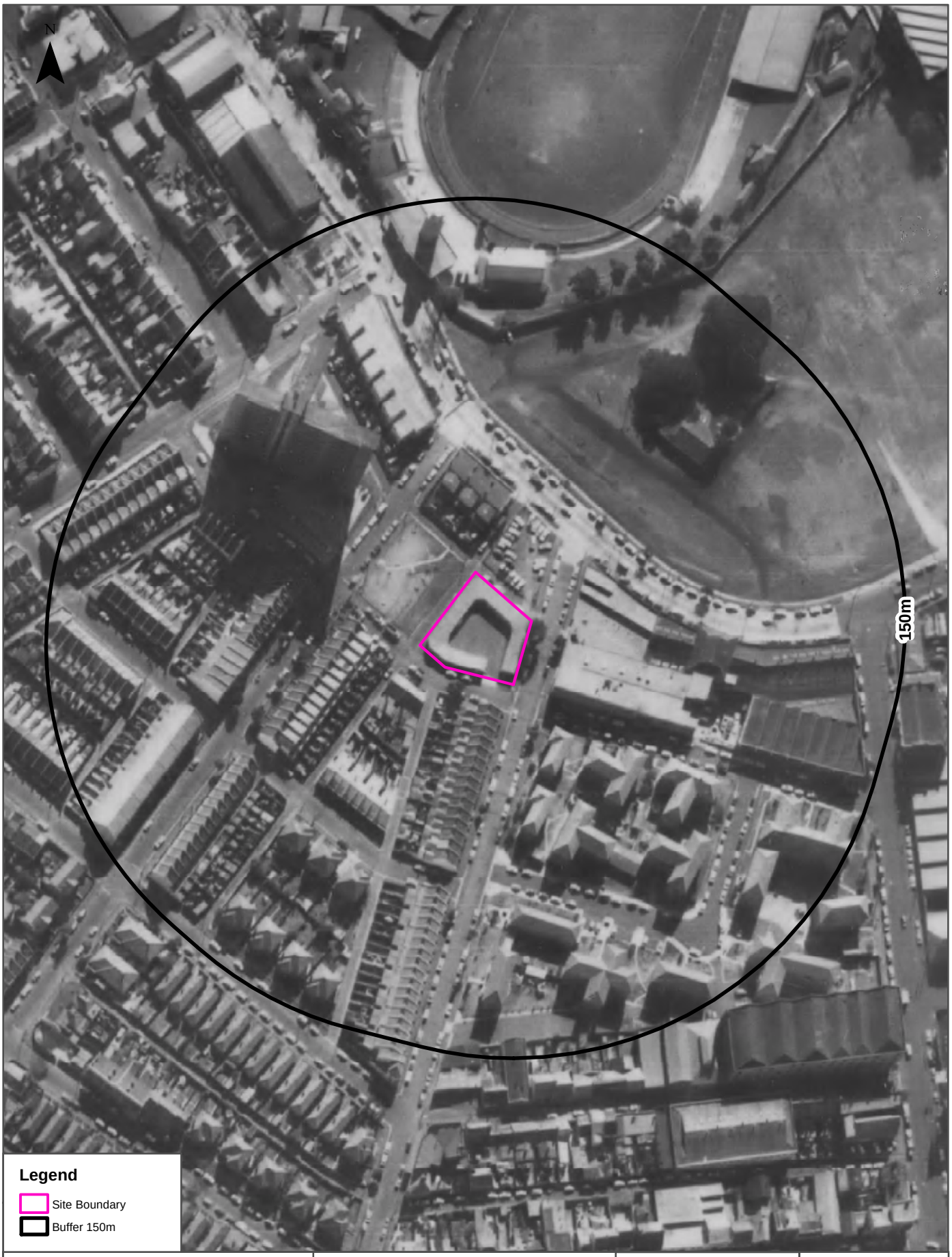
31 Cowper Street, Glebe, NSW 2037

Scale:	Data Sources: Aerial Imagery © Department of Finance, Services & Innovation	Coordinate System: GDA 1994 MGA Zone 56	Date: 17 January 2020

0 20 40 60 80 Meters

Aerial Imagery 1970

31 Cowper Street, Glebe, NSW 2037



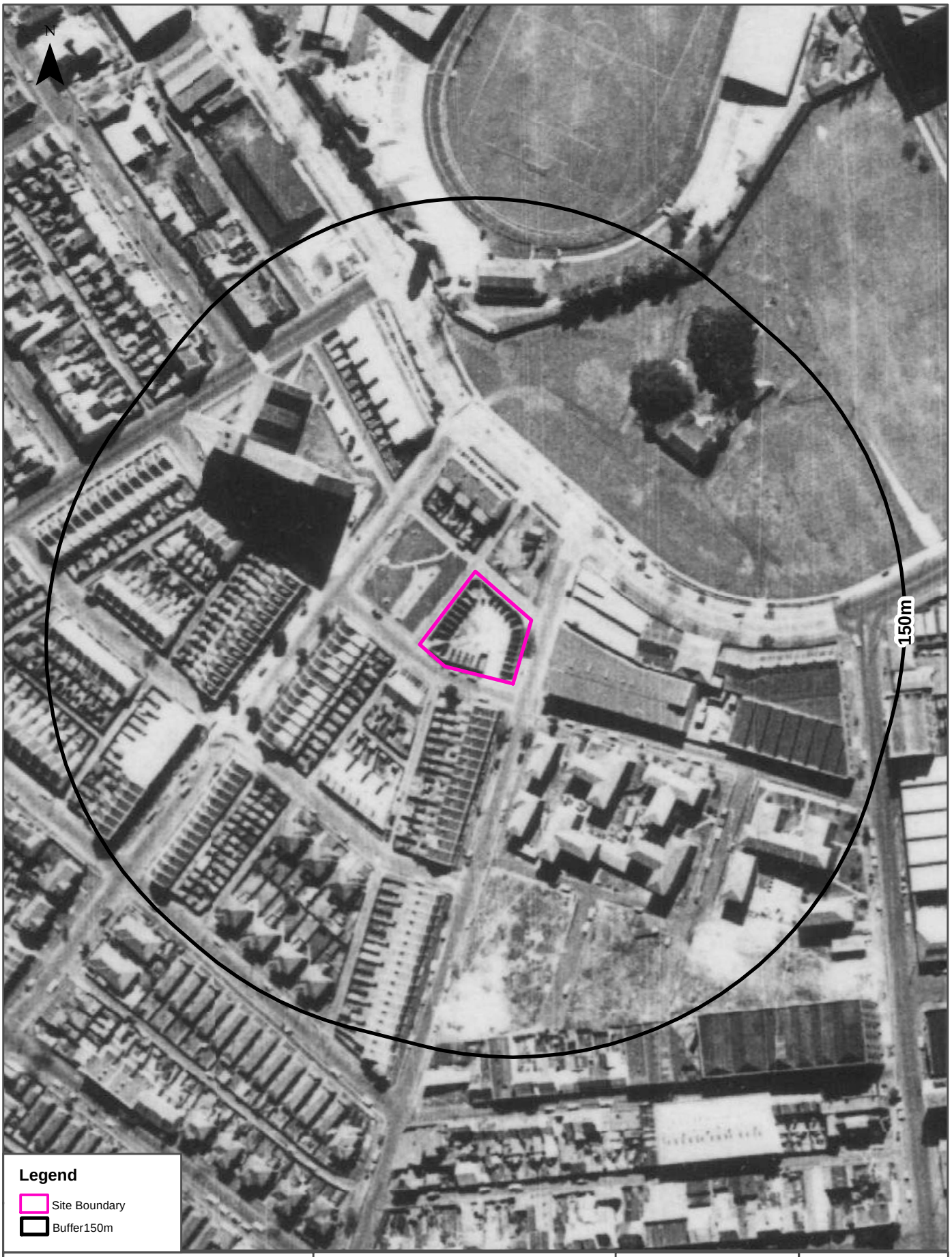
Data Sources: Aerial Imagery © Department of Finance, Services & Innovation

Coordinate System: GDA 1994 MGA Zone 56

Date: 17 January 2020

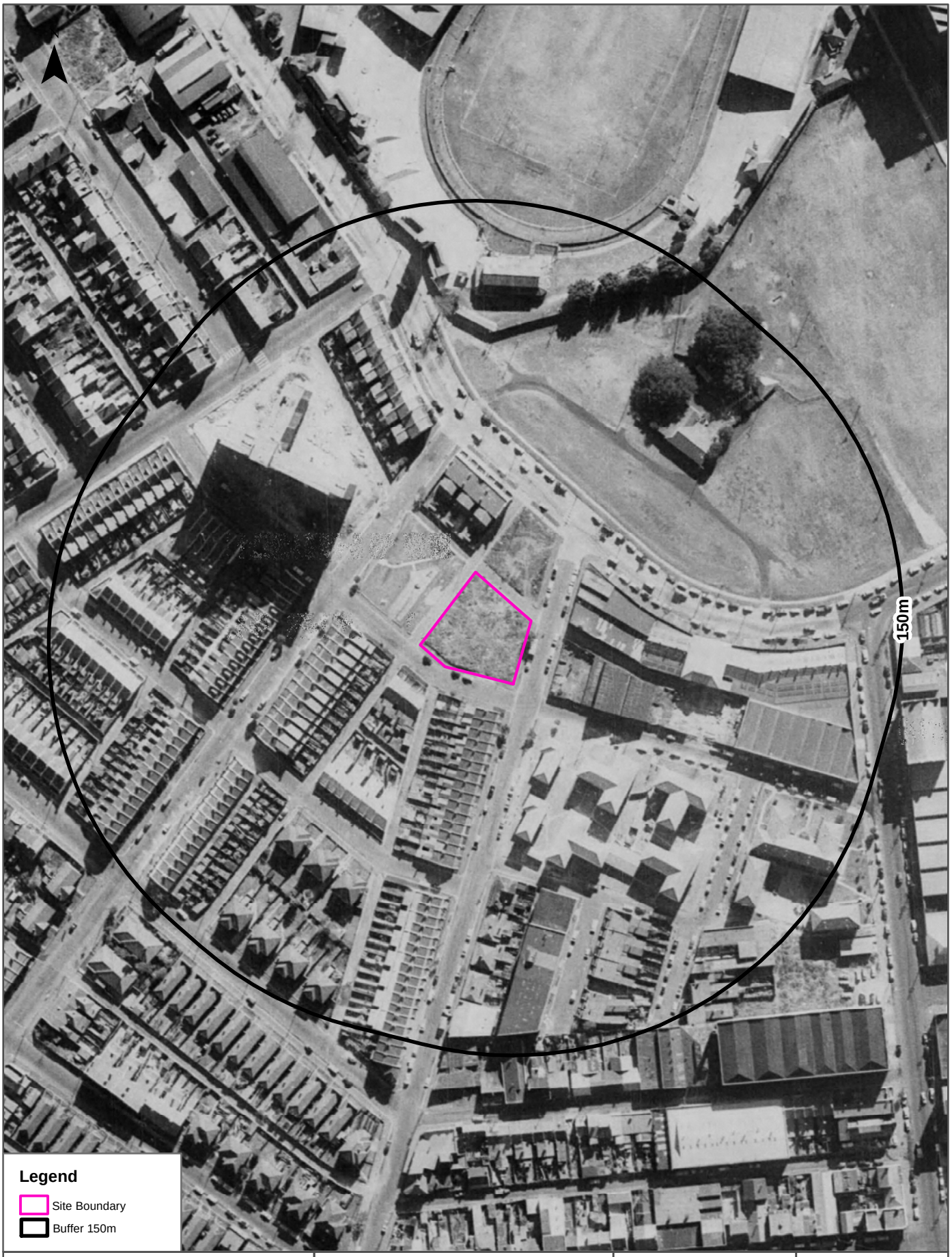
Aerial Imagery 1965

31 Cowper Street, Glebe, NSW 2037



Aerial Imagery 1961

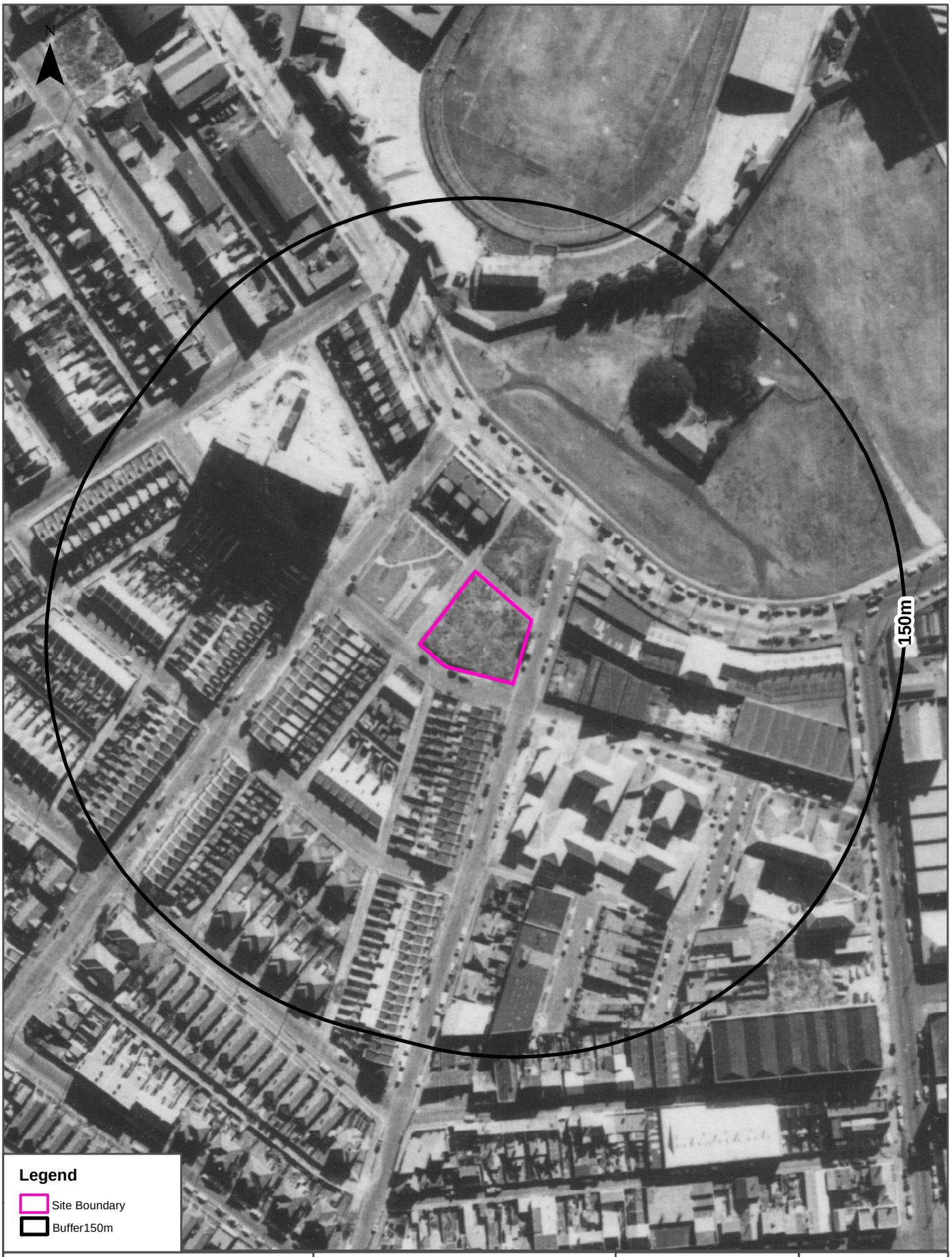
31 Cowper Street, Glebe, NSW 2037



Scale: 0 20 40 60 80 Meters	Data Sources: Aerial Imagery © Aerometrex Pty Ltd	Coordinate System: GDA 1994 MGA Zone 56	Date: 17 January 2020

Aerial Imagery 1961

31 Cowper Street, Glebe, NSW 2037



Data Source Aerial Imagery:
© NSW Department Finance, Services & Innovation

Coordinate System:
GDA 1994 MGA Zone 56

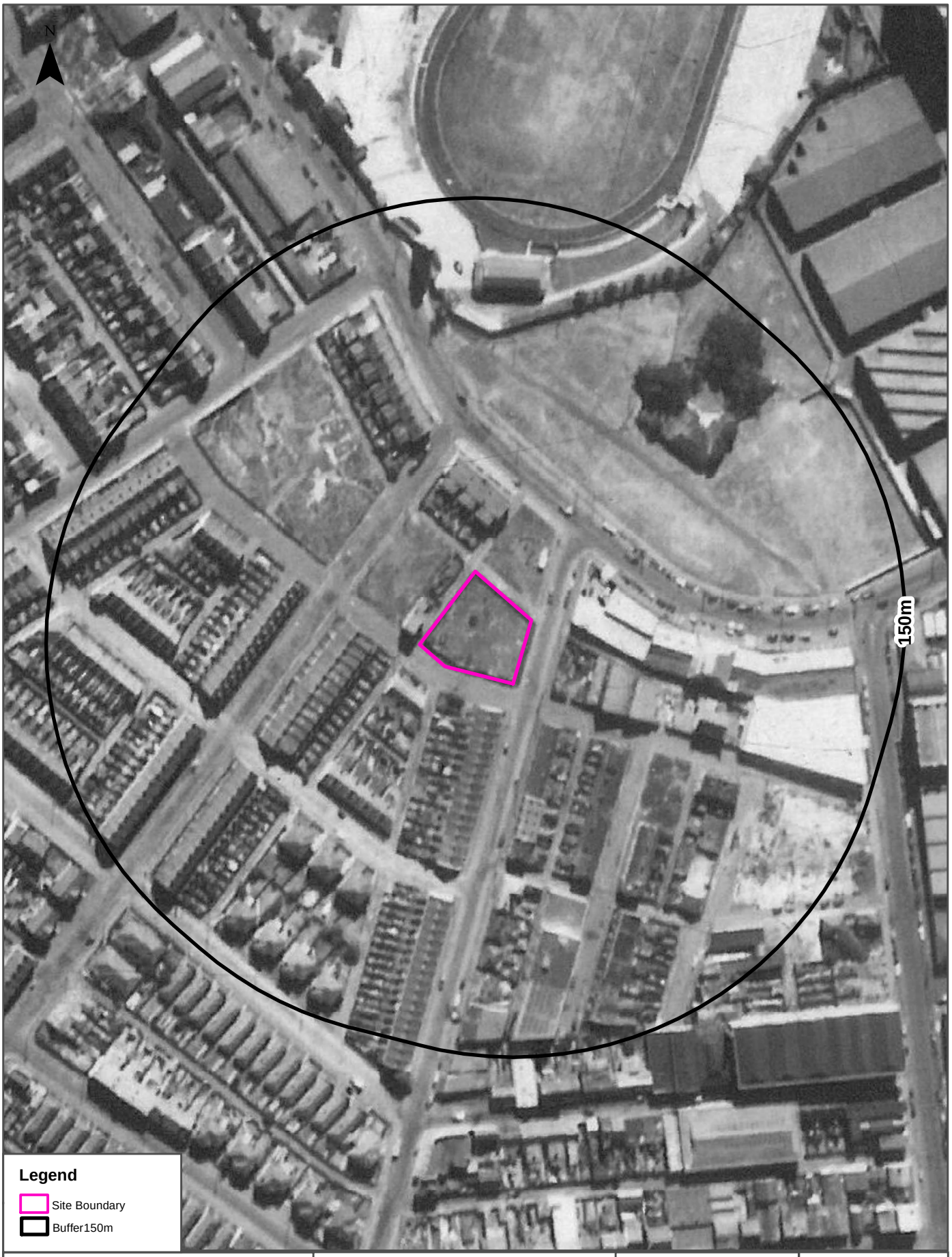
Date: 16 January 2020

Aerial Imagery 1955

31 Cowper Street, Glebe, NSW 2037

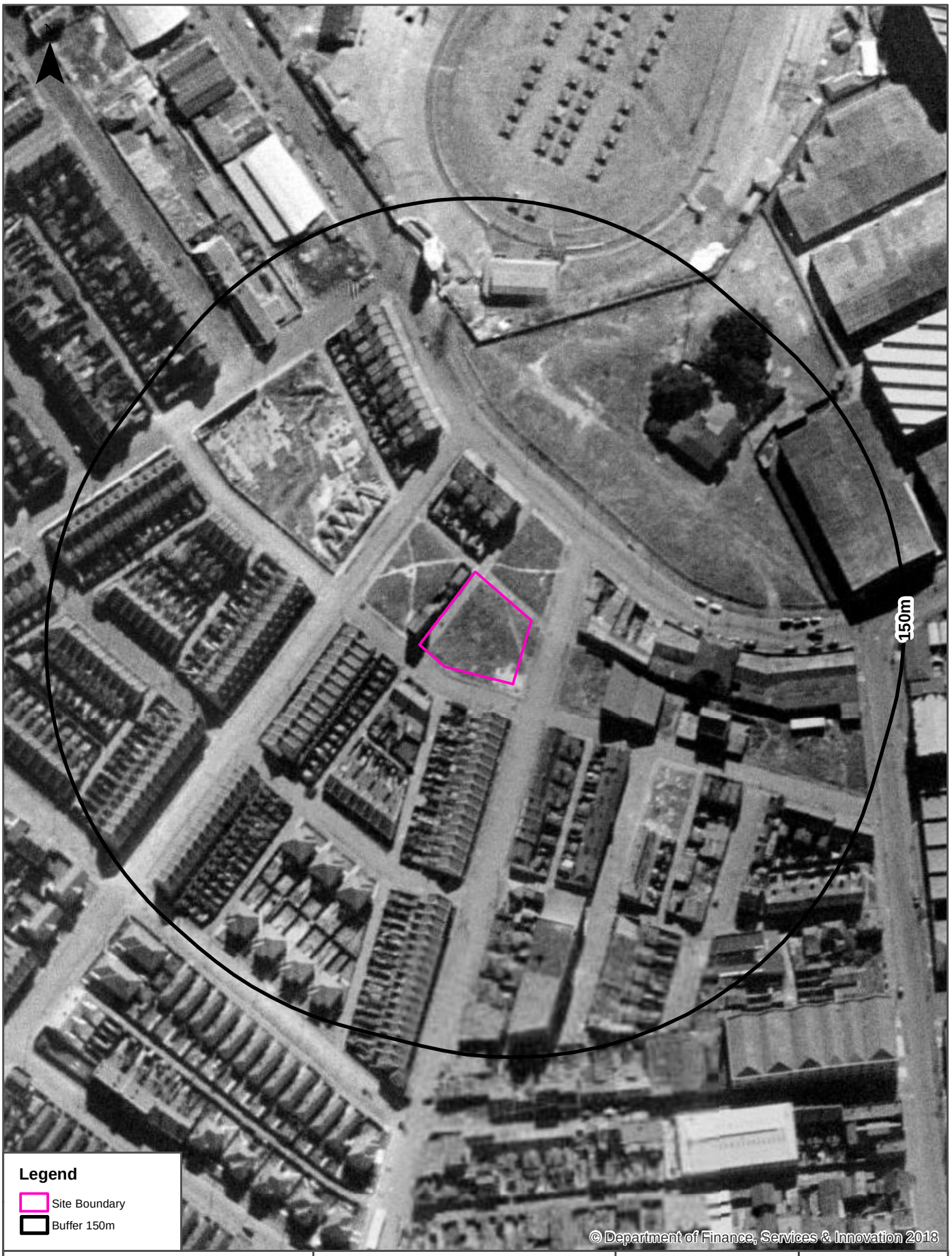
Aerial Imagery 1951

31 Cowper Street, Glebe, NSW 2037



Aerial Imagery 1943

31 Cowper Street, Glebe, NSW 2037



Scale:	Data Sources: Aerial Imagery © Department of Finance, Services & Innovation	Coordinate System: GDA 1994 MGA Zone 56	Date: 17 January 2020

0 20 40 60 80
Meters

Aerial Imagery 1930

31 Cowper Street, Glebe, NSW 2037

Appendix F

SafeWork NSW Schedule 11 Hazardous Chemical on Premises Search

NSW GOVERNMENT | SafeWork NSW

Locked Bag 2906, Lisarow NSW 2252
Customer Experience 13 10 50
ABN 81 913 830 179 | www.safework.nsw.gov.au

Our Ref: D20/063623

31 January 2020

Mr Joel James-Hall
Douglas Partners Pty Ltd
96 Hermitage Rd
WEST RYDE NSW 2114

Dear Mr James-Hall

RE SITE: Lots 17-18 DP 244897 Cowper St & Wentworth Park Rd, Glebe NSW 2037

I refer to your site search request received by SafeWork NSW on 20 Jan 2020 requesting information on Storage of Hazardous Chemicals for the above site.

A search of the records held by SafeWork NSW has not located any records pertaining to the above-mentioned premises.

For further information or if you have any questions, please call us on 13 10 50 or email licensing@safework.nsw.gov.auw

Yours sincerely

Customer Service Officer
Customer Experience - Operations
SafeWork NSW

Appendix G

Council Records

City of Sydney
Town Hall House
456 Kent Street
Sydney NSW 2000

Telephone +61 2 9265 9333
Fax +61 2 9265 9222
council@cityofsydney.nsw.gov.au

GPO Box 1591 Sydney NSW 2001
cityofsydney.nsw.gov.au

DOUGLAS PARTNERS PTY LTD
96 Hermitage Rd
WEST RYDE NSW 2114

PLANNING CERTIFICATE

Under Section 10.7 of the Environmental Planning and Assessment Act, 1979

Applicant:	DOUGLAS PARTNERS PTY LTD
Your reference:	
Address of property:	17-31 Cowper Street , GLEBE NSW 2037
Owner:	NEW SOUTH WALES LAND AND HOUSING CORPORATION
Description of land:	Lot 17 DP 244897
Certificate No.:	2020301117
Certificate Date:	19/02/20
Receipt No:	0150369
Fee:	$80.00
Paid:	19/02/20

Title information and description of land are provided from data supplied by the Valuer General and shown where available.

Issuing Officer
per **Monica Barone**
Chief Executive Officer

CERTIFICATE ENQUIRIES:
Ph: 9265 9333
Fax: 9265 9415

PLANNING CERTIFICATE UNDER SECTION 10.7 (2) OF THE ENVIRONMENTAL PLANNING AND ASSESSMENT ACT, 1979

MATTERS AFFECTING THE LAND AS PRESCRIBED BY SCHEDULE 4 - ENVIRONMENTAL PLANNING & ASSESSMENT REGULATION, 2000, CLAUSES (1) - (2).

DEVELOPMENT CONTROLS

The following information must be read in conjunction with and subject to all other provisions of the environmental planning instruments specified in this certificate.

ZONING

Zone R1 General Residential (Sydney Local Environmental Plan 2012)

1 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 maintain the existing land use pattern of predominantly residential uses..

2 Permitted without consent
Home occupations

3 Permitted with consent
Attached dwellings; Bed and breakfast accommodation; Boarding houses; Child care centres; Community facilities; Dwelling houses; Food and drink premises; Group homes; Home industries; Horticulture; Hostels; Multi dwelling housing; Neighbourhood shops; Places of public worship; Residential flat buildings; Respite day care centres; Roads; Roadside stalls; Semi-detached dwellings; Seniors housing; Shop top housing; shops; Any other development not specified in item 2 or 4

4 Prohibited
Agriculture; Air transport facilities; Airstrips; Amusement centres; Animal boarding or training establishments; Boat launching ramps; Boat building and repair facilities; Camping grounds; Car parks; Caravan parks; Charter and tourism boating facilities; Commercial premises; Crematoria; Depots; Eco-tourist facilities; Entertainment facilities; Environmental protection works; Exhibition villages; Extractive industries; Farm buildings; Forestry; Freight transport facilities; Function centres; Heavy industrial storage establishments; Helipads; Highway service centres; Industrial retail outlets; Industries; Mooring pens; Moorings; Mortuaries; Passenger transport facilities; Port facilities; Recreation facilities (major); Recreation facilities(outdoor); Registered clubs; Research stations; Restricted premises; Rural industries; Rural supplies; Service stations; Sewerage systems; Sex services premises; Storage premises; Tourist and visitor accommodation; Transport depots; Truck depots; Vehicle body repair workshops; Vehicle repair stations; Veterinary hospitals; Warehouse or distribution centres; Waste or resource management facilities; Water recreation structures; Water supply systems; Wholesale supplies

PROPOSED ZONING

This property is not affected by a draft zone.

LOCAL PLANNING CONTROLS

Sydney Local Environmental Plan 2012 (as amended) – Published 14 December 2012 NSW Legislation Website.

Sydney Development Control Plan 2012 (as amended) - (commenced 14.12.2012)

HERITAGE

Conservation Area
(Sydney Local Environmental Plan 2012)
This property has been identified as land within a Heritage Conservation Area.

State Heritage Register (Amendment To Heritage Act, 1977 Gazetted 2/4/99)
This property may be identified as being of state heritage significance, and entered on the State Heritage Register.

To confirm whether the site is listed under the Heritage Act 1977 a Section 167 Certificate should be obtained from the NSW Heritage Office by contacting the NSW Heritage office on (02) 9873 8500 for an application from or by downloading the application form from www.heritage.nsw.gov.au

STATE PLANNING INSTRUMENTS

Full copies of State Environmental Planning Policies are available online at www.planning.nsw.gov.au.

State Environmental Planning Policy No. 19 – Bushland in Urban Areas
This is a policy to protect and preserve bushland within certain urban areas, as part of the natural heritage or for recreational, educational and scientific purposes. This policy is designed to protect bushland in public open space zones and reservations, and to ensure that bush preservation is given a high priority when local environmental plans for urban development are prepared.

State Environmental Planning Policy No. 33 – Hazardous and Offensive Development
This policy aims to amend the definitions of hazardous and offensive industries; to render ineffective any environmental planning instruments not defining hazardous or offensive as per this policy; to control development of hazardous and offensive industries.

State Environmental Planning Policy No. 55 – Remediation of Land
This policy provides planning controls for the remediation of contaminated land. The policy states that land must not be developed if it is unsuitable for a proposed use because it is contaminated. If the land is unsuitable, remediation must take place before the land is developed. The policy makes remediation permissible across the State, defines when consent is required, requires all remediation to comply with standards, ensures land is investigated if contamination is suspected, and requires councils to be notified of all remediation proposals. To assist councils and developers, the Department, in conjunction with the Environment Protection Authority, has prepared Managing Land Contamination: Planning Guidelines.

State Environmental Planning Policy No. 64 – Advertising and Signage
This policy aims to ensure that signage (including advertising):
Is compatible with the desired amenity and visual character of an area, and

- Provides effective communications in suitable locations, and
- Is of a high quality design and finish.

To this end the policy regulates signage (but not content) under Part 4 of the Act and provides limited time consents for the display of certain advertisements. The policy does not apply to signage that is exempt development under an environmental planning instrument. It does apply to all signage that can be displayed with or without consent and is visible from any public place or reserve, except as provided by the policy.

This policy should be read in conjunction with the Sydney Local Environmental Plan 2005, the City of Sydney Signage and Advertising Structures Development Control Plan 2005 and State Environmental Planning Policy No. 60 where these apply.

State Environmental Planning Policy No. 65 – Design Quality of Residential Apartment Development
This policy aims to improve the design quality of flats of three or more storeys with four or more self contained dwellings. The policy sets out a series of design principles for local councils to consider when assessing development proposals for residential flat development. The policy also creates a role for an independent design review panel and requires the involvement of a qualified designer in the design and approval process.

State Environmental Planning Policy No.70 – Affordable Housing (Revised Schemes) (Gazetted 31.05.02)
The policy identifies that there is a need for affordable housing in the City of Sydney, describes the kinds of households for which affordable housing may be provided and makes a requirement with respect to the imposition of conditions relating to the provision of affordable housing (provided other requirements under the Act are met).

State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004
This Policy does not apply to land described in Schedule 1 (Environmentally sensitive land), or land that is zoned for industrial purposes, or land to which an interim heritage order made under the *Heritage Act 1997* by the Minister administering that Act applies, or land to which a listing on the State Heritage Register kept under the *Heritage Act 1997* applies.

The Policy aims to encourage the provision of housing (including residential care facilities) that will increase the supply and diversity of residences that meet the needs of seniors or people with a disability, and make efficient use of existing infrastructure and services, and be of good design.

State Environmental Planning Policy (Building Sustainability Index: BASIX) 2004
Aims to ensure consistency in the implementation of the BASIX scheme throughout the State. This Policy achieves its aim by overriding provisions of other environmental planning instruments and development control plans that would otherwise add to, subtract from or modify any obligations arising under the BASIX scheme.

State Environmental Planning Policy (State Significant Precincts) 2005
This Policy aims to identify development of economic, social or environmental significance to the State or regions of the State so as to provide a consistent and comprehensive assessment and decision making process for that development.
NB: This SEPP also contains exempt & complying provisions

State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007
This Policy aims to provide for the proper management and development of mineral, petroleum and extractive material resources for the social and economic welfare of the State.

State Environmental Planning Policy (Miscellaneous Consent Provisions) 2007
This Policy aims to ensure that suitable provision is made for ensuring the safety of persons using temporary structures or places of public entertainment.

State Environmental Planning Policy (Infrastructure) 2007
This Policy aims to facilitate the effective delivery of infrastructure across the state.
NB: This SEPP also contains exempt & complying provisions

State Environmental Planning Policy (Exempt and Complying Development Codes) 2008
This Policy Streamlines assessment processes for development that complies with specified development standards. The policy provides exempt and complying development codes that have State-wide application, identifying, in the General Exempt Development Code, types of development that are of minimal environmental impact that may be carried out without the need for development consent; and, in the General Housing Code, types of complying

development that may be carried out in accordance with a complying development certificate as defined in the Environmental Planning and Assessment Act 1979.

State Environmental Planning Policy (Affordable Rental Housing) 2009
Establishes a consistent planning regime for the provision of affordable rental housing. The policy provides incentives for new affordable rental housing, facilitates the retention of existing affordable rentals, and expands the role of not-for-profit providers. It also aims to support local centres by providing housing for workers close to places of work, and facilitate development of housing for the homeless and other disadvantaged people. NOTE: Does not apply to land at Green Square or at Ultimo Pyrmont, or on southern employment land.

State Environmental Planning Policy (Urban Renewal) 2010
The aims of this Policy are as follows:
(a) to establish the process for assessing and identifying sites as urban renewal precincts,
(b) to facilitate the orderly and economic development and redevelopment of sites in and around urban renewal precincts,
(c) to facilitate delivery of the objectives of any applicable government State, regional or metropolitan strategies connected with the renewal of urban areas that are accessible by public transport.

State Environmental Planning Policy (State and Regional Development) 2011
The aims of this Policy are as follows:
(a) to identify development that is State significant development,
(b) to identify development that is State significant infrastructure and critical State significant infrastructure,
(c) to confer functions on joint regional planning panels to determine development applications.

State Environmental Planning Policy (Vegetation in Non-Rural Areas) 2017
The aims of this Policy are:
(a) to protect the biodiversity values of trees and other vegetation in non-rural areas of the State, and
(b) to preserve the amenity of non-rural areas of the State through the preservation of trees and other vegetation.

State Environmental Planning Policy (Educational Establishments and Child Care Facilities) 2017
The aim of this Policy is to facilitate the effective delivery of educational establishments and early education and care facilities across the state.

State Environmental Planning Policy (Coastal Management) 2018
The aim of this Policy is to promote an integrated and co-ordinated approach to land use planning in the coastal zone in a manner consistent with the objects of the Coastal Management Act 2016, including the management objectives for each coastal management area, by:
(a) managing development in the coastal zone and protecting the environmental assets of the coast, and
(b) establishing a framework for land use planning to guide decision-making in the coastal zone, and
(c) mapping the 4 coastal management areas that comprise the NSW coastal zone for the purpose of the definitions in the Coastal Management Act 2016.

Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005
This plan applies to land within the Sydney Harbour Catchment, as shown edged heavy black on the Sydney Harbour Catchment Map, being part of the Sydney Region declared by order published in Gazette No 38 of 7 April 1989 at page 1841.

This plan has the following aims with respect to the Sydney Harbour Catchment:

to ensure that the catchment, foreshores, waterways and islands of Sydney Harbour are recognised, protected and maintained: as outstanding natural asset, and as a public asset of national and heritage significance, for existing and future generations; to ensure a healthy, sustainable environment on land and water; to achieve a high quality urban environment; to ensure a prosperous working waterfront and an effective transport corridor, to encourage a culturally rich and vibrant place for people; to ensure accessibility to and along Sydney Harbour and its foreshores; to ensure the protection, maintenance and rehabilitation of watercourses, wetlands, riparian lands, remnant vegetation and ecological connectivity, to provide a consolidated, simplified and updated legislative framework for future planning.

OTHER MATTERS AFFECTING THE LAND AS PRESCRIBED BY SCHEDULE 4 - E. P. & A. REGULATION, 2000. CLAUSES (2A) - (10)

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

This SEPP does not apply to the land.

(3) Complying Development

(1) The extent to which the land is 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*.

(2) The extent to which 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 and the reasons why it may not be carried out under those clauses.

(3) If the council does not have sufficient information to ascertain the extent to which complying development may or may not be carried out on the land, a statement that a restriction applies to the land, but it may not apply to all of the land, and that council does not have sufficient information to ascertain the extent to which complying development may or may not be carried out on the land.

Note: All Exempt and Complying Development Codes: Council does not have sufficient information to ascertain the extent of a land based exclusion on a property. Despite any statement preventing the carrying out of complying development in the Codes listed below, complying development may still be carried out providing the development is not on the land affected by the exclusion and meets the requirements and standards of *State Environmental Planning Policy (Exempt and Complying Development Codes) 2008*.

General Housing Code & Commercial and Industrial (New Buildings and Additions) Code

Complying development **may not** be carried out on the land under the General Housing Code & the Commercial and Industrial (New Buildings and Additions) Code if because of the provisions of clause 1.17A, 1.18(1)(c3) & 1.19 (Land-based requirements for exempt and complying development) any of the following statements are **YES**

▪ Clause 1.19(5)d. Land that is significantly contaminated land within the meaning of the Contaminated Land Management Act 1997. (Applies only to the Commercial and Industrial (New Buildings and Additions) Code.	NO
▪ Clause 1.17A(d). Has been identified as a property that comprises, or on which there is, an item that is listed on the State Heritage Register under the *Heritage Act 1977* or that is subject to an interim heritage order under the *Heritage Act 1977*.	NO
▪ Clause 1.17A(d) & 1.18(1)(c3). Has been identified as a property that comprises, or on which there is, a heritage item or draft heritage item.	**NO**
▪ Clause 1.17A(c). Has been identified as being within a wilderness area (identified under the *Wilderness Act 1987*.	**NO**
▪ Clause 1.17A(e) & 1.19(1)e or 1.19(5)f. Has been identified as land that is within an environmentally sensitive area or by an environmental planning instrument as being within a buffer area, a river front area, an ecologically sensitive area, environmentally sensitive land or a protected area	**NO**
▪ Clause 1.19(1)a.or 1.19(5)a Has been identified as being within a heritage conservation area or a draft heritage conservation area.	**YES**
▪ Clause 1.19(1)b or 1.19(5)b. Has been identified as being land that is reserved for a public purpose in an environmental planning instrument.	**NO**
▪ Clause 1.19(1)c or 1.19(5)c. Has been identified as being on an Acid Sulfate Soils Map as being Class 1 or Class 2.	**YES**
▪ Clause 1.19(1)d or 1.19(5)e. Has been identified as land that is subject to a biobanking agreement under part 7A of the threatened Species Conservation Act 1995 or a property vegetation plan under the Native Vegetation Act 2003.	**NO**
▪ Clause 1.19(1)f or 1.19(5)g. Has been identified by an environmental planning instrument, a development control plan or a policy adopted by the Council as being or affected by a coastline hazard, a coastal hazard or a coastal erosion hazard.	**NO**
▪ Clause 1.19(1)g or 1.19(5)h. Has been identified as being land in a foreshore area.	**NO**
▪ Clause 1.19(1)h. Has been identified as land that is in the 25 ANEF contour or a higher ANEF contour. (Applies only to the General Housing Code)	**NO**
▪ Clause 1.19(1)j or 1.19(5)i. Has been identified as unsewered land within a drinking water catchment.	**NO**
▪ Clause 1.19(1)i. Has been identified as land that is declared to be a special area under the Sydney Water Catchment Management Act 1998.	**NO**

Housing Alterations Code
Complying development under the Housing Alterations Code **may** be carried out on the land.

Commercial and Industrial Alterations Code
Complying development under the Commercial and Industrial Alterations Code **may** be carried out on the land.

Subdivisions Code

Complying development under the Subdivisions Code **may** be carried out on the land.

Rural Housing Code
The Rural Housing Code does not apply to this Local Government Area.

General Development Code
Complying development under the General Development Code **may** be carried out on the land.

Demolition Code
Complying development under the Demolition Code **may** be carried out on the land.

Low Rise Medium Density Housing Code
This Code does not apply to this Local Government Area.

(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 : The owner (or any previous owner) of the land has not 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.

(5) Mine Subsidence District

This land has not been proclaimed to be a mine subsidence district within the meaning of section 15 of the mine subsidence compensation act, 1961.

(6) Road Widening and/or Road Realignment affected by (a) Division 2 of Part 3 of the Roads act 1993 or (c) any resolution of council or other authority.

This land **is not** affected by road widening and/or road realignment under section 25 of the Roads Act, 1993 and/or resolution of Council or any other authority.

(6) Road Widening and/or Road Realignment Affected by (b) any environmental planning instrument.

This land **is not** affected by any road widening or road realignment under any planning instrument.

(7) Council and other public authorities policies on hazard risk restrictions:

(a) The land **is not** affected by a policy adopted by the Council that that restricts the development of the land because of the likelihood of land slip, bushfire, flooding, tidal inundation, subsidence, acid sulphate soils or any other risk; and

(b) The land **is not** affected by a policy adopted by any other public authority and notified to the council for the express purpose of its adoption by that authority being referred to on planning certificate issued by Council, that restricts the development of the land because of the likelihood of land slip, bushfire, flooding, tidal inundation, subsidence, acid sulphate soils or any other risk.

(7A) Flood related development controls information.

The development on this land or part of this land is subject to flood related development controls refer to Clause 7.15 of Sydney Local Environment Plan 2012 and Section 3.7 of Sydney Development Control Plan 2012.

(8) Land reserved for acquisition

No environmental planning instrument, or proposed environmental planning instrument applying to the land, provides for the acquisition of the land by a public authority, as referred to in section 3.15 of the Act.

(9) Contribution plans

The following Contributions Plans apply to properties within the City of Sydney local government area. Contributions plans marked **YES** may apply to this property:

▪ Central Sydney Development Contributions Plan 2013 – in operation 9th July 2013	**NO**
▪ City of Sydney Development Contributions Plan 2015 – in operation 1st July 2016	**YES**
▪ Redfern Waterloo Authority Contributions Plan 2006 – in operation 16th May 2007 ▪ Redfern Waterloo Authority Affordable Housing Contributions Plan – in operation 16th May 2007	**NO**

(9A) Biodiversity certified land

The land has not been certified as biodiversity certified land.

(10) Biodiversity Conservation Act 2016

Not Applicable.

(10A) Native vegetation clearing set asides

Not Applicable.

(11) Bush fire prone land

The land has not been identified as Bush fire prone land.

(12) Property vegetation plans

Not Applicable.

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

Council has not been notified of an order which as been made under the *Trees (Disputes Between Neighbours) Act 2006* to carry out work in relation to a tree on the land.

(14) Directions under Part 3A

Not Applicable.

(15) Site compatibility certificates and conditions for seniors housing

(a) The land to which the certificate relates is not subject to a current site compatibility certificate (seniors housing), of which Council is aware, in respect of proposed development on the land.

(b) The land to which the certificate relates is not subject to any condition of consent to a development application granted after 11 October 2007 required by State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004.

(16) Site compatibility certificates for infrastructure, schools or TAFE establishments

The land to which the certificate relates is not subject to a valid site compatibility certificate (infrastructure), of which Council is aware, in respect of proposed development on the land.

(17) Site compatibility certificates and conditions for affordable rental housing

(a) The land to which the certificate relates is not subject to a current site compatibility certificate (affordable rental housing), of which Council is aware, in respect of proposed development on the land.

(b) The land to which the certificate relates is not subject to any terms of a kind referred to in clause 17(1) or 37(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.

(18) Paper subdivision information

Not Applicable.

(19) Site verification certificates

The land to which the certificate relates is not subject to a valid site verification certificate of which Council is aware.

(20) Loose-fill asbestos insulation

Not Applicable

(21) Affected building notices and building product rectification orders

(1)The land to which the certificate relates is not subject to any affected building notice of which Council is aware.

(2) (a) The land to which the certificate relates is not subject to any building product rectification order of which Council is aware and has not been fully complied with.

(b) The land to which the certificate relates is not subject to any notice of intention to make a building product rectification order of which Council is aware and is outstanding.

(3) In this clause:
affected building notice has the same meaning as in Part 4 of the Building Products (Safety) Act 2017.
building product rectification order has the same meaning as in the Building Products (Safety) Act 2017.

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

(a) The land to which the certificate relates **is not** declared to be **significantly contaminated land** within the meaning of that act as at the date when the certificate is issued.

(b) The land to which the certificate relates **is not** subject to a **management order** within the meaning of that act as at the date when the certificate is issued.

(c) The land to which the certificate relates **is not** the subject of an **approved voluntary management proposal** within the meaning of that act at the date the certificate is issued.

(d) The land to which the certificate relates **is not** the subject of an **ongoing maintenance order** within the meaning of that act as at the date when the certificate is issued.

(e) As at the date when the certificate is issued, Council **has not** identified that a **site audit statement** within the meaning of that act has been received in respect of the land the subject of the certificate.

PLANNING CERTIFICATE SECTION 10.7 (2) INFORMATION:
Information provided in accordance with planning certificate section 10.7 (2) has been taken from council's records and advice from other authorities but council disclaims all liability for any omission or inaccuracy in the information. Specific inquiry should be made where doubt exists.

PLANNING CERTIFICATE UNDER SECTION 10.7 (5) OF THE ENVIRONMENTAL PLANNING AND ASSESSMENT ACT, 1979

PLANNING CERTIFICATE SECTION 10.7 (5) ADVICE is current as at 12:00 noon two working days prior to the date of issue of this certificate. The following matters have been considered & details provided where information exists: easements in favour of council; parking permit scheme; heritage floor space restrictions; low-rental residential building; foreshore building line; tree preservation order.

Contaminated Land Potential:
Council records do not have sufficient information about the uses (including previous uses) of the land which is the subject of this section 10.7 certificate to confirm that the land has not been used for a purpose which would be likely to have contaminated the land. Parties should make their own enquiries as to whether the land may be contaminated.

Hazard Risk Restriction:
Some City of Sydney Local Environmental Plans incorporate Acid Sulfate soil maps. Development on the land identified in those maps should have regard to the acid sulfate soil clause within the relevant Local Environmental Plan.

Construction Noise and View Loss Advice:
Intending purchasers are advised that the subject property may be affected by construction noise and loss or diminution of views as a result of surrounding development.

Outstanding Notice & Order information
In relation to this property, there **is not** an outstanding Order or Notice of Intention to issue an Order relating to Fire Safety (being an Order or Notice of Intention to issue an Order under Part 2 of Schedule 5 of the Environmental Planning and Assessment Act, 1979). Further information about the Order or Notice of Intention to issue an Order may be obtained by applying for a certificate under clause 41 of Schedule 5 of the Environmental Planning and Assessment Act and Section 735A of the Local Government Act.

In relation to this property, there **is not** an outstanding Order or Notice of Intention to issue an Order (being an Order or Notice of Intention to issue an Order of a type other than relating to fire safety). Further information about the Order or Notice of Intention to issue an Order may be obtained by applying for a certificate under clause 41 of Schedule 5 of the Environmental Planning and Assessment Act and Section 735A of the Local Government Act.

Neighbourhood Parking Policy
The City of Sydney co-ordinates a Resident Permit Parking Scheme and a Visitor Permit Parking scheme. This property may be restricted from participating in either scheme. Eligibility may change after the date of this certificate, as parking supply and other traffic demands change. For more information contact Council's call centre on 9265 9333.

ADVICE FROM OTHER BODIES

Sydney Ports Corporation Advice
Some land in the City of Sydney located in the vicinity of the White Bay, Glebe Island and Darling Harbour ports may be affected by noise from port operations.

Advice provided in accordance with planning certificate section 10.7 (5) is supplied in good faith. Council accepts no liability for the validity of the advice given. (see section 10.7 (6) of the Environmental Planning and Assessment Act, 1979).

Planning certificate section 10.7 (2), local planning controls are available are available online at www.cityofsydney.nsw.gov.au

General Enquiries:
Telephone: 02 9265 9333

Town Hall House
Level 2
Town Hall House
456 Kent Street
Sydney
8am – 6pm Monday - Friday

State planning controls are available online at www.legislation.nsw.gov.au

Where planning certificate section 10.7 (5) matters are supplied, complete details are available by writing to:
Chief Executive Officer
City of Sydney
G.P.O. Box 1591
Sydney NSW 2000

End of Document

City of Sydney
Town Hall House
456 Kent Street
Sydney NSW 2000

Telephone +61 2 9265 9333
Fax +61 2 9265 9222
council@cityofsydney.nsw.gov.au

GPO Box 1591 Sydney NSW 2001
cityofsydney.nsw.gov.au

DOUGLAS PARTNERS PTY LTD
96 Hermitage Rd
WEST RYDE NSW 2114

PLANNING CERTIFICATE

Under Section 10.7 of the Environmental Planning and Assessment Act, 1979

Applicant:	DOUGLAS PARTNERS PTY LTD
Your reference:	
Address of property:	2A-2D Wentworth Park Road , GLEBE NSW 2037
Owner:	NEW SOUTH WALES LAND AND HOUSING CORPORATION
Description of land:	Lot 18 DP 244897
Certificate No.:	2020301118
Certificate Date:	19/02/20
Receipt No:	0150369
Fee:	$80.00
Paid:	19/02/20

Title information and description of land are provided from data supplied by the Valuer General and shown where available.

Issuing Officer
per **Monica Barone**
Chief Executive Officer

CERTIFICATE ENQUIRIES:
Ph: 9265 9333
Fax: 9265 9415

PLANNING CERTIFICATE UNDER SECTION 10.7 (2) OF THE ENVIRONMENTAL PLANNING AND ASSESSMENT ACT, 1979

MATTERS AFFECTING THE LAND AS PRESCRIBED BY SCHEDULE 4 - ENVIRONMENTAL PLANNING & ASSESSMENT REGULATION, 2000, CLAUSES (1) - (2).

DEVELOPMENT CONTROLS

The following information must be read in conjunction with and subject to all other provisions of the environmental planning instruments specified in this certificate.

ZONING

Zone R1 General Residential (Sydney Local Environmental Plan 2012)

1 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 maintain the existing land use pattern of predominantly residential uses..

2 Permitted without consent
Home occupations

3 Permitted with consent
Attached dwellings; Bed and breakfast accommodation; Boarding houses; Child care centres; Community facilities; Dwelling houses; Food and drink premises; Group homes; Home industries; Horticulture; Hostels; Multi dwelling housing; Neighbourhood shops; Places of public worship; Residential flat buildings; Respite day care centres; Roads; Roadside stalls; Semi-detached dwellings; Seniors housing; Shop top housing; shops; Any other development not specified in item 2 or 4

4 Prohibited
Agriculture; Air transport facilities; Airstrips; Amusement centres; Animal boarding or training establishments; Boat launching ramps; Boat building and repair facilities; Camping grounds; Car parks; Caravan parks; Charter and tourism boating facilities; Commercial premises; Crematoria; Depots; Eco-tourist facilities; Entertainment facilities; Environmental protection works; Exhibition villages; Extractive industries; Farm buildings; Forestry; Freight transport facilities; Function centres; Heavy industrial storage establishments; Helipads; Highway service centres; Industrial retail outlets; Industries; Mooring pens; Moorings; Mortuaries; Passenger transport facilities; Port facilities; Recreation facilities (major); Recreation facilities(outdoor); Registered clubs; Research stations; Restricted premises; Rural industries; Rural supplies; Service stations; Sewerage systems; Sex services premises; Storage premises; Tourist and visitor accommodation; Transport depots; Truck depots; Vehicle body repair workshops; Vehicle repair stations; Veterinary hospitals; Warehouse or distribution centres; Waste or resource management facilities; Water recreation structures; Water supply systems; Wholesale supplies

PROPOSED ZONING

This property is not affected by a draft zone.

LOCAL PLANNING CONTROLS

Sydney Local Environmental Plan 2012 (as amended) – Published 14 December 2012 NSW Legislation Website.

Sydney Development Control Plan 2012 (as amended) - (commenced 14.12.2012)

HERITAGE

Conservation Area
(Sydney Local Environmental Plan 2012)
This property has been identified as land within a Heritage Conservation Area.

State Heritage Register (Amendment To Heritage Act, 1977 Gazetted 2/4/99)
This property may be identified as being of state heritage significance, and entered on the State Heritage Register.

To confirm whether the site is listed under the Heritage Act 1977 a Section 167 Certificate should be obtained from the NSW Heritage Office by contacting the NSW Heritage office on (02) 9873 8500 for an application from or by downloading the application form from www.heritage.nsw.gov.au

STATE PLANNING INSTRUMENTS

Full copies of State Environmental Planning Policies are available online at www.planning.nsw.gov.au.

State Environmental Planning Policy No. 19 – Bushland in Urban Areas
This is a policy to protect and preserve bushland within certain urban areas, as part of the natural heritage or for recreational, educational and scientific purposes. This policy is designed to protect bushland in public open space zones and reservations, and to ensure that bush preservation is given a high priority when local environmental plans for urban development are prepared.

State Environmental Planning Policy No. 33 – Hazardous and Offensive Development
This policy aims to amend the definitions of hazardous and offensive industries; to render ineffective any environmental planning instruments not defining hazardous or offensive as per this policy; to control development of hazardous and offensive industries.

State Environmental Planning Policy No. 55 – Remediation of Land
This policy provides planning controls for the remediation of contaminated land. The policy states that land must not be developed if it is unsuitable for a proposed use because it is contaminated. If the land is unsuitable, remediation must take place before the land is developed. The policy makes remediation permissible across the State, defines when consent is required, requires all remediation to comply with standards, ensures land is investigated if contamination is suspected, and requires councils to be notified of all remediation proposals. To assist councils and developers, the Department, in conjunction with the Environment Protection Authority, has prepared Managing Land Contamination: Planning Guidelines.

State Environmental Planning Policy No. 64 – Advertising and Signage
This policy aims to ensure that signage (including advertising):
Is compatible with the desired amenity and visual character of an area, and

- Provides effective communications in suitable locations, and
- Is of a high quality design and finish.

To this end the policy regulates signage (but not content) under Part 4 of the Act and provides limited time consents for the display of certain advertisements. The policy does not apply to signage that is exempt development under an environmental planning instrument. It does apply to all signage that can be displayed with or without consent and is visible from any public place or reserve, except as provided by the policy.

This policy should be read in conjunction with the Sydney Local Environmental Plan 2005, the City of Sydney Signage and Advertising Structures Development Control Plan 2005 and State Environmental Planning Policy No. 60 where these apply.

State Environmental Planning Policy No. 65 – Design Quality of Residential Apartment Development
This policy aims to improve the design quality of flats of three or more storeys with four or more self contained dwellings. The policy sets out a series of design principles for local councils to consider when assessing development proposals for residential flat development. The policy also creates a role for an independent design review panel and requires the involvement of a qualified designer in the design and approval process.

State Environmental Planning Policy No.70 – Affordable Housing (Revised Schemes) (Gazetted 31.05.02)
The policy identifies that there is a need for affordable housing in the City of Sydney, describes the kinds of households for which affordable housing may be provided and makes a requirement with respect to the imposition of conditions relating to the provision of affordable housing (provided other requirements under the Act are met).

State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004
This Policy does not apply to land described in Schedule 1 (Environmentally sensitive land), or land that is zoned for industrial purposes, or land to which an interim heritage order made under the *Heritage Act 1997* by the Minister administering that Act applies, or land to which a listing on the State Heritage Register kept under the *Heritage Act 1997* applies.

The Policy aims to encourage the provision of housing (including residential care facilities) that will increase the supply and diversity of residences that meet the needs of seniors or people with a disability, and make efficient use of existing infrastructure and services, and be of good design.

State Environmental Planning Policy (Building Sustainability Index: BASIX) 2004
Aims to ensure consistency in the implementation of the BASIX scheme throughout the State. This Policy achieves its aim by overriding provisions of other environmental planning instruments and development control plans that would otherwise add to, subtract from or modify any obligations arising under the BASIX scheme.

State Environmental Planning Policy (State Significant Precincts) 2005
This Policy aims to identify development of economic, social or environmental significance to the State or regions of the State so as to provide a consistent and comprehensive assessment and decision making process for that development.
NB: This SEPP also contains exempt & complying provisions

State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007
This Policy aims to provide for the proper management and development of mineral, petroleum and extractive material resources for the social and economic welfare of the State.

State Environmental Planning Policy (Miscellaneous Consent Provisions) 2007
This Policy aims to ensure that suitable provision is made for ensuring the safety of persons using temporary structures or places of public entertainment.

State Environmental Planning Policy (Infrastructure) 2007
This Policy aims to facilitate the effective delivery of infrastructure across the state.
NB: This SEPP also contains exempt & complying provisions

State Environmental Planning Policy (Exempt and Complying Development Codes) 2008
This Policy Streamlines assessment processes for development that complies with specified development standards. The policy provides exempt and complying development codes that have State-wide application, identifying, in the General Exempt Development Code, types of development that are of minimal environmental impact that may be carried out without the need for development consent; and, in the General Housing Code, types of complying

development that may be carried out in accordance with a complying development certificate as defined in the Environmental Planning and Assessment Act 1979.

State Environmental Planning Policy (Affordable Rental Housing) 2009
Establishes a consistent planning regime for the provision of affordable rental housing. The policy provides incentives for new affordable rental housing, facilitates the retention of existing affordable rentals, and expands the role of not-for-profit providers. It also aims to support local centres by providing housing for workers close to places of work, and facilitate development of housing for the homeless and other disadvantaged people. NOTE: Does not apply to land at Green Square or at Ultimo Pyrmont, or on southern employment land.

State Environmental Planning Policy (Urban Renewal) 2010
The aims of this Policy are as follows:
(a) to establish the process for assessing and identifying sites as urban renewal precincts,
(b) to facilitate the orderly and economic development and redevelopment of sites in and around urban renewal precincts,
(c) to facilitate delivery of the objectives of any applicable government State, regional or metropolitan strategies connected with the renewal of urban areas that are accessible by public transport.

State Environmental Planning Policy (State and Regional Development) 2011
The aims of this Policy are as follows:
(a) to identify development that is State significant development,
(b) to identify development that is State significant infrastructure and critical State significant infrastructure,
(c) to confer functions on joint regional planning panels to determine development applications.

State Environmental Planning Policy (Vegetation in Non-Rural Areas) 2017
The aims of this Policy are:
(a) to protect the biodiversity values of trees and other vegetation in non-rural areas of the State, and
(b) to preserve the amenity of non-rural areas of the State through the preservation of trees and other vegetation.

State Environmental Planning Policy (Educational Establishments and Child Care Facilities) 2017
The aim of this Policy is to facilitate the effective delivery of educational establishments and early education and care facilities across the state.

State Environmental Planning Policy (Coastal Management) 2018
The aim of this Policy is to promote an integrated and co-ordinated approach to land use planning in the coastal zone in a manner consistent with the objects of the Coastal Management Act 2016, including the management objectives for each coastal management area, by:
(a) managing development in the coastal zone and protecting the environmental assets of the coast, and
(b) establishing a framework for land use planning to guide decision-making in the coastal zone, and
(c) mapping the 4 coastal management areas that comprise the NSW coastal zone for the purpose of the definitions in the Coastal Management Act 2016.

Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005
This plan applies to land within the Sydney Harbour Catchment, as shown edged heavy black on the Sydney Harbour Catchment Map, being part of the Sydney Region declared by order published in Gazette No 38 of 7 April 1989 at page 1841.

This plan has the following aims with respect to the Sydney Harbour Catchment:

to ensure that the catchment, foreshores, waterways and islands of Sydney Harbour are recognised, protected and maintained: as outstanding natural asset, and as a public asset of national and heritage significance, for existing and future generations; to ensure a healthy, sustainable environment on land and water; to achieve a high quality urban environment; to ensure a prosperous working waterfront and an effective transport corridor, to encourage a culturally rich and vibrant place for people; to ensure accessibility to and along Sydney Harbour and its foreshores; to ensure the protection, maintenance and rehabilitation of watercourses, wetlands, riparian lands, remnant vegetation and ecological connectivity, to provide a consolidated, simplified and updated legislative framework for future planning.

OTHER MATTERS AFFECTING THE LAND AS PRESCRIBED BY SCHEDULE 4 - E. P. & A. REGULATION, 2000. CLAUSES (2A) - (10)

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

This SEPP does not apply to the land.

(3) Complying Development

(1) The extent to which the land is 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*.

(2) The extent to which 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 and the reasons why it may not be carried out under those clauses.

(3) If the council does not have sufficient information to ascertain the extent to which complying development may or may not be carried out on the land, a statement that a restriction applies to the land, but it may not apply to all of the land, and that council does not have sufficient information to ascertain the extent to which complying development may or may not be carried out on the land.

Note: All Exempt and Complying Development Codes: Council does not have sufficient information to ascertain the extent of a land based exclusion on a property. Despite any statement preventing the carrying out of complying development in the Codes listed below, complying development may still be carried out providing the development is not on the land affected by the exclusion and meets the requirements and standards of *State Environmental Planning Policy (Exempt and Complying Development Codes) 2008*.

General Housing Code & Commercial and Industrial (New Buildings and Additions) Code

Complying development **may not** be carried out on the land under the General Housing Code & the Commercial and Industrial (New Buildings and Additions) Code if because of the provisions of clause 1.17A, 1.18(1)(c3) & 1.19 (Land-based requirements for exempt and complying development) any of the following statements are **YES**

▪ Clause 1.19(5)d. Land that is significantly contaminated land within the meaning of the Contaminated Land Management Act 1997. (Applies only to the Commercial and Industrial (New Buildings and Additions) Code.	NO
▪ Clause 1.17A(d). Has been identified as a property that comprises, or on which there is, an item that is listed on the State Heritage Register under the *Heritage Act 1977* or that is subject to an interim heritage order under the *Heritage Act 1977*.	NO
▪ Clause 1.17A(d) & 1.18(1)(c3). Has been identified as a property that comprises, or on which there is, a heritage item or draft heritage item.	**NO**
▪ Clause 1.17A(c). Has been identified as being within a wilderness area (identified under the *Wilderness Act 1987*.	**NO**
▪ Clause 1.17A(e) & 1.19(1)e or 1.19(5)f. Has been identified as land that is within an environmentally sensitive area or by an environmental planning instrument as being within a buffer area, a river front area, an ecologically sensitive area, environmentally sensitive land or a protected area	**NO**
▪ Clause 1.19(1)a.or 1.19(5)a Has been identified as being within a heritage conservation area or a draft heritage conservation area.	**YES**
▪ Clause 1.19(1)b or 1.19(5)b. Has been identified as being land that is reserved for a public purpose in an environmental planning instrument.	**NO**
▪ Clause 1.19(1)c or 1.19(5)c. Has been identified as being on an Acid Sulfate Soils Map as being Class 1 or Class 2.	**YES**
▪ Clause 1.19(1)d or 1.19(5)e. Has been identified as land that is subject to a biobanking agreement under part 7A of the threatened Species Conservation Act 1995 or a property vegetation plan under the Native Vegetation Act 2003.	**NO**
▪ Clause 1.19(1)f or 1.19(5)g. Has been identified by an environmental planning instrument, a development control plan or a policy adopted by the Council as being or affected by a coastline hazard, a coastal hazard or a coastal erosion hazard.	**NO**
▪ Clause 1.19(1)g or 1.19(5)h. Has been identified as being land in a foreshore area.	**NO**
▪ Clause 1.19(1)h. Has been identified as land that is in the 25 ANEF contour or a higher ANEF contour. (Applies only to the General Housing Code)	**NO**
▪ Clause 1.19(1)j or 1.19(5)i. Has been identified as unsewered land within a drinking water catchment.	**NO**
▪ Clause 1.19(1)i. Has been identified as land that is declared to be a special area under the Sydney Water Catchment Management Act 1998.	**NO**

Housing Alterations Code
Complying development under the Housing Alterations Code **may** be carried out on the land.

Commercial and Industrial Alterations Code
Complying development under the Commercial and Industrial Alterations Code **may** be carried out on the land.

Subdivisions Code

Complying development under the Subdivisions Code **may** be carried out on the land.

Rural Housing Code
The Rural Housing Code does not apply to this Local Government Area.

General Development Code
Complying development under the General Development Code **may** be carried out on the land.

Demolition Code
Complying development under the Demolition Code **may** be carried out on the land.

Low Rise Medium Density Housing Code
This Code does not apply to this Local Government Area.

(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 : The owner (or any previous owner) of the land has not 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.

(5) Mine Subsidence District

This land has not been proclaimed to be a mine subsidence district within the meaning of section 15 of the mine subsidence compensation act, 1961.

(6) Road Widening and/or Road Realignment affected by (a) Division 2 of Part 3 of the Roads act 1993 or (c) any resolution of council or other authority.

This land **is not** affected by road widening and/or road realignment under section 25 of the Roads Act, 1993 and/or resolution of Council or any other authority.

(6) Road Widening and/or Road Realignment Affected by (b) any environmental planning instrument.

This land **is not** affected by any road widening or road realignment under any planning instrument.

(7) Council and other public authorities policies on hazard risk restrictions:

(a) The land **is not** affected by a policy adopted by the Council that that restricts the development of the land because of the likelihood of land slip, bushfire, flooding, tidal inundation, subsidence, acid sulphate soils or any other risk; and

(b) The land **is not** affected by a policy adopted by any other public authority and notified to the council for the express purpose of its adoption by that authority being referred to on planning certificate issued by Council, that restricts the development of the land because of the likelihood of land slip, bushfire, flooding, tidal inundation, subsidence, acid sulphate soils or any other risk.

(7A) Flood related development controls information.

The development on this land or part of this land is subject to flood related development controls refer to Clause 7.15 of Sydney Local Environment Plan 2012 and Section 3.7 of Sydney Development Control Plan 2012.

(8) Land reserved for acquisition

No environmental planning instrument, or proposed environmental planning instrument applying to the land, provides for the acquisition of the land by a public authority, as referred to in section 3.15 of the Act.

(9) Contribution plans

The following Contributions Plans apply to properties within the City of Sydney local government area. Contributions plans marked **YES** may apply to this property:

▪ Central Sydney Development Contributions Plan 2013 – in operation 9th July 2013	**NO**
▪ City of Sydney Development Contributions Plan 2015 – in operation 1st July 2016	**YES**
▪ Redfern Waterloo Authority Contributions Plan 2006 – in operation 16th May 2007 ▪ Redfern Waterloo Authority Affordable Housing Contributions Plan – in operation 16th May 2007	**NO**

(9A) Biodiversity certified land

The land has not been certified as biodiversity certified land.

(10) Biodiversity Conservation Act 2016

Not Applicable.

(10A) Native vegetation clearing set asides

Not Applicable.

(11) Bush fire prone land

The land has not been identified as Bush fire prone land.

(12) Property vegetation plans

Not Applicable.

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

Council has not been notified of an order which as been made under the *Trees (Disputes Between Neighbours) Act 2006* to carry out work in relation to a tree on the land.

(14) Directions under Part 3A

Not Applicable.

(15) Site compatibility certificates and conditions for seniors housing

(a) The land to which the certificate relates is not subject to a current site compatibility certificate (seniors housing), of which Council is aware, in respect of proposed development on the land.

(b) The land to which the certificate relates is not subject to any condition of consent to a development application granted after 11 October 2007 required by State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004.

(16) Site compatibility certificates for infrastructure, schools or TAFE establishments

The land to which the certificate relates is not subject to a valid site compatibility certificate (infrastructure), of which Council is aware, in respect of proposed development on the land.

(17) Site compatibility certificates and conditions for affordable rental housing

(a) The land to which the certificate relates is not subject to a current site compatibility certificate (affordable rental housing), of which Council is aware, in respect of proposed development on the land.

(b) The land to which the certificate relates is not subject to any terms of a kind referred to in clause 17(1) or 37(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.

(18) Paper subdivision information

Not Applicable.

(19) Site verification certificates

The land to which the certificate relates is not subject to a valid site verification certificate of which Council is aware.

(20) Loose-fill asbestos insulation

Not Applicable

(21) Affected building notices and building product rectification orders

(1)The land to which the certificate relates is not subject to any affected building notice of which Council is aware.

(2) (a) The land to which the certificate relates is not subject to any building product rectification order of which Council is aware and has not been fully complied with.

(b) The land to which the certificate relates is not subject to any notice of intention to make a building product rectification order of which Council is aware and is outstanding.

(3) In this clause:
affected building notice has the same meaning as in Part 4 of the Building Products (Safety) Act 2017.
building product rectification order has the same meaning as in the Building Products (Safety) Act 2017.

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

(a) The land to which the certificate relates **is not** declared to be **significantly contaminated land** within the meaning of that act as at the date when the certificate is issued.

(b) The land to which the certificate relates **is not** subject to a **management order** within the meaning of that act as at the date when the certificate is issued.

(c) The land to which the certificate relates **is not** the subject of an **approved voluntary management proposal** within the meaning of that act at the date the certificate is issued.

(d) The land to which the certificate relates **is not** the subject of an **ongoing maintenance order** within the meaning of that act as at the date when the certificate is issued.

(e) As at the date when the certificate is issued, Council **has not** identified that a **site audit statement** within the meaning of that act has been received in respect of the land the subject of the certificate.

PLANNING CERTIFICATE SECTION 10.7 (2) INFORMATION:
Information provided in accordance with planning certificate section 10.7 (2) has been taken from council's records and advice from other authorities but council disclaims all liability for any omission or inaccuracy in the information. Specific inquiry should be made where doubt exists.

PLANNING CERTIFICATE UNDER SECTION 10.7 (5) OF THE ENVIRONMENTAL PLANNING AND ASSESSMENT ACT, 1979

PLANNING CERTIFICATE SECTION 10.7 (5) ADVICE is current as at 12:00 noon two working days prior to the date of issue of this certificate. The following matters have been considered & details provided where information exists: easements in favour of council; parking permit scheme; heritage floor space restrictions; low-rental residential building; foreshore building line; tree preservation order.

Contaminated Land Potential:
Council records do not have sufficient information about the uses (including previous uses) of the land which is the subject of this section 10.7 certificate to confirm that the land has not been used for a purpose which would be likely to have contaminated the land. Parties should make their own enquiries as to whether the land may be contaminated.

Hazard Risk Restriction:
Some City of Sydney Local Environmental Plans incorporate Acid Sulfate soil maps. Development on the land identified in those maps should have regard to the acid sulfate soil clause within the relevant Local Environmental Plan.

Construction Noise and View Loss Advice:
Intending purchasers are advised that the subject property may be affected by construction noise and loss or diminution of views as a result of surrounding development.

Outstanding Notice & Order information
In relation to this property, there **is not** an outstanding Order or Notice of Intention to issue an Order relating to Fire Safety (being an Order or Notice of Intention to issue an Order under Part 2 of Schedule 5 of the Environmental Planning and Assessment Act, 1979). Further information about the Order or Notice of Intention to issue an Order may be obtained by applying for a certificate under clause 41 of Schedule 5 of the Environmental Planning and Assessment Act and Section 735A of the Local Government Act.

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ADVICE FROM OTHER BODIES

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Some land in the City of Sydney located in the vicinity of the White Bay, Glebe Island and Darling Harbour ports may be affected by noise from port operations.

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8am – 6pm Monday - Friday

State planning controls are available online at www.legislation.nsw.gov.au

Where planning certificate section 10.7 (5) matters are supplied, complete details are available by writing to:
Chief Executive Officer
City of Sydney
G.P.O. Box 1591
Sydney NSW 2000

End of Document

Photograph: John Byrne Court Council flats

Description

Unique ID: A-00012502
Series: Sydney Reference Collection (SRC) - Photographs
Date:
Date qualifier: year only
Format: Photograph - Print
Description: Aerial view Glebe Estate, showing newly erected John Byrne Court Council flats in St Johns Rd. Cowper Street, Mitchell Street, Wentworth Street, Phillip Street, Bellevue Street, Broughton Street, Darghan Street visible.
Language: No linguistic content - Not applicable (zxx)

Characteristics

Colour depth: Grayscale

Identification

Source system ID: 032\032705
Alternative ID: SRC6297

Disposal

Disposal status: Archive

Data quality

Legacy data: Date: 1961
Address: Looking W from above Wentworth Park Oval near cnr of St Johns Road.
Format: B&W print
Series: Sydney Reference Collection
Citation: SRC6297
Provenance: City of Sydney Archives
Notes: None
Cleanup status: Unclean

Estray

Estray: No

Relationships

Source systems: Perfect pictures (aka ArchivePix)
Consignment: Consignment 1730
Box: Photographs

Registration

Date registered: 14/03/2019
Registered by: Data Migration User
Registration status: Approved

Copyright

WT:PL PUBLIC WORKS DEPT- RE D.A. WENTWORTH PARK ROAD & COWPER ST.

DEPARTMENT OF PUBLIC WORKS

STATE OFFICE BLOCK
PHILLIP STREET, SYDNEY, N.S.W. 2000

Registered No. 15110

TELEGRAPHIC ADDRESS: STATEWORKS, SYDNEY
TELEPHONE: 2051, EXT. 4823
IN REPLY PLEASE QUOTE No. Misc. 64/3699.D.

The Town Clerk,
Leichhardt Municipal Council,
P.O. Box 45,
LEICHHARDT. N.S.W. 2040.

19 FEB 1970

DJN 21(26)

Property Corner Wentworth Park Road and Cowper Street, Glebe, Leased for Government Motor Garage: Parking.

Dear Sir,

In accordance with the advice contained in your letter dated 21st April, 1969 (Ref. 198:5241:21:69 - RR) application is hereby made for approval to the continued use of the abovementionn land for open air off-street parking of vehicles.

15709

REFERRED to The Planning Office.

23 FEB 1970

Yours faithfully,

L.A. DAVIS,
Secretary.
Per:

Copy Only
return to T/P office 9/4/70

MEMORANDUM

3rd April, 1970

To: TOWN PLANNER

SUBJECT: Item No. 1599 - Development Application No. 27 (L.G.) - Property on the corner of Wentworth Park Road and Cowper Street, Glebe.

Please note that your report regarding request by the Department of Public Works for permanent approval to Development Application No. 27(L.G.) of 25th March, 1969, for permission to use land on the corner of Wentworth Park Road and Cowper Street, Glebe, for off-street parking in connection with the nearby Government Garage, was considered by Council at Meeting held on the 31st ultimo, when it was decided - "that consideration of the report be deferred for fourteen (14) days and that a report be furnished on cars from the Government Garage parking in surrounding streets, namely, Cowper and Mitchell Streets and Wentworth Park Road."

Please submit the necessary report.

TOWN CLERK

RR

ITEM NO. 1599 ITEM NO. 1599

Subject: THE DEPARTMENT OF PUBLIC WORKS IN LETTER DATED 19/2/70, FOR PERMANENT APPROVAL TO DEVELOPMENT APPLICATION, D.A. 27 (L.G.) OF 25/3/69, FOR PERMISSION TO USE LAND ON THE CORNER OF WENTWORTH PARK ROAD AND COWPER STREET, GLEBE, FOR OFF-STREET PARKING IN CONNECTION WITH THE NEARBY GOVERNMENT GARAGE. R.P. 15110 - 23/2/70.

Report: The abovementioned Development Application, D.A. 27 (L.G.) of 25th March, 1969, and the report thereon, were originally before Council at its Meeting on 2nd April, 1969, but was deferred until 16th April, 1969. ~~Copy of my report of 2nd April, 1969 is attached (see pages 3/a to 3/c).~~

T/P's Rep

After consideration of my report, Council approved this application (Minute No. 570/69) subject to the following conditions:-

1. The subject site shall be used only for the open air off-street parking of vehicles, being a purpose which is "severable" from the nearby Government Garage property, in accordance with the judgement given in the Land and Valuation Court by Mr. Justice Sugerman on 14th April, 1958, in the case of Scotts Provision Stores Pty. Ltd. -v- The Council of the City of Sydney.

2. Access to and egress from all car parking spaces shall be made to the satisfaction of Council.

3. The applicant shall bear the cost of closing up any existing vehicular crossings not required with the proposal including the construction of the necessary kerbs, footpaths, etc. and shall pre-pay such charges and the cost of the required vehicular crossings.

4. This approval is for a limited period of twelve (12) months, terminating on 16th April, 1970, after which the continued use of the property for the purpose hereby approved or for any other use on a permanent basis, subject to the conditions previously imposed.

Recommendation: That the Department of Public Works be informed that, after consideration of its request for permanent approval to Development Application, D.A. 27 (L.G.) of 25th March, 1969, for permission to use land on the corner of Wentworth Park Road and Cowper Street, Glebe, for off-street parking in connection with the nearby Government Garage, Council approves this request, subject to the following conditions:-

1. The subject site shall be used only for the open air off-street parking of vehicles, being a purpose which is "severable" from the nearby Government Garage property, in accordance with the judgement given in the Land and Valuation Court by Mr. Justice Sugerman on 14th April, 1958, in the case of Scotts Provision Stores Pty. Ltd. V the Council of the City of Sydney.

2. Access to and egress from all car parking spaces shall be made to the satisfaction of Council.

3. The applicant shall bear the cost of closing up any existing vehicular crossings not required with the proposal including the construction of the necessary kerbs, footpaths, etc. and shall pre-pay such charges and the cost of the required vehicular crossings.

AND that the applicant be advised that this approval shall be regarded as being otherwise in accordance with the particulars and information as set out and described in Development Application, registered in Council's records as D.A. 27 (L.G.) of 25th March, 1969, and that any alteration, variation or extension of the use for which approval is hereby given, would require further Town Planning approval from this Council.

- - - - - - - - - - - - - - - - - - -

NO. 1599 (Cont'd.)

ort:
ont'd.)

purpose without the approval of Council would constitute a breach of the Local Government Act, 1919, as amended, and the onus is on the applicant to apply to Council for renewal if it desires to continue such use.

Formal permit and covering letter issued in accordance with Council's approval on 21st April, 1969.

T/P Rep

Letter dated 19th February, 1970, from the Department of Public Works, (R.P. 15110 - 23/2/70), reads as follows:-

" Property Corner Wentworth Park Road and Cowper Street, Glebe, leased for Government Motor Garage: Parking.

Dear Sir,

In accordance with the advice contained in your letter dated 21st April, 1969 (Ref. 198:5241:21:69 - RR) application is hereby made for approval to the continued use of the above-mentioned land for open air off-street parking of vehicles."

No complaints have been received relative to the use of this property. It is, therefore, felt that Council could approve this use on a permanent basis, subject to the conditions previously imposed.

Recommendation: That the Department of Public Works be informed that, after consideration of its request for permanent approval to Development Application, D.A. 27 (L.G.) of 25th March, 1969, for permission to use land on the corner of Wentworth Park Road and Cowper Street, Glebe, for off-street parking in connection with the nearby Government Garage, Council approves this request, subject to the following conditions:-

1. The subject site shall be used only for the open air off-street parking of vehicles, being a purpose which is "severable" from the nearby Government Garage property, in accordance with the judgement given in the Land and Valuation Court by Mr. Justice Sugerman on 14th April, 1958, in the case of Scotts Provision Stores Pty. Ltd. V the Council of the City of Sydney.

2. Access to and egress from all car parking spaces shall be made to the satisfaction of Council.

3. The applicant shall bear the cost of closing up any existing vehicular crossings not required with the proposal including the construction of the necessary kerbs, footpaths, etc. and shall pre-pay such charges and the cost of the required vehicular crossings.

AND that the applicant be advised that this approval shall be regarded as being otherwise in accordance with the particulars and information as set out and described in Development Application, registered in Council's records as D.A. 27 (L.G.) of 25th March, 1969, and that any alteration, variation or extension of the use for which approval is hereby given, would require further Town Planning approval from this Council.

- - - - - - - - - - - - - - - - - -

D... 27 (L.1) D... 27 (L.3)

Subject: THE DE...RTMENT OF PUBLIC ...ORKS IN DEVELOPMENT APPLICATION, D... 27 (L.2) OF 25/3/69, FOR DISPENSATION TO USE L...D ON THE CORNER OF ...ORTH PARK ROAD AND COOPER STREET, GLEBE, FOR OFF-STREET PARKING IN CONNECTION WITH THE NEW GOVERNMENT G.R.G. R.F. 5241 - 25/2/69.

Report: Particulars of this application are summarised as follows:-

SITE - Bounded by Wentworth Park Road, Cooper Street, Park Lane and Mitchell Lane east, with frontages of 55'4¼", 100'3", 90'9½" and 89'11¼" respectively. Area about 6,570 sq.ft.

T/P's Rep

Zoned "Living Area" under the County of Cumberland Planning Scheme and "2(d) Residential (Redevelopment)" under the City of Sydney Planning Scheme. Also within Proclaimed Residential District No.7

T.P. 34a

(2/4/69)
JR.

Photograph: Aerial photograph (oblique)

Description

Unique ID: A-00009710
Series: Sydney Reference Collection (SRC) - Photographs
Date:
Date qualifier: circa
Format: Photograph - Print
Description: Wentworth Park Oval is visible at centre and Ultimo Public school is in foreground. Sydney University is visible in distance.
Language: No linguistic content - Not applicable (zxx)

Characteristics

Colour depth: Grayscale

Identification

Source system ID: 028\028342
Alternative ID: SRC1924

Disposal

Disposal status: Archive

Data quality

Legacy data: Date: 1970?
Address: Looking SW down St Johns Road Glebe from above Wentworth Park. Mitchell Street and Cowper Street run away on L.
Format: B&W print. Hi-Res digital copy available.
Series: Sydney Reference Collection
Citation: SRC1924
Provenance: City of Sydney Archives
Notes: None
Cleanup status: Unclean

Estray

Estray: No

Relationships

Collections: Glebe
Source systems: Perfect pictures (aka ArchivePix)
Consignment: Consignment 1730
Box: Photographs

Registration

Date registered: 14/03/2019
Registered by: Data Migration User
Registration status: Approved

Copyright

Appendix H

Borehole Logs

Groundwater Field Sheet

Soil Descriptions

Douglas Partners

Description and Classification Methods

The methods of description and classification of soils and rocks used in this report are generally based on Australian Standard AS1726:2017, Geotechnical Site Investigations. 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	19 - 63
Medium gravel	6.7 - 19
Fine gravel	2.36 – 6.7
Coarse sand	0.6 - 2.36
Medium sand	0.21 - 0.6
Fine sand	0.075 - 0.21

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

The proportions of secondary constituents of soils are described as follows:

In fine grained soils (>35% fines)

Term	Proportion of sand or gravel	Example
And	Specify	Clay (60%) and Sand (40%)
Adjective	>30%	Sandy Clay
With	15 – 30%	Clay with sand
Trace	0 - 15%	Clay with trace sand

In coarse grained soils (>65% coarse)
- with clays or silts

Term	Proportion of fines	Example
And	Specify	Sand (70%) and Clay (30%)
Adjective	>12%	Clayey Sand
With	5 - 12%	Sand with clay
Trace	0 - 5%	Sand with trace clay

In coarse grained soils (>65% coarse)
- with coarser fraction

Term	Proportion of coarser fraction	Example
And	Specify	Sand (60%) and Gravel (40%)
Adjective	>30%	Gravelly Sand
With	15 - 30%	Sand with gravel
Trace	0 - 15%	Sand with trace gravel

The presence of cobbles and boulders shall be specifically noted by beginning the description with 'Mix of Soil and Cobbles/Boulders' with the word order indicating the dominant first and the proportion of cobbles and boulders described together.

Soil Descriptions

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
Friable	Fr	-

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	Density Index (%)
Very loose	VL	<15
Loose	L	15-35
Medium dense	MD	35-65
Dense	D	65-85
Very dense	VD	>85

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;
- Extremely weathered material – formed from in-situ weathering of geological formations. Has soil strength but retains the structure or fabric of the parent rock;
- Alluvial soil – deposited by streams and rivers;
- Estuarine soil – deposited in coastal estuaries;
- Marine soil – deposited in a marine environment;
- Lacustrine soil – deposited in freshwater lakes;
- Aeolian soil – carried and deposited by wind;
- Colluvial soil – soil and rock debris transported down slopes by gravity;
- Topsoil – mantle of surface soil, often with high levels of organic material.
- Fill – any material which has been moved by man.

Moisture Condition – Coarse Grained Soils

For coarse grained soils the moisture condition should be described by appearance and feel using the following terms:

- Dry (D) — Non-cohesive and free-running.
- Moist (M) — Soil feels cool, darkened in colour.
  Soil tends to stick together.
  Sand forms weak ball but breaks easily.
- Wet (W) — Soil feels cool, darkened in colour.
  Soil tends to stick together, free water forms when handling.

Moisture Condition – Fine Grained Soils

For fine grained soils the assessment of moisture content is relative to their plastic limit or liquid limit, as follows:

- 'Moist, dry of plastic limit' or 'w <PL' (i.e. hard and friable or powdery).
- 'Moist, near plastic limit' or 'w ≈ PL (i.e. soil can be moulded at moisture content approximately equal to the plastic limit).
- 'Moist, wet of plastic limit' or 'w >PL' (i.e. soils usually weakened and free water forms on the hands when handling).
- 'Wet' or 'w ≈LL' (i.e. near the liquid limit).
- 'Wet' or 'w >LL' (i.e. wet of the liquid limit).

Rock Strength

Rock strength is defined by the Unconfined Compressive Strength and it 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 Point Load Strength Index $Is_{(50)}$ is commonly used to provide an estimate of the rock strength and site specific correlations should be developed to allow UCS values to be determined. The point load strength test procedure is described by Australian Standard AS4133.4.1-2007. The terms used to describe rock strength are as follows:

Strength Term	Abbreviation	Unconfined Compressive Strength MPa	Point Load Index * $Is_{(50)}$ MPa
Very low	VL	0.6 - 2	0.03 - 0.1
Low	L	2 - 6	0.1 - 0.3
Medium	M	6 - 20	0.3 - 1.0
High	H	20 - 60	1 - 3
Very high	VH	60 - 200	3 - 10
Extremely high	EH	>200	>10

* Assumes a ratio of 20:1 for UCS to $Is_{(50)}$. It should be noted that the UCS to $Is_{(50)}$ ratio varies significantly for different rock types and specific ratios should be determined for each site.

Degree of Weathering

The degree of weathering of rock is classified as follows:

Term	Abbreviation	Description
Residual Soil	RS	Material is weathered to such an extent that it has soil properties. Mass structure and material texture and fabric of original rock are no longer visible, but the soil has not been significantly transported.
Extremely weathered	XW	Material is weathered to such an extent that it has soil properties. Mass structure and material texture and fabric of original rock are still visible
Highly weathered	HW	The whole of the rock material is discoloured, usually by iron staining or bleaching to the extent that the colour of the original rock is not recognisable. Rock strength is significantly changed by weathering. Some primary minerals have weathered to clay minerals. Porosity may be increased by leaching, or may be decreased due to deposition of weathering products in pores.
Moderately weathered	MW	The whole of the rock material is discoloured , usually by iron staining or bleaching to the extent that the colour of the original rock is not recognisable, but shows little or no change of strength from fresh rock.
Slightly weathered	SW	Rock is partially discoloured with staining or bleaching along joints but shows little or no change of strength from fresh rock.
Fresh	FR	No signs of decomposition or staining.
Note: If HW and MW cannot be differentiated use DW (see below)		
Distinctly weathered	DW	Rock strength usually changed by weathering. The rock may be highly discoloured, usually by iron staining. Porosity may be increased by leaching or may be decreased due to deposition of weathered products in pores.

Rock Descriptions

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 occasional fragments
Fractured	Core lengths of 30-100 mm with occasional shorter and longer sections
Slightly Fractured	Core lengths of 300 mm or longer with occasional sections of 100-300 mm
Unbroken	Core contains very few fractures

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 stronger. 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

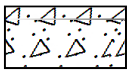
Symbols & Abbreviations

Graphic Symbols for Soil and Rock

General


Asphalt


Road base

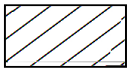

Concrete

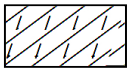

Filling

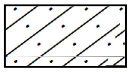
Soils

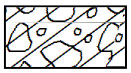

Topsoil

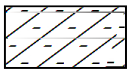

Peat

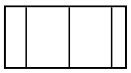

Clay


Silty clay

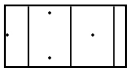

Sandy clay

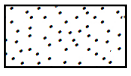

Gravelly clay

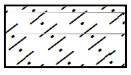

Shaly clay

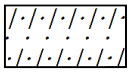

Silt

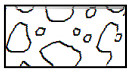

Clayey silt

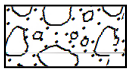

Sandy silt

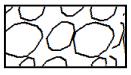

Sand


Clayey sand


Silty sand


Gravel

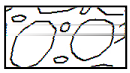

Sandy gravel

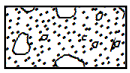

Cobbles, boulders

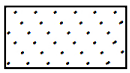

Talus

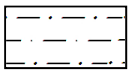
Sedimentary Rocks

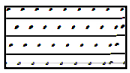

Boulder conglomerate

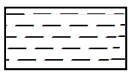

Conglomerate


Conglomeratic sandstone

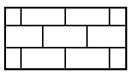

Sandstone


Siltstone

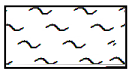

Laminite

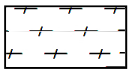

Mudstone, claystone, shale

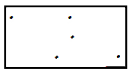

Coal


Limestone

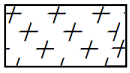
Metamorphic Rocks

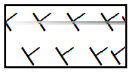

Slate, phyllite, schist

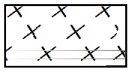

Gneiss

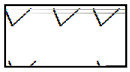

Quartzite

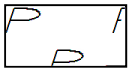
Igneous Rocks


Granite


Dolerite, basalt, andesite


Dacite, epidote


Tuff, breccia


Porphyry

Sampling Methods

Douglas Partners

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.

BOREHOLE LOG

CLIENT: New South Wales Land and Housing Corporation
PROJECT: Glebe Mid-Rise Project
LOCATION: 31 Cowper St and 2A-2D Wentworth Park Rd, Glebe

SURFACE LEVEL: 3.2 AHD
EASTING: 332849
NORTHING: 6249728
DIP/AZIMUTH: 90°/--

BORE No: BH1
PROJECT No: 99554.00
DATE: 21/01/2020
SHEET 1 OF 3

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low / Very Low / Low / Medium / High / Very High / Ex High)	Water	Fracture Spacing (m) (0.01 / 0.05 / 0.10 / 0.50 / 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
3												
	0.3	FILL/SAND: fine to medium, dark grey, trace silt, organic debris, gravel and charcoal fragments, moist, appears generally in a loose condition							A/E			PID=3
		FILL/GRAVEL and SAND: medium to coarse gravel, angular to subangular and rectangular, flaky, mostly ripped sandstone gravel, fine to medium sand, with glass, ceramic tile and timber, trace ash, slag and charcoal, moist, appears generally in a loose condition							A/E*			PID=2
2	1								A/E			PID=4
									S			1,1,2 N = 3 PID=2
	1.8	CLAY CH: high plasticity, mottled brown and pale grey, trace silt and ironstone gravel, w=PL, stiff, alluvial							A/E			PID=3
1	2											
									S			5,6,5 N = 11 PID=2
	3.0	Sandy CLAY CL: low plasticity, pale brown, 30% fine sand, w~PL, stiff, alluvial				21-01-20			A/E			PID=1
0	3											
	4								S			2,2,2 N = 4 PID=1
-1	4.5	Sandy CLAY CL: low plasticity, pale grey and brown, fine to medium, 35% clay/silt, w>PL, stiff, alluvial										
	5.0											

RIG: XC100 **DRILLER:** FF **LOGGED:** SI **CASING:** HW to 5.5m

TYPE OF BORING: Solid flight auger (TC-bit) to 5.5m, NMLC to 14.2m

WATER OBSERVATIONS: Free groundwater at 3.0m whilst augering

REMARKS: *BD2 210120 replicate of sample 0.4-0.5m. Surface level obtained from Veris Australia Pty Ltd, drawing number 201704 dated 15/08/2019. Co-ordinate obtained using Nearmap and site measurements.

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: New South Wales Land and Housing Corporation
PROJECT: Glebe Mid-Rise Project
LOCATION: 31 Cowper St and 2A-2D Wentworth Park Rd, Glebe

SURFACE LEVEL: 3.2 AHD
EASTING: 332849
NORTHING: 6249728
DIP/AZIMUTH: 90°/--

BORE No: BH1
PROJECT No: 99554.00
DATE: 21/01/2020
SHEET 2 OF 3

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low / Very Low / Low / Medium / High / Very High / Ex High)	Water	Fracture Spacing (m) (0.01 / 0.05 / 0.10 / 0.50 / 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Type	Core Rec. %	RQD %	Test Results & Comments
-2	5.2	Sandy CLAY CL: refer previous page										
		SANDSTONE: fine to medium grained, brown, very low strength, highly weathered, Hawkesbury Sandstone										
	6							5.5 to 5.6m: fg, fe 5.7m: J45°, pl, ro, fe 6.0 & 6.2m: J(x2) 70°, pl, ro, cln	C	100	50	PL(A) = 0.1
-3	6.22	SANDSTONE: medium grained, pale grey and brown, low to medium strength with very low strength bands, slightly then highly weathered, slightly fractured, Hawkesbury Sandstone										PL(A) = 0.3
	7							6.7m: Ds, 200mm 6.95m: J50°, pl, ro, cly				
-4	7.05	SANDSTONE: medium to coarse grained, pale grey, thinly bedded and cross bedded (5° to 25°), high strength, fresh, slightly fractured to unbroken, Hawkesbury Sandstone						7.05m: J45°, pl, ro, cly	C	100	68	PL(A) = 1.4
	8							7.95m: B0°, pln, ro, cly co, 2mm 8.1 & 8.35m: B(x2) 10°, pln, ro, cly co, 2mm				
-5												PL(A) = 1.7
	9							8.92m: B0°, cly 5mm 8.93 to 9.3m: J70° to 90°, cu, he, cly 5mm	C	100	100	
-6		Below 9.3m, unbroken										PL(A) = 1.2
	10.0								C	100	52	

RIG: XC100 **DRILLER:** FF **LOGGED:** SI **CASING:** HW to 5.5m

TYPE OF BORING: Solid flight auger (TC-bit) to 5.5m, NMLC to 14.2m

WATER OBSERVATIONS: Free groundwater at 3.0m whilst augering

REMARKS: *BD2 210120 replicate of sample 0.4-0.5m. Surface level obtained from Veris Australia Pty Ltd, drawing number 201704 dated 15/08/2019. Co-ordinate obtained using Nearmap and site measurements.

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: New South Wales Land and Housing Corporation
PROJECT: Glebe Mid-Rise Project
LOCATION: 31 Cowper St and 2A-2D Wentworth Park Rd, Glebe

SURFACE LEVEL: 3.2 AHD
EASTING: 332849
NORTHING: 6249728
DIP/AZIMUTH: 90°/--

BORE No: BH1
PROJECT No: 99554.00
DATE: 21/01/2020
SHEET 3 OF 3

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low / Very Low / Low / Medium / High / Very High / Ex High)	Water	Fracture Spacing (m) (0.01 / 0.05 / 0.10 / 0.50 / 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
-7	10.08	SANDSTONE: refer previous page										
		CARBONACEOUS SHALE: dark grey, with irregular clayey zones, very low strength, highly to slightly weathered, highly fractured, Hawkesbury Shale						10.06m: J35°, un, ro, cly 10mm 10.2m: J45°, pl, sm, cly 10.4m: J45°, pl, sm, cln	C	100	52	PL(A) = 0.2
	10.7	SANDSTONE: medium grained, pale grey, thinly bedded and cross bedded (10°-20°) with carbonaceous flakes and laminations between 10.7-12.4m, high strength, fresh, slightly fractured to unbroken, Hawkesbury Sandstone										
-8	11							11.06m: B10°, cly co, 2mm 11.36m: J45°, pl, ro, cly 5mm	C	100	96	PL(A) = 2.6
-9	12							12.1m: J45°, pl, ro, cly 3mm				PL(A) = 1.1
-10	13							13.2m: J35°, pl, ro, cly 15mm 13.3m: J30°, pl, ro, cly 10mm 13.38m: B5°, cly 2mm	C	100	94	PL(A) = 0.7
								13.8m: B20°, pl, ro, cly vn 13.9m: J45°, pl, ro, cln				PL(A) = 1.6
-11	14											
	14.2	Bore discontinued at 14.2m - Target depth reached										

RIG: XC100 **DRILLER:** FF **LOGGED:** SI **CASING:** HW to 5.5m

TYPE OF BORING: Solid flight auger (TC-bit) to 5.5m, NMLC to 14.2m

WATER OBSERVATIONS: Free groundwater at 3.0m whilst augering

REMARKS: *BD2 210120 replicate of sample 0.4-0.5m. Surface level obtained from Veris Australia Pty Ltd, drawing number 201704 dated 15/08/2019. Co-ordinate obtained using Nearmap and site measurements.

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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BOREHOLE LOG

CLIENT: New South Wales Land and Housing Corporation
PROJECT: Glebe Mid-Rise Project
LOCATION: 31 Cowper St and 2A-2D Wentworth Park Rd, Glebe

SURFACE LEVEL: 3.5 AHD
EASTING: 332882
NORTHING: 6249712
DIP/AZIMUTH: 90°/--

BORE No: BH2
PROJECT No: 99554.00
DATE: 22/01/2020
SHEET 1 OF 3

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low / Very Low / Low / Medium / High / Very High / Ex High)	Water	Fracture Spacing (m) (0.01 / 0.05 / 0.10 / 0.50 / 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
		CONCRETE										
	0.3	FILL/Sandy CLAY: low plasticity, dark grey, fine to medium, with fine to coarse, angular to subangular igneous gravel and clay, trace ash, slag, glass, brick, rootlets, ripped sandstone gravel and wire, w~PL, appears generally in a loose condition							A/E			PID<1
									A/E			PID<1
									S			1,2,2 N = 4 PID<1
									A/E			PID<1
	2.4	Sandy CLAY CL: low plasticity, brown, fine to medium, w~PL, firm, alluvial							A/E			PID<1
									S			4,2,3 N = 5 PID<1
	3.1	CLAY CH: high plasticity, dark grey, trace fine to medium ironstone gravel and fine sand, w>PL, firm, alluvial				22-01-20			A/E			PID<1
	4.0	Sandy CLAY CL-CI: low to medium plasticity, grey-brown, fine to medium sand, w>PL, very soft, alluvial							A/E			PID<1
									S			1,0,0 N = 0 PID=2
	5.0								A/E			PID=3

RIG: XC100 **DRILLER:** Terratest **LOGGED:** IT **CASING:** HW to 5.5m

TYPE OF BORING: Diatube (250mm) to 0.3m, Solid flight auger (TC-bit) to 5.2m, NMLC coring to 14.0m

WATER OBSERVATIONS: Free groundwater observed at 3.2m whilst augering

REMARKS: Surface level obtained from Mepstead and Associates Pty Ltd, drawing 5743 dated 18/12/2018. Co-ordinates obtained using Nearmap & site measurements

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: New South Wales Land and Housing Corporation
PROJECT: Glebe Mid-Rise Project
LOCATION: 31 Cowper St and 2A-2D Wentworth Park Rd, Glebe

SURFACE LEVEL: 3.5 AHD
EASTING: 332882
NORTHING: 6249712
DIP/AZIMUTH: 90°/--

BORE No: BH2
PROJECT No: 99554.00
DATE: 22/01/2020
SHEET 2 OF 3

RL	Depth (m)	Description of Strata	Degree of Weathering	Graphic Log	Rock Strength	Water	Fracture Spacing (m)	Discontinuities	Sampling & In Situ Testing			
			EW HW MW SW FS FR		Ex Low Very Low Low Medium High Very High Ex High		0.01 0.05 0.10 0.50 1.00	B - Bedding J - Joint S - Shear F - Fault	Type	Core Rec. %	RQD %	Test Results & Comments
	5.1	Sandy CLAY CL-CI: as per previous page										
	5.3	SANDSTONE: fine to medium grained, pale grey, very low strength, highly weathered, Hawkesbury Sandstone						5.23m: Cs, 30mm				PL(A) = 1.4
-2		SANDSTONE: medium to coarse grained, orange-brown and pale grey, thinly bedded and cross bedded, high strength, moderately weathered, slightly fractured, Hawkesbury Sandstone						5.88m: B5°, un, ro, fe stn	C	100	96	
6												PL(A) = 2
-3								6.62m: B5°, pl, ro, fe stn				
								6.75m: B5°, pl, ro, cbs vn				
		Below 6.85m, red-brown, highly weathered then slightly weathered, unbroken						6.85m: B0°, pl, sm, cly co				
-4									C	100	100	PL(A) = 2.3
7												
8												
												PL(A) = 2.2
-5												
	8.64	SANDSTONE: medium to coarse grained, pale grey and orange-brown, thinly bedded and cross bedded, with carbonaceous flakes and laminations, medium to high then high strength, moderately weathered then slightly weathered, unbroken, Hawkesbury Sandstone						8.7m: B5°, un, ro, fe	C	100	100	
9												
-6												PL(A) = 0.9
									C	100	100	

RIG: XC100 **DRILLER:** Terratest **LOGGED:** IT **CASING:** HW to 5.5m

TYPE OF BORING: Diatube (250mm) to 0.3m, Solid flight auger (TC-bit) to 5.2m, NMLC coring to 14.0m

WATER OBSERVATIONS: Free groundwater observed at 3.2m whilst augering

REMARKS: Surface level obtained from Mepstead and Associates Pty Ltd, drawing 5743 dated 18/12/2018. Co-ordinates obtained using Nearmap & site measurements

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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BOREHOLE LOG

CLIENT: New South Wales Land and Housing Corporation
PROJECT: Glebe Mid-Rise Project
LOCATION: 31 Cowper St and 2A-2D Wentworth Park Rd, Glebe

SURFACE LEVEL: 3.5 AHD
EASTING: 332882
NORTHING: 6249712
DIP/AZIMUTH: 90°/--

BORE No: BH2
PROJECT No: 99554.00
DATE: 22/01/2020
SHEET 3 OF 3

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low / Very Low / Low / Medium / High / Very High / Ex High)	Water	Fracture Spacing (m) (0.01 / 0.05 / 0.10 / 0.50 / 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
-7		SANDSTONE: medium to coarse grained, pale grey and orange-brown, thinly bedded and cross bedded, with carbonaceous flakes and laminations, medium to high then high strength, moderately weathered then slightly weathered, unbroken, Hawkesbury Sandstone *(continued)*						10.27m: B0-5°, pl, sm, cly co	C	100	100	PL(A) = 2.1
	11							11.1m: B0°, pl, sm, cly co				
-8		Below 11.5m, with occasional thin bands of fine gravel							C	100	100	PL(A) = 2.2
	12											
-9		Below 12.35m, fresh										PL(A) = 2.4
	13								C	100	100	PL(A) = 1.4
-10												
	14 14.0	Bore discontinued at 14.0m - Target depth reached										
-11												

RIG: XC100 **DRILLER:** Terratest **LOGGED:** IT **CASING:** HW to 5.5m

TYPE OF BORING: Diatube (250mm) to 0.3m, Solid flight auger (TC-bit) to 5.2m, NMLC coring to 14.0m

WATER OBSERVATIONS: Free groundwater observed at 3.2m whilst augering

REMARKS: Surface level obtained from Mepstead and Associates Pty Ltd, drawing 5743 dated 18/12/2018. Co-ordinates obtained using Nearmap & site measurements

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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BOREHOLE LOG

CLIENT: New South Wales Land and Housing Corporation
PROJECT: Glebe Mid-Rise Project
LOCATION: 31 Cowper St and 2A-2D Wentworth Park Rd, Glebe

SURFACE LEVEL: 3.5 AHD
EASTING: 332870
NORTHING: 6249725
DIP/AZIMUTH: 90°/--

BORE No: BH3
PROJECT No: 99554.00
DATE: 20/01/2020
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)
		FILL/Silty SAND: find and medium, dark brown, trace gravel and fine roots, dry to moist, appears generally in a loose to very loose condition		A/E	0.0 0.1		PID<1		
	0.32	FILL/SAND: fine and medium, pale brown, trace gravel and silt, moist, appears generally in a loose condition		A/E*	0.4 0.5		PID<1		
	0.65 0.7	FILL/Gravelly SAND: fine to coarse sand, pale brown, dark brown and orange, medium to coarse gravel, trace brick fragments and plastic, moist, appears generally in a dense condition							
	1	Bore discontinued at 0.7m - Refusal on inferred tree root within fill							

RIG: Hand Tools **DRILLER:** HDS **LOGGED:** HDS **CASING:** Uncased

TYPE OF BORING: Hand Auger to 0.7m, within garden bed.

WATER OBSERVATIONS: No free groundwater observed

REMARKS: *BDA 200120 replicate of sample 0.4-0.5m. Surface level obtained from Mepstead and Associates Pty Ltd, drawing 5743 dated 18/12/2018. Co-ordinates from Nearmap & site measurements

☐ 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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BOREHOLE LOG

CLIENT: New South Wales Land and Housing Corporation
PROJECT: Glebe Mid-Rise Project
LOCATION: 31 Cowper St and 2A-2D Wentworth Park Rd, Glebe

SURFACE LEVEL: 2.9 AHD
EASTING: 332875.4
NORTHING: 6249737.4
DIP/AZIMUTH: 90°/--

BORE No: BH4
PROJECT No: 99554.00
DATE: 20/01/2020
SHEET 1 OF 3

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low / Very Low / Low / Medium / High / Very High / Ex High)	Water	Fracture Spacing (m) (0.01 / 0.05 / 0.10 / 0.50 / 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
2	0.09	CONCRETE: grey, fine and medium igneous aggregate, trace voids, 8mm diameter steel reinforcement at 0.05m										
	0.12								A/E			PID=3
	0.14	FILL/ROADBASE: Gravelly SAND, fine to medium, angular to subangular gravel, fine to coarse sand, moist to wet, appears well compacted							A/E			PID=1
	0.7	CONCRETE: grey										
1	1.0	FILL/SAND: fine to coarse, dark grey, with ash, trace gravel, slag, ceramic tiles, glass, timber, moist, appears generally in a loose condition							A/E*			PID=4
		FILL/Clayey SAND: fine to medium, dark grey and brown, trace gravel, ash, slag and glass, moist, appears generally in a loose condition							S			1,1,2 N = 3
1	1.9	FILL/SAND: fine to coarse, dark grey, with fine to coarse angular to sub-angular gravel and glass, trace silt, ash, slag, ceramic tile, and clay nodules, moist, appears generally in a loose condition										
		CLAY CL: low plasticity, brown, trace sand and silt, w<PL, firm, alluvial (possible fill)							A/E			PID=1
2	2.2	Sandy CLAY CL: low plasticity, pale grey to grey, fine to medium, w=PL, very soft, alluvial				20-01-20			A/E			
									S			0,0,0 N = 0 PID=2
0						29-01-20						
3	3.5	Sandy CLAY Cl: medium plasticity, mottled brown and pale grey, 30% fine sand, 5% ironstone gravel, firm to stiff, w~PL, alluvial										
-1									S			2,3,5 N = 8 PID=2
4												
-2												

RIG: XC100 **DRILLER:** FF **LOGGED:** SI **CASING:** HW to 6.32m

TYPE OF BORING: Diatube (250mm) to 0.09m, Solid flight auger (TC-bit) to 6.32m, NMLC Coring 6.32 to 13.8m

WATER OBSERVATIONS: Free groundwater at 2.2m whilst augering

REMARKS: *BD1 200120 replicate of sample 0.9-1.0m. Standpipe installed: Solid PVC to 0.1-1.5m, screened PVC 1.5-6.5m with end cap, backfill 0.2-0.5m, Bentonite 0.5-1.0m, gravel 1.0-6.5m, bentonite 6.5-7.0m, gravel backfill 7.0-13.8m, gatic cover at the surface.

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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BOREHOLE LOG

CLIENT: New South Wales Land and Housing Corporation
PROJECT: Glebe Mid-Rise Project
LOCATION: 31 Cowper St and 2A-2D Wentworth Park Rd, Glebe

SURFACE LEVEL: 2.9 AHD
EASTING: 332875.4
NORTHING: 6249737.4
DIP/AZIMUTH: 90°/--

BORE No: BH4
PROJECT No: 99554.00
DATE: 20/01/2020
SHEET 2 OF 3

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
-3	6	Sandy CLAY CI: medium plasticity, mottled brown and pale grey, 30% fine sand, 5% ironstone gravel, firm to stiff, w~PL, alluvial *(continued)*							S			4,4,5 N = 9 PID=2
	6.0	Clayey SAND SC: fine to medium, pale grey-brown, 30% clay, apparently dense, wet, residual (possibly extremely weathered sandstone)										
	6.32	SANDSTONE: medium grained, pale grey, orange-brown and yellow-brown, thinly bedded and cross bedded with zones of iron cementation, medium then high strength, moderately then highly weathered, fractured to slightly fractured, Hawkesbury Sandstone						6.7m: Cs, 150mm	C	100	85	PL(A) = 0.9
-4	7											PL(A) = 2
								7.5m: B20°, fe 7.55m: B25°, pl, ro, fe				
-5	8							7.85-7.88m: fg 7.9m: B25°, fe, he				
		Below 8.35m, moderately weathered, unbroken						8.35m: B10°, fe	C	100	100	PL(A) = 1.9
-6	9											
	9.1	SANDSTONE: medium to coarse grained, pale grey, thinly bedded and cross bedded, trace siltstone flakes, high strength, fresh, unbroken, Hawkesbury Sandstone						9.1m: B10°, fe				PL(A) = 1.6
-7									C	100	98	

RIG: XC100 **DRILLER:** FF **LOGGED:** SI **CASING:** HW to 6.32m

TYPE OF BORING: Diatube (250mm) to 0.09m, Solid flight auger (TC-bit) to 6.32m, NMLC Coring 6.32 to 13.8m

WATER OBSERVATIONS: Free groundwater at 2.2m whilst augering

REMARKS: *BD1 200120 replicate of sample 0.9-1.0m. Standpipe installed: Solid PVC to 0.1-1.5m, screened PVC 1.5-6.5m with end cap, backfill 0.2-0.5m, Bentonite 0.5-1.0m, gravel 1.0-6.5m, bentonite 6.5-7.0m, gravel backfill 7.0-13.8m, gatic cover at the surface.

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

BOREHOLE LOG

CLIENT: New South Wales Land and Housing Corporation
PROJECT: Glebe Mid-Rise Project
LOCATION: 31 Cowper St and 2A-2D Wentworth Park Rd, Glebe

SURFACE LEVEL: 2.9 AHD
EASTING: 332875.4
NORTHING: 6249737.4
DIP/AZIMUTH: 90°/--

BORE No: BH4
PROJECT No: 99554.00
DATE: 20/01/2020
SHEET 3 OF 3

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
-8		SANDSTONE: medium to coarse grained, pale grey, thinly bedded and cross bedded, trace siltstone flakes, high strength, fresh, unbroken, Hawkesbury Sandstone *(continued)*						10.15m: B0°, cly, fg 10mm	C	100	98	PL(A) = 1.8
	11	Between 10.8-11.98m, high to very high strength										
-9									C	100	98	PL(A) = 3.1
	12							11.98m: Cs, 30mm				PL(A) = 1.9
-10									C	100	100	
	13											PL(A) = 1.6
-11	13.8	Bore discontinued at 13.8m - Target depth reached. Standpipe piezometer installed						13.75m: B5°, cly co 2mm				
	14											
-12												

RIG: XC100 **DRILLER:** FF **LOGGED:** SI **CASING:** HW to 6.32m

TYPE OF BORING: Diatube (250mm) to 0.09m, Solid flight auger (TC-bit) to 6.32m, NMLC Coring 6.32 to 13.8m

WATER OBSERVATIONS: Free groundwater at 2.2m whilst augering

REMARKS: *BD1 200120 replicate of sample 0.9-1.0m. Standpipe installed: Solid PVC to 0.1-1.5m, screened PVC 1.5-6.5m with end cap, backfill 0.2-0.5m, Bentonite 0.5-1.0m, gravel 1.0-6.5m, bentonite 6.5-7.0m, gravel backfill 7.0-13.8m, gatic cover at the surface.

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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BOREHOLE LOG

CLIENT: New South Wales Land and Housing Corporation
PROJECT: Glebe Mid-Rise Project
LOCATION: 31 Cowper St and 2A-2D Wentworth Park Rd, Glebe

SURFACE LEVEL: 2.7 AHD
EASTING: 332874
NORTHING: 6249756
DIP/AZIMUTH: 90°/--

BORE No: BH5
PROJECT No: 99554.00
DATE: 23/01/2020
SHEET 1 OF 4

RL	Depth (m)	Description of Strata	Degree of Weathering	Graphic Log	Rock Strength	Water	Fracture Spacing (m)	Discontinuities	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
			EW HW MW SW FS FR		Ex Low / Very Low / Low / Medium / High / Very High / Ex High		0.01 / 0.05 / 0.10 / 0.50 / 1.00	B - Bedding J - Joint S - Shear F - Fault				
	0.2	FILL/TOPSOIL: SAND, fine to medium, brown, with silt, trace ash, slag, gravel and rootlets, dry, appears generally in a loose condition							A/E			PID<1
		FILL/Sandy CLAY: low plasticity, dark grey, fine to medium sand, with fine to coarse, angular to subangular igneous gravel, trace ash, slag, glass, brick, rootlets, ripped sandstone gravel, w~PL, appears generally in a loose condition							A/E			PID<1
									A/E			PID<1
									S			2,2,2 N = 4 PID<1
	1.8	Clayey SAND SC: fine to coarse, orange-brown, moist, medium dense, alluvial							A/E*			PID<1
	2.4	Sandy CLAY CL-CI: low to medium plasticity, dark grey and red-brown, fine to medium, w>PL, firm to stiff, alluvial				23-01-20			A/E			PID<1
									S			1,4,4 N = 8 PID<1
	3.0	CLAY CH: high plasticity, dark grey and red-brown, trace fine sand, w>PL, firm to stiff, alluvial							A/E			PID<1
									A/E			PID<1
									A/E			PID<1
									S			2,4,4 N = 8 PID<1
	4.6	Sandy CLAY CL: medium plasticity, pale grey and red-brown, fine to medium, w>PL, firm to stiff, alluvial							A/E			PID<1
	5.0											

RIG: Comacchio Geo 205 **DRILLER:** Terratest **LOGGED:** IT **CASING:** HW to 5.7m

TYPE OF BORING: Solid flight auger (TC-bit) to 5.5m, NMLC coring to 15.3m

WATER OBSERVATIONS: Free groundwater observed at 2.4m whilst augering

REMARKS: *BD3 230120 replicate of sample 1.9-2.0m. Surface level obtained from Veris Australia Pty Ltd, drawing number 201704 dated 15/08/2019. Co-ordinates obtained using Nearmap & site measurements

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

BOREHOLE LOG

CLIENT: New South Wales Land and Housing Corporation
PROJECT: Glebe Mid-Rise Project
LOCATION: 31 Cowper St and 2A-2D Wentworth Park Rd, Glebe

SURFACE LEVEL: 2.7 AHD
EASTING: 332874
NORTHING: 6249756
DIP/AZIMUTH: 90°/--

BORE No: BH5
PROJECT No: 99554.00
DATE: 23/01/2020
SHEET 2 OF 4

RL	Depth (m)	Description of Strata	Degree of Weathering	Graphic Log	Rock Strength	Water	Fracture Spacing (m)	Discontinuities	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
		Sandy CLAY CL: as per previous page										
	5.2	Clayey SAND SC: fine to coarse, pale grey, wet, dense, residual (possibly extremely weathered sandstone)							A/E			PID<1
-3									S			4,5,2/100 refusal PID<1
	6 6.0	SANDSTONE: medium to coarse grained, orange-brown and red-brown, thinly bedded and cross bedded, high strength, moderately weathered then slightly weathered, slightly fractured to unbroken, Hawkesbury Sandstone						6.32m: B10°, pl, ro, fe				PL(A) = 1.1
-4									C	100	93	
	7											PL(A) = 1.4
-5								7.48m: B10°, pl, ro, fe, cly co				
	8							8.12m: B5°, pl, ro, fe				
	8.52	SANDSTONE: medium to coarse grained, pale grey, cross bedded, high strength, fresh, unbroken, Hawkesbury Sandstone										PL(A) = 1.7
-6									C	100	98	
	9											
-7												PL(A) = 1.4

RIG: Comacchio Geo 205 **DRILLER:** Terratest **LOGGED:** IT **CASING:** HW to 5.7m

TYPE OF BORING: Solid flight auger (TC-bit) to 5.5m, NMLC coring to 15.3m

WATER OBSERVATIONS: Free groundwater observed at 2.4m whilst augering

REMARKS: *BD3 230120 replicate of sample 1.9-2.0m. Surface level obtained from Veris Australia Pty Ltd, drawing number 201704 dated 15/08/2019. Co-ordinates obtained using Nearmap & site measurements

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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BOREHOLE LOG

CLIENT: New South Wales Land and Housing Corporation
PROJECT: Glebe Mid-Rise Project
LOCATION: 31 Cowper St and 2A-2D Wentworth Park Rd, Glebe
SURFACE LEVEL: 2.7 AHD
EASTING: 332874
NORTHING: 6249756
DIP/AZIMUTH: 90°/--
BORE No: BH5
PROJECT No: 99554.00
DATE: 23/01/2020
SHEET 3 OF 4

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low / Very Low / Low / Medium / High / Very High / Ex High)	Water	Fracture Spacing (m) (0.01 / 0.05 / 0.10 / 0.50 / 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Type	Core Rec. %	RQD %	Test Results & Comments
		SANDSTONE: medium to coarse grained, pale grey, cross bedded, high strength, fresh, unbroken, Hawkesbury Sandstone *(continued)*						10.3m: fg, 50mm	C	100	98	
	10.4							10.35m: CORE LOSS: 50mm 10.4m: fg, 50mm				PL(A) = 1.9
-9	11								C	98	95	PL(A) = 1.7
	12							12.04m: fg, 20mm, cly vn				
-10								12.77m: B0°, pl, sm, cly co 12.81m: B0°, pl, ro, cly vn				PL(A) = 1.7
-11	13											PL(A) = 1.5
	14								C	100	99	
-12												PL(A) = 1
	14.79	SANDSTONE: refer following page						14.77m: fg, 20mm, cly co				
	15.0											

RIG: Comacchio Geo 205 **DRILLER:** Terratest **LOGGED:** IT **CASING:** HW to 5.7m

TYPE OF BORING: Solid flight auger (TC-bit) to 5.5m, NMLC coring to 15.3m

WATER OBSERVATIONS: Free groundwater observed at 2.4m whilst augering

REMARKS: *BD3 230120 replicate of sample 1.9-2.0m. Surface level obtained from Veris Australia Pty Ltd, drawing number 201704 dated 15/08/2019. Co-ordinates obtained using Nearmap & site measurements

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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BOREHOLE LOG

CLIENT: New South Wales Land and Housing Corporation
PROJECT: Glebe Mid-Rise Project
LOCATION: 31 Cowper St and 2A-2D Wentworth Park Rd, Glebe

SURFACE LEVEL: 2.7 AHD
EASTING: 332874
NORTHING: 6249756
DIP/AZIMUTH: 90°/--

BORE No: BH5
PROJECT No: 99554.00
DATE: 23/01/2020
SHEET 4 OF 4

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
		SANDSTONE: fine to medium grained, grey, massive, medium strength, fresh, unbroken, Hawkesbury Sandstone							C	100	99	PL(A) = 0.9
	15.3	Bore discontinued at 15.3m - Target depth reached										

RIG: Comacchio Geo 205 **DRILLER:** Terratest **LOGGED:** IT **CASING:** HW to 5.7m

TYPE OF BORING: Solid flight auger (TC-bit) to 5.5m, NMLC coring to 15.3m

WATER OBSERVATIONS: Free groundwater observed at 2.4m whilst augering

REMARKS: *BD3 230120 replicate of sample 1.9-2.0m. Surface level obtained from Veris Australia Pty Ltd, drawing number 201704 dated 15/08/2019. Co-ordinates obtained using Nearmap & site measurements

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

BOREHOLE LOG

CLIENT: New South Wales Land and Housing Corporation
PROJECT: Glebe Mid-Rise Project
LOCATION: 31 Cowper St and 2A-2D Wentworth Park Rd, Glebe

SURFACE LEVEL: 2.7 AHD
EASTING: 332885
NORTHING: 6249747
DIP/AZIMUTH: 90°/--

BORE No: BH6
PROJECT No: 99554.00
DATE: 24/01/2020
SHEET 1 OF 4

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low / Very Low / Low / Medium / High / Very High / Ex High)	Water	Fracture Spacing (m) (0.01 / 0.05 / 0.10 / 0.50 / 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
		FILL/TOPSOIL: SAND, fine to medium, dark brown, trace silt, gravel, brick, clay nodules, charcoal, ash, slag and rootlets, moist, appears generally in a loose condition							A/E			PID<1
	0.2	FILL/Sandy CLAY: low plasticity, dark grey, fine to medium, with clay and fine to coarse, angular to subangular igneous gravel, trace ash, slag, glass, brick, rootlets, ripped sandstone gravel, w~PL, appears generally in a loose condition							A/E			PID<1
									A/E			PID<1
									S			2,1,1 N = 2 PID<1
	1.9	Clayey SAND SC: fine to medium, orange-brown, moist, loose, alluvial							A/E			PID<1
	2.4	Sandy CLAY CL-CI: low to medium plasticity, grey, fine to medium sand, w>PL, very soft, alluvial				24-01-20			A/E			PID<1
	2.5	CLAY CI-CH: medium to high plasticity, grey and red-brown, trace fine to medium sand, w>PL, very soft, alluvial							S			0,0,0 N = 0 PID<1
									A/E			PID<1
									A/E			PID<1
	4.0	Sandy CLAY CL-CI: low to medium plasticity, red-brown and pale grey, fine to coarse, w>PL, firm, alluvial							A/E			PID<1
									S			2,3,5 N = 8 PID<1
									A/E			PID<1

RIG: Comacchio Geo 205 **DRILLER:** Terratest **LOGGED:** IT **CASING:** HW to 8.4m

TYPE OF BORING: Solid flight auger (TC-bit) to 8.1m; NMLC coring to 15.38m

WATER OBSERVATIONS: Free groundwater observed at 2.4m whilst augering

REMARKS: Surface level obtained from Veris Australia Pty Ltd, drawing number 201704 dated 15/08/2019. Co-ordinates obtained using Nearmap & site measurements

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: New South Wales Land and Housing Corporation
PROJECT: Glebe Mid-Rise Project
LOCATION: 31 Cowper St and 2A-2D Wentworth Park Rd, Glebe

SURFACE LEVEL: 2.7 AHD
EASTING: 332885
NORTHING: 6249747
DIP/AZIMUTH: 90°/--

BORE No: BH6
PROJECT No: 99554.00
DATE: 24/01/2020
SHEET 2 OF 4

RL	Depth (m)	Description of Strata	Degree of Weathering	Graphic Log	Rock Strength	Water	Fracture Spacing (m)	Discontinuities	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
		Sandy CLAY CL-CI: low to medium plasticity, red-brown and pale grey, fine to coarse, w>PL, firm, alluvial *(continued)*						B - Bedding J - Joint S - Shear F - Fault	A/E			PID<1
									S			3,4,3 N = 7 PID<1
									A/E			PID<1
	7.1	Clayey SAND SC: fine to coarse, red-brown, wet, loose, alluvial							S			2,4,4 N = 8 PID<1
	8.0	SANDSTONE: fine to medium grained, red-brown, very low to low strength, highly weathered, Hawkesbury Sandstone							S			10/20,B refusal PID<1
	8.16	SANDSTONE: medium to coarse grained, red-brown and orange-brown, thinly bedded and cross bedded, high strength, highly weathered, slightly fractured, Hawkesbury Sandstone						8.16m: B5°, pl, ro, cly vn, fe stn 8.53m: B0°, pl, sm, cly co				PL(A) = 1.1
								9.27-9.3m: J45°, pl, ro, cly vn	C	100	96	
	9.49	SANDSTONE: medium to coarse grained, pale grey, thinly bedded and cross bedded, with carbonaceous flakes and laminations, high strength, moderately weathered to fresh, slightly fractured										PL(A) = 1.4
	10.0							9.86m: Cs, 20mm				

RIG: Comacchio Geo 205 **DRILLER:** Terratest **LOGGED:** IT **CASING:** HW to 8.4m

TYPE OF BORING: Solid flight auger (TC-bit) to 8.1m; NMLC coring to 15.38m

WATER OBSERVATIONS: Free groundwater observed at 2.4m whilst augering

REMARKS: Surface level obtained from Veris Australia Pty Ltd, drawing number 201704 dated 15/08/2019. Co-ordinates obtained using Nearmap & site measurements

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: New South Wales Land and Housing Corporation
PROJECT: Glebe Mid-Rise Project
LOCATION: 31 Cowper St and 2A-2D Wentworth Park Rd, Glebe

SURFACE LEVEL: 2.7 AHD
EASTING: 332885
NORTHING: 6249747
DIP/AZIMUTH: 90°/--

BORE No: BH6
PROJECT No: 99554.00
DATE: 24/01/2020
SHEET 3 OF 4

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Type	Core Rec. %	RQD %	Test Results & Comments
-8		SANDSTONE: medium to coarse grained, pale grey, thinly bedded and cross bedded, with carbonaceous flakes and laminations, high strength, moderately weathered to fresh, slightly fractured, Hawkesbury Sandstone						10.05m: B0°, pl, ro, cly vn	C	100	96	
												PL(A) = 1.1
								10.62-10.7m: J60°, pl, ro, cly vn 10.7m: B5°, un, sm, cbs co				
-9	11	Below 10.95m, unbroken						10.95m: B0-10°, un, sm, cly co				
												PL(A) = 2
									C	100	97	
-10	12											
												PL(A) = 2.5
								12.87m: B0°, pl, sm, cly co				
	13							13.05m: fg, 10mm, cly co 13.17m: B0°, pl, sm, cly co				
-11												PL(A) = 1.2
	14								C	100	100	
												PL(A) = 1.6
-12	15.0											

RIG: Comacchio Geo 205 **DRILLER:** Terratest **LOGGED:** IT **CASING:** HW to 8.4m

TYPE OF BORING: Solid flight auger (TC-bit) to 8.1m; NMLC coring to 15.38m

WATER OBSERVATIONS: Free groundwater observed at 2.4m whilst augering

REMARKS: Surface level obtained from Veris Australia Pty Ltd, drawing number 201704 dated 15/08/2019. Co-ordinates obtained using Nearmap & site measurements

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: New South Wales Land and Housing Corporation
PROJECT: Glebe Mid-Rise Project
LOCATION: 31 Cowper St and 2A-2D Wentworth Park Rd, Glebe
SURFACE LEVEL: 2.7 AHD
EASTING: 332885
NORTHING: 6249747
DIP/AZIMUTH: 90°/--
BORE No: BH6
PROJECT No: 99554.00
DATE: 24/01/2020
SHEET 4 OF 4

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low / Very Low / Low / Medium / High / Very High / Ex High)	Water	Fracture Spacing (m) (0.01 / 0.05 / 0.10 / 0.50 / 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
		SANDSTONE: refer previous page							C	100	100	PL(A) = 1.3
-13	15.38	Bore discontinued at 15.38m - Target depth reached										
	16											
-14												
	17											
-15												
	18											
-16												
	19											
-17												

RIG: Comacchio Geo 205 **DRILLER:** Terratest **LOGGED:** IT **CASING:** HW to 8.4m

TYPE OF BORING: Solid flight auger (TC-bit) to 8.1m; NMLC coring to 15.38m

WATER OBSERVATIONS: Free groundwater observed at 2.4m whilst augering

REMARKS: Surface level obtained from Veris Australia Pty Ltd, drawing number 201704 dated 15/08/2019. Co-ordinates obtained using Nearmap & site measurements

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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BOREHOLE LOG

CLIENT: New South Wales Land and Housing Corporation
PROJECT: Glebe Mid-Rise Project
LOCATION: 31 Cowper St and 2A-2D Wentworth Park Rd, Glebe

SURFACE LEVEL: 3.5 AHD
EASTING: 332897
NORTHING: 6249767
DIP/AZIMUTH: 90°/--

BORE No: BH7
PROJECT No: 99554.00
DATE: 20/01/2020
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)
	0.0	FILL/SAND: fine and medium, dark brown, trace silt, brick fragments and gravel, moist to wet, appears generally in a loose to medium dense condition		A/E	0.0		PID<1		
	0.2	FILL/Gravelly SAND: fine and medium, dark brown and brown, fine and medium gravel (brick, sandstone), trace ash, plastic, charcoal, glass and tile, moist, appears generally in a medium dense condition		A/E	0.2		PID<1		
		At 0.54 m, layer of white fabric and green glass		A/E	0.3 0.5		PID<1		
				A/E	0.6 0.8		PID<1		
	1.0	FILL/Sandy CLAY: low plasticity, pale brown to brown, fine and medium, trace rusted metal objects, silt, ash and charcoal, w<PL, appears generally in a stiff condition		A/E	0.9 1.0		PID<1		
				A/E	1.1 1.2		PID<1		
	1.3	Bore discontinued at 1.3m - Refusal in fill on coarse gravel		A/E	1.3		PID<1		

RIG: Hand Tools **DRILLER:** HDS **LOGGED:** HDS **CASING:** Uncased

TYPE OF BORING: Hand Auger to 1.3m

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Within garden box, 0.65 m above street level and 0.52m back from the inside face of the brick retaining wall.

☐ 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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Groundwater Field Sheet

Bore Volume = casing volume + filter pack volume
= $\pi h_1 d_1^2/4 + n(\pi h_2 d_2^2/4 - \pi h_2 d_1^2/4)$
Where: $\pi = 3.14$
n = porosity (0.3 for most filter pack material)
h_2 = height of water column
d_2 = diameter of annulus
h_1 = length of filter pack
d_1 = diameter of casing
Bore Vol Normally: 7.2*h

Project and Bore Installation Details	
Bore / Standpipe ID:	BH4
Project Name:	
Project Number:	99554.01
Site Location:	Glebe
Bore GPS Co-ord:	
Installation Date:	
GW Level (during drilling):	- m bgl
Well Depth:	m bgl
Screened Interval:	m bgl
Contaminants/Comments:	-

Bore Development Details	
Date/Time:	29/01/20
Purged By:	TB
GW Level (pre-purge):	2.84 m bgl
GW Level (post-purge):	2.6 m bgl
PSH observed:	Yes / No (interface / visual). Thickness if observed:
Observed Well Depth:	6.4 m bgl
Estimated Bore Volume:	~80-90 L
Total Volume Purged:	(target: no drill mud, min 3 well vol. or dry)
Equipment:	

3.54
7.2

Micropurge and Sampling Details	
Date/Time:	5/2/20 0900
Sampled By:	TB
Weather Conditions:	Sunny
GW Level (pre-purge):	2.84 m bgl
GW Level (post sample):	2.84 m bgl
PSH observed:	Yes / No (interface / visual). Thickness if observed:
Observed Well Depth:	6.38 m bgl
Estimated Bore Volume:	~25.48 L
Total Volume Purged:	~20 L
Equipment:	

Water Quality Parameters

Time / Volume	Temp (°C)	DO (mg/L)	EC (µS or mS/cm)	pH	Turbidity	Redox (mV)
Stabilisation Criteria (3 readings)	**0.1° C**	**+/- 0.3 mg/L**	**+/- 3%**	**+/- 0.1**	**+/- 10%**	**+/- 10 mV**
	23.9	0.54	1609	7.05	640	71
	23.1	0.31	1592	7.01	594	62
	23.2	0.23	1581	7.02	546	45
	23.2	0.17	1568	6.99	488	58
	23.2	0.12	1556	6.93	412	56
	23.2	0.12	1545	6.92	361	42
	23.2	0.09	1525	6.92	291	63
	23.2	0.09	1497	6.80	262	47
	23.1	0.04	1470	6.30	286	41
	23.1	0.02	1461	6.30	285	37
Additional Readings Following stabilisation:	DO % Sat	SPC	TDS			

Sample Details

Sampling Depth (rationale):	~5.0 m bgl,
Sample Appearance (e.g. colour, siltiness, odour):	Sulfur odour, grey colour
Sample ID:	
QA/QC Samples:	
Sampling Containers and filtration:	
Comments / Observations:	

Appendix I

Assessment Criteria

S1. Site Assessment Criteria

The Site Assessment Criteria (SAC) applied in the current investigation are based on identified potential human and ecological receptors 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, *National Environment Protection (Assessment of Site Contamination) Measure* 1999, as amended 2013 (NEPC, 2013). The NEPC guidelines are endorsed by the 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 proposed development comprises mixed use, multi-storey buildings with partial basements. There is a small area of the site which comprises townhouses with no basement below. The most sensitive land use for the proposed development will therefore be residential with garden / accessible soil. It is anticipated that, if required, once the development plans have been finalised any exceedances of the generic SAC adopted herein will be reviewed to determine their significance with relation to proposed development.

S1.1 Soils

S1.1.1 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.

HIL 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 HIL apply for other land uses.

HSL are applicable to selected petroleum compounds and fractions to assess the risk to human health via the inhalation pathway. HSL have been developed for different land uses, soil types and depths to contamination.

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 A; and
- **HSL- AB** – residential AB.

The adopted soil HIL and HSL for the potential contaminants of concern are presented, along with the laboratory results, in Table J1, Appendix J. The HSL adopted are predicated on the inputs summarised in Table S1.

Table S1: Inputs to the Derivation of HSL

Variable	Input	Rationale
Potential exposure pathway	Soil vapour intrusion (inhalation)*	As provided in NEPC (2013)
Soil Type	Sand / clay	As applicable, both sandy and clayey material encountered at the site
Depth to contamination	0 m to <1 m	Given that the basement design has not yet been finalised a depth of 0-<1m has been adopted for all samples as a conservative screen.

S1.1.2 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.

EIL (and ACL 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 NEPC (2013) toolbox *Interactive (Excel) Calculation Spreadsheet* are shown in the following Table S3, below (as well as in Table J1, Appendix J with the site specific data and assumptions used to determine the EIL provided in Table S2.

Table S2*:* Inputs to the Derivation of EIL

Variable	Input	Rationale
Level of Protection	80% (residential)	Based on NEPC (2013) recommendations for urban residential and public open space.
Depth of EIL 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.
Contaminant “age”	“aged” (>2 years)	Based on likely source of contamination being historic fill and land use.
Traffic volume	High	Based on the site location in a busy inner-city area
pH (pH units)	7.7 (sandy fill ‘coarse’) 8 (clayey fill ‘fine’)	Based on the average of field results obtained for the laboratory testing.
CEC (cmol/kg)	6.6 (sandy fill ‘coarse’) 19 (clayey fill ‘fine’)	Based on the average of field results obtained for the laboratory testing
Clay content	5% (sandy fill ‘coarse’) 30% (fill ‘fine’)	Based on the general description of fill soil observed at the site.
Organic Carbon content	1%	This is considered to be a conservative estimate given the presence of organic matter observed in the boreholes.

Table S3: Ecological Investigation Levels (EIL) in mg/kg

Analyte		EIL		Comments
		Sandy Fill ('coarse' texture)	Clayey Fill ('fine' texture)	
Metals	Arsenic	100	100	Generic value
	Chromium III	590 [a]	590 [a]	Calculated value
	Copper	230 [b]	230 [b]	Calculated value
	Lead	1,100	1,100	Generic value
	Nickel	260 [c]	260 [c]	Calculated value
	Zinc	790 [b]	790 [b]	Calculated value
OCP	DDT	180	180	Generic value
PAH	Naphthalene	170	170	Generic value

Notes:

[a] – EIL value based on clay content

[b] – EIL value based on pH and CEC

[c] – EIL value based on CEC

S1.1.3 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 apply to the top 2 m of the soil profile as for EIL.

ESL have 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 S4 have been used to determine the ESL. The adopted ESL, from Table 1B (6), Schedule B1 of NEPC (2013) are shown in Table J1, Appendix J.

Table S4: 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	Urban residential and public open space	Based on most conservative of proposed land uses
Soil Texture	Coarse / fine	As applicable, both sandy and clayey material encountered at the site

S1.1.4 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;
- 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 Table J1, Appendix J. 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 public open space have been adopted for both the marina and proposed residential land use given the residential nature of the area; and
- "Coarse" or "fine" soil texture will be adopted as applicable.

S1.1.5 Asbestos in Soil

A detailed asbestos assessment was not undertaken as part of these works. Therefore, the presence or absence of asbestos at a limit of reporting of 0.1 g/kg has been adopted for this assessment as an initial screen.

S2.1 Groundwater

The potential receptors of impacted groundwater from the site include:

- Marine water ecosystems in Blackwattle Bay; and
- Recreational users of Sydney Harbour.

Groundwater at the site is not considered suitable for consumption based on its elevated EC.

S2.1.1 Groundwater Investigation Levels

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

- *The Australian and New Zealand Guidelines for Fresh and Marine Water Quality* (ANZG 2018), default guideline values (DGV) for water quality for marine ecosystems. The 95% Level of Protection (LOP) has been adopted with the exception of contaminants with the potential to bioaccumulate, which have been assessed with reference to the 99% LOP in accordance with the guidance; and
- NHMRC *Guidelines for Managing Risk in Recreational Waters* 2008 (GMRRW).

The GMRRW is based on applying a factor of 10 to the drinking water guidelines (i.e., they are 10 times the drinking water guidelines), which have been sourced from NHMRC *Australian Drinking Water Guidelines* 2011 (2019) (ADWG);
The adopted GIL for the analytes included in the assessment (where applicable), and the corresponding source documents, are shown in Table J2, Appendix J.

S2.1.2 Health Screening Levels – Petroleum Hydrocarbons

The generic HSL are considered to be appropriate for the assessment of contamination at the site where the areas of excavation are at least 2 m above the groundwater table. However, if excavations extend to within 2 m of the groundwater table, as is anticipated over the majority of the site for basement level construction, the HSL are not applicable and the laboratory practical quantitation limit (PQL) will be used as an initial screen.

Site specific data and assumptions as summarised in Table S5 have been used to determine the HSL. The adopted HSL, from Table 1B (6), Schedule B1 of NEPC (2013) are shown in Table J2, Appendix J.

Table S5: Inputs to the derivation of HSL

Variable	Input	Rationale
Potential exposure pathway	Groundwater vapour intrusion (inhalation)	Potential exposure pathways include vapour intrusion through concrete from potentially contaminated groundwater.
Soil Type	Sand	Sand has been adopted as a conservative approach as a mixture of sandy and clay soils were identified.
Depth to contamination	<2 m (basement areas) 2 m to <4 m (no basements)	Based on site observations and the proposed development.

S2. Waste Classification

Soil has been assessed for waste classification with respect to:

- EPA *Waste Classification Guidelines* 2014 (EPA, 2014); and
- EPA assessment requirements for Virgin Excavated Natural Material (VENM).

S3. Acid Sulfate Soil

Acid sulfate soil (ASS) has been assessed with reference to the following guidance:

- NSW Acid Sulfate Soil Management Advisory Committee (ASSMAC), 1998. *Acid Sulfate Soil Manual* (ASSMAC, 1998);
- Ahern CR, McElnea AE, Sullivan LA (2004). *Acid Sulfate Soils Laboratory Methods Guidelines*. Queensland Department of Natural Resources, Mines and Energy, Indooroopilly, Queensland, Australia (Ahern et al, 2004);
- Sullivan, L, Ward, N, Toppler, N and Lancaster, G 2018, *National Acid Sulfate Soils guidance: National acid sulfate soils sampling and identification methods manual*, Department of Agriculture and Water Resources, Canberra ACT. CC BY 4.0 (Sullivan et al, 2018a); and
- Sullivan, L, Ward, N, Toppler, N and Lancaster, G 2018, *National Acid Sulfate Soils Guidance: National acid sulfate soils identification and laboratory methods manual,* Department of Agriculture and Water Resources, Canberra, ACT. CC BY 4.0 (Sullivan et al, 2018b).

Soils have been compared against the action criteria for disturbance or more than 1,000 tonnes of soil of any texture as presented in Table J3, Appendix J.

Appendix J

Tables J1 to J4 (Summary of Laboratory Results

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Table J1: Summary of Laboratory Results For Proposed Land Use

				Metals																TRH						BTEX				PAH			
				Arsenic	Cadmium	Total Chromium	Copper	Lead	Mercury (inorganic)	Nickel	Zinc	Manganese	Beryllium	Boron	Cobalt	Iron	Molybdenum	Selenium	Silver	TRH C6 - C10	TRH >C10-C16	F1 ((C6-C10)-BTEX)	F2 (>C10-C16 less Naphthalene)	F3 (>C16-C34)	F4 (>C34-C40)	Benzene	Toluene	Ethylbenzene	Total Xylenes	Naphthalene [b]	Benzo(a)pyrene (BaP)	Benzo(a)pyrene TEQ	Total PAHs
				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	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
				4	0.4	1	1	1	0.1	1	1	1	1	3	1	10	1	2	1	25	50	25	50	100	100	0.2	0.5	1	1	1	0.05	0.5	0.05
Site Assessment Criteria (SAC) - Residential with Accessible Soil																																	
HIL A				100	20	100 [c]	6,000	300	40	400	7,400	3,800	60	4,500	100			200														3	300
EIL/ ESL		coarse		100		as below	as below	1,100		as below	as below										120	180		300	2800	50	85	70	105	170	0.7		
EIL/ ESL		fine		100		as below	as below	1,100		as below	as below										120	180		1300	5600	65	105	125	45	170	0.7		
Management Limit		coarse																		700	1000			2500	10000								
Management Limit		fine																		800	1000			3500	10000								
HSLs - Vapour Intrusion																																	
HSL A&B	0-<1m	sand																				45	110			0.5	160	55	40	3			
HSL A&B	0-<1m	clay																				50	280			0.7	480	NL	110	5			
Laboratory Results																																	
Sample ID	Depth	Soil Type	Sampled Date																														
1	0.1 - 0.2 m	Fill/ Sand	21/01/2020	<4	<0.4	7	15	25	<0.1	4	91	210	<1	<3	4	9100	<1	<2	<1	<25	<50	<25	<50	130	120	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
				100 100	20 NC	100 330	6000 150	300 1100	40 NC	400 65	7400 410	3800 NC	60 NC	4500 NC	100 NC	NC NC	NC NC	200 NC	NC NC	NC NC	NC NC	45 180	110 120	NC 300	NC 2800	0.5 50	160 85	55 70	40 105	3 170	NC 0.7	3 NC	300 NC
1	0.9 - 1 m	Fill/ Sand	21/01/2020	16	<0.4	24	87	510	4.7	12	250	200	<1	<3	5	32000	<1	<2	<1	<25	60	<25	60	2900	600	<0.2	<0.5	<1	<1	<1	70	110	870
				100 100	20 NC	100 330	6000 150	300 1100	40 NC	400 65	7400 410	3800 NC	60 NC	4500 NC	100 NC	NC NC	NC NC	200 NC	NC NC	NC NC	NC NC	45 180	110 120	NC 300	NC 2800	0.5 50	160 85	55 70	40 105	3 170	NC 0.7	3 NC	300 NC
2	0.9 - 1 m	Fill/ Clay	22/01/2020	5	<0.4	13	28	150	1.5	4	140	300	<1	<3	3	13000	<1	<2	<1	<25	<50	<25	<50	110	<100	<0.2	<0.5	<1	<1	<1	0.68	1	6.7
				100 100	20 NC	100 590	6000 230	300 1100	40 NC	400 260	7400 790	3800 NC	60 NC	4500 NC	100 NC	NC NC	NC NC	200 NC	NC NC	NC NC	NC NC	50 180	280 120	NC 1300	NC 5600	0.7 65	480 105	NL 125	110 45	5 170	NC 0.7	3 NC	300 NC
2	1.9 - 2 m	Fill/ Clay	22/01/2020	36	1	52	240	1900	47	10	1100	230	<1	4	5	24000	<1	<2	1	<25	<50	<25	<50	150	110	<0.2	<0.5	<1	<1	<1	1.1	1.7	10
				100 100	20 NC	100 590	6000 230	300 1100	40 NC	400 260	7400 790	3800 NC	60 NC	4500 NC	100 NC	NC NC	NC NC	200 NC	NC NC	NC NC	NC NC	90 180	NL 120	NC 1300	NC 5600	1 65	NL 105	NL 125	310 45	NL 170	NC 0.7	3 NC	300 NC
2	3.4 - 3.5 m	Clay	22/01/2020	8	<0.4	14	16	120	1.8	2	73	27	<1	<3	<1	7500	11	<2	<1	<25	<50	<25	<50	<100	110	<0.2	<0.5	<1	<1	<1	0.07	<0.5	0.3
				100 100	20 NC	100 730	6000 190	300 1100	40 NC	400 120	7400 470	3800 NC	60 NC	4500 NC	100 NC	NC NC	NC NC	200 NC	NC NC	NC NC	NC NC	150 180	NL 120	NC 1300	NC 5600	2 65	NL 105	NL 125	NL 45	NL 170	NC 0.7	3 NC	300 NC
3	0 - 0.1 m	Fill/ Sand	20/01/2020	5	0.5	9	37	76	0.1	6	160	210	<1	6	4	7700	1	<2	<1	<25	77	<25	77	380	220	<0.2	<0.5	<1	<1	<1	0.2	<0.5	2
				100 100	20 NC	100 330	6000 150	300 1100	40 NC	400 65	7400 410	3800 NC	60 NC	4500 NC	100 NC	NC NC	NC NC	200 NC	NC NC	NC NC	NC NC	45 180	110 120	NC 300	NC 2800	0.5 50	160 85	55 70	40 105	3 170	NC 0.7	3 NC	300 NC
4	0.4 - 0.5 m	Fill/ Sand	20/01/2020	9	0.5	12	97	1100	1.9	9	360	180	<1	4	4	18000	1	<2	<1	<25	<50	<25	<50	160	<100	<0.2	<0.5	<1	<1	<1	2.6	4.2	35
				100 100	20 NC	100 330	6000 150	300 1100	40 NC	400 65	7400 410	3800 NC	60 NC	4500 NC	100 NC	NC NC	NC NC	200 NC	NC NC	NC NC	NC NC	45 180	110 120	NC 300	NC 2800	0.5 50	160 85	55 70	40 105	3 170	NC 0.7	3 NC	300 NC
4	0.9 - 1 m	Fill/ Sand	20/01/2020	13	0.6	12	910	670	2.5	16	450	340	<1	5	6	34000	1	<2	<1	<25	<50	<25	<50	280	140	<0.2	<0.5	<1	<1	<1	1.6	2.5	16
				100 100	20 NC	100 330	6000 150	300 1100	40 NC	400 65	7400 410	3800 NC	60 NC	4500 NC	100 NC	NC NC	NC NC	200 NC	NC NC	NC NC	NC NC	45 180	110 120	NC 300	NC 2800	0.5 50	160 85	55 70	40 105	3 170	NC 0.7	3 NC	300 NC
BD1/200120	0.9 - 1 m	Fill/ Sand	20/01/2020	12	<0.4	19	530	890	8.9	11	540	140	<1	<3	4	28000	2	<2	<1	<25	<50	<25	<50	230	120	<0.2	<0.5	<1	<1	<1	1.4	2.1	18
				100 100	20 NC	100 330	6000 150	300 1100	40 NC	400 65	7400 410	3800 NC	60 NC	4500 NC	100 NC	NC NC	NC NC	200 NC	NC NC	NC NC	NC NC	45 180	110 120	NC 300	NC 2800	0.5 50	160 85	55 70	40 105	3 170	NC 0.7	3 NC	300 NC
4	2.5 - 2.6 m	Clay	20/01/2020	13	<0.4	15	120	410	9.2	5	220	58	<1	<3	2	20000	16	<2	<1	<25	<50	<25	<50	160	120	<0.2	<0.5	<1	<1	<1	0.2	<0.5	2.2
				100 100	20 NC	100 590	6000 190	300 1100	40 NC	400 120	7400 470	3800 NC	60 NC	4500 NC	100 NC	NC NC	NC NC	200 NC	NC NC	NC NC	NC NC	150 180	NL 120	NC 1300	NC 5600	2 65	NL 105	NL 125	NL 45	NL 170	NC 0.7	3 NC	300 NC
5	0.4 - 0.5 m	Fill/ Clay	23/01/2020	6	0.9	15	190	650	0.5	8	230	270	<1	<3	3	18000	1	<2	<1	<25	<50	<25	<50	160	130	<0.2	<0.5	<1	<1	<1	0.84	1.3	8.2
				100 100	20 NC	100 590	6000 230	300 1100	40 NC	400 260	7400 790	3800 NC	60 NC	4500 NC	100 NC	NC NC	NC NC	200 NC	NC NC	NC NC	NC NC	50 180	280 120	NC 1300	NC 5600	0.7 65	480 105	NL 125	110 45	5 170	NC 0.7	3 NC	300 NC
5	4 - 4.45 m	Clay	23/01/2020	<4	<0.4	4	2	3	<0.1	<1	1	2	<1	<3	<1	1500	2	<2	<1	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
				100 100	20 NC	100 730	6000 190	300 1100	40 NC	400 120	7400 470	3800 NC	60 NC	4500 NC	100 NC	NC NC	NC NC	200 NC	NC NC	NC NC	NC NC	290 180	NL 120	NC 1300	NC 5600	3 65	NL 105	NL 125	NL 45	NL 170	NC 0.7	3 NC	300 NC
6	0.1 - 0.2 m	Fill/ Sand	24/01/2020	8	0.7	20	360	2200	0.4	17	170	230	<1	<3	5	16000	<1	<2	<1	<25	<50	<25	<50	180	120	<0.2	<0.5	<1	<1	<1	1.3	1.9	13
				100 100	20 NC	100 330	6000 150	300 1100	40 NC	400 65	7400 410	3800 NC	60 NC	4500 NC	100 NC	NC NC	NC NC	200 NC	NC NC	NC NC	NC NC	45 180	110 120	NC 300	NC 2800	0.5 50	160 85	55 70	40 105	3 170	NC 0.7	3 NC	300 NC
6	0.9 - 1 m	Fill/ Clay	24/01/2020	6	<0.4	10	79	700	10	6	180	170	<1	<3	3	12000	<1	<2	<1	<25	<50	<25	<50	160	110	<0.2	<0.5	<1	<1	<1	1.6	2.3	17
				100 100	20 NC	100 590	6000 230	300 1100	40 NC	400 260	7400 790	3800 NC	60 NC	4500 NC	100 NC	NC NC	NC NC	200 NC	NC NC	NC NC	NC NC	50 180	280 120	NC 1300	NC 5600	0.7 65	480 105	NL 125	110 45	5 170	NC 0.7	3 NC	300 NC
7	0 - 0.2 m	Fill/ Sand	20/01/2020	<4	<0.4	10	27	140	0.3	8	100	150	<1	<3	4	9700	<1	<2	<1	<25	<50	<25	<50	<100	100	<0.2	<0.5	<1	<1	<1	0.2	<0.5	2.2
				100 100	20 NC	100 330	6000 150	300 1100	40 NC	400 65	7400 410	3800 NC	60 NC	4500 NC	100 NC	NC NC	NC NC	200 NC	NC NC	NC NC	NC NC	45 180	110 120	NC 300	NC 2800	0.5 50	160 85	55 70	40 105	3 170	NC 0.7	3 NC	300 NC
7	0.2 - 0.3 m	Fill/ Sand	20/01/2020	<4	0.5	12	69	290	0.5	11	190	160	<1	<3	4	12000	<1	<2	<1	<25	<50	<25	<50	300	140	<0.2	<0.5	<1	<1	<1	1.7	2.7	20
				100 100	20 NC	100 330	6000 150	300 1100	40 NC	400 65	7400 410	3800 NC	60 NC	4500 NC	100 NC	NC NC	NC NC	200 NC	NC NC	NC NC	NC NC	45 180	110 120	NC 300	NC 2800	0.5 50	160 85	55 70	40 105	3 170	NC 0.7	3 NC	300 NC
7	1.2 - 1.3 m	Fill/ Clay	20/01/2020	7	<0.4	18	31	150	1.4	9	75	100	<1	<3	3	41000	1	<2	<1	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	1.4	2.2	12
				100 100	20 NC	100 590	6000 230	300 1100	40 NC	400 260	7400 790	3800 NC	60 NC	4500 NC	100 NC	NC NC	NC NC	200 NC	NC NC	NC NC	NC NC	90 180	NL 120	NC 1300	NC 5600	1 65	NL 105	NL 125	310 45	NL 170	NC 0.7	3 NC	300 NC

Lab result
HIL/HSL value EIL/ESL value

HIL/HSL exceedance | EIL/ESL exceedance | HIL/HSL and EIL/ESL exceedance | ML exceedance | ML and HIL/HSL or EIL/ESL exceedance

Indicates that asbestos has been detected by the lab below the PQL, refer to the lab report **Blue** = DC exceedance

Bold = Lab detections NT = Not tested NL = Non limiting NC = No criteria NA = Not applicable NAD = No asbestos detected

Notes:

HIL/HSL/DC	NEPC, Schedule B1 - HIL A (undefined), HSL A/B (undefined), DC HSL B (undefined)
EIL/ESL	NEPC, Schedule B1 - EIL UR/POS (undefined), ESL UR/POS (undefined)
ML	NEPC, Schedule B1 - ML R/P/POS (undefined)
a	QA/QC replicate of sample listed directly below the primary sample
b	reported naphthalene laboratory result obtained from BTEXN suite
c	criteria applies to DDT only

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Table J1: Summary of Laboratory Results For Proposed Land Use - Continued

				Phenol	OCP											OPP	PCB	Asbestos
				Phenol	DDT+DDE+DDD c	DDD	DDE	DDT	Aldrin & Dieldrin	Total Chlordane	Total Endosulfan	Endrin	Heptachlor	HCB	Methoxychlor	Chlorpyriphos	Total PCB	Asbestos (50 g)
			Units	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	-
			PQL	5	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	-
Site Assessment Criteria (SAC) - Residential with Accessible Soil																		
HIL A				100	240				6	50	270	10	6	10	300	160	1	
EIL/ ESL		coarse			180													
EIL/ ESL		fine			180													
Management Limit		coarse																
Management Limit		fine																
HSLs - Vapour Intrusion																		
HSL A&B	0-<1m	sand																
HSL A&B	0-<1m	clay																
Laboratory Results																		
Sample ID	Depth	Soil Type	Sampled Date															
1	0.1 - 0.2 m	Fill/ Sand	21/01/2020	-	<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	NAD
					240 180	NC NC	NC NC	NC 180	6 NC	50 NC	270 NC	10 NC	6 NC	10 NC	300 NC	160 NC	1 NC	
1	0.9 - 1 m	Fill/ Sand	21/01/2020	-	<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	NAD
					240 180	NC NC	NC NC	NC 180	6 NC	50 NC	270 NC	10 NC	6 NC	10 NC	300 NC	160 NC	1 NC	
2	0.9 - 1 m	Fill/ Clay	22/01/2020	<5	<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	NAD
				100 NC	240 180	NC NC	NC NC	NC 180	6 NC	50 NC	270 NC	10 NC	6 NC	10 NC	300 NC	160 NC	1 NC	
2	1.9 - 2 m	Fill/ Clay	22/01/2020	<5	<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	NAD
				100 NC	240 180	NC NC	NC NC	NC 180	6 NC	50 NC	270 NC	10 NC	6 NC	10 NC	300 NC	160 NC	1 NC	
2	3.4 - 3.5 m	Fill/ Clay	22/01/2020	<5	<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	NAD
				100 NC	240 180	NC NC	NC NC	NC 180	6 NC	50 NC	270 NC	10 NC	6 NC	10 NC	300 NC	160 NC	1 NC	
3	0 - 0.1 m	Clay	20/01/2020	-	<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	NAD
					240 180	NC NC	NC NC	NC 180	6 NC	50 NC	270 NC	10 NC	6 NC	10 NC	300 NC	160 NC	1 NC	
4	0.4 - 0.5 m	Fill/ Sand	20/01/2020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	0.4 - 0.5 m	Fill/ Sand	20/01/2020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	0.9 - 1 m	Fill/ Sand	20/01/2020	-	<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	NAD
					240 180	NC NC	NC NC	NC 180	6 NC	50 NC	270 NC	10 NC	6 NC	10 NC	300 NC	160 NC	1 NC	
BD1/200120	0.9 - 1 m	Fill/ Sand	20/01/2020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	2.5 - 2.6 m	Clay	20/01/2020	-	<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	-
					240 180	NC NC	NC NC	NC 180	6 NC	50 NC	270 NC	10 NC	6 NC	10 NC	300 NC	160 NC	1 NC	
5	0.4 - 0.5 m	Fill/ Clay	23/01/2020	<5	<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	NAD
				100 NC	240 180	NC NC	NC NC	NC 180	6 NC	50 NC	270 NC	10 NC	6 NC	10 NC	300 NC	160 NC	1 NC	
5	4 - 4.45 m	Clay	23/01/2020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6	0.1 - 0.2 m	Fill/ Sand	24/01/2020	<5	<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	NAD
				100 NC	240 180	NC NC	NC NC	NC 180	6 NC	50 NC	270 NC	10 NC	6 NC	10 NC	300 NC	160 NC	1 NC	
6	0.9 - 1 m	Fill/ Clay	24/01/2020	<5	<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	NAD
				100 NC	240 180	NC NC	NC NC	NC 180	6 NC	50 NC	270 NC	10 NC	6 NC	10 NC	300 NC	160 NC	1 NC	
7	0 - 0.2 m	Fill/ Sand	20/01/2020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NAD
7	0.2 - 0.3 m	Fill/ Sand	20/01/2020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NAD
7	1.2 - 1.3 m	Fill/ Clay	20/01/2020	-	<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	NAD
					240 180	NC NC	NC NC	NC 180	6 NC	50 NC	270 NC	10 NC	6 NC	10 NC	300 NC	160 NC	1 NC	

Lab result
HIL/HSL value EIL/ESL value

HIL/HSL exceedance EIL/ESL exceedance HIL/HSL and EIL/ESL exceedance ML exceedance ML and HIL/HSL or EIL/ESL exceedance

Indicates that asbestos has been detected by the lab below the PQL, refer to the lab report **Blue** = DC exceedance

Bold = Lab detections NT = Not tested NL = Non limiting NC = No criteria NA = Not applicable NAD = No asbestos detected

Notes:

HIL/HSL/DC	NEPC, Schedule B1 - HIL A (undefined), HSL A/B (undefined), DC HSL B (undefined)
EIL/ESL	NEPC, Schedule B1 - EIL UR/POS (undefined), ESL UR/POS (undefined)
ML	NEPC, Schedule B1 - ML R/P/POS (undefined)
a	QA/QC replicate of sample listed directly below the primary sample
b	reported naphthalene laboratory result obtained from BTEXN suite
c	criteria applies to DDT only

Table J2: Summary of Laboratory Results for Groundwater Analysis

Sample ID	Depth [b]	Date Sampled	Hardness	Applicable Soil Type [e]	As	Cd	Cr	Cu	Pb	Hg	Ni	Zn	B	Be	Co	Fe	Mn	Mo	Se	Ag	Total Cyanide	TRH C_6 - C_{10}	TRH >C_{10} - C_{16}	C6-C10 less BTEX (F1)	>C10-C16 less Naphthalene (F2)	>C16-C34	>C34-40	Benzene	Toluene	Ethylbenzene	m+p-xylene	o-xylene	Naphthalene	BaP	Anthracene	Phenanthrene	Fluoranthene	PAH	Total Phenols	OCP	OPP	PCB	Arochlor 1242	Arochlor 1254	Other	VOC
	m bgl		mgCaCO3/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	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	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Groundwater Investigation Levels																																													
Ecological (ANZG, 2018)																																													
GIL (marine water)					-	0.7 (5.5)	4.4/ 27 [c]	1.3	4.4	0.1 (0.4)	7 (70)	15	-	-	1	-	-	-	-	1.4	4	-	-	-	-	-	-	500 (700)	180	80	75 [f]	-	50 (70)	0.1 (0.2)	0.01 (0.4)	0.6 (2)	1 (1.4)	-	0.011 (0.022) [g]	-	-	-	-	-	-	-
Human Health																																													
Recreational Risk [k]					100	20	500	20000	100	10	200	-	40000	600	-	-	5000	500	100	1000	800	-	-	-	-	-	-	10	8000	3000	6000		-	0.1	-	-	-	-	0.1	-	-	-	-	-	-	-
HSL (Residential)																																													
HSL-A&B	2-<4m			Sand	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	1,000	1,000	-	-	800	NL	NL	NL	-	NL	-				-	-	-	-	-	-	-	-
HSL-A&B	2-<4m			Clay	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NL	NL	-	-	5,000	NL	NL	NL	-	NL	-				-	-	-	-	-	-	-	-
Reference Levels																																													
ANZECC low reliability (marine) [h]					*2.3/ 4.5* [i]	-	-	-	-	-	-	-	*5,100*	-	-	-	*80*	*23*	*3*	-	-	-	-	-	-	-	-	-	-	-	*200* [i]	*350*	-	-	-	-	-	-	-	-	-	-	*0.3*	*0.01*	-	-
Laboratory Results																																													
GW4/050220	2.6	5/02/20	72		1	<0.1	<1	<1	<1	<0.05	<1	1	2,600	<0.5	2	7,100	150	3	<1	<1	<0.004	<10	<50	<10	<50	<100	<100	<1	<1	<1	<2	<1	<0.2	<0.1	<0.1	<0.1	<0.1	<PQL	<0.05	<0.001	<0.2	<0.01	<0.01	<0.01	<0.01	<10/<1
BD1/050220 [a]	2.6	5/02/20			1	<0.1	<1	<1	<1	<0.05	<1	3	2,400	<0.5	3	9,300	190	3	<1	<1													<0.2	<0.1	<0.1	<0.1	<0.1	<PQL							

Notes:

a	Replicate sample of sample listed directly above
b	Depth to groundwater as measured immediately prior to sampling
c	Threshold value for Cr (VI) / Cr(III)
d	Threshold value for Cr (VI)
e	Overlying material applying for HSL. Soil type adopted on conservative basis
f	For m-xylene
g	threshold for pentachlorophenol as a conservative screen
h	ANZG (2018), Low reliability values
i	Given in order As(III)/ As(V)
j	For p-xylene
k	Calculated as 10 times the ADWG
<	result less than the laboratory PQL, as provided
-	Not defined/ not analysed/ not applicable
(bracket)	95% LOP provided in brackets when 99% LOP recommended due to bioaccumulation
italics	low reliability
BOLD	Concentration detected at or above the PQL
Shaded	Exceeds GIL or HSL

Abbreviations

ADWG	Australian Drinking Water Guideline		
As	arsenic	OCP	organochlorine pesticides
B	boron	OPP	organophosphorus pesticides
BaP	benzo(a)pyrene	PAH	polycyclic aromatic hydrocarbons
BaP TEQ	benzo(a)pyrene toxic equivalent	Pb	lead
Be	beryllium	PCB	polychlorinated biphenyls
BTEX	benzene, toluene, ethyl benzene, total xylenes	PQL	practical quantitation limit
Cd	cadmium	Se	selenium
Co	cobalt	TPH	total petroleum hydrocarbons
Cr	chromium	TRH	total recoverable hydrocarbons, including total petroleum hydrocarbons (TPH)
Cu	copper	VOC	volatile organic compounds
Fe	iron	Zn	zinc
GIL	groundwater investigation level		
Hg	mercury		
HSL	health screening level		
Mn	manganese		
Mo	molybdenum		
Ni	nickel		
NL	“not limiting” to human health for the proposed land use for vapour intrusion from petroleum hydrocarbons		

Table J3: Summary of Laboratory Results for Acid Sulfate Soil

Sample				Screening Tests				S_{Cr} Suite Laboratory Results								Soil Description
Location	Depth		Date Sampled	pH_F	pH_{FOX}	pH_{FOX} minus pH_F	Reaction	pH_{KCl}	Chromium Reducible Sulphur (S_{Cr})	Total Actual Acidity (s-TAA)	Net Acid Soluble Sulfur (s-S_{NAS})	Acid Neutralising Capacity (s-ANC_{BT})	Net Acidity (excluding ANC)	Net Acidity (excluding ANC)	Liming Rate (excluding ANC)	
	(m)			pH units			-	pH units	(%w/w S)					moles H+/T	kg CaCO3/T	
Investigation Levels																
ASSMAC (1998)																
Screening Indicators					<3.5	≤ -1										
Threshold, >1,000 tonnes, Any Texture									0.03	0.03			0.03	18		
EPA (2014)																
PASS Requirement				≥5.5												
Test Results																
1	/	2.5-2.95	21/01/20	6.4	4.5	**-1.9**	M									CLAY, brown and pale grey, ironstone gravel
1	/	3.0-3.5	21/01/20	6.7	5.1	**-1.6**	M	6.3	<0.005	<0.01	NT	<0.05	<0.005	<5	<0.75	Sandy CLAY, pale brown
1	/	4.0-4.45	21/01/20	6.1	5.4	-0.7	X									
1	/	5.5-5.95	21/01/20	5.6	4.6	**-1**	H									Sandstone, brown
4	/	1.5-1.6	20/01/20	6.6	**3**	**-3.6**	X									FILL/ Sand, dark grey
4	/	2.5-2.95	20/01/20	7.1	**3.5**	**-3.6**	H	5	**0.04**	**0.02**	<0.005	<0.05	**0.053**	**33**	2.5	*Sandy CLAY, pale grey to grey*
4	/	4.0-4.45	20/01/20	7.1	4.7	**-2.4**	H	5.3	**0.006**	<0.01	NT	<0.05	0.012	7.2	<0.75	*Sandy CLAY, mottled brown and pale grey, ironstone gravel*
4	/	5.5-5.95	20/01/20	7	5.9	**-1.1**	H									
5	/	1-1.45	23/01/20	6.9	4.6	**-2.3**	H									Fill/ Sandy CLAY, dark grey
5	/	1.9-2.0	23/01/20	7.1	4.1	**-3**	X									Clayey SAND, orange-brown
5	/	2.5-2.95	23/01/20	6.5	5.9	-0.6	V	5.1	<0.005	**0.03**	NT	<0.05	0.026	16	1.2	Sandy CLAY, dark grey and red-brown
5	/	3.0-3.1	23/01/20	6.5	6.1	-0.4	V	4.9	**0.005**	**0.03**	<0.005	<0.05	**0.031**	**19**	1.4	CLAY, dark grey and red-brown
5	/	4.0-4.45	23/01/20	6.8	5.3	**-1.5**	H									
5	/	4.9-5.0	23/01/20	6.7	4.7	**-2**	H	5.1	<0.005	**0.01**	NT	<0.05	0.013	8.2	<0.75	*Sandy CLAY, pale grey and red-brown*
5	/	5.5-5.9	23/01/20	6.5	5.6	-0.9	X									Clayey SAND, pale grey (residual)
6	/	1.0-1.45	24/01/20	8	6.9	**-1.1**	X									FILL/ Sandy CLAY, dark grey
6	/	1.9-2.0	24/01/20	7.8	5.7	**-2.1**	H									Clayey SAND, orange brown
6	/	2.5-2.95	24/01/20	6.8	4.5	**-2.3**	H									*CLAY, grey and red-brown*
6	/	3.0-3.1	24/01/20	7.2	4.1	**-3.1**	H	7.1	**0.03**	<0.01	NT	0.21	**0.03**	**19**	1.4	
6	/	4.0-4.45	24/01/20	6.5	4.6	**-1.9**	H									
6	/	4.9-5.0	24/01/20	7.5	**3.1**	**-4.4**	H	5.3	**0.08**	**0.01**	<0.005	<0.05	**0.087**	**54**	4.1	*Sandy CLAY, red-brown and pale grey*
6	/	5.5-5.95	24/01/20	6.8	5.8	**-1**	H									
6	/	7-7.45	24/01/20	7.1	6.5	-0.6	H	5.9	<0.005	<0.01	NT	<0.05	0.008	<5	<0.75	Clayey SAND, red-brown

Notes:

Shaded	Exceedance of ASS threshold
Bold	Detectable Scr of TAA possibly from low levels of ASS
Red	Assume ASS requiring treatment
italics	Assume not VENM due to ASS
	Blue line - observed groundwater level during drilling

Reaction Description (after Sullivan et al, 2018)

L	Low reaction
M	Medium reaction
H	High reaction
X	Extreme reaction
V	'Volcanic' reaction
F	denotes frothy reaction (can be indicative of organics)

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Table J4: Summary of Laboratory Results for Waste Classification

				Metals														TRH		BTEX						PAH				Phenol	OCP		OPP	PCB	
				Arsenic	Beryllium	Cadmium	Total Chromium	Copper	Lead	TCLP Lead	Molybdenum	Mercury (inorganic)	TCLP Mercury (inorganic)	Selenium	Nickel	Silver	Silver	Zinc	C6 - C9	C10-C36	Benzene	Toluene	Ethylbenzene	m+p-Xylene	o-Xylene	Xylenes (total)	Benzo(a)pyrene (BaP)	TCLP BaP	Total PAHs	TCLP Total PAHs	Phenol	Total Endosulfan	Total Analysed OCP	Total Analysed OPP	Total PCB	Total Asbestos
	Units			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/L	mg/kg	mg/kg	mg/L	mg/kg	mg/kg	mg/kg	µg/swab	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/L	mg/kg	mg/L	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	-
	PQL			4	1	0.4	1	1	1	0.03	1	0.1	0.0005	2	1	1	0.5	1	25	50	0.2	0.5	1	2	1	3	0.05	0.001	0.05	0.001	5	0.1	0.1	0.1	0.1	
Waste Classification Thresholds (refer to Appendix I)																																			
CT1				100	20	20	100		100	N/A	100	4	N/A	20	40	100	100		650	10000	10	288	600	N/A	N/A	1000	0.8	N/A	200	N/A	288	60	<50	4	<50	N/A
SCC1 / TCLP1				500	100	100	1900		1500	5	1000	50	0.2	50	1050	180	180		650	10000	18	518	1080	N/A	N/A	1800	10	0.04	200	N/A	518	108	<50	7.5	<50	N/A
CT2				400	80	80	400		400	N/A	400	16	N/A	80	160	400	400		2600	40000	40	1152	2400	N/A	N/A	4000	3.2	N/A	800	N/A	1152	240	<50	16	<50	N/A
SCC2 / TCLP2				2000	400	400	7600		6000	20	4000	200	0.8	200	4200	720	720		2600	40000	72	2073	4320	N/A	N/A	7200	23	0.16	800	N/A	2073	432	<50	30	<50	N/A
Published Background Ranges																																			
NEPC (1999)				1-50		1	5-1000	2-100	2-200			0.03			5-500			10-300																		
ANZECC (1992)				0.2-30		0.04-2	0.5-110	1-190	<2-200			0.001-0.1			2-400			2-180																		
ANZECC (2000)				1-53		0.016-0.78	2.5-673	0.4-412	2-81						1-517			1-263																		
Laboratory Results																																			
Bore	Depth	Date	Soil Type																																
1	0.1 - 0.2m	21/01/20	Fill/ Sand	<4	<1	<0.4	**7**	**15**	**25**	-	<1	<0.1	-	<2	**4**	<1	-	**91**	<25	**100**	<0.2	<0.5	<1	<2	<1	<3	<0.05	-	<0.05	-	-	<0.1	<0.1	<0.1	<0.1	NAD
1	0.9 - 1m	21/01/20	Fill/ Sand	**16**	<1	<0.4	**24**	**87**	**510**	**0.2**	<1	**4.7**	<0.0005	<2	**12**	<1	-	**250**	<25	**3200**	<0.2	<0.5	<1	<2	<1	<3	**70**	<0.001	**870**	**0.0067**	-	<0.1	<0.1	<0.1	<0.1	NAD
2	0.9 - 1m	22/01/20	Fill/ Clay	**5**	<1	<0.4	**13**	**28**	**150**	-	<1	**1.5**	-	<2	**4**	<1	-	**140**	<25	<50	<0.2	<0.5	<1	<2	<1	<3	**0.68**	-	**6.7**	-	<5	<0.1	<0.1	<0.1	<0.1	NAD
2	1.9 - 2m	22/01/20	Fill/ Clay	**36**	<1	**1**	**52**	**240**	**1,900**	**0.58**	<1	**47**	<0.0005	<2	**10**	**1**	-	**1100**	<25	**110**	<0.2	<0.5	<1	<2	<1	<3	**1.1**	<0.001	**10**	<PQL	<5	<0.1	<0.1	<0.1	<0.1	NAD
2	3.4 - 3.5m	22/01/20	Clay	**8**	<1	<0.4	**14**	**16**	**120**	-	**11**	**1.8**	-	<2	**2**	<1	-	**73**	<25	<50	<0.2	<0.5	<1	<2	<1	<3	**0.07**	-	**0.3**	-	<5	<0.1	<0.1	<0.1	<0.1	NAD
3	0 - 0.1m	20/01/20	Fill/ Sand	**5**	<1	**0.5**	**9**	**37**	**76**	-	**1**	**0.1**	-	<2	**6**	<1	-	**160**	<25	**520**	<0.2	<0.5	<1	<2	<1	<3	**0.2**	-	**2**	-	-	<0.1	<0.1	<0.1	<0.1	NAD
4	0.4 - 0.5m	20/01/20	Fill/ Sand	**9**	<1	**0.5**	**12**	**97**	**1,100**	**0.89**	**1**	**1.9**	-	<2	**9**	<1	<0.5	**360**	<25	**110**	<0.2	<0.5	<1	<2	<1	<3	**2.6**	<0.001	**35**	<PQL	-	-	-	-	-	-
4	0.9 - 1m	20/01/20	Fill/ Sand	**13**	<1	**0.6**	**12**	**910**	**670**	-	**1**	**2.5**	-	<2	**16**	<1	-	**450**	<25	**330**	<0.2	<0.5	<1	<2	<1	<3	**1.6**	-	**16**	-	-	<0.1	<0.1	<0.1	<0.1	NAD
BD1/200120		20/01/20	Fill/ Sand	**12**	<1	<0.4	**19**	**530**	**890**	**0.49**	**2**	**8.9**	<0.0005	<2	**11**	<1	-	**540**	<25	**270**	<0.2	<0.5	<1	<2	<1	<3	**1.4**	<0.001	**18**	<PQL	-	-	-	-	-	-
4	2.5 - 2.6m	20/01/20	Clay	**13**	<1	<0.4	**15**	**120**	**410**	**1.4**	**16**	**9.2**	<0.0005	<2	**5**	<1	-	**220**	<25	**130**	<0.2	<0.5	<1	<2	<1	<3	**0.2**	-	**2.2**	-	-	<0.1	<0.1	<0.1	<0.1	-
5	0.4 - 0.5m	23/01/20	Fill/ Clay	**6**	<1	**0.9**	**15**	**190**	**650**	-	**1**	**0.5**	-	<2	**8**	<1	-	**230**	<25	**140**	<0.2	<0.5	<1	<2	<1	<3	**0.84**	-	**8.2**	-	<5	<0.1	<0.1	<0.1	<0.1	NAD
5	4 - 4.45m	23/01/20	Clay	<4	<1	<0.4	**4**	**2**	**3**	-	**2**	<0.1	-	<2	<1	<1	-	**1**	<25	<50	<0.2	<0.5	<1	<2	<1	<3	<0.05	-	<0.05	-	-	-	-	-	-	-
6	0.1 - 0.2m	24/01/20	Fill/ Sand	**8**	<1	**0.7**	**20**	**360**	**2,200**	**26**	<1	**0.4**	-	<2	**17**	<1	-	**170**	<25	**130**	<0.2	<0.5	<1	<2	<1	<3	**1.3**	<0.001	**13**	<PQL	<5	<0.1	<0.1	<0.1	<0.1	NAD
6	0.9 - 1m	24/01/20	Fill/ Clay	**6**	<1	<0.4	**10**	**79**	**700**	-	<1	**10**	-	<2	**6**	<1	-	**180**	<25	**110**	<0.2	<0.5	<1	<2	<1	<3	**1.6**	-	**17**	-	<5	<0.1	<0.1	<0.1	<0.1	NAD
7	0 - 0.2m	20/01/20	Fill/ Sand	<4	<1	<0.4	**10**	**27**	**140**	-	<1	**0.3**	-	<2	**8**	<1	-	**100**	<25	<50	<0.2	<0.5	<1	<2	<1	<3	**0.2**	-	**2.2**	-	-	-	-	-	-	NAD
7	0.2 - 0.3m	20/01/20	Fill/ Sand	<4	<1	**0.5**	**12**	**69**	**290**	-	<1	**0.5**	-	<2	**11**	<1	-	**190**	<25	**350**	<0.2	<0.5	<1	<2	<1	<3	**1.7**	-	**20**	-	-	-	-	-	-	NAD
7	1.2 - 1.3m	20/01/20	Fill/ Clay	**7**	<1	<0.4	**18**	**31**	**150**	-	**1**	**1.4**	-	<2	**9**	<1	-	**75**	<25	<50	<0.2	<0.5	<1	<2	<1	<3	**1.4**	-	**12**	-	-	<0.1	<0.1	<0.1	<0.1	NAD

CT1 exceedance TCLP1 and/or SCC1 exceedance CT2 exceedance TCLP2 and/or SCC2 exceedance Asbestos detection

NT = Not tested NC = No criteria AD = Asbestos detected NAD = No asbestos detected

Notes:

*	QA/QC replicate of sample listed directly below the primary sample
**	Total chromium used as initial screen for chromium(VI).
***	Total recoverable hydrocarbons (TRH) used as an initial screen for total petroleum hydrocarbons (TPH)
****	Criteria for scheduled chemicals used as an initial screen
*****	Criteria for Chlorpyrifos used as initial screen
PQL	Practical quantitation limit
CT1	General solid waste without TCLP
SCC1	General solid waste with TCLP
TCLP1	General solid waste TCLP
CT2	Restricted solid waste with TCLP
SCC2	Restricted solid waste TCLP
TCLP2	Restricted solid waste without TCLP

Appendix K

Laboratory Certificates and Chain of Custody Information

Douglas Partners
Geotechnics / Environment / Groundwater

CHAIN OF CUSTODY DESPATCH SHEET

Project No:	99554.01	**Suburb:** Glebe	**To:** Envirolab Services
Project Name:		**Order Number**	12 Ashley St Chatswood 2067
Project Manager:	NLE	**Sampler:** NLE/SI	**Attn:** Aileen Hie
Emails:	nerilee.edwards@douglaspartners.c		**Phone:** (02) 9910 6200
Date Required:	Same day ☐ 24 hours ☐ 48 hours ☐ 72 hours ☐ Standard ☑		**Email:** AHie@envirolab.com.au
Prior Storage:	☐ Esky ☑ Fridge ☐ Shelved	Do samples contain 'potential' HBM? Yes ☐ No ☐ (If YES, then handle, transport and store in accordance with FPM HAZID)	

Sample ID	Lab ID	Date Sampled	Sample Type (S - soil, W - water)	Container Type (G - glass, P - plastic)	Analytes: Combo 8a	Combo 3a	Combo 3	Combo 8	pH, CEC	BTEX	PAH	Heavy Metals	TRH and BTEX	Notes/preservation
1/0.1-0.2	1	21.01.20	S	G	×									See metals to analyse below
1/0.9-1	2	21.01.20	S	G		×		×						
3/0-0.1	3	20.01.20	S	G	×									
4/0.9-1	4	20.01.20	S	G, P	×									
4/2.5-2.6	5	20.01.20	S	G				×						
7/0.2-0.3	6	20.01.20	S	G		×								
7/1.2-1.3	7	20.01.20	S	G	×				×					
BD1/200120	8	20.01.20	S	G			×							
TB1/200120	9	20.01.20	S	G									×	
TS1/200120	10	20.01.20	S	G						×				
BH4/1.9-2.0	11													
extra														
PQL (S) mg/kg												**ANZECC PQLs req'd for all water analytes** ☐		

ENVIROLAB GROUP
Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

Job No: 235035
Date Received: 22-01-2020
Time Received: 1346 14.1°C
Received by: RG
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

PQL = practical quantitation limit. If none given, default to Laboratory Method Detection Limit

Metals to Analyse: As, Be, B, Cd, Cr, Co, Cu, Fe, Pb, Mn, Hg, Mo, Ni, Se, Ag, Zn

Lab Report/Reference No: 235035

Total number of samples in container: **Relinquished by:** NLE **Transported to laboratory by:** Hunter Express

Send Results to: Douglas Partners Pty Ltd **Address:** 96 Hermitage Road West Ryde NSW 2114 **Phone:** (02) 4271 1836 **Fax:** (02) 4271 1897

Signed: **Received by:** ES Syd K Moore **Date & Time:** 22-01-2020 1346

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

SAMPLE RECEIPT ADVICE

Client Details

Client	Douglas Partners Pty Ltd
Attention	Nerilee Edwards

Sample Login Details

Your reference	99554.01, Glebe
Envirolab Reference	235035
Date Sample Received	22/01/2020
Date Instructions Received	22/01/2020
Date Results Expected to be Reported	30/01/2020

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	11 Soil
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	14.1
Cooling Method	Ice Pack
Sampling Date Provided	YES

Comments

Extra - BH4/1.9-2.0

Please direct any queries to:

Aileen Hie	Jacinta Hurst
Phone: 02 9910 6200	**Phone: 02 9910 6200**
Fax: 02 9910 6201	**Fax: 02 9910 6201**
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Analysis Underway, details on the following page:

Envirolab Services Pty Ltd
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Sample ID	vTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Organochlorine Pesticides in soil	Organophosphorus Pesticides in Soil	PCBsin Soil	Acid Extractable metalsin soil	Asbestos ID - soils	Misc Inorg - Soil	CEC	On Hold
1/0.1-0.2	✓	✓	✓	✓	✓	✓	✓	✓			
1/0.9-1	✓	✓	✓	✓	✓	✓	✓	✓			
3/0-0.1	✓	✓	✓	✓	✓	✓	✓	✓			
4/0.9-1	✓	✓	✓	✓	✓	✓	✓	✓			
4/2.5-2.6	✓	✓	✓	✓	✓	✓	✓				
7/0.2-0.3	✓	✓	✓				✓	✓			
7/1.2-1.3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
BD1/200120	✓	✓	✓				✓				
TB1/200120	✓										
TS1/200120	✓										
BH4/1.9-2.0											✓

The '✓' indicates the testing you have requested. **THIS IS NOT A REPORT OF THE RESULTS.**

Additional Info

Sample storage - Waters are routinely disposed of approximately 1 month and soils approximately 2 months from receipt.
Requests for longer term sample storage must be received in writing.
Please contact the laboratory immediately if observed settled sediment present in water samples is to be included in the extraction and/or analysis (exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS analysis where solids are included by default.
TAT for Micro is dependent on incubation. This varies from 3 to 6 days.

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CERTIFICATE OF ANALYSIS 235035

Client Details

Client	Douglas Partners Pty Ltd
Attention	Nerilee Edwards
Address	96 Hermitage Rd, West Ryde, NSW, 2114

Sample Details

Your Reference	**99554.01, Glebe**
Number of Samples	11 Soil
Date samples received	22/01/2020
Date completed instructions received	22/01/2020

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	30/01/2020
Date of Issue	29/01/2020

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Asbestos Approved By
Analysed by Asbestos Approved Identifier: Aida Marner
Authorised by Asbestos Approved Signatory: Lucy Zhu

Results Approved By
Jaimie Loa-Kum-Cheung, Metals Supervisor
Josh Williams, Senior Chemist
Lucy Zhu, Asbestos Supervisor
Priya Samarawickrama, Senior Chemist
Steven Luong, Organics Supervisor

Authorised By

Nancy Zhang, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		235035-1	235035-2	235035-3	235035-4	235035-5
Your Reference	UNITS	1/0.1-0.2	1/0.9-1	3/0-0.1	4/0.9-1	4/2.5-2.6
Date Sampled		21/01/2020	21/01/2020	20/01/2020	20/01/2020	20/01/2020
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	23/01/2020	23/01/2020	23/01/2020	23/01/2020	23/01/2020
Date analysed	-	23/01/2020	23/01/2020	23/01/2020	23/01/2020	23/01/2020
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<3	<3	<3	<3	<3
Surrogate aaa-Trifluorotoluene	%	97	92	95	93	93

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		235035-6	235035-7	235035-8	235035-9	235035-10
Your Reference	UNITS	7/0.2-0.3	7/1.2-1.3	BD1/200120	TB1/200120	TS1/200120
Date Sampled		20/01/2020	20/01/2020	20/01/2020	20/01/2020	20/01/2020
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	23/01/2020	23/01/2020	23/01/2020	23/01/2020	23/01/2020
Date analysed	-	23/01/2020	23/01/2020	23/01/2020	23/01/2020	23/01/2020
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	[NA]
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	[NA]
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	[NA]
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	89%
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	91%
Ethylbenzene	mg/kg	<1	<1	<1	<1	88%
m+p-xylene	mg/kg	<2	<2	<2	<2	89%
o-Xylene	mg/kg	<1	<1	<1	<1	88%
naphthalene	mg/kg	<1	<1	<1	<1	[NA]
Total +ve Xylenes	mg/kg	<3	<3	<3	<3	[NA]
Surrogate aaa-Trifluorotoluene	%	93	98	93	99	90

svTRH (C10-C40) in Soil						
Our Reference		235035-1	235035-2	235035-3	235035-4	235035-5
Your Reference	UNITS	1/0.1-0.2	1/0.9-1	3/0-0.1	4/0.9-1	4/2.5-2.6
Date Sampled		21/01/2020	21/01/2020	20/01/2020	20/01/2020	20/01/2020
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	23/01/2020	23/01/2020	23/01/2020	23/01/2020	23/01/2020
Date analysed	-	24/01/2020	24/01/2020	24/01/2020	24/01/2020	24/01/2020
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	2,000	230	160	<100
TRH C_{29} - C_{36}	mg/kg	100	1,200	290	170	130
TRH >C_{10} -C_{16}	mg/kg	<50	60	77	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	60	77	<50	<50
TRH >C_{16} -C_{34}	mg/kg	130	2,900	380	280	160
TRH >C_{34} -C_{40}	mg/kg	120	600	220	140	120
Total +ve TRH (>C10-C40)	mg/kg	250	3,600	680	430	270
Surrogate o-Terphenyl	%	76	#	78	79	79

svTRH (C10-C40) in Soil				
Our Reference		235035-6	235035-7	235035-8
Your Reference	UNITS	7/0.2-0.3	7/1.2-1.3	BD1/200120
Date Sampled		20/01/2020	20/01/2020	20/01/2020
Type of sample		Soil	Soil	Soil
Date extracted	-	23/01/2020	23/01/2020	23/01/2020
Date analysed	-	24/01/2020	24/01/2020	24/01/2020
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	170	<100	130
TRH C_{29} - C_{36}	mg/kg	180	<100	140
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	300	<100	230
TRH >C_{34} -C_{40}	mg/kg	140	<100	120
Total +ve TRH (>C10-C40)	mg/kg	440	<50	350
Surrogate o-Terphenyl	%	102	67	68

PAHs in Soil						
Our Reference		235035-1	235035-2	235035-3	235035-4	235035-5
Your Reference	UNITS	1/0.1-0.2	1/0.9-1	3/0-0.1	4/0.9-1	4/2.5-2.6
Date Sampled		21/01/2020	21/01/2020	20/01/2020	20/01/2020	20/01/2020
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	23/01/2020	23/01/2020	23/01/2020	23/01/2020	23/01/2020
Date analysed	-	23/01/2020	23/01/2020	23/01/2020	23/01/2020	23/01/2020
Naphthalene	mg/kg	<0.1	0.7	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	0.6	<0.1	0.2	<0.1
Acenaphthene	mg/kg	<0.1	8.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	5.7	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	88	0.1	1	0.2
Anthracene	mg/kg	<0.1	18	<0.1	0.3	<0.1
Fluoranthene	mg/kg	<0.1	180	0.3	2.2	0.4
Pyrene	mg/kg	<0.1	140	0.3	2.1	0.3
Benzo(a)anthracene	mg/kg	<0.1	85	0.3	1.9	0.3
Chrysene	mg/kg	<0.1	72	0.3	2.0	0.4
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	120	0.3	2.5	0.3
Benzo(a)pyrene	mg/kg	<0.05	70	0.2	1.6	0.2
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	34	0.1	0.8	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	13	<0.1	0.3	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	36	0.1	0.9	0.1
Total +ve PAH's	mg/kg	<0.05	870	2.0	16	2.2
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	110	<0.5	2.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	110	<0.5	2.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	110	<0.5	2.5	<0.5
Surrogate p-Terphenyl-d14	%	94	98	85	95	88

PAHs in Soil				
Our Reference		235035-6	235035-7	235035-8
Your Reference	UNITS	7/0.2-0.3	7/1.2-1.3	BD1/200120
Date Sampled		20/01/2020	20/01/2020	20/01/2020
Type of sample		Soil	Soil	Soil
Date extracted	-	23/01/2020	23/01/2020	23/01/2020
Date analysed	-	23/01/2020	23/01/2020	23/01/2020
Naphthalene	mg/kg	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	0.1	0.2	0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	1.1	0.5	2.2
Anthracene	mg/kg	0.2	0.2	0.5
Fluoranthene	mg/kg	3.5	1.6	3.0
Pyrene	mg/kg	3.0	1.6	2.4
Benzo(a)anthracene	mg/kg	2.5	1.5	2.1
Chrysene	mg/kg	2.6	1.6	2.1
Benzo(b,j+k)fluoranthene	mg/kg	2.8	2.0	2.3
Benzo(a)pyrene	mg/kg	1.7	1.4	1.4
Indeno(1,2,3-c,d)pyrene	mg/kg	0.9	0.7	0.6
Dibenzo(a,h)anthracene	mg/kg	0.4	0.3	0.2
Benzo(g,h,i)perylene	mg/kg	1.2	0.8	0.7
Total +ve PAH's	mg/kg	20	12	18
Benzo(a)pyrene TEQ calc (zero)	mg/kg	2.7	2.2	2.1
Benzo(a)pyrene TEQ calc(half)	mg/kg	2.7	2.2	2.1
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	2.7	2.2	2.1
Surrogate p-Terphenyl-d14	%	94	90	93

Organochlorine Pesticides in soil						
Our Reference		235035-1	235035-2	235035-3	235035-4	235035-5
Your Reference	UNITS	1/0.1-0.2	1/0.9-1	3/0-0.1	4/0.9-1	4/2.5-2.6
Date Sampled		21/01/2020	21/01/2020	20/01/2020	20/01/2020	20/01/2020
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	23/01/2020	23/01/2020	23/01/2020	23/01/2020	23/01/2020
Date analysed	-	23/01/2020	23/01/2020	23/01/2020	23/01/2020	23/01/2020
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
HCB	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
gamma-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
Endosulfan II	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
Endrin Aldehyde	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
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	90	90	80	89	84

Organochlorine Pesticides in soil		
Our Reference		235035-7
Your Reference	UNITS	7/1.2-1.3
Date Sampled		20/01/2020
Type of sample		Soil
Date extracted	-	23/01/2020
Date analysed	-	23/01/2020
alpha-BHC	mg/kg	<0.1
HCB	mg/kg	<0.1
beta-BHC	mg/kg	<0.1
gamma-BHC	mg/kg	<0.1
Heptachlor	mg/kg	<0.1
delta-BHC	mg/kg	<0.1
Aldrin	mg/kg	<0.1
Heptachlor Epoxide	mg/kg	<0.1
gamma-Chlordane	mg/kg	<0.1
alpha-chlordane	mg/kg	<0.1
Endosulfan I	mg/kg	<0.1
pp-DDE	mg/kg	<0.1
Dieldrin	mg/kg	<0.1
Endrin	mg/kg	<0.1
Endosulfan II	mg/kg	<0.1
pp-DDD	mg/kg	<0.1
Endrin Aldehyde	mg/kg	<0.1
pp-DDT	mg/kg	<0.1
Endosulfan Sulphate	mg/kg	<0.1
Methoxychlor	mg/kg	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1
Surrogate TCMX	%	86

Organophosphorus Pesticides in Soil						
Our Reference		235035-1	235035-2	235035-3	235035-4	235035-5
Your Reference	UNITS	1/0.1-0.2	1/0.9-1	3/0-0.1	4/0.9-1	4/2.5-2.6
Date Sampled		21/01/2020	21/01/2020	20/01/2020	20/01/2020	20/01/2020
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	23/01/2020	23/01/2020	23/01/2020	23/01/2020	23/01/2020
Date analysed	-	23/01/2020	23/01/2020	23/01/2020	23/01/2020	23/01/2020
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
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
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
Chlorpyriphos	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
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	90	90	80	89	84

Organophosphorus Pesticides in Soil		
Our Reference		235035-7
Your Reference	UNITS	7/1.2-1.3
Date Sampled		20/01/2020
Type of sample		Soil
Date extracted	-	23/01/2020
Date analysed	-	23/01/2020
Dichlorvos	mg/kg	<0.1
Dimethoate	mg/kg	<0.1
Diazinon	mg/kg	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1
Ronnel	mg/kg	<0.1
Fenitrothion	mg/kg	<0.1
Malathion	mg/kg	<0.1
Chlorpyriphos	mg/kg	<0.1
Parathion	mg/kg	<0.1
Bromophos-ethyl	mg/kg	<0.1
Ethion	mg/kg	<0.1
Azinphos-methyl (Guthion)	mg/kg	<0.1
Surrogate TCMX	%	86

PCBs in Soil						
Our Reference		235035-1	235035-2	235035-3	235035-4	235035-5
Your Reference	UNITS	1/0.1-0.2	1/0.9-1	3/0-0.1	4/0.9-1	4/2.5-2.6
Date Sampled		21/01/2020	21/01/2020	20/01/2020	20/01/2020	20/01/2020
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	23/01/2020	23/01/2020	23/01/2020	23/01/2020	23/01/2020
Date analysed	-	23/01/2020	23/01/2020	23/01/2020	23/01/2020	23/01/2020
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	90	90	80	89	84

PCBs in Soil		
Our Reference		235035-7
Your Reference	UNITS	7/1.2-1.3
Date Sampled		20/01/2020
Type of sample		Soil
Date extracted	-	23/01/2020
Date analysed	-	23/01/2020
Aroclor 1016	mg/kg	<0.1
Aroclor 1221	mg/kg	<0.1
Aroclor 1232	mg/kg	<0.1
Aroclor 1242	mg/kg	<0.1
Aroclor 1248	mg/kg	<0.1
Aroclor 1254	mg/kg	<0.1
Aroclor 1260	mg/kg	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1
Surrogate TCMX	%	86

Acid Extractable metals in soil						
Our Reference		235035-1	235035-2	235035-3	235035-4	235035-5
Your Reference	UNITS	1/0.1-0.2	1/0.9-1	3/0-0.1	4/0.9-1	4/2.5-2.6
Date Sampled		21/01/2020	21/01/2020	20/01/2020	20/01/2020	20/01/2020
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	23/01/2020	23/01/2020	23/01/2020	23/01/2020	23/01/2020
Date analysed	-	23/01/2020	23/01/2020	23/01/2020	23/01/2020	23/01/2020
Arsenic	mg/kg	<4	16	5	13	13
Cadmium	mg/kg	<0.4	<0.4	0.5	0.6	<0.4
Chromium	mg/kg	7	24	9	12	15
Copper	mg/kg	15	87	37	910	120
Lead	mg/kg	25	510	76	670	410
Mercury	mg/kg	<0.1	4.7	0.1	2.5	9.2
Nickel	mg/kg	4	12	6	16	5
Zinc	mg/kg	91	250	160	450	220
Beryllium	mg/kg	<1	<1	<1	<1	<1
Boron	mg/kg	<3	<3	6	5	<3
Cobalt	mg/kg	4	5	4	6	2
Iron	mg/kg	9,100	32,000	7,700	34,000	20,000
Manganese	mg/kg	210	200	210	340	58
Molybdenum	mg/kg	<1	<1	1	1	16
Selenium	mg/kg	<2	<2	<2	<2	<2
Silver	mg/kg	<1	<1	<1	<1	<1

Acid Extractable metals in soil				
Our Reference		235035-6	235035-7	235035-8
Your Reference	UNITS	7/0.2-0.3	7/1.2-1.3	BD1/200120
Date Sampled		20/01/2020	20/01/2020	20/01/2020
Type of sample		Soil	Soil	Soil
Date prepared	-	23/01/2020	23/01/2020	23/01/2020
Date analysed	-	23/01/2020	23/01/2020	23/01/2020
Arsenic	mg/kg	<4	7	12
Cadmium	mg/kg	0.5	<0.4	<0.4
Chromium	mg/kg	12	18	19
Copper	mg/kg	69	31	530
Lead	mg/kg	290	150	890
Mercury	mg/kg	0.5	1.4	8.9
Nickel	mg/kg	11	9	11
Zinc	mg/kg	190	75	540
Beryllium	mg/kg	<1	<1	<1
Boron	mg/kg	<3	<3	<3
Cobalt	mg/kg	4	3	4
Iron	mg/kg	12,000	41,000	28,000
Manganese	mg/kg	160	100	140
Molybdenum	mg/kg	<1	1	2
Selenium	mg/kg	<2	<2	<2
Silver	mg/kg	<1	<1	<1

Moisture						
Our Reference		235035-1	235035-2	235035-3	235035-4	235035-5
Your Reference	UNITS	1/0.1-0.2	1/0.9-1	3/0-0.1	4/0.9-1	4/2.5-2.6
Date Sampled		21/01/2020	21/01/2020	20/01/2020	20/01/2020	20/01/2020
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	23/01/2020	23/01/2020	23/01/2020	23/01/2020	23/01/2020
Date analysed	-	24/01/2020	24/01/2020	24/01/2020	24/01/2020	24/01/2020
Moisture	%	11	14	9.8	16	19

Moisture				
Our Reference		235035-6	235035-7	235035-8
Your Reference	UNITS	7/0.2-0.3	7/1.2-1.3	BD1/200120
Date Sampled		20/01/2020	20/01/2020	20/01/2020
Type of sample		Soil	Soil	Soil
Date prepared	-	23/01/2020	23/01/2020	23/01/2020
Date analysed	-	24/01/2020	24/01/2020	24/01/2020
Moisture	%	11	10	16

Asbestos ID - soils						
Our Reference		235035-1	235035-2	235035-3	235035-4	235035-6
Your Reference	UNITS	1/0.1-0.2	1/0.9-1	3/0-0.1	4/0.9-1	7/0.2-0.3
Date Sampled		21/01/2020	21/01/2020	20/01/2020	20/01/2020	20/01/2020
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	24/01/2020	24/01/2020	24/01/2020	24/01/2020	24/01/2020
Sample mass tested	g	Approx. 25g	Approx. 25g	Approx. 25g	Approx. 30g	Approx. 30g
Sample Description	-	Brown sandy soil & rocks	Brown sandy soil & rocks	Brown sandy soil & rocks	Brown sandy soil & rocks	Brown sandy 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		235035-7
Your Reference	UNITS	7/1.2-1.3
Date Sampled		20/01/2020
Type of sample		Soil
Date analysed	-	24/01/2020
Sample mass tested	g	Approx. 30g
Sample Description	-	Brown sandy soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected

Misc Inorg - Soil		
Our Reference		235035-7
Your Reference	UNITS	7/1.2-1.3
Date Sampled		20/01/2020
Type of sample		Soil
Date prepared	-	24/01/2020
Date analysed	-	24/01/2020
pH 1:5 soil:water	pH Units	8.4

CEC		
Our Reference		235035-7
Your Reference	UNITS	7/1.2-1.3
Date Sampled		20/01/2020
Type of sample		Soil
Date prepared	-	24/01/2020
Date analysed	-	28/01/2020
Exchangeable Ca	meq/100g	17
Exchangeable K	meq/100g	0.1
Exchangeable Mg	meq/100g	0.33
Exchangeable Na	meq/100g	<0.1
Cation Exchange Capacity	meq/100g	17

Method ID	Methodology Summary
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.
AT-008	Determination of VOCs sampled onto coconut shell charcoal sorbent tubes, that can be desorbed using carbon disulphide, and analysed by GC-MS.
Inorg-001	pH - Measured using pH meter and electrode in accordance with APHA latest edition, 4500-H+. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times.
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Metals-009	Determination of exchangeable cations and cation exchange capacity in soils using 1M Ammonium Chloride exchange and ICP-AES analytical finish.
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
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. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD. Note, the Total +ve PCBs PQL is reflective of the lowest individual PQL and is therefore" Total +ve PCBs" is simply a sum of the positive individual PCBs.
Org-012/017	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS and/or GC-MS/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. Note, the Total +ve reported DDD+DDE+DDT PQL is reflective of the lowest individual PQL and is therefore simply a sum of the positive individually report DDD+DDE+DDT.

Method ID	Methodology Summary
Org-012/017	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS and/or GC-MS/MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013. For soil results:- 1. 'EQ PQL'values are assuming all contributing PAHs reported as <PQL are actually at the PQL. This is the most conservative approach and can give false positive TEQs given that PAHs that contribute to the TEQ calculation may not be present. 2. 'EQ zero'values are assuming all contributing PAHs reported as <PQL are zero. This is the least conservative approach and is more susceptible to false negative TEQs when PAHs that contribute to the TEQ calculation are present but below PQL. 3. 'EQ half PQL'values are assuming all contributing PAHs reported as <PQL are half the stipulated PQL. Hence a mid-point between the most and least conservative approaches above. 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-014	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
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. Note, the Total +ve Xylene PQL is reflective of the lowest individual PQL and is therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes.

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	[NT]
Date extracted	-			23/01/2020	1	23/01/2020	23/01/2020		23/01/2020	[NT]
Date analysed	-			23/01/2020	1	23/01/2020	23/01/2020		23/01/2020	[NT]
TRH C_6 - C_9	mg/kg	25	Org-016	<25	1	<25	<25	0	110	[NT]
TRH C_6 - C_{10}	mg/kg	25	Org-016	<25	1	<25	<25	0	110	[NT]
Benzene	mg/kg	0.2	Org-016	<0.2	1	<0.2	<0.2	0	102	[NT]
Toluene	mg/kg	0.5	Org-016	<0.5	1	<0.5	<0.5	0	103	[NT]
Ethylbenzene	mg/kg	1	Org-016	<1	1	<1	<1	0	113	[NT]
m+p-xylene	mg/kg	2	Org-016	<2	1	<2	<2	0	116	[NT]
o-Xylene	mg/kg	1	Org-016	<1	1	<1	<1	0	112	[NT]
naphthalene	mg/kg	1	Org-014	<1	1	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	103	1	97	98	1	106	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	[NT]
Date extracted	-			23/01/2020	1	23/01/2020	23/01/2020		23/01/2020	[NT]
Date analysed	-			24/01/2020	1	24/01/2020	24/01/2020		24/01/2020	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-003	<50	1	<50	<50	0	84	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-003	<100	1	<100	<100	0	82	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-003	<100	1	100	100	0	92	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-003	<50	1	<50	<50	0	84	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-003	<100	1	130	110	17	82	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-003	<100	1	120	110	9	92	[NT]
Surrogate o-Terphenyl	%		Org-003	67	1	76	76	0	100	[NT]

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	[NT]
Date extracted	-			23/01/2020	1	23/01/2020	23/01/2020		23/01/2020	[NT]
Date analysed	-			23/01/2020	1	23/01/2020	23/01/2020		23/01/2020	[NT]
Naphthalene	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	88	[NT]
Acenaphthylene	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	86	[NT]
Phenanthrene	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	94	[NT]
Anthracene	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	92	[NT]
Pyrene	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	88	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	110	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-012/017	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-012/017	<0.05	1	<0.05	0.06	18	94	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012/017	99	1	94	97	3	94	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	[NT]
Date extracted	-			23/01/2020	1	23/01/2020	23/01/2020		23/01/2020	[NT]
Date analysed	-			23/01/2020	1	23/01/2020	23/01/2020		23/01/2020	[NT]
alpha-BHC	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	100	[NT]
HCB	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	96	[NT]
gamma-BHC	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	90	[NT]
delta-BHC	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	106	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	100	[NT]
gamma-Chlordane	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	104	[NT]
Dieldrin	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	114	[NT]
Endrin	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	94	[NT]
Endosulfan II	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	100	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	110	[NT]
Methoxychlor	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-012/017	92	1	90	93	3	88	[NT]

QUALITY CONTROL: Organophosphorus Pesticides in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	[NT]
Date extracted	-			23/01/2020	1	23/01/2020	23/01/2020		23/01/2020	[NT]
Date analysed	-			23/01/2020	1	23/01/2020	23/01/2020		23/01/2020	[NT]
Dichlorvos	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	86	[NT]
Dimethoate	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos-methyl	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	104	[NT]
Fenitrothion	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	98	[NT]
Malathion	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	90	[NT]
Chlorpyriphos	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	106	[NT]
Parathion	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	102	[NT]
Bromophos-ethyl	mg/kg	0.1	AT-008	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	100	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-012/017	92	1	90	93	3	88	[NT]

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	[NT]
Date extracted	-			23/01/2020	1	23/01/2020	23/01/2020		23/01/2020	[NT]
Date analysed	-			23/01/2020	1	23/01/2020	23/01/2020		23/01/2020	[NT]
Aroclor 1016	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	87	[NT]
Aroclor 1260	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-006	92	1	90	93	3	88	[NT]

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	[NT]
Date prepared	-			23/01/2020	1	23/01/2020	23/01/2020		23/01/2020	[NT]
Date analysed	-			23/01/2020	1	23/01/2020	23/01/2020		23/01/2020	[NT]
Arsenic	mg/kg	4	Metals-020	<4	1	<4	<4	0	110	[NT]
Cadmium	mg/kg	0.4	Metals-020	<0.4	1	<0.4	<0.4	0	106	[NT]
Chromium	mg/kg	1	Metals-020	<1	1	7	7	0	108	[NT]
Copper	mg/kg	1	Metals-020	<1	1	15	17	12	103	[NT]
Lead	mg/kg	1	Metals-020	<1	1	25	27	8	111	[NT]
Mercury	mg/kg	0.1	Metals-021	<0.1	1	<0.1	<0.1	0	98	[NT]
Nickel	mg/kg	1	Metals-020	<1	1	4	5	22	108	[NT]
Zinc	mg/kg	1	Metals-020	<1	1	91	100	9	110	[NT]
Beryllium	mg/kg	1	Metals-020	<1	1	<1	<1	0	107	[NT]
Boron	mg/kg	3	Metals-020	<3	1	<3	<3	0	96	[NT]
Cobalt	mg/kg	1	Metals-020	<1	1	4	4	0	104	[NT]
Iron	mg/kg	10	Metals-020	<10	1	9100	8700	4	117	[NT]
Manganese	mg/kg	1	Metals-020	<1	1	210	230	9	106	[NT]
Molybdenum	mg/kg	1	Metals-020	<1	1	<1	<1	0	104	[NT]
Selenium	mg/kg	2	Metals-020	<2	1	<2	<2	0	98	[NT]
Silver	mg/kg	1	Metals-020	<1	1	<1	<1	0	80	[NT]

QUALITY CONTROL: Misc Inorg - Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	[NT]
Date prepared	-			24/01/2020	[NT]	[NT]	[NT]	[NT]	24/01/2020	[NT]
Date analysed	-			24/01/2020	[NT]	[NT]	[NT]	[NT]	24/01/2020	[NT]
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	[NT]	[NT]	[NT]	[NT]	101	[NT]

QUALITY CONTROL: CEC					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	[NT]
Date prepared	-			24/01/2020	[NT]	[NT]	[NT]	[NT]	24/01/2020	[NT]
Date analysed	-			28/01/2020	[NT]	[NT]	[NT]	[NT]	28/01/2020	[NT]
Exchangeable Ca	meq/100g	0.1	Metals-009	<0.1	[NT]	[NT]	[NT]	[NT]	111	[NT]
Exchangeable K	meq/100g	0.1	Metals-009	<0.1	[NT]	[NT]	[NT]	[NT]	110	[NT]
Exchangeable Mg	meq/100g	0.1	Metals-009	<0.1	[NT]	[NT]	[NT]	[NT]	112	[NT]
Exchangeable Na	meq/100g	0.1	Metals-009	<0.1	[NT]	[NT]	[NT]	[NT]	109	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

Report Comments

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 235035-1-3, 6 & 7 were sub-sampled from jars provided by the client.

Asbestos: Excessive sample volume was provided for asbestos analysis.
A portion of the supplied sample was sub-sampled according to Envirolab procedures. We cannot guarantee that this sub-sample is indicative of the entire sample.
Envirolab recommends supplying 40-50g (50mL) of sample in its own container as per AS4964-2004.
Note: Sample 235035-4 was sub-sampled from a bag provided by the client.

TRH Soil C10-C40 NEPM - # Percent recovery for the surrogate is not possible to report as the high concentration of analytes in sample 235035-2 has caused interference.

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ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

CERTIFICATE OF ANALYSIS 235035-B

Client Details

Client	Douglas Partners Pty Ltd
Attention	Nerilee Edwards
Address	96 Hermitage Rd, West Ryde, NSW, 2114

Sample Details

Your Reference	**99554.01, Glebe**
Number of Samples	Additional Testing on 3 Soils
Date samples received	22/01/2020
Date completed instructions received	30/01/2020

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Report Details

Date results requested by	06/02/2020
Date of Issue	06/02/2020

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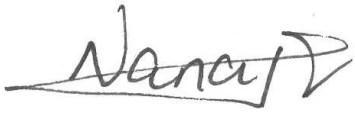
Asbestos Approved By
Analysed by Asbestos Approved Identifier: Aida Marner
Authorised by Asbestos Approved Signatory: Lucy Zhu

Results Approved By
Josh Williams, Senior Chemist
Loren Bardwell, Senior Chemist

Authorised By



Nancy Zhang, Laboratory Manager

Metals in TCLP USEPA1311				
Our Reference		235035-B-2	235035-B-5	235035-B-8
Your Reference	UNITS	1/0.9-1	4/2.5-2.6	BD1/200120
Type of sample		Soil	Soil	Soil
Date extracted	-	03/02/2020	03/02/2020	03/02/2020
Date analysed	-	03/02/2020	03/02/2020	03/02/2020
pH of soil for fluid# determ.	pH units	9.3	7.2	7.8
pH of soil TCLP (after HCl)	pH units	2.0	5.0	1.7
Extraction fluid used	-	1	1	1
pH of final Leachate	pH units	5.3	5.0	5.1
Arsenic in TCLP	mg/L	<0.05	<0.05	<0.05
Cadmium in TCLP	mg/L	<0.01	<0.01	<0.01
Chromium in TCLP	mg/L	<0.01	<0.01	<0.01
Copper in TCLP	mg/L	0.04	0.08	0.3
Lead in TCLP	mg/L	0.2	1.4	0.49
Mercury in TCLP	mg/L	<0.0005	<0.0005	<0.0005
Nickel in TCLP	mg/L	<0.02	<0.02	<0.02
Zinc in TCLP	mg/L	0.9	1.1	2.1

PAHs in TCLP (USEPA 1311)			
Our Reference	UNITS	235035-B-2	235035-B-8
Your Reference		1/0.9-1	BD1/200120
Type of sample		Soil	Soil
Date extracted	-	03/02/2020	03/02/2020
Date analysed	-	03/02/2020	03/02/2020
Naphthalene in TCLP	mg/L	<0.001	<0.001
Acenaphthylene in TCLP	mg/L	<0.001	<0.001
Acenaphthene in TCLP	mg/L	0.002	<0.001
Fluorene in TCLP	mg/L	0.001	<0.001
Phenanthrene in TCLP	mg/L	0.004	<0.001
Anthracene in TCLP	mg/L	<0.001	<0.001
Fluoranthene in TCLP	mg/L	<0.001	<0.001
Pyrene in TCLP	mg/L	<0.001	<0.001
Benzo(a)anthracene in TCLP	mg/L	<0.001	<0.001
Chrysene in TCLP	mg/L	<0.001	<0.001
Benzo(bjk)fluoranthene in TCLP	mg/L	<0.002	<0.002
Benzo(a)pyrene in TCLP	mg/L	<0.001	<0.001
Indeno(1,2,3-c,d)pyrene - TCLP	mg/L	<0.001	<0.001
Dibenzo(a,h)anthracene in TCLP	mg/L	<0.001	<0.001
Benzo(g,h,i)perylene in TCLP	mg/L	<0.001	<0.001
Total +ve PAH's	mg/L	0.0067	NIL (+)VE
Surrogate p-Terphenyl-d14	%	93	106

Method ID	Methodology Summary
EXTRACT.7	Toxicity Characteristic Leaching Procedure (TCLP) using Zero Headspace Extraction (zHE) using AS4439 and USEPA 1311.
Inorg-001	pH - Measured using pH meter and electrode in accordance with APHA latest edition, 4500-H+. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times.
Inorg-004	Toxicity Characteristic Leaching Procedure (TCLP) using in house method INORG-004. Please note that the mass used may be scaled down from the default based on sample mass available.
Metals-020 ICP-AES	Determination of various metals by ICP-AES.
Metals-021 CV-AAS	Determination of Mercury by Cold Vapour AAS.
Org-012/017	Leachates are extracted with Dichloromethane and analysed by GC-MS and/or GC-MS/MS.

QUALITY CONTROL: Metals in TCLP USEPA1311						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			03/02/2020	2	03/02/2020	03/02/2020		03/02/2020	[NT]
Date analysed	-			03/02/2020	2	03/02/2020	03/02/2020		03/02/2020	[NT]
Arsenic in TCLP	mg/L	0.05	Metals-020 ICP-AES	<0.05	2	<0.05	<0.05	0	115	[NT]
Cadmium in TCLP	mg/L	0.01	Metals-020 ICP-AES	<0.01	2	<0.01	<0.01	0	105	[NT]
Chromium in TCLP	mg/L	0.01	Metals-020 ICP-AES	<0.01	2	<0.01	<0.01	0	103	[NT]
Copper in TCLP	mg/L	0.01	Metals-020 ICP-AES	<0.01	2	0.04	0.04	0	119	[NT]
Lead in TCLP	mg/L	0.03	Metals-020 ICP-AES	<0.03	2	0.2	0.1	67	103	[NT]
Mercury in TCLP	mg/L	0.0005	Metals-021 CV-AAS	<0.0005	2	<0.0005	<0.0005	0	101	[NT]
Nickel in TCLP	mg/L	0.02	Metals-020 ICP-AES	<0.02	2	<0.02	<0.02	0	105	[NT]
Zinc in TCLP	mg/L	0.02	Metals-020 ICP-AES	<0.02	2	0.9	0.9	0	105	[NT]

QUALITY CONTROL: PAHs in TCLP (USEPA 1311)					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	235035-B-2
Date extracted	-			03/02/2020	[NT]	[NT]	[NT]	[NT]	03/02/2020	03/02/2020
Date analysed	-			03/02/2020	[NT]	[NT]	[NT]	[NT]	03/02/2020	03/02/2020
Naphthalene in TCLP	mg/L	0.001	Org-012/017	<0.001	[NT]	[NT]	[NT]	[NT]	118	105
Acenaphthylene in TCLP	mg/L	0.001	Org-012/017	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene in TCLP	mg/L	0.001	Org-012/017	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluorene in TCLP	mg/L	0.001	Org-012/017	<0.001	[NT]	[NT]	[NT]	[NT]	112	107
Phenanthrene in TCLP	mg/L	0.001	Org-012/017	<0.001	[NT]	[NT]	[NT]	[NT]	120	138
Anthracene in TCLP	mg/L	0.001	Org-012/017	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene in TCLP	mg/L	0.001	Org-012/017	<0.001	[NT]	[NT]	[NT]	[NT]	116	105
Pyrene in TCLP	mg/L	0.001	Org-012/017	<0.001	[NT]	[NT]	[NT]	[NT]	120	138
Benzo(a)anthracene in TCLP	mg/L	0.001	Org-012/017	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene in TCLP	mg/L	0.001	Org-012/017	<0.001	[NT]	[NT]	[NT]	[NT]	110	99
Benzo(bjk)fluoranthene in TCLP	mg/L	0.002	Org-012/017	<0.002	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene in TCLP	mg/L	0.001	Org-012/017	<0.001	[NT]	[NT]	[NT]	[NT]	102	89
Indeno(1,2,3-c,d)pyrene - TCLP	mg/L	0.001	Org-012/017	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene in TCLP	mg/L	0.001	Org-012/017	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene in TCLP	mg/L	0.001	Org-012/017	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012/017	116	[NT]	[NT]	[NT]	[NT]	111	109

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

The recommended maximums for analytes in urine are taken from “2018 TLVs and BEIs”, as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.

Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2

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: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

Douglas Partners
Geotechnics | Environment | Groundwater

CHAIN OF CUSTODY DESPATCH SHEET

Project No:	99554.01	**Suburb:**	Glebe	**To:**	Envirolab Services
Project Name:		**Order Number**			12 Ashley St Chatswood 2067
Project Manager:	NLE	**Sampler:**	IT	**Attn:**	Aileen Hie
Emails:	nerilee.edwards@douglaspartners.com.au			**Phone:**	(02) 9910 6200
Date Required:	Same day ☐ 24 hours ☐ 48 hours ☐ 72 hours ☐ Standard ☑			**Email:**	AHie@envirolab.com.au
Prior Storage:	☐ Esky ☑ Fridge ☐ Shelved	Do samples contain 'potential' HBM?	Yes ☐ No ☐ (If YES, then handle, transport and store in accordance with FPM HAZID)		

Sample ID	Lab ID	Date Sampled	Sample Type (S - soil W - water)	Container Type (G - glass P - plastic)	Analytes: Combo 8a	Combo 3a	Combo 3	Combo 8	pH, CEC	BTEX	PAH	Heavy Metals	TRH and BTEX	Notes/preservation
2/0.9-1	1	22.01.20	S	G	×									See metals to analyse below
2/1.9-2	2	22.01.20	S	G	×									
2/3.4-3.5	3	22.01.20	S	G	×				×					
5/0.4-0.5	4	23.01.20	S	G	×				×					
5/4-4.45	5	23.01.20	S	G			×							
6/0.1-0.2	6	24.01.20	S	G	×									
6/0.9-1	7	24.01.20	S	G	×									
7/0-0.2	8	20.01.20	S	G		×								
TB1/220120	9	22.01.20	S	G									×	
TS1/220120	10	22.01.20	S	G						×				
PQL (S) mg/kg												**ANZECC PQLs req'd for all water analytes** ☐		

Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

Job No: 235387
Date Received: 28.01.2020
Time Received: 12:28
Received by: TC.
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

PQL = practical quantitation limit. If none given, default to Laboratory Method Detection Limit

Metals to Analyse: As, Be, B, Cd, Cr, Co, Cu, Fe, Pb, Mn, Hg, Mo, Ni, Se, Ag, Zn

Lab Report/Reference No: 235387

Total number of samples in container: | **Relinquished by:** NLE | **Transported to laboratory by:** Hunter Express

Send Results to: Douglas Partners Pty Ltd | **Address:** 96 Hermitage Road West Ryde NSW 2114 | **Phone:** (02) 4271 1836 **Fax:** (02) 4271 1897

Signed: | **Received by:** ES, Trudad Gomes | **Date & Time:** 28.01.20

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12 Ashley St Chatswood NSW 2067
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customerservice@envirolab.com.au
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SAMPLE RECEIPT ADVICE

Client Details

Client	Douglas Partners Pty Ltd
Attention	Nerilee Edwards

Sample Login Details

Your reference	99554.01, Glebe
Envirolab Reference	235387
Date Sample Received	22/01/2020
Date Instructions Received	28/01/2020
Date Results Expected to be Reported	04/02/2020

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	10 Soil
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	16.0
Cooling Method	Ice Pack
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

Aileen Hie	Jacinta Hurst
Phone: 02 9910 6200	**Phone: 02 9910 6200**
Fax: 02 9910 6201	**Fax: 02 9910 6201**
Email: ahie@envirolab.com.au	**Email: jhurst@envirolab.com.au**

Analysis Underway, details on the following page:

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

Sample ID	vTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Organochlorine Pesticides in soil	Organophosphorus Pesticides in Soil	PCBsin Soil	Acid Extractable metalsin soil	Misc Soil - Inorg	Asbestos ID - soils	Misc Inorg - Soil	CEC
2-0.9-1.0	✓	✓	✓	✓	✓	✓	✓	✓	✓		
2-1.9-2.0	✓	✓	✓	✓	✓	✓	✓	✓	✓		
2-3.4-3.5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
5-0.4-0.5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
5-4.0-4.45	✓	✓	✓				✓				
6-0.1-0.2	✓	✓	✓	✓	✓	✓	✓	✓	✓		
6-0.9-1.0	✓	✓	✓	✓	✓	✓	✓	✓	✓		
7-0.0-0.2	✓	✓	✓				✓		✓		
TB1/220120	✓										
TS1/220120	✓										

The '✓' indicates the testing you have requested. **THIS IS NOT A REPORT OF THE RESULTS.**

Additional Info

Sample storage - Waters are routinely disposed of approximately 1 month and soils approximately 2 months from receipt.
Requests for longer term sample storage must be received in writing.
Please contact the laboratory immediately if observed settled sediment present in water samples is to be included in the extraction and/or analysis (exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS analysis where solids are included by default.
TAT for Micro is dependent on incubation. This varies from 3 to 6 days.

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customerservice@envirolab.com.au
www.envirolab.com.au

CERTIFICATE OF ANALYSIS 235387

Client Details

Client	Douglas Partners Pty Ltd
Attention	Nerilee Edwards
Address	96 Hermitage Rd, West Ryde, NSW, 2114

Sample Details

Your Reference	**99554.01, Glebe**
Number of Samples	10 Soil
Date samples received	22/01/2020
Date completed instructions received	28/01/2020

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	04/02/2020
Date of Issue	04/02/2020

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Asbestos Approved By
Analysed by Asbestos Approved Identifier: Lucy Zhu
Authorised by Asbestos Approved Signatory: Lucy Zhu

Results Approved By
Diego Bigolin, Team Leader, Inorganics
Jaimie Loa-Kum-Cheung, Metals Supervisor
Josh Williams, Senior Chemist
Loren Bardwell, Senior Chemist
Lucy Zhu, Asbestos Supervisor
Priya Samarawickrama, Senior Chemist

Authorised By

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vTRH(C6-C10)/BTEXN in Soil						
Our Reference		235387-1	235387-2	235387-3	235387-4	235387-5
Your Reference	UNITS	2	2	2	5	5
Depth		0.9-1.0	1.9-2.0	3.4-3.5	0.4-0.5	4.0-4.45
Date Sampled		22/01/2020	22/01/2020	22/01/2020	23/01/2020	23/01/2020
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	29/01/2020	29/01/2020	29/01/2020	29/01/2020	29/01/2020
Date analysed	-	30/01/2020	30/01/2020	30/01/2020	30/01/2020	30/01/2020
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<3	<3	<3	<3	<3
Surrogate aaa-Trifluorotoluene	%	96	88	79	84	81

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		235387-6	235387-7	235387-8	235387-9	235387-10
Your Reference	UNITS	6	6	7	TB1/220120	TS1/220120
Depth		0.1-0.2	0.9-1.0	0.0-0.2	-	-
Date Sampled		24/01/2020	24/01/2020	20/01/2020	22/01/2020	22/01/2020
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	29/01/2020	29/01/2020	29/01/2020	29/01/2020	29/01/2020
Date analysed	-	30/01/2020	30/01/2020	30/01/2020	30/01/2020	30/01/2020
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	[NA]
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	[NA]
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	[NA]
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	91%
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	90%
Ethylbenzene	mg/kg	<1	<1	<1	<1	90%
m+p-xylene	mg/kg	<2	<2	<2	<2	91%
o-Xylene	mg/kg	<1	<1	<1	<1	91%
naphthalene	mg/kg	<1	<1	<1	<1	[NA]
Total +ve Xylenes	mg/kg	<3	<3	<3	<3	[NA]
Surrogate aaa-Trifluorotoluene	%	95	92	99	95	100

svTRH (C10-C40) in Soil						
Our Reference		235387-1	235387-2	235387-3	235387-4	235387-5
Your Reference	UNITS	2	2	2	5	5
Depth		0.9-1.0	1.9-2.0	3.4-3.5	0.4-0.5	4.0-4.45
Date Sampled		22/01/2020	22/01/2020	22/01/2020	23/01/2020	23/01/2020
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	29/01/2020	29/01/2020	29/01/2020	29/01/2020	29/01/2020
Date analysed	-	30/01/2020	30/01/2020	30/01/2020	30/01/2020	30/01/2020
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	110	<100	140	<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	110	150	<100	160	<100
TRH >C_{34} -C_{40}	mg/kg	<100	110	110	130	<100
Total +ve TRH (>C10-C40)	mg/kg	110	260	110	290	<50
Surrogate o-Terphenyl	%	77	79	83	76	76

svTRH (C10-C40) in Soil				
Our Reference		235387-6	235387-7	235387-8
Your Reference	UNITS	6	6	7
Depth		0.1-0.2	0.9-1.0	0.0-0.2
Date Sampled		24/01/2020	24/01/2020	20/01/2020
Type of sample		Soil	Soil	Soil
Date extracted	-	29/01/2020	29/01/2020	29/01/2020
Date analysed	-	30/01/2020	30/01/2020	30/01/2020
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	130	110	<100
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	180	160	<100
TRH >C_{34} -C_{40}	mg/kg	120	110	100
Total +ve TRH (>C10-C40)	mg/kg	310	270	100
Surrogate o-Terphenyl	%	77	76	76

PAHs in Soil						
Our Reference		235387-1	235387-2	235387-3	235387-4	235387-5
Your Reference	UNITS	2	2	2	5	5
Depth		0.9-1.0	1.9-2.0	3.4-3.5	0.4-0.5	4.0-4.45
Date Sampled		22/01/2020	22/01/2020	22/01/2020	23/01/2020	23/01/2020
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	29/01/2020	29/01/2020	29/01/2020	29/01/2020	29/01/2020
Date analysed	-	29/01/2020	29/01/2020	29/01/2020	29/01/2020	29/01/2020
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	0.5	0.6	<0.1	0.6	<0.1
Anthracene	mg/kg	0.1	0.1	<0.1	0.1	<0.1
Fluoranthene	mg/kg	1	1.4	0.1	1.3	<0.1
Pyrene	mg/kg	1	1.5	0.1	1.3	<0.1
Benzo(a)anthracene	mg/kg	0.7	1.2	<0.1	0.8	<0.1
Chrysene	mg/kg	0.7	1.3	<0.1	0.9	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	1	2	<0.2	1	<0.2
Benzo(a)pyrene	mg/kg	0.68	1.1	0.07	0.84	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	0.4	0.6	<0.1	0.5	<0.1
Dibenzo(a,h)anthracene	mg/kg	0.1	0.2	<0.1	0.2	<0.1
Benzo(g,h,i)perylene	mg/kg	0.5	0.7	<0.1	0.6	<0.1
Total +ve PAH's	mg/kg	6.7	10	0.3	8.2	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	1.0	1.7	<0.5	1.3	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	1.0	1.7	<0.5	1.3	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	1.0	1.7	<0.5	1.3	<0.5
Surrogate p-Terphenyl-d14	%	89	96	94	89	92

PAHs in Soil				
Our Reference		235387-6	235387-7	235387-8
Your Reference	UNITS	6	6	7
Depth		0.1-0.2	0.9-1.0	0.0-0.2
Date Sampled		24/01/2020	24/01/2020	20/01/2020
Type of sample		Soil	Soil	Soil
Date extracted	-	29/01/2020	29/01/2020	29/01/2020
Date analysed	-	29/01/2020	29/01/2020	29/01/2020
Naphthalene	mg/kg	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	0.1	0.2	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.8	1.3	0.1
Anthracene	mg/kg	0.2	0.3	<0.1
Fluoranthene	mg/kg	2.0	2.8	0.4
Pyrene	mg/kg	2.0	2.8	0.4
Benzo(a)anthracene	mg/kg	1.2	1.8	0.2
Chrysene	mg/kg	1.3	1.9	0.2
Benzo(b,j+k)fluoranthene	mg/kg	2	2.3	0.4
Benzo(a)pyrene	mg/kg	1.3	1.6	0.2
Indeno(1,2,3-c,d)pyrene	mg/kg	0.8	0.8	0.1
Dibenzo(a,h)anthracene	mg/kg	0.2	0.2	<0.1
Benzo(g,h,i)perylene	mg/kg	1	0.9	0.2
Total +ve PAH's	mg/kg	13	17	2.2
Benzo(a)pyrene TEQ calc (zero)	mg/kg	1.9	2.3	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	1.9	2.3	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	1.9	2.3	<0.5
Surrogate p-Terphenyl-d14	%	91	94	90

Organochlorine Pesticides in soil						
Our Reference		235387-1	235387-2	235387-3	235387-4	235387-6
Your Reference	UNITS	2	2	2	5	6
Depth		0.9-1.0	1.9-2.0	3.4-3.5	0.4-0.5	0.1-0.2
Date Sampled		22/01/2020	22/01/2020	22/01/2020	23/01/2020	24/01/2020
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	29/01/2020	29/01/2020	29/01/2020	29/01/2020	29/01/2020
Date analysed	-	29/01/2020	29/01/2020	29/01/2020	29/01/2020	29/01/2020
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
HCB	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
gamma-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
Endosulfan II	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
Endrin Aldehyde	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
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	84	89	93	82	85

Organochlorine Pesticides in soil		
Our Reference		235387-7
Your Reference	UNITS	6
Depth		0.9-1.0
Date Sampled		24/01/2020
Type of sample		Soil
Date extracted	-	29/01/2020
Date analysed	-	29/01/2020
alpha-BHC	mg/kg	<0.1
HCB	mg/kg	<0.1
beta-BHC	mg/kg	<0.1
gamma-BHC	mg/kg	<0.1
Heptachlor	mg/kg	<0.1
delta-BHC	mg/kg	<0.1
Aldrin	mg/kg	<0.1
Heptachlor Epoxide	mg/kg	<0.1
gamma-Chlordane	mg/kg	<0.1
alpha-chlordane	mg/kg	<0.1
Endosulfan I	mg/kg	<0.1
pp-DDE	mg/kg	<0.1
Dieldrin	mg/kg	<0.1
Endrin	mg/kg	<0.1
Endosulfan II	mg/kg	<0.1
pp-DDD	mg/kg	<0.1
Endrin Aldehyde	mg/kg	<0.1
pp-DDT	mg/kg	<0.1
Endosulfan Sulphate	mg/kg	<0.1
Methoxychlor	mg/kg	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1
Surrogate TCMX	%	89

Organophosphorus Pesticides in Soil						
Our Reference		235387-1	235387-2	235387-3	235387-4	235387-6
Your Reference	UNITS	2	2	2	5	6
Depth		0.9-1.0	1.9-2.0	3.4-3.5	0.4-0.5	0.1-0.2
Date Sampled		22/01/2020	22/01/2020	22/01/2020	23/01/2020	24/01/2020
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	29/01/2020	29/01/2020	29/01/2020	29/01/2020	29/01/2020
Date analysed	-	29/01/2020	29/01/2020	29/01/2020	29/01/2020	29/01/2020
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
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
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
Chlorpyriphos	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
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	84	89	93	82	85

Organophosphorus Pesticides in Soil		
Our Reference		235387-7
Your Reference	UNITS	6
Depth		0.9-1.0
Date Sampled		24/01/2020
Type of sample		Soil
Date extracted	-	29/01/2020
Date analysed	-	29/01/2020
Dichlorvos	mg/kg	<0.1
Dimethoate	mg/kg	<0.1
Diazinon	mg/kg	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1
Ronnel	mg/kg	<0.1
Fenitrothion	mg/kg	<0.1
Malathion	mg/kg	<0.1
Chlorpyriphos	mg/kg	<0.1
Parathion	mg/kg	<0.1
Bromophos-ethyl	mg/kg	<0.1
Ethion	mg/kg	<0.1
Azinphos-methyl (Guthion)	mg/kg	<0.1
Surrogate TCMX	%	89

PCBs in Soil						
Our Reference		235387-1	235387-2	235387-3	235387-4	235387-6
Your Reference	UNITS	2	2	2	5	6
Depth		0.9-1.0	1.9-2.0	3.4-3.5	0.4-0.5	0.1-0.2
Date Sampled		22/01/2020	22/01/2020	22/01/2020	23/01/2020	24/01/2020
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	29/01/2020	29/01/2020	29/01/2020	29/01/2020	29/01/2020
Date analysed	-	29/01/2020	29/01/2020	29/01/2020	29/01/2020	29/01/2020
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	84	89	93	82	85

PCBs in Soil		
Our Reference		235387-7
Your Reference	UNITS	6
Depth		0.9-1.0
Date Sampled		24/01/2020
Type of sample		Soil
Date extracted	-	29/01/2020
Date analysed	-	29/01/2020
Aroclor 1016	mg/kg	<0.1
Aroclor 1221	mg/kg	<0.1
Aroclor 1232	mg/kg	<0.1
Aroclor 1242	mg/kg	<0.1
Aroclor 1248	mg/kg	<0.1
Aroclor 1254	mg/kg	<0.1
Aroclor 1260	mg/kg	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1
Surrogate TCMX	%	89

Acid Extractable metals in soil						
Our Reference		235387-1	235387-2	235387-3	235387-4	235387-5
Your Reference	UNITS	2	2	2	5	5
Depth		0.9-1.0	1.9-2.0	3.4-3.5	0.4-0.5	4.0-4.45
Date Sampled		22/01/2020	22/01/2020	22/01/2020	23/01/2020	23/01/2020
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	29/01/2020	29/01/2020	29/01/2020	29/01/2020	29/01/2020
Date analysed	-	29/01/2020	29/01/2020	29/01/2020	29/01/2020	29/01/2020
Arsenic	mg/kg	5	36	8	6	<4
Cadmium	mg/kg	<0.4	1	<0.4	0.9	<0.4
Chromium	mg/kg	13	52	14	15	4
Copper	mg/kg	28	240	16	190	2
Lead	mg/kg	150	1,900	120	650	3
Mercury	mg/kg	1.5	47	1.8	0.5	<0.1
Nickel	mg/kg	4	10	2	8	<1
Zinc	mg/kg	140	1,100	73	230	1
Beryllium	mg/kg	<1	<1	<1	<1	<1
Boron	mg/kg	<3	4	<3	<3	<3
Cobalt	mg/kg	3	5	<1	3	<1
Iron	mg/kg	13,000	24,000	7,500	18,000	1,500
Manganese	mg/kg	300	230	27	270	2
Molybdenum	mg/kg	<1	<1	11	1	2
Selenium	mg/kg	<2	<2	<2	<2	<2
Silver	mg/kg	<1	1	<1	<1	<1

Acid Extractable metals in soil					
Our Reference		235387-6	235387-7	235387-8	235387-11
Your Reference	UNITS	6	6	7	2 - [TRIPLICATE]
Depth		0.1-0.2	0.9-1.0	0.0-0.2	0.9-1.0
Date Sampled		24/01/2020	24/01/2020	20/01/2020	22/01/2020
Type of sample		Soil	Soil	Soil	Soil
Date prepared	-	29/01/2020	29/01/2020	29/01/2020	29/01/2020
Date analysed	-	29/01/2020	29/01/2020	29/01/2020	29/01/2020
Arsenic	mg/kg	8	6	<4	5
Cadmium	mg/kg	0.7	<0.4	<0.4	<0.4
Chromium	mg/kg	20	10	10	14
Copper	mg/kg	360	79	27	30
Lead	mg/kg	2,200	700	140	200
Mercury	mg/kg	0.4	10	0.3	2.0
Nickel	mg/kg	17	6	8	4
Zinc	mg/kg	170	180	100	150
Beryllium	mg/kg	<1	<1	<1	<1
Boron	mg/kg	<3	<3	<3	<3
Cobalt	mg/kg	5	3	4	3
Iron	mg/kg	16,000	12,000	9,700	14,000
Manganese	mg/kg	230	170	150	290
Molybdenum	mg/kg	<1	<1	<1	<1
Selenium	mg/kg	<2	<2	<2	<2
Silver	mg/kg	<1	<1	<1	<1

Misc Soil - Inorg						
Our Reference		235387-1	235387-2	235387-3	235387-4	235387-6
Your Reference	UNITS	2	2	2	5	6
Depth		0.9-1.0	1.9-2.0	3.4-3.5	0.4-0.5	0.1-0.2
Date Sampled		22/01/2020	22/01/2020	22/01/2020	23/01/2020	24/01/2020
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	29/01/2020	29/01/2020	29/01/2020	29/01/2020	29/01/2020
Date analysed	-	29/01/2020	29/01/2020	29/01/2020	29/01/2020	29/01/2020
Total Phenolics (as Phenol)	mg/kg	<5	<5	<5	<5	<5

Misc Soil - Inorg		
Our Reference		235387-7
Your Reference	UNITS	6
Depth		0.9-1.0
Date Sampled		24/01/2020
Type of sample		Soil
Date prepared	-	29/01/2020
Date analysed	-	29/01/2020
Total Phenolics (as Phenol)	mg/kg	<5

Moisture						
Our Reference		235387-1	235387-2	235387-3	235387-4	235387-5
Your Reference	UNITS	2	2	2	5	5
Depth		0.9-1.0	1.9-2.0	3.4-3.5	0.4-0.5	4.0-4.45
Date Sampled		22/01/2020	22/01/2020	22/01/2020	23/01/2020	23/01/2020
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	29/01/2020	29/01/2020	29/01/2020	29/01/2020	29/01/2020
Date analysed	-	30/01/2020	30/01/2020	30/01/2020	30/01/2020	30/01/2020
Moisture	%	7.7	10	20	10	14

Moisture				
Our Reference		235387-6	235387-7	235387-8
Your Reference	UNITS	6	6	7
Depth		0.1-0.2	0.9-1.0	0.0-0.2
Date Sampled		24/01/2020	24/01/2020	20/01/2020
Type of sample		Soil	Soil	Soil
Date prepared	-	29/01/2020	29/01/2020	29/01/2020
Date analysed	-	30/01/2020	30/01/2020	30/01/2020
Moisture	%	9.0	12	11

Asbestos ID - soils						
Our Reference		235387-1	235387-2	235387-3	235387-4	235387-6
Your Reference	UNITS	2	2	2	5	6
Depth		0.9-1.0	1.9-2.0	3.4-3.5	0.4-0.5	0.1-0.2
Date Sampled		22/01/2020	22/01/2020	22/01/2020	23/01/2020	24/01/2020
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	30/01/2020	30/01/2020	30/01/2020	30/01/2020	30/01/2020
Sample mass tested	g	Approx. 30g	Approx. 25g	Approx. 25g	Approx. 30g	Approx. 30g
Sample Description	-	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks	Brown fine-grained 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		235387-7	235387-8
Your Reference	UNITS	6	7
Depth		0.9-1.0	0.0-0.2
Date Sampled		24/01/2020	20/01/2020
Type of sample		Soil	Soil
Date analysed	-	30/01/2020	30/01/2020
Sample mass tested	g	Approx. 25g	Approx. 30g
Sample Description	-	Brown fine-grained soil & rocks	Brown fine-grained 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

Misc Inorg - Soil			
Our Reference		235387-3	235387-4
Your Reference	UNITS	2	5
Depth		3.4-3.5	0.4-0.5
Date Sampled		22/01/2020	23/01/2020
Type of sample		Soil	Soil
Date prepared	-	04/02/2020	04/02/2020
Date analysed	-	04/02/2020	04/02/2020
pH 1:5 soil:water	pH Units	7.0	7.6

CEC			
Our Reference		235387-3	235387-4
Your Reference	UNITS	2	5
Depth		3.4-3.5	0.4-0.5
Date Sampled		22/01/2020	23/01/2020
Type of sample		Soil	Soil
Date prepared	-	03/02/2020	03/02/2020
Date analysed	-	03/02/2020	03/02/2020
Exchangeable Ca	meq/100g	5.6	21
Exchangeable K	meq/100g	0.4	0.1
Exchangeable Mg	meq/100g	2.4	0.30
Exchangeable Na	meq/100g	0.10	<0.1
Cation Exchange Capacity	meq/100g	8.4	21

Method ID	Methodology Summary
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.
AT-008	Determination of VOCs sampled onto coconut shell charcoal sorbent tubes, that can be desorbed using carbon disulphide, and analysed by GC-MS.
Inorg-001	pH - Measured using pH meter and electrode in accordance with APHA latest edition, 4500-H+. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times.
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
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-009	Determination of exchangeable cations and cation exchange capacity in soils using 1M Ammonium Chloride exchange and ICP-AES analytical finish.
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
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. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD. Note, the Total +ve PCBs PQL is reflective of the lowest individual PQL and is therefore" Total +ve PCBs" is simply a sum of the positive individual PCBs.
Org-012/017	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS and/or GC-MS/MS.

Method ID	Methodology Summary
Org-012/017	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-MS and/or GC-MS/MS. Note, the Total +ve reported DDD+DDE+DDT PQL is reflective of the lowest individual PQL and is therefore simply a sum of the positive individually report DDD+DDE+DDT.
Org-012/017	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS and/or GC-MS/MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013. For soil results:- 1. 'EQ PQL'values are assuming all contributing PAHs reported as <PQL are actually at the PQL. This is the most conservative approach and can give false positive TEQs given that PAHs that contribute to the TEQ calculation may not be present. 2. 'EQ zero'values are assuming all contributing PAHs reported as <PQL are zero. This is the least conservative approach and is more susceptible to false negative TEQs when PAHs that contribute to the TEQ calculation are present but below PQL. 3. 'EQ half PQL'values are assuming all contributing PAHs reported as <PQL are half the stipulated PQL. Hence a mid-point between the most and least conservative approaches above. 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-014	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
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. Note, the Total +ve Xylene PQL is reflective of the lowest individual PQL and is therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes.

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	235387-2
Date extracted	-			29/01/2020	1	29/01/2020	29/01/2020		29/01/2020	29/01/2020
Date analysed	-			30/01/2020	1	30/01/2020	30/01/2020		30/01/2020	30/01/2020
TRH C_6 - C_9	mg/kg	25	Org-016	<25	1	<25	<25	0	102	81
TRH C_6 - C_{10}	mg/kg	25	Org-016	<25	1	<25	<25	0	102	81
Benzene	mg/kg	0.2	Org-016	<0.2	1	<0.2	<0.2	0	94	75
Toluene	mg/kg	0.5	Org-016	<0.5	1	<0.5	<0.5	0	100	78
Ethylbenzene	mg/kg	1	Org-016	<1	1	<1	<1	0	107	84
m+p-xylene	mg/kg	2	Org-016	<2	1	<2	<2	0	104	84
o-Xylene	mg/kg	1	Org-016	<1	1	<1	<1	0	107	83
naphthalene	mg/kg	1	Org-014	<1	1	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	94	1	96	89	8	93	83

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	235387-2
Date extracted	-			29/01/2020	1	29/01/2020	29/01/2020		29/01/2020	29/01/2020
Date analysed	-			30/01/2020	1	30/01/2020	30/01/2020		30/01/2020	30/01/2020
TRH C_{10} - C_{14}	mg/kg	50	Org-003	<50	1	<50	<50	0	113	106
TRH C_{15} - C_{28}	mg/kg	100	Org-003	<100	1	<100	<100	0	121	128
TRH C_{29} - C_{36}	mg/kg	100	Org-003	<100	1	<100	<100	0	92	98
TRH >C_{10} -C_{16}	mg/kg	50	Org-003	<50	1	<50	<50	0	113	106
TRH >C_{16} -C_{34}	mg/kg	100	Org-003	<100	1	110	110	0	121	128
TRH >C_{34} -C_{40}	mg/kg	100	Org-003	<100	1	<100	<100	0	92	98
Surrogate o-Terphenyl	%		Org-003	75	1	77	76	1	112	79

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	235387-2
Date extracted	-			29/01/2020	1	29/01/2020	29/01/2020		29/01/2020	29/01/2020
Date analysed	-			29/01/2020	1	29/01/2020	29/01/2020		29/01/2020	29/01/2020
Naphthalene	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	98	98
Acenaphthylene	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	108	109
Phenanthrene	mg/kg	0.1	Org-012/017	<0.1	1	0.5	0.6	18	104	104
Anthracene	mg/kg	0.1	Org-012/017	<0.1	1	0.1	0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-012/017	<0.1	1	1	1.0	0	102	89
Pyrene	mg/kg	0.1	Org-012/017	<0.1	1	1	1	0	104	88
Benzo(a)anthracene	mg/kg	0.1	Org-012/017	<0.1	1	0.7	0.7	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-012/017	<0.1	1	0.7	0.8	13	98	84
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-012/017	<0.2	1	1	1	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-012/017	<0.05	1	0.68	0.66	3	108	86
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012/017	<0.1	1	0.4	0.4	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012/017	<0.1	1	0.1	0.2	67	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012/017	<0.1	1	0.5	0.5	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012/017	116	1	89	93	4	94	90

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	235387-2
Date extracted	-			29/01/2020	1	29/01/2020	29/01/2020		29/01/2020	29/01/2020
Date analysed	-			29/01/2020	1	29/01/2020	29/01/2020		29/01/2020	29/01/2020
alpha-BHC	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	104	107
HCB	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	104	96
gamma-BHC	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	84	86
delta-BHC	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	108	99
Heptachlor Epoxide	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	106	97
gamma-Chlordane	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	106	96
Dieldrin	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	112	102
Endrin	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	100	94
Endosulfan II	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	98	92
Endrin Aldehyde	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	96	94
Methoxychlor	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-012/017	95	1	84	92	9	86	82

QUALITY CONTROL: Organophosphorus Pesticides in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	235387-2
Date extracted	-			29/01/2020	1	29/01/2020	29/01/2020		29/01/2020	29/01/2020
Date analysed	-			29/01/2020	1	29/01/2020	29/01/2020		29/01/2020	29/01/2020
Dichlorvos	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	74	81
Dimethoate	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos-methyl	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	102	97
Fenitrothion	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	108	104
Malathion	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	99	97
Chlorpyriphos	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	106	109
Parathion	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	116	114
Bromophos-ethyl	mg/kg	0.1	AT-008	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	104	99
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-012/017	95	1	84	92	9	86	82

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	235387-2
Date extracted	-			29/01/2020	1	29/01/2020	29/01/2020		29/01/2020	29/01/2020
Date analysed	-			29/01/2020	1	29/01/2020	29/01/2020		29/01/2020	29/01/2020
Aroclor 1016	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	108	103
Aroclor 1260	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-006	95	1	84	92	9	86	82

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	235387-2
Date prepared	-			29/01/2020	1	29/01/2020	29/01/2020		29/01/2020	29/01/2020
Date analysed	-			29/01/2020	1	29/01/2020	29/01/2020		29/01/2020	29/01/2020
Arsenic	mg/kg	4	Metals-020	<4	1	5	5	0	97	##
Cadmium	mg/kg	0.4	Metals-020	<0.4	1	<0.4	<0.4	0	89	73
Chromium	mg/kg	1	Metals-020	<1	1	13	22	51	102	#
Copper	mg/kg	1	Metals-020	<1	1	28	29	4	97	###
Lead	mg/kg	1	Metals-020	<1	1	150	180	18	106	###
Mercury	mg/kg	0.1	Metals-021	<0.1	1	1.5	2.0	29	102	###
Nickel	mg/kg	1	Metals-020	<1	1	4	4	0	91	70
Zinc	mg/kg	1	Metals-020	<1	1	140	160	13	96	###
Beryllium	mg/kg	1	Metals-020	<1	1	<1	<1	0	92	82
Boron	mg/kg	3	Metals-020	<3	1	<3	<3	0	85	79
Cobalt	mg/kg	1	Metals-020	<1	1	3	4	29	89	74
Iron	mg/kg	10	Metals-020	<10	1	13000	13000	0	121	###
Manganese	mg/kg	1	Metals-020	<1	1	300	380	24	103	###
Molybdenum	mg/kg	1	Metals-020	<1	1	<1	<1	0	93	82
Selenium	mg/kg	2	Metals-020	<2	1	<2	<2	0	88	78
Silver	mg/kg	1	Metals-020	<1	1	<1	<1	0	96	#

QUALITY CONTROL: Misc Soil - Inorg						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	235387-2
Date prepared	-			29/01/2020	1	29/01/2020	29/01/2020		29/01/2020	29/01/2020
Date analysed	-			29/01/2020	1	29/01/2020	29/01/2020		29/01/2020	29/01/2020
Total Phenolics (as Phenol)	mg/kg	5	Inorg-031	<5	1	<5	<5	0	99	103

QUALITY CONTROL: Misc Inorg - Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	[NT]
Date prepared	-			04/02/2020	3	04/02/2020	04/02/2020		04/02/2020	[NT]
Date analysed	-			04/02/2020	3	04/02/2020	04/02/2020		04/02/2020	[NT]
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	3	7.0	7.0	0	102	[NT]

QUALITY CONTROL: CEC					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	[NT]
Date prepared	-			03/02/2020	[NT]	[NT]	[NT]	[NT]	03/02/2020	[NT]
Date analysed	-			03/02/2020	[NT]	[NT]	[NT]	[NT]	03/02/2020	[NT]
Exchangeable Ca	meq/100g	0.1	Metals-009	<0.1	[NT]	[NT]	[NT]	[NT]	102	[NT]
Exchangeable K	meq/100g	0.1	Metals-009	<0.1	[NT]	[NT]	[NT]	[NT]	100	[NT]
Exchangeable Mg	meq/100g	0.1	Metals-009	<0.1	[NT]	[NT]	[NT]	[NT]	94	[NT]
Exchangeable Na	meq/100g	0.1	Metals-009	<0.1	[NT]	[NT]	[NT]	[NT]	96	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

Report Comments

Acid Extractable Metals in Soil:
-The laboratory RPD acceptance criteria has been exceeded for 235387-1 for Cr. Therefore a triplicate result has been issued as laboratory sample number 235387-11.
-# Percent recovery is not possible to report due to the inhomogeneous nature of the element/s in the sample/s. However an acceptable recovery was obtained for the LCS.
-## Low spike recovery was obtained for this sample. Sample matrix interference is suspected. However, an acceptable recovery was obtained for the LCS.
-### Percent recovery is not possible to report due to the high concentration of the element/s in the sample/s. However an acceptable recovery was obtained for the LCS.

Asbestos: A portion of the supplied sample was sub-sampled for asbestos analysis according to Envirolab procedures.
We cannot guarantee that this sub-sample is indicative of the entire sample. Envirolab recommends supplying 40-50g of sample in its own container.
Note: Samples were sub-sampled from jars provided by the client.

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
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CERTIFICATE OF ANALYSIS 235387-A

Client Details

Client	Douglas Partners Pty Ltd
Attention	Nerilee Edwards
Address	96 Hermitage Rd, West Ryde, NSW, 2114

Sample Details

Your Reference	**99554.01, Glebe**
Number of Samples	10 Soil
Date samples received	22/01/2020
Date completed instructions received	05/02/2020

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Report Details

Date results requested by	12/02/2020
Date of Issue	10/02/2020

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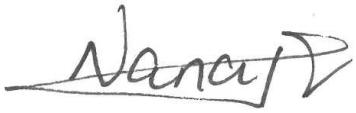
Accredited for compliance with ISO/IEC 17025 - Testing. **Tests not covered by NATA are denoted with ***

Results Approved By
Jaimie Loa-Kum-Cheung, Metals Supervisor
Josh Williams, Senior Chemist
Loren Bardwell, Senior Chemist
Priya Samarawickrama, Senior Chemist

Authorised By



Nancy Zhang, Laboratory Manager

Metals in TCLP USEPA1311			
Our Reference		235387-A-2	235387-A-6
Your Reference	UNITS	2	6
Depth		1.9-2.0	0.1-0.2
Type of sample		Soil	Soil
Date extracted	-	06/02/2020	06/02/2020
Date analysed	-	06/02/2020	06/02/2020
pH of soil for fluid# determ.	pH units	8.8	9.2
pH of soil TCLP (after HCl)	pH units	2.3	2.1
Extraction fluid used	-	1	1
pH of final Leachate	pH units	5.7	5.6
Arsenic in TCLP	mg/L	<0.05	<0.05
Cadmium in TCLP	mg/L	<0.01	<0.01
Chromium in TCLP	mg/L	<0.01	<0.01
Copper in TCLP	mg/L	0.04	0.2
Lead in TCLP	mg/L	0.58	26
Mercury in TCLP	mg/L	<0.0005	<0.0005
Nickel in TCLP	mg/L	0.02	<0.02
Zinc in TCLP	mg/L	17	0.8

PAHs in TCLP (USEPA 1311)			
Our Reference		235387-A-2	235387-A-6
Your Reference	UNITS	2	6
Depth		1.9-2.0	0.1-0.2
Type of sample		Soil	Soil
Date extracted	-	06/02/2020	06/02/2020
Date analysed	-	06/02/2020	06/02/2020
Naphthalene in TCLP	mg/L	<0.001	<0.001
Acenaphthylene in TCLP	mg/L	<0.001	<0.001
Acenaphthene in TCLP	mg/L	<0.001	<0.001
Fluorene in TCLP	mg/L	<0.001	<0.001
Phenanthrene in TCLP	mg/L	<0.001	<0.001
Anthracene in TCLP	mg/L	<0.001	<0.001
Fluoranthene in TCLP	mg/L	<0.001	<0.001
Pyrene in TCLP	mg/L	<0.001	<0.001
Benzo(a)anthracene in TCLP	mg/L	<0.001	<0.001
Chrysene in TCLP	mg/L	<0.001	<0.001
Benzo(bjk)fluoranthene in TCLP	mg/L	<0.002	<0.002
Benzo(a)pyrene in TCLP	mg/L	<0.001	<0.001
Indeno(1,2,3-c,d)pyrene - TCLP	mg/L	<0.001	<0.001
Dibenzo(a,h)anthracene in TCLP	mg/L	<0.001	<0.001
Benzo(g,h,i)perylene in TCLP	mg/L	<0.001	<0.001
Total +ve PAH's	mg/L	NIL (+)VE	NIL (+)VE
Surrogate p-Terphenyl-d14	%	85	78

CEC		
Our Reference		235387-A-8
Your Reference	UNITS	7
Depth		0.0-0.2
Type of sample		Soil
Date prepared	-	07/02/2020
Date analysed	-	07/02/2020
Exchangeable Ca	meq/100g	6.1
Exchangeable K	meq/100g	<0.1
Exchangeable Mg	meq/100g	0.39
Exchangeable Na	meq/100g	<0.1
Cation Exchange Capacity	meq/100g	6.6

Misc Inorg - Soil		
Our Reference		235387-A-8
Your Reference	UNITS	7
Depth		0.0-0.2
Type of sample		Soil
Date prepared	-	07/02/2020
Date analysed	-	07/02/2020
pH 1:5 soil:water	pH Units	7.7

Method ID	Methodology Summary
EXTRACT.7	Toxicity Characteristic Leaching Procedure (TCLP) using Zero Headspace Extraction (zHE) using AS4439 and USEPA 1311.
Inorg-001	pH - Measured using pH meter and electrode in accordance with APHA latest edition, 4500-H+. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times.
Inorg-004	Toxicity Characteristic Leaching Procedure (TCLP) using in house method INORG-004. Please note that the mass used may be scaled down from the default based on sample mass available.
Metals-009	Determination of exchangeable cations and cation exchange capacity in soils using 1M Ammonium Chloride exchange and ICP-AES analytical finish.
Metals-020 ICP-AES	Determination of various metals by ICP-AES.
Metals-021 CV-AAS	Determination of Mercury by Cold Vapour AAS.
Org-012/017	Leachates are extracted with Dichloromethane and analysed by GC-MS and/or GC-MS/MS.

QUALITY CONTROL: Metals in TCLP USEPA1311					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			06/02/2020	[NT]	[NT]	[NT]	[NT]	06/02/2020	[NT]
Date analysed	-			06/02/2020	[NT]	[NT]	[NT]	[NT]	06/02/2020	[NT]
Arsenic in TCLP	mg/L	0.05	Metals-020 ICP-AES	<0.05	[NT]	[NT]	[NT]	[NT]	130	[NT]
Cadmium in TCLP	mg/L	0.01	Metals-020 ICP-AES	<0.01	[NT]	[NT]	[NT]	[NT]	117	[NT]
Chromium in TCLP	mg/L	0.01	Metals-020 ICP-AES	<0.01	[NT]	[NT]	[NT]	[NT]	117	[NT]
Copper in TCLP	mg/L	0.01	Metals-020 ICP-AES	<0.01	[NT]	[NT]	[NT]	[NT]	107	[NT]
Lead in TCLP	mg/L	0.03	Metals-020 ICP-AES	<0.03	[NT]	[NT]	[NT]	[NT]	116	[NT]
Mercury in TCLP	mg/L	0.0005	Metals-021 CV-AAS	<0.0005	[NT]	[NT]	[NT]	[NT]	101	[NT]
Nickel in TCLP	mg/L	0.02	Metals-020 ICP-AES	<0.02	[NT]	[NT]	[NT]	[NT]	116	[NT]
Zinc in TCLP	mg/L	0.02	Metals-020 ICP-AES	<0.02	[NT]	[NT]	[NT]	[NT]	124	[NT]

QUALITY CONTROL: PAHs in TCLP (USEPA 1311)						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			05/02/2020	6	06/02/2020	06/02/2020		05/02/2020	[NT]
Date analysed	-			07/02/2020	6	06/02/2020	06/02/2020		07/02/2020	[NT]
Naphthalene in TCLP	mg/L	0.001	Org-012/017	<0.001	6	<0.001	<0.001	0	102	[NT]
Acenaphthylene in TCLP	mg/L	0.001	Org-012/017	<0.001	6	<0.001	<0.001	0	[NT]	[NT]
Acenaphthene in TCLP	mg/L	0.001	Org-012/017	<0.001	6	<0.001	<0.001	0	[NT]	[NT]
Fluorene in TCLP	mg/L	0.001	Org-012/017	<0.001	6	<0.001	<0.001	0	94	[NT]
Phenanthrene in TCLP	mg/L	0.001	Org-012/017	<0.001	6	<0.001	<0.001	0	90	[NT]
Anthracene in TCLP	mg/L	0.001	Org-012/017	<0.001	6	<0.001	<0.001	0	[NT]	[NT]
Fluoranthene in TCLP	mg/L	0.001	Org-012/017	<0.001	6	<0.001	<0.001	0	90	[NT]
Pyrene in TCLP	mg/L	0.001	Org-012/017	<0.001	6	<0.001	<0.001	0	96	[NT]
Benzo(a)anthracene in TCLP	mg/L	0.001	Org-012/017	<0.001	6	<0.001	<0.001	0	[NT]	[NT]
Chrysene in TCLP	mg/L	0.001	Org-012/017	<0.001	6	<0.001	<0.001	0	106	[NT]
Benzo(bjk)fluoranthene in TCLP	mg/L	0.002	Org-012/017	<0.002	6	<0.002	<0.002	0	[NT]	[NT]
Benzo(a)pyrene in TCLP	mg/L	0.001	Org-012/017	<0.001	6	<0.001	<0.001	0	80	[NT]
Indeno(1,2,3-c,d)pyrene - TCLP	mg/L	0.001	Org-012/017	<0.001	6	<0.001	<0.001	0	[NT]	[NT]
Dibenzo(a,h)anthracene in TCLP	mg/L	0.001	Org-012/017	<0.001	6	<0.001	<0.001	0	[NT]	[NT]
Benzo(g,h,i)perylene in TCLP	mg/L	0.001	Org-012/017	<0.001	6	<0.001	<0.001	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012/017	99	6	78	79	1	91	[NT]

QUALITY CONTROL: CEC					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			07/02/2020	[NT]	[NT]	[NT]	[NT]	07/02/2020	[NT]
Date analysed	-			07/02/2020	[NT]	[NT]	[NT]	[NT]	07/02/2020	[NT]
Exchangeable Ca	meq/100g	0.1	Metals-009	<0.1	[NT]	[NT]	[NT]	[NT]	99	[NT]
Exchangeable K	meq/100g	0.1	Metals-009	<0.1	[NT]	[NT]	[NT]	[NT]	96	[NT]
Exchangeable Mg	meq/100g	0.1	Metals-009	<0.1	[NT]	[NT]	[NT]	[NT]	98	[NT]
Exchangeable Na	meq/100g	0.1	Metals-009	<0.1	[NT]	[NT]	[NT]	[NT]	99	[NT]

QUALITY CONTROL: Misc Inorg - Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			07/02/2020	[NT]	[NT]	[NT]	[NT]	07/02/2020	[NT]
Date analysed	-			07/02/2020	[NT]	[NT]	[NT]	[NT]	07/02/2020	[NT]
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	[NT]	[NT]	[NT]	[NT]	102	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

The recommended maximums for analytes in urine are taken from “2018 TLVs and BEIs”, as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.

Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2

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: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

Douglas Partners
Geotechnics / Environment / Groundwater

CHAIN OF CUSTODY DESPATCH SHEET

Project No:	99554.01	**Suburb:**	Glebe	**To:**	Envirolab Services
Project Name:		**Order Number**			12 Ashley St Chatswood 2067
Project Manager:	NLE	**Sampler:**	SI/IT	**Attn:**	Aileen Hie
Emails:	nerilee.edwards@douglaspartners.com.au			**Phone:**	(02) 9910 6200
Date Required:	Same day ☐ 24 hours ☐ 48 hours ☐ 72 hours ☐ Standard ☑			**Email:**	AHie@envirolab.com.au
Prior Storage:	☐ Esky ☑ Fridge ☐ Freezer	Do samples contain 'potential' HBM?	Yes ☐ No ☐ (If YES, then handle, transport and store in accordance with FPM HAZID)		

Sample ID	Lab ID	Date Sampled	Sample Type (S - soil, W - water)	Container Type (G - glass, P - plastic)	Analytes: ASS screen (pHf, pHfox)	Scr full suite								Notes/preservation
1/2.5-2.95	1	21.01.20	S	P	x									
1/3-3.5	2	21.01.20	S	P	x									
1/4-4.45	3	21.01.20	S	P	x									
1/5.5-5.95	4	21.01.20	S	P	x									
4/1.5-1.6	5	20.01.20	S	P	x									
4/2.5-2.95	6	20.01.20	S	P	x									
4/4-4.45	7	20.01.20	S	P	x									
4/5.5-5.95	8	20.01.20	S	P	x									
5/1-1.45	9	23.01.20	S	P	x									
5/1.9-2	10	23.01.20	S	P	x									
5/2.5-2.95	11	23.01.20	S	P	x									
5/3-3.1	12	23.01.20	S	P	x									
5/4-4.45	13	23.01.20	S	P	x									
5/4.9-5	14	23.01.20	S	P	x									
5/5.5-5.9	15	23.01.20	S	P	x									
PQL (S) mg/kg													**ANZECC PQLs req'd for all water analytes** ☐	

ENVIROLAB — Envirolab Services, 12 Ashley St, Chatswood NSW 2067, Ph: (02) 9910 6200
Job No: 235396
Date Received: 28.9.2020
Time Received: 12:28
Received by: TC
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

PQL = practical quantitation limit. If none given, default to Laboratory Method Detection Limit

Metals to Analyse: As, Cd, Cr, Cu, Pb, Hg, Ni, Zn, Fe

Lab Report/Reference No: 235396

Total number of samples in container:	**Relinquished by:** NLE	**Transported to laboratory by:** Hunter Express	
Send Results to: Douglas Partners Pty Ltd	**Address:** 96 Hermitage Road West Ryde NSW 2114	**Phone:** (02) 4271 1836	**Fax:** (02) 4271 1897
Signed:	**Received by:** ES, Thursday Canberra	**Date & Time:** 28·1·20	

Douglas Partners
Geotechnics / Environment / Groundwater

CHAIN OF CUSTODY DESPATCH SHEET

Project No: 99554.01	**Suburb:** Glebe	**To:**	Envirolab Services
Project Name:	**Order Number**		12 Ashley St Chatswood 2067
Project Manager: NLE	**Sampler:** SI/IT	**Attn:**	Aileen Hie
Emails: nerilee.edwards@douglaspartners.com.au		**Phone:**	(02) 9910 6200
Date Required: Same day ☐ 24 hours ☐ 48 hours ☐ 72 hours ☐ Standard ☑		**Email:**	AHie@envirolab.com.au
Prior Storage: ☐ Esky ☑ Fridge ☐ Freezer	Do samples contain 'potential' HBM? Yes ☐	No ☐ (If YES, then handle, transport and store in accordance with FPM HAZID)	

Sample ID	Lab ID	Sampling Date	Sample Type (S - soil, W - water)	Container Type (G - glass, P - plastic)	Analytes: ASS screen (pHf, pHfox)	Scr full suite								Notes/preservation
6/1-1.45	16	24.01.20	S	P	×									
6/1.9-2	17	24.01.20	S	P	×									
6/2.5-2.95	18	24.01.20	S	P	×									
6/3-3.1	19	24.01.20	S	P	×									
6/4-4.45	20	24.01.20	S	P	×									
6/4.9-5	21	24.01.20	S	P	×									
6/5.5-5.95	22	24.01.20	S	P	×									
6/7-7.45	23	24.01.20	S	P	×									
PQL (S) mg/kg														**ANZECC PQLs req'd for all water analytes** ☐

PQL = practical quantitation limit. If none given, default to Laboratory Method Detection Limit

Lab Report/Reference No: 235396

Metals to Analyse:

Total number of samples in container: **Relinquished by:** NLE **Transported to laboratory by:** Hunter Express

Send Results to: Douglas Partners Pty Ltd **Address:** 96 Hermitage Road West Ryde NSW 2114 **Phone:** (02) 4271 1836 **Fax:** (02) 4271 1897

Signed: [signature] **Received by:** ELS, Trinidad Canales **Date & Time:** 28.1.20

Douglas Partners
Geotechnics / Environment / Groundwater

CHAIN OF CUSTODY DESPATCH SHEET

Project No:	99554.00	**Suburb:**	GLEBE	**To:**	Envirolab Services
Project Name:	Mixed-Use Development	**Order Number**			12 Ashley Street, Chatswood 2067
Project Manager:	HDS	**Sampler:**	NLE/SI	**Attn:**	Aileen Hie
Emails:	huw.smith@douglaspartners.com.au			**Phone:**	02 9910 6200
Date Required:	Same day ☐ 24 hours ☐ 48 hours ☐ 72 hours ☐ Standard ☐			**Email:**	Ahie@envirolab.com.au
Prior Storage:	☐ Esky x Freezer ☐ Shelved	Do samples contain 'potential' HBM? Yes ☐		No ☐	(If YES, then handle, transport and store in accordance with FPM HAZID)

Sample ID	Lab ID	Date Sampled	Sample Type (S - soil, W - water)	Container Type (G - glass, P - plastic)	Analytes: Aggressivity (pH, EC, SO4, Chloride)								Notes/preservation
1/2.5-2.95	1	21/01/20	S	G, P	X								Please analyse and report separately to contamination testing
PQL (S) mg/kg													ANZECC PQLs req'd for all water analytes ☐

Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200
Job No: 235396-A
Date Received: 28.01.2020
Time Received: 12:28
Received by: TC.
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

PQL = practical quantitation limit. If none given, default to Laboratory Method Detection Limit

Lab Report/Reference No: 235396-A.

Metals to Analyse: Nil

Total number of samples in container: | **Relinquished by:** NLE | **Transported to laboratory by:**

Send Results to: Douglas Partners Pty Ltd | **Address:** 96 Hermitage Road, West Ryde | **Phone:** 02 9809 0666 | **Fax:**

Signed: [signature] | **Received by:** ELS, Thursday Gomalet. | **Date & Time:** 28.1.20

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

SAMPLE RECEIPT ADVICE

Client Details

Client	Douglas Partners Pty Ltd
Attention	Nerilee Edwards

Sample Login Details

Your reference	99554.01, Glebe
Envirolab Reference	235396
Date Sample Received	28/01/2020
Date Instructions Received	28/01/2020
Date Results Expected to be Reported	04/02/2020

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	23 Soil
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	18.0
Cooling Method	Ice Pack
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

Aileen Hie	Jacinta Hurst
Phone: 02 9910 6200	**Phone: 02 9910 6200**
Fax: 02 9910 6201	**Fax: 02 9910 6201**
Email: ahie@envirolab.com.au	**Email: jhurst@envirolab.com.au**

Analysis Underway, details on the following page:

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Sample ID	sPOCAS field test
1-2.5-2.95	✓
1-3.0-3.5	✓
1-4.0-4.45	✓
1-5.5-5.95	✓
4-1.5-1.6	✓
4-2.5-2.95	✓
4-4.0-4.45	✓
4-5.5-5.95	✓
5-1-1.45	✓
5-1.9-2.0	✓
5-2.5-2.95	✓
5-3.0-3.1	✓
5-4.0-4.45	✓
5-4.9-5.0	✓
5-5.5-5.9	✓
6-1.0-1.45	✓
6-1.9-2.0	✓
6-2.5-2.95	✓
6-3.0-3.1	✓
6-4.0-4.45	✓
6-4.9-5.0	✓
6-5.5-5.95	✓
6-7-7.45	✓

The '✓' indicates the testing you have requested. **THIS IS NOT A REPORT OF THE RESULTS.**

Additional Info

Sample storage - Waters are routinely disposed of approximately 1 month and soils approximately 2 months from receipt.
Requests for longer term sample storage must be received in writing.
Please contact the laboratory immediately if observed settled sediment present in water samples is to be included in the extraction and/or analysis (exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS analysis where solids are included by default.
TAT for Micro is dependent on incubation. This varies from 3 to 6 days.

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CERTIFICATE OF ANALYSIS 235396

Client Details

Client	Douglas Partners Pty Ltd
Attention	Nerilee Edwards
Address	96 Hermitage Rd, West Ryde, NSW, 2114

Sample Details

Your Reference	**99554.01, Glebe**
Number of Samples	23 Soil
Date samples received	28/01/2020
Date completed instructions received	28/01/2020

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	04/02/2020
Date of Issue	30/01/2020

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Results Approved By
Nick Sarlamis, Inorganics Supervisor

Authorised By

Nancy Zhang, Laboratory Manager

sPOCAS field test						
Our Reference		235396-1	235396-2	235396-3	235396-4	235396-5
Your Reference	UNITS	1	1	1	1	4
Depth		2.5-2.95	3.0-3.5	4.0-4.45	5.5-5.95	1.5-1.6
Date Sampled		21/01/2020	21/01/2020	21/01/2020	21/01/2020	20/01/2020
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	29/01/2020	29/01/2020	29/01/2020	29/01/2020	29/01/2020
Date analysed	-	29/01/2020	29/01/2020	29/01/2020	29/01/2020	29/01/2020
pH_F (field pH test)*	pH Units	6.4	6.7	6.1	5.6	6.6
pH_{FOX} (field peroxide test)*	pH Units	4.5	5.1	5.4	4.6	3.0
Reaction Rate*	-	Medium reaction	Medium reaction	Extreme reaction	High reaction	Extreme reaction

sPOCAS field test						
Our Reference		235396-6	235396-7	235396-8	235396-9	235396-10
Your Reference	UNITS	4	4	4	5	5
Depth		2.5-2.95	4.0-4.45	5.5-5.95	1-1.45	1.9-2.0
Date Sampled		20/01/2020	20/01/2020	20/01/2020	23/01/2020	23/01/2020
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	29/01/2020	29/01/2020	29/01/2020	29/01/2020	29/01/2020
Date analysed	-	29/01/2020	29/01/2020	29/01/2020	29/01/2020	29/01/2020
pH_F (field pH test)*	pH Units	7.1	7.1	7.0	6.9	7.1
pH_{FOX} (field peroxide test)*	pH Units	3.5	4.7	5.9	4.6	4.1
Reaction Rate*	-	High reaction	High reaction	High reaction	High reaction	Extreme reaction

sPOCAS field test						
Our Reference		235396-11	235396-12	235396-13	235396-14	235396-15
Your Reference	UNITS	5	5	5	5	5
Depth		2.5-2.95	3.0-3.1	4.0-4.45	4.9-5.0	5.5-5.9
Date Sampled		23/01/2020	23/01/2020	23/01/2020	23/01/2020	23/01/2020
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	29/01/2020	29/01/2020	29/01/2020	29/01/2020	29/01/2020
Date analysed	-	29/01/2020	29/01/2020	29/01/2020	29/01/2020	29/01/2020
pH_F (field pH test)*	pH Units	6.5	6.5	6.8	6.7	6.5
pH_{FOX} (field peroxide test)*	pH Units	5.9	6.1	5.3	4.7	5.6
Reaction Rate*	-	Volcanic reaction	Volcanic reaction	High reaction	High reaction	Extreme reaction

sPOCAS field test						
Our Reference		235396-16	235396-17	235396-18	235396-19	235396-20
Your Reference	UNITS	6	6	6	6	6
Depth		1.0-1.45	1.9-2.0	2.5-2.95	3.0-3.1	4.0-4.45
Date Sampled		24/01/2020	24/01/2020	24/01/2020	24/01/2020	24/01/2020
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	29/01/2020	29/01/2020	29/01/2020	29/01/2020	29/01/2020
Date analysed	-	29/01/2020	29/01/2020	29/01/2020	29/01/2020	29/01/2020
pH_F (field pH test)*	pH Units	8.0	7.8	6.8	7.2	6.5
pH_{FOX} (field peroxide test)*	pH Units	6.9	5.7	4.5	4.1	4.6
Reaction Rate*	-	Extreme reaction	High reaction	High reaction	High reaction	High reaction

sPOCAS field test				
Our Reference		235396-21	235396-22	235396-23
Your Reference	UNITS	6	6	6
Depth		4.9-5.0	5.5-5.95	7-7.45
Date Sampled		24/01/2020	24/01/2020	24/01/2020
Type of sample		Soil	Soil	Soil
Date prepared	-	29/01/2020	29/01/2020	29/01/2020
Date analysed	-	29/01/2020	29/01/2020	29/01/2020
pH_F (field pH test)*	pH Units	7.5	6.8	7.1
pH_{FOX} (field peroxide test)*	pH Units	3.1	5.8	6.5
Reaction Rate*	-	High reaction	High reaction	High reaction

Method ID	Methodology Summary
Inorg-063	pH- measured using pH meter and electrode. Soil is oxidised with Hydrogen Peroxide or extracted with water. Based on section H, Acid Sulfate Soils Laboratory Methods Guidelines, Version 2.1 - June 2004. To ensure accurate results these tests are recommended to be done in the field as pH may change with time thus these results may not be representative of true field conditions.

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

Report Comments

SPOCAS FIELD TEST has exceeded the recommended technical holding times, Envirolab Group form 347 "Recommended Preservation and Holding Times" can be provided on request (available on the Envirolab website)

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CERTIFICATE OF ANALYSIS 235396-B

Client Details

Client	Douglas Partners Pty Ltd
Attention	Nerilee Edwards
Address	96 Hermitage Rd, West Ryde, NSW, 2114

Sample Details

Your Reference	**99554.01, Glebe**
Number of Samples	23 Soil
Date samples received	28/01/2020
Date completed instructions received	31/01/2020

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	07/02/2020
Date of Issue	05/02/2020

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

Results Approved By
Priya Samarawickrama, Senior Chemist

Authorised By

Nancy Zhang, Laboratory Manager

Chromium Suite				
Our Reference		235396-B-6	235396-B-12	235396-B-21
Your Reference	UNITS	4	5	6
Depth		2.5-2.95	3.0-3.1	4.9-5.0
Date Sampled		20/01/2020	23/01/2020	24/01/2020
Type of sample		Soil	Soil	Soil
Date prepared	-	03/02/2020	03/02/2020	03/02/2020
Date analysed	-	03/02/2020	03/02/2020	03/02/2020
pH $_{kcl}$	pH units	5.0	4.9	5.3
s-TAA pH 6.5	%w/w S	0.02	0.03	0.01
TAA pH 6.5	moles H^+ /t	11	16	6
Chromium Reducible Sulfur	%w/w	0.04	0.005	0.08
a-Chromium Reducible Sulfur	moles H^+ /t	22	<3	48
S_{HCl}	%w/w S	<0.005	<0.005	<0.005
S_{KCl}	%w/w S	0.007	0.015	0.018
S_{NAS}	%w/w S	<0.005	<0.005	<0.005
ANC_{BT}	% $CaCO_3$	<0.05	<0.05	<0.05
s-ANC_{BT}	%w/w S	<0.05	<0.05	<0.05
s-Net Acidity	%w/w S	0.053	0.031	0.087
a-Net Acidity	moles H^+ /t	33	19	54
Liming rate	kg $CaCO_3$ /t	2	1	4
a-Net Acidity without ANCE	moles H^+ /t	33	19	54
Liming rate without ANCE	kg $CaCO_3$ /t	2.5	1.4	4.1
s-Net Acidity without ANCE	%w/w S	0.053	0.031	0.087

Method ID	Methodology Summary
Inorg-068	Chromium Reducible Sulfur - Hydrogen Sulfide is quantified by iodometric titration after distillation to determine potential acidity. Based on Acid Sulfate Soils Laboratory Methods Guidelines, Version 2.1 - June 2004.

QUALITY CONTROL: Chromium Suite						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			03/02/2020	21	03/02/2020	03/02/2020		03/02/2020	[NT]
Date analysed	-			03/02/2020	21	03/02/2020	03/02/2020		03/02/2020	[NT]
pH $_{kcl}$	pH units		Inorg-068	[NT]	21	5.3	5.3	0	93	[NT]
s-TAA pH 6.5	%w/w S	0.01	Inorg-068	<0.01	21	0.01	0.01	0	[NT]	[NT]
TAA pH 6.5	moles H^+ /t	5	Inorg-068	<5	21	6	6	0	95	[NT]
Chromium Reducible Sulfur	%w/w	0.005	Inorg-068	<0.005	21	0.08	0.08	0	[NT]	[NT]
a-Chromium Reducible Sulfur	moles H^+ /t	3	Inorg-068	<3	21	48	50	4	110	[NT]
S_{HCl}	%w/w S	0.005	Inorg-068	<0.005	21	<0.005	<0.005	0	[NT]	[NT]
S_{KCl}	%w/w S	0.005	Inorg-068	<0.005	21	0.018	0.017	6	[NT]	[NT]
S_{NAS}	%w/w S	0.005	Inorg-068	<0.005	21	<0.005	<0.005	0	[NT]	[NT]
ANC_{BT}	% $CaCO_3$	0.05	Inorg-068	<0.05	21	<0.05	<0.05	0	[NT]	[NT]
s-ANC_{BT}	%w/w S	0.05	Inorg-068	<0.05	21	<0.05	<0.05	0	[NT]	[NT]
s-Net Acidity	%w/w S	0.005	Inorg-068	<0.005	21	0.087	0.090	3	[NT]	[NT]
a-Net Acidity	moles H^+ /t	5	Inorg-068	<5	21	54	56	4	[NT]	[NT]
Liming rate	kg $CaCO_3$ /t	0.75	Inorg-068	<0.75	21	4	4	0	[NT]	[NT]
a-Net Acidity without ANCE	moles H^+ /t	5	Inorg-068	<5	21	54	56	4	[NT]	[NT]
Liming rate without ANCE	kg $CaCO_3$ /t	0.75	Inorg-068	<0.75	21	4.1	4.2	2	[NT]	[NT]
s-Net Acidity without ANCE	%w/w S	0.005	Inorg-068	<0.005	21	0.087	0.090	3	[NT]	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

The recommended maximums for analytes in urine are taken from “2018 TLVs and BEIs”, as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.

Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2

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: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

Report Comments

Samples were out of the recommended holding time for this analysis.

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CERTIFICATE OF ANALYSIS 235396-C

Client Details

Client	Douglas Partners Pty Ltd
Attention	Nerilee Edwards
Address	96 Hermitage Rd, West Ryde, NSW, 2114

Sample Details

Your Reference	**99554.01, Glebe**
Number of Samples	23 Soil
Date samples received	28/01/2020
Date completed instructions received	13/02/2020

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	20/02/2020
Date of Issue	20/02/2020

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Results Approved By
Priya Samarawickrama, Senior Chemist

Authorised By

Nancy Zhang, Laboratory Manager

Chromium Suite						
Our Reference		235396-C-2	235396-C-7	235396-C-11	235396-C-14	235396-C-19
Your Reference	UNITS	1	4	5	5	6
Depth		3.0-3.5	4.0-4.45	2.5-2.95	4.9-5.0	3.0-3.1
Date Sampled		21/01/2020	20/01/2020	23/01/2020	23/01/2020	24/01/2020
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	16/02/2020	16/02/2020	16/02/2020	16/02/2020	16/02/2020
Date analysed	-	16/02/2020	16/02/2020	16/02/2020	16/02/2020	16/02/2020
pH $_{kcl}$	pH units	6.3	5.3	5.1	5.1	7.1
s-TAA pH 6.5	%w/w S	<0.01	<0.01	0.03	0.01	<0.01
TAA pH 6.5	moles H^+ /t	<5	<5	16	6	<5
Chromium Reducible Sulfur	%w/w	<0.005	0.006	<0.005	<0.005	0.03
a-Chromium Reducible Sulfur	moles H^+ /t	<3	4	<3	<3	19
S_{HCl}	%w/w S	NT	NT	NT	NT	NT
S_{KCl}	%w/w S	0.008	<0.005	0.023	0.012	0.010
S_{NAS}	%w/w S	NT	NT	NT	NT	NT
ANC_{BT}	% $CaCO_3$	<0.05	<0.05	<0.05	<0.05	0.65
s-ANC_{BT}	%w/w S	<0.05	<0.05	<0.05	<0.05	0.21
s-Net Acidity	%w/w S	<0.005	0.012	0.026	0.013	<0.005
a-Net Acidity	moles H^+ /t	<5	7.2	16	8.2	<5
Liming rate	kg $CaCO_3$ /t	<0.75	<0.75	1	<0.75	<0.75
a-Net Acidity without ANCE	moles H^+ /t	<5	7.2	16	8.2	19
Liming rate without ANCE	kg $CaCO_3$ /t	<0.75	<0.75	1.2	<0.75	1.4
s-Net Acidity without ANCE	%w/w S	<0.005	0.012	0.026	0.013	0.030

Chromium Suite		
Our Reference		235396-C-23
Your Reference	UNITS	6
Depth		7-7.45
Date Sampled		24/01/2020
Type of sample		Soil
Date prepared	-	16/02/2020
Date analysed	-	16/02/2020
pH $_{kcl}$	pH units	5.9
s-TAA pH 6.5	%w/w S	<0.01
TAA pH 6.5	moles H^+ /t	<5
Chromium Reducible Sulfur	%w/w	<0.005
a-Chromium Reducible Sulfur	moles H^+ /t	<3
S_{HCl}	%w/w S	NT
S_{KCl}	%w/w S	0.015
S_{NAS}	%w/w S	NT
ANC_{BT}	% $CaCO_3$	<0.05
s-ANC_{BT}	%w/w S	<0.05
s-Net Acidity	%w/w S	0.0080
a-Net Acidity	moles H^+ /t	<5
Liming rate	kg $CaCO_3$ /t	<0.75
a-Net Acidity without ANCE	moles H^+ /t	<5
Liming rate without ANCE	kg $CaCO_3$ /t	<0.75
s-Net Acidity without ANCE	%w/w S	0.0080

Method ID	Methodology Summary
Inorg-068	Chromium Reducible Sulfur - Hydrogen Sulfide is quantified by iodometric titration after distillation to determine potential acidity. Based on Acid Sulfate Soils Laboratory Methods Guidelines, Version 2.1 - June 2004.

QUALITY CONTROL: Chromium Suite						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			16/02/2020	[NT]	[NT]	[NT]	[NT]	16/02/2020	[NT]
Date analysed	-			16/02/2020	[NT]	[NT]	[NT]	[NT]	16/02/2020	[NT]
pH $_{kcl}$	pH units		Inorg-068	[NT]	[NT]	[NT]	[NT]	[NT]	94	[NT]
s-TAA pH 6.5	%w/w S	0.01	Inorg-068	<0.01	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
TAA pH 6.5	moles H^+ /t	5	Inorg-068	<5	[NT]	[NT]	[NT]	[NT]	85	[NT]
Chromium Reducible Sulfur	%w/w	0.005	Inorg-068	<0.005	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
a-Chromium Reducible Sulfur	moles H^+ /t	3	Inorg-068	<3	[NT]	[NT]	[NT]	[NT]	116	[NT]
S_{HCl}	%w/w S	0.005	Inorg-068	<0.005	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
S_{KCl}	%w/w S	0.005	Inorg-068	<0.005	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
S_{NAS}	%w/w S	0.005	Inorg-068	<0.005	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
ANC_{BT}	% $CaCO_3$	0.05	Inorg-068	<0.05	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
s-ANC_{BT}	%w/w S	0.05	Inorg-068	<0.05	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
s-Net Acidity	%w/w S	0.005	Inorg-068	<0.005	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
a-Net Acidity	moles H^+ /t	5	Inorg-068	<5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Liming rate	kg $CaCO_3$ /t	0.75	Inorg-068	<0.75	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
a-Net Acidity without ANCE	moles H^+ /t	5	Inorg-068	<5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Liming rate without ANCE	kg $CaCO_3$ /t	0.75	Inorg-068	<0.75	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
s-Net Acidity without ANCE	%w/w S	0.005	Inorg-068	<0.005	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

The recommended maximums for analytes in urine are taken from “2018 TLVs and BEIs”, as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.

Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2

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: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

Report Comments

Samples were out of the recommended holding time for this analysis.

CHAIN OF CUSTODY - Client

ENVIROLAB GROUP - National phone number 1300 424 344

Client: Douglas Partners	**Client Project Name / Number / Site etc (ie report title):** 99554.01
Contact Person: Neriee	
Project Mgr: Neriee Edwards	**PO No.:**
Sampler: Tim Bransgrove	**Envirolab Quote No.:**
Address: 96 Hermitage Road West Ryde	**Date results required:** Or choose: standard / same day / 1 day / 2 day / 3 day *Note: Inform lab in advance if urgent turnaround is required - surcharges apply*
Phone: **Mob:**	**Additional report format:** esdat / equis /
Email: Neriee.edwards@douglaspartners.com.au tim.bransgrove@douglaspartners.com.au	**Lab Comments:**

Sydney Lab - Envirolab Services
12 Ashley St, Chatswood, NSW 2067
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16-18 Hayden Crt, Myaree, WA 6154
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Darwin Office - Envirolab Services
Unit 7, 17 Willes Rd, Berrimah, NT 0820
Ph: 08 8967 1201 / darwin@envirolab.com.au

Sample information					Tests Required														Comments
Envirolab Sample ID	Client Sample ID or information	Depth	Date sampled	Type of sample	METALS	BTEX, VOC	Low level PAH	Trace level PCB, OCP, OPP	total Phenols	Cyanide	Hardness	BTEX							Provide as much information about the sample as you can
1	GW4/050220		5/02/20	water	✓	✓	✓	✓	✓	✓	✓								combo 4 L ŵ
(4) NR	BD1/050220		↓	↓	✓		✓												trace OC, OP, PCB
2	TB1/050220		↓	↓								✓							
3	TS1/050220		↓	↓								✓							
																			Metals: (As) (Be), (B), Cd, Cr, Co, Cu, Fe, Pb, Mn, Hg, Mo, Ni, Se, Ag, Zn

Relinquished by (Company):	**Received by (Company):** ELS Syd	***Lab Use Only***	
Print Name: Tim Bransgrove	**Print Name:** S. Bolton	**Job number:** 236055	**Cooling:** Ice / Ice pack / None
Date & Time: 5/2/20	**Date & Time:** 05/02/20 1755	**Temperature:** 11-2	**Security seal:** Intact / Broken / None
Signature:	**Signature:**	**TAT Req - SAME day / 1 / 2 / 3 / 4 / STD**	

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

SAMPLE RECEIPT ADVICE

Client Details

Client	Douglas Partners Pty Ltd
Attention	Nerilee Edwards

Sample Login Details

Your reference	99554.01
Envirolab Reference	236055
Date Sample Received	05/02/2020
Date Instructions Received	05/02/2020
Date Results Expected to be Reported	12/02/2020

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	4 Water
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	11.2
Cooling Method	Ice Pack
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

Aileen Hie	Jacinta Hurst
Phone: 02 9910 6200	**Phone: 02 9910 6200**
Fax: 02 9910 6201	**Fax: 02 9910 6201**
Email: ahie@envirolab.com.au	**Email: jhurst@envirolab.com.au**

Analysis Underway, details on the following page:

Envirolab Services Pty Ltd
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Sample ID	VOCs in water	BTEX in Water	PAHs in Water - Low Level	OCPs in Water - Trace Level	OP in water Trace ANZECCF/ADWG	PCBs in Water - Trace Level	Total Phenolicsin Water	HM in water - dissolved	Total Cyanide	Cations in water Dissolved
GW4/050220	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
TB1/050220		✓								
TS1/050220		✓								
BD1/050220			✓					✓		

The '✓' indicates the testing you have requested. **THIS IS NOT A REPORT OF THE RESULTS.**

Additional Info

Sample storage - Waters are routinely disposed of approximately 1 month and soils approximately 2 months from receipt.
Requests for longer term sample storage must be received in writing.
Please contact the laboratory immediately if observed settled sediment present in water samples is to be included in the extraction and/or analysis (exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS analysis where solids are included by default.
TAT for Micro is dependent on incubation. This varies from 3 to 6 days.

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CERTIFICATE OF ANALYSIS 236055

Client Details

Client	Douglas Partners Pty Ltd
Attention	Nerilee Edwards
Address	96 Hermitage Rd, West Ryde, NSW, 2114

Sample Details

Your Reference	**99554.01**
Number of Samples	4 Water
Date samples received	05/02/2020
Date completed instructions received	05/02/2020

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Report Details

Date results requested by	12/02/2020
Date of Issue	12/02/2020

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

Results Approved By
Diego Bigolin, Team Leader, Inorganics
Josh Williams, Senior Chemist
Loren Bardwell, Senior Chemist
Steven Luong, Organics Supervisor

Authorised By

Nancy Zhang, Laboratory Manager

VOCs in water		
Our Reference		236055-1
Your Reference	UNITS	GW4/050220
Date Sampled		05/02/2020
Type of sample		Water
Date extracted	-	07/02/2020
Date analysed	-	07/02/2020
Dichlorodifluoromethane	µg/L	<10
Chloromethane	µg/L	<10
Vinyl Chloride	µg/L	<10
Bromomethane	µg/L	<10
Chloroethane	µg/L	<10
Trichlorofluoromethane	µg/L	<10
1,1-Dichloroethene	µg/L	<1
Trans-1,2-dichloroethene	µg/L	<1
1,1-dichloroethane	µg/L	<1
Cis-1,2-dichloroethene	µg/L	<1
Bromochloromethane	µg/L	<1
Chloroform	µg/L	<1
2,2-dichloropropane	µg/L	<1
1,2-dichloroethane	µg/L	<1
1,1,1-trichloroethane	µg/L	<1
1,1-dichloropropene	µg/L	<1
Cyclohexane	µg/L	<1
Carbon tetrachloride	µg/L	<1
Benzene	µg/L	<1
Dibromomethane	µg/L	<1
1,2-dichloropropane	µg/L	<1
Trichloroethene	µg/L	<1
Bromodichloromethane	µg/L	<1
trans-1,3-dichloropropene	µg/L	<1
cis-1,3-dichloropropene	µg/L	<1
1,1,2-trichloroethane	µg/L	<1
Toluene	µg/L	<1
1,3-dichloropropane	µg/L	<1
Dibromochloromethane	µg/L	<1
1,2-dibromoethane	µg/L	<1
Tetrachloroethene	µg/L	<1
1,1,1,2-tetrachloroethane	µg/L	<1
Chlorobenzene	µg/L	<1
Ethylbenzene	µg/L	<1

VOCs in water		
Our Reference		236055-1
Your Reference	UNITS	GW4/050220
Date Sampled		05/02/2020
Type of sample		Water
Bromoform	µg/L	<1
m+p-xylene	µg/L	<2
Styrene	µg/L	<1
1,1,2,2-tetrachloroethane	µg/L	<1
o-xylene	µg/L	<1
1,2,3-trichloropropane	µg/L	<1
Isopropylbenzene	µg/L	<1
Bromobenzene	µg/L	<1
n-propyl benzene	µg/L	<1
2-chlorotoluene	µg/L	<1
4-chlorotoluene	µg/L	<1
1,3,5-trimethyl benzene	µg/L	<1
Tert-butyl benzene	µg/L	<1
1,2,4-trimethyl benzene	µg/L	<1
1,3-dichlorobenzene	µg/L	<1
Sec-butyl benzene	µg/L	<1
1,4-dichlorobenzene	µg/L	<1
4-isopropyl toluene	µg/L	<1
1,2-dichlorobenzene	µg/L	<1
n-butyl benzene	µg/L	<1
1,2-dibromo-3-chloropropane	µg/L	<1
1,2,4-trichlorobenzene	µg/L	<1
Hexachlorobutadiene	µg/L	<1
1,2,3-trichlorobenzene	µg/L	<1
Surrogate Dibromofluoromethane	%	100
Surrogate toluene-d8	%	96
Surrogate 4-BFB	%	107

vTRH(C6-C10)/BTEXN in Water				
Our Reference	UNITS	236055-1	236055-2	236055-3
Your Reference		GW4/050220	TB1/050220	TS1/050220
Date Sampled		05/02/2020	05/02/2020	05/02/2020
Type of sample		Water	Water	Water
Date extracted	-	07/02/2020	07/02/2020	07/02/2020
Date analysed	-	07/02/2020	07/02/2020	07/02/2020
TRH C_6 - C_9	µg/L	<10	<10	[NA]
TRH C_6 - C_{10}	µg/L	<10	<10	[NA]
TRH C_6 - C_{10} less BTEX (F1)	µg/L	<10	<10	[NA]
Benzene	µg/L	<1	<1	126%
Toluene	µg/L	<1	<1	126%
Ethylbenzene	µg/L	<1	<1	107%
m+p-xylene	µg/L	<2	<2	106%
o-xylene	µg/L	<1	<1	112%
Naphthalene	µg/L	<1	<1	[NA]
Surrogate Dibromofluoromethane	%	100	103	105
Surrogate toluene-d8	%	96	98	105
Surrogate 4-BFB	%	107	108	102

svTRH (C10-C40) in Water		
Our Reference		236055-1
Your Reference	UNITS	GW4/050220
Date Sampled		05/02/2020
Type of sample		Water
Date extracted	-	07/02/2020
Date analysed	-	08/02/2020
TRH C_{10} - C_{14}	µg/L	<50
TRH C_{15} - C_{28}	µg/L	<100
TRH C_{29} - C_{36}	µg/L	<100
TRH >C_{10} - C_{16}	µg/L	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	µg/L	<50
TRH >C_{16} - C_{34}	µg/L	<100
TRH >C_{34} - C_{40}	µg/L	<100
Surrogate o-Terphenyl	%	89

PAHs in Water - Low Level			
Our Reference	UNITS	236055-1	236055-4
Your Reference		GW4/050220	BD1/050220
Date Sampled		05/02/2020	05/02/2020
Type of sample		Water	Water
Date extracted	-	07/02/2020	07/02/2020
Date analysed	-	10/02/2020	10/02/2020
Naphthalene	µg/L	<0.2	<0.2
Acenaphthylene	µg/L	<0.1	<0.1
Acenaphthene	µg/L	<0.1	<0.1
Fluorene	µg/L	<0.1	<0.1
Phenanthrene	µg/L	<0.1	<0.1
Anthracene	µg/L	<0.1	<0.1
Fluoranthene	µg/L	<0.1	<0.1
Pyrene	µg/L	<0.1	<0.1
Benzo(a)anthracene	µg/L	<0.1	<0.1
Chrysene	µg/L	<0.1	<0.1
Benzo(b,j+k)fluoranthene	µg/L	<0.2	<0.2
Benzo(a)pyrene	µg/L	<0.1	<0.1
Indeno(1,2,3-c,d)pyrene	µg/L	<0.1	<0.1
Dibenzo(a,h)anthracene	µg/L	<0.1	<0.1
Benzo(g,h,i)perylene	µg/L	<0.1	<0.1
Benzo(a)pyrene TEQ	µg/L	<0.5	<0.5
Total +ve PAH's	µg/L	<0.1	<0.1
Surrogate p-Terphenyl-d14	%	116	75

OCPs in Water - Trace Level		
Our Reference		236055-1
Your Reference	UNITS	GW4/050220
Date Sampled		05/02/2020
Type of sample		Water
Date extracted	-	07/02/2020
Date analysed	-	10/02/2020
alpha-BHC	µg/L	<0.001
HCB	µg/L	<0.001
beta-BHC	µg/L	<0.001
gamma-BHC	µg/L	<0.001
Heptachlor	µg/L	<0.001
delta-BHC	µg/L	<0.001
Aldrin	µg/L	<0.001
Heptachlor Epoxide	µg/L	<0.001
gamma-Chlordane	µg/L	<0.001
alpha-Chlordane	µg/L	<0.001
Endosulfan I	µg/L	<0.002
pp-DDE	µg/L	<0.001
Dieldrin	µg/L	<0.001
Endrin	µg/L	<0.001
Endosulfan II	µg/L	<0.002
pp-DDD	µg/L	<0.001
Endrin Aldehyde	µg/L	<0.001
pp-DDT	µg/L	<0.001
Endosulfan Sulphate	µg/L	<0.001
Methoxychlor	µg/L	<0.001
Surrogate TCMX	%	107

OP in water Trace ANZECCF/ADWG		
Our Reference		236055-1
Your Reference	UNITS	GW4/050220
Date Sampled		05/02/2020
Type of sample		Water
Date extracted	-	07/02/2020
Date analysed	-	10/02/2020
Dichlorovos	µg/L	<0.2
Dimethoate	µg/L	<0.15
Diazinon	µg/L	<0.01
Chlorpyriphos-methyl	µg/L	<0.2
Methyl Parathion	µg/L	<0.2
Ronnel	µg/L	<0.2
Fenitrothion	µg/L	<0.2
Malathion	µg/L	<0.05
Chlorpyriphos	µg/L	<0.009
Parathion	µg/L	<0.004
Bromophos ethyl	µg/L	<0.2
Ethion	µg/L	<0.2
Azinphos-methyl (Guthion)	µg/L	<0.02
Surrogate TCMX	%	107

PCBs in Water - Trace Level		
Our Reference		236055-1
Your Reference	UNITS	GW4/050220
Date Sampled		05/02/2020
Type of sample		Water
Date extracted	-	07/02/2020
Date analysed	-	10/02/2020
Aroclor 1016	µg/L	<0.01
Aroclor 1221	µg/L	<0.01
Aroclor 1232	µg/L	<0.01
Aroclor 1242	µg/L	<0.01
Aroclor 1248	µg/L	<0.01
Aroclor 1254	µg/L	<0.01
Aroclor 1260	µg/L	<0.01
Surrogate TCMX	%	107

Total Phenolics in Water		
Our Reference		236055-1
Your Reference	UNITS	GW4/050220
Date Sampled		05/02/2020
Type of sample		Water
Date extracted	-	07/02/2020
Date analysed	-	07/02/2020
Total Phenolics (as Phenol)	mg/L	<0.05

HM in water - dissolved			
Our Reference	UNITS	236055-1	236055-4
Your Reference		GW4/050220	BD1/050220
Date Sampled		05/02/2020	05/02/2020
Type of sample		Water	Water
Date prepared	-	07/02/2020	07/02/2020
Date analysed	-	07/02/2020	07/02/2020
Arsenic-Dissolved	µg/L	1	1
Boron-Dissolved	µg/L	2,600	2,400
Beryllium-Dissolved	µg/L	<0.5	<0.5
Cadmium-Dissolved	µg/L	<0.1	<0.1
Chromium-Dissolved	µg/L	<1	<1
Cobalt-Dissolved	µg/L	2	3
Copper-Dissolved	µg/L	<1	<1
Iron-Dissolved	µg/L	7,100	9,300
Lead-Dissolved	µg/L	<1	<1
Manganese-Dissolved	µg/L	150	190
Mercury-Dissolved	µg/L	<0.05	<0.05
Molybdenum-Dissolved	µg/L	3	3
Nickel-Dissolved	µg/L	<1	<1
Selenium-Dissolved	µg/L	<1	<1
Silver-Dissolved	µg/L	<1	<1
Zinc-Dissolved	µg/L	1	3

Miscellaneous Inorganics		
Our Reference		236055-1
Your Reference	UNITS	GW4/050220
Date Sampled		05/02/2020
Type of sample		Water
Date prepared	-	07/02/2020
Date analysed	-	07/02/2020
Total Cyanide	mg/L	<0.004

Cations in water Dissolved		
Our Reference		236055-1
Your Reference	UNITS	GW4/050220
Date Sampled		05/02/2020
Type of sample		Water
Date digested	-	07/02/2020
Date analysed	-	07/02/2020
Calcium - Dissolved	mg/L	12
Magnesium - Dissolved	mg/L	10
Hardness	mgCaCO 3 /L	72

Method ID	Methodology Summary
Inorg-014	Cyanide - free, total, weak acid dissociable by segmented flow analyser (in line dialysis with colourimetric finish). Solids/Filters and sorbents are extracted in a caustic media prior to analysis. Impingers are pH adjsuted as required prior to analysis. Cyanides amenable to Chlorination - samples are analysed untreated and treated with hyperchlorite to assess the potential for chlorination of cyanide forms. Based on APHA latest edition, 4500-CN_G,H.
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	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Metals-022	Determination of various metals by ICP-MS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Org-012/017	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS and/or GC-MS/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. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013.
Org-013	Water samples are analysed directly by purge and trap GC-MS.
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.

QUALITY CONTROL: VOCs in water					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			07/02/2020	[NT]	[NT]	[NT]	[NT]	07/02/2020	[NT]
Date analysed	-			07/02/2020	[NT]	[NT]	[NT]	[NT]	07/02/2020	[NT]
Dichlorodifluoromethane	µg/L	10	Org-013	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chloromethane	µg/L	10	Org-013	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Vinyl Chloride	µg/L	10	Org-013	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bromomethane	µg/L	10	Org-013	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chloroethane	µg/L	10	Org-013	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Trichlorofluoromethane	µg/L	10	Org-013	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1-Dichloroethene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Trans-1,2-dichloroethene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1-dichloroethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	82	[NT]
Cis-1,2-dichloroethene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bromochloromethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chloroform	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	84	[NT]
2,2-dichloropropane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dichloroethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	82	[NT]
1,1,1-trichloroethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	81	[NT]
1,1-dichloropropene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Cyclohexane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Carbon tetrachloride	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibromomethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dichloropropane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Trichloroethene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	86	[NT]
Bromodichloromethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	73	[NT]
trans-1,3-dichloropropene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
cis-1,3-dichloropropene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1,2-trichloroethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Toluene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,3-dichloropropane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibromochloromethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	70	[NT]
1,2-dibromoethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Tetrachloroethene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	84	[NT]
1,1,1,2-tetrachloroethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chlorobenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ethylbenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bromoform	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
m+p-xylene	µg/L	2	Org-013	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Styrene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1,2,2-tetrachloroethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]

QUALITY CONTROL: VOCs in water					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
o-xylene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2,3-trichloropropane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Isopropylbenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bromobenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
n-propyl benzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
2-chlorotoluene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
4-chlorotoluene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,3,5-trimethyl benzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Tert-butyl benzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2,4-trimethyl benzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,3-dichlorobenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Sec-butyl benzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,4-dichlorobenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
4-isopropyl toluene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dichlorobenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
n-butyl benzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dibromo-3-chloropropane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2,4-trichlorobenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Hexachlorobutadiene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2,3-trichlorobenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-013	99	[NT]	[NT]	[NT]	[NT]	97	[NT]
Surrogate toluene-d8	%		Org-013	98	[NT]	[NT]	[NT]	[NT]	100	[NT]
Surrogate 4-BFB	%		Org-013	105	[NT]	[NT]	[NT]	[NT]	97	[NT]

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Water					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			11/02/2020	[NT]	[NT]	[NT]	[NT]	07/02/2020	[NT]
Date analysed	-			11/02/2020	[NT]	[NT]	[NT]	[NT]	07/02/2020	[NT]
TRH C_6 - C_9	µg/L	10	Org-016	<10	[NT]	[NT]	[NT]	[NT]	82	[NT]
TRH C_6 - C_{10}	µg/L	10	Org-016	<10	[NT]	[NT]	[NT]	[NT]	82	[NT]
Benzene	µg/L	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	81	[NT]
Toluene	µg/L	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	86	[NT]
Ethylbenzene	µg/L	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	78	[NT]
m+p-xylene	µg/L	2	Org-016	<2	[NT]	[NT]	[NT]	[NT]	82	[NT]
o-xylene	µg/L	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	79	[NT]
Naphthalene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-016	99	[NT]	[NT]	[NT]	[NT]	97	[NT]
Surrogate toluene-d8	%		Org-016	98	[NT]	[NT]	[NT]	[NT]	100	[NT]
Surrogate 4-BFB	%		Org-016	105	[NT]	[NT]	[NT]	[NT]	97	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Water					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date extracted	-			07/02/2020	[NT]	[NT]	[NT]	[NT]	07/02/2020	[NT]
Date analysed	-			08/02/2020	[NT]	[NT]	[NT]	[NT]	08/02/2020	[NT]
TRH C_{10} - C_{14}	µg/L	50	Org-003	<50	[NT]	[NT]	[NT]	[NT]	92	[NT]
TRH C_{15} - C_{28}	µg/L	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	91	[NT]
TRH C_{29} - C_{36}	µg/L	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	77	[NT]
TRH >C_{10} - C_{16}	µg/L	50	Org-003	<50	[NT]	[NT]	[NT]	[NT]	92	[NT]
TRH >C_{16} - C_{34}	µg/L	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	91	[NT]
TRH >C_{34} - C_{40}	µg/L	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	77	[NT]
Surrogate o-Terphenyl	%		Org-003	92	[NT]	[NT]	[NT]	[NT]	106	[NT]

QUALITY CONTROL: PAHs in Water - Low Level						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W4	[NT]
Date extracted	-			07/02/2020	[NT]	[NT]	[NT]	[NT]	07/02/2020	[NT]
Date analysed	-			10/02/2020	[NT]	[NT]	[NT]	[NT]	10/02/2020	[NT]
Naphthalene	µg/L	0.2	Org-012/017	<0.2	[NT]	[NT]	[NT]	[NT]	88	[NT]
Acenaphthylene	µg/L	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene	µg/L	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluorene	µg/L	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	94	[NT]
Phenanthrene	µg/L	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	97	[NT]
Anthracene	µg/L	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene	µg/L	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	94	[NT]
Pyrene	µg/L	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	87	[NT]
Benzo(a)anthracene	µg/L	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene	µg/L	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	89	[NT]
Benzo(b,j+k)fluoranthene	µg/L	0.2	Org-012/017	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene	µg/L	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	91	[NT]
Indeno(1,2,3-c,d)pyrene	µg/L	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene	µg/L	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene	µg/L	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012/017	106	[NT]	[NT]	[NT]	[NT]	114	[NT]

QUALITY CONTROL: OCPs in Water - Trace Level					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W4	[NT]
Date extracted	-			07/02/2020	[NT]	[NT]	[NT]	[NT]	07/02/2020	[NT]
Date analysed	-			10/02/2020	[NT]	[NT]	[NT]	[NT]	10/02/2020	[NT]
alpha-BHC	µg/L	0.001	Org-012/017	<0.001	[NT]	[NT]	[NT]	[NT]	94	[NT]
HCB	µg/L	0.001	Org-012/017	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
beta-BHC	µg/L	0.001	Org-012/017	<0.001	[NT]	[NT]	[NT]	[NT]	96	[NT]
gamma-BHC	µg/L	0.001	Org-012/017	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Heptachlor	µg/L	0.001	Org-012/017	<0.001	[NT]	[NT]	[NT]	[NT]	84	[NT]
delta-BHC	µg/L	0.001	Org-012/017	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aldrin	µg/L	0.001	Org-012/017	<0.001	[NT]	[NT]	[NT]	[NT]	94	[NT]
Heptachlor Epoxide	µg/L	0.001	Org-012/017	<0.001	[NT]	[NT]	[NT]	[NT]	93	[NT]
gamma-Chlordane	µg/L	0.001	Org-012/017	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
alpha-Chlordane	µg/L	0.001	Org-012/017	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan I	µg/L	0.002	Org-012/017	<0.002	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDE	µg/L	0.001	Org-012/017	<0.001	[NT]	[NT]	[NT]	[NT]	86	[NT]
Dieldrin	µg/L	0.001	Org-012/017	<0.001	[NT]	[NT]	[NT]	[NT]	85	[NT]
Endrin	µg/L	0.001	Org-012/017	<0.001	[NT]	[NT]	[NT]	[NT]	84	[NT]
Endosulfan II	µg/L	0.002	Org-012/017	<0.002	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDD	µg/L	0.001	Org-012/017	<0.001	[NT]	[NT]	[NT]	[NT]	90	[NT]
Endrin Aldehyde	µg/L	0.001	Org-012/017	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDT	µg/L	0.001	Org-012/017	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan Sulphate	µg/L	0.001	Org-012/017	<0.001	[NT]	[NT]	[NT]	[NT]	87	[NT]
Methoxychlor	µg/L	0.001	Org-012/017	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCMX	%		Org-012/017	100	[NT]	[NT]	[NT]	[NT]	100	[NT]

QUALITY CONTROL: OP in water Trace ANZECCF/ADWG						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W4	[NT]
Date extracted	-			07/02/2020	[NT]	[NT]	[NT]	[NT]	07/02/2020	[NT]
Date analysed	-			10/02/2020	[NT]	[NT]	[NT]	[NT]	10/02/2020	[NT]
Dichlorovos	µg/L	0.2	Org-012/017	<0.2	[NT]	[NT]	[NT]	[NT]	88	[NT]
Dimethoate	µg/L	0.15	Org-012/017	<0.15	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Diazinon	µg/L	0.01	Org-012/017	<0.01	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chlorpyriphos-methyl	µg/L	0.2	Org-012/017	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Methyl Parathion	µg/L	0.2	Org-012/017	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ronnel	µg/L	0.2	Org-012/017	<0.2	[NT]	[NT]	[NT]	[NT]	86	[NT]
Fenitrothion	µg/L	0.2	Org-012/017	<0.2	[NT]	[NT]	[NT]	[NT]	88	[NT]
Malathion	µg/L	0.05	Org-012/017	<0.05	[NT]	[NT]	[NT]	[NT]	91	[NT]
Chlorpyriphos	µg/L	0.009	Org-012/017	<0.009	[NT]	[NT]	[NT]	[NT]	109	[NT]
Parathion	µg/L	0.004	Org-012/017	<0.004	[NT]	[NT]	[NT]	[NT]	97	[NT]
Bromophos ethyl	µg/L	0.2	Org-012/017	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ethion	µg/L	0.2	Org-012/017	<0.2	[NT]	[NT]	[NT]	[NT]	88	[NT]
Azinphos-methyl (Guthion)	µg/L	0.02	Org-012/017	<0.02	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCMX	%		Org-012/017	100	[NT]	[NT]	[NT]	[NT]	100	[NT]

QUALITY CONTROL: PCBs in Water - Trace Level						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W4	[NT]
Date extracted	-			07/02/2020	[NT]	[NT]	[NT]	[NT]	07/02/2020	[NT]
Date analysed	-			10/02/2020	[NT]	[NT]	[NT]	[NT]	10/02/2020	[NT]
Aroclor 1016	µg/L	0.01	Org-006	<0.01	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1221	µg/L	0.01	Org-006	<0.01	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1232	µg/L	0.01	Org-006	<0.01	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1242	µg/L	0.01	Org-006	<0.01	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1248	µg/L	0.01	Org-006	<0.01	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1254	µg/L	0.01	Org-006	<0.01	[NT]	[NT]	[NT]	[NT]	89	[NT]
Aroclor 1260	µg/L	0.01	Org-006	<0.01	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCMX	%		Org-006	100	[NT]	[NT]	[NT]	[NT]	100	[NT]

QUALITY CONTROL: Total Phenolics in Water					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			07/02/2020	[NT]	[NT]	[NT]	[NT]	07/02/2020	[NT]
Date analysed	-			07/02/2020	[NT]	[NT]	[NT]	[NT]	07/02/2020	[NT]
Total Phenolics (as Phenol)	mg/L	0.05	Inorg-031	<0.05	[NT]	[NT]	[NT]	[NT]	103	[NT]

QUALITY CONTROL: HM in water - dissolved						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			07/02/2020	[NT]	[NT]	[NT]	[NT]	07/02/2020	[NT]
Date analysed	-			07/02/2020	[NT]	[NT]	[NT]	[NT]	07/02/2020	[NT]
Arsenic-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	99	[NT]
Boron-Dissolved	µg/L	20	Metals-022	<20	[NT]	[NT]	[NT]	[NT]	109	[NT]
Beryllium-Dissolved	µg/L	0.5	Metals-022	<0.5	[NT]	[NT]	[NT]	[NT]	104	[NT]
Cadmium-Dissolved	µg/L	0.1	Metals-022	<0.1	[NT]	[NT]	[NT]	[NT]	98	[NT]
Chromium-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	105	[NT]
Cobalt-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	107	[NT]
Copper-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	106	[NT]
Iron-Dissolved	µg/L	10	Metals-022	<10	[NT]	[NT]	[NT]	[NT]	106	[NT]
Lead-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	105	[NT]
Manganese-Dissolved	µg/L	5	Metals-022	<5	[NT]	[NT]	[NT]	[NT]	102	[NT]
Mercury-Dissolved	µg/L	0.05	Metals-021	<0.05	[NT]	[NT]	[NT]	[NT]	96	[NT]
Molybdenum-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	101	[NT]
Nickel-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	103	[NT]
Selenium-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	103	[NT]
Silver-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	99	[NT]
Zinc-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	102	[NT]

QUALITY CONTROL: Miscellaneous Inorganics					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			07/02/2020	[NT]	[NT]	[NT]	[NT]	07/02/2020	[NT]
Date analysed	-			07/02/2020	[NT]	[NT]	[NT]	[NT]	07/02/2020	[NT]
Total Cyanide	mg/L	0.004	Inorg-014	<0.004	[NT]	[NT]	[NT]	[NT]	97	[NT]

QUALITY CONTROL: Cations in water Dissolved						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date digested	-			07/02/2020	[NT]	[NT]	[NT]	[NT]	07/02/2020	[NT]
Date analysed	-			07/02/2020	[NT]	[NT]	[NT]	[NT]	07/02/2020	[NT]
Calcium - Dissolved	mg/L	0.5	Metals-020	<0.5	[NT]	[NT]	[NT]	[NT]	108	[NT]
Magnesium - Dissolved	mg/L	0.5	Metals-020	<0.5	[NT]	[NT]	[NT]	[NT]	108	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

The recommended maximums for analytes in urine are taken from “2018 TLVs and BEIs”, as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.

Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2

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: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

Douglas Partners
Geotechnics | Environment | Groundwater

CHAIN OF CUSTODY DESPATCH SHEET

Project No:	99554.01	**Suburb:**	Glebe	**To:**	Envirolab Services
Project Name:		**Order Number**			12 Ashley St Chatswood 2067
Project Manager:	NLE	**Sampler:**	SI	**Attn:**	Aileen Hie
Emails:	nerilee.edwards@douglaspartners.com.au			**Phone:**	(02) 9910 6200
Date Required:	Same day ☐ 24 hours ☐ 48 hours ☐ 72 hours ☐ Standard ☑			**Email:**	AHie@envirolab.com.au
Prior Storage:	☐ Esky ☐ Fridge ☐ Shelved	Do samples contain 'potential' HBM?	Yes ☐ No ☐ (If YES, then handle, transport and store in accordance with FPM HAZID)		

Sample ID	Lab ID	Date Sampled	Sample Type (S - soil, W - water)	Container Type (G - glass, P - plastic)	Analytes: Combo 8a	Combo 3a	Combo 3	Combo 8	pH, CEC	BTEX	PAH	Heavy Metals	TRH and BTEX	Notes/preservation
4/0.4-0.5	1	20.01.20	S	G, P			x							See metals to analyse below
PQL (S) mg/kg														**ANZECC PQLs req'd for all water analytes** ☐

Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

Job No: 236059
Date Received: 05/02/20
Time Received: 1755
Received By: SB
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

PQL = practical quantitation limit. If none given, default to Laboratory Method Detection Limit

Metals to Analyse: As, Be, B, Cd, Cr, Co, Cu, Fe, Pb, Mn, Hg, Mo, Ni, Se, Ag, Zn

Lab Report/Reference No: 236059

Total number of samples in container: | **Relinquished by:** NLE | **Transported to laboratory by:** Hunter Express

Send Results to: Douglas Partners Pty Ltd | **Address:** 96 Hermitage Road West Ryde NSW 2114 | **Phone:** (02) 4271 1836 **Fax:** (02) 4271 1897

Signed: | **Received by:** S.Bolton ELS Sydney SBu | **Date & Time:** 5/2/20 1755

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

SAMPLE RECEIPT ADVICE

Client Details

Client	Douglas Partners Pty Ltd
Attention	Nerilee Edwards

Sample Login Details

Your reference	99554.01, Glebe
Envirolab Reference	236059
Date Sample Received	05/02/2020
Date Instructions Received	05/02/2020
Date Results Expected to be Reported	12/02/2020

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	1 Soil
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	14.7
Cooling Method	Ice Pack
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

Aileen Hie	Jacinta Hurst
Phone: 02 9910 6200	**Phone: 02 9910 6200**
Fax: 02 9910 6201	**Fax: 02 9910 6201**
Email: ahie@envirolab.com.au	**Email: jhurst@envirolab.com.au**

Analysis Underway, details on the following page:

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

Sample ID	vTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Acid Extractable metalsin soil
4-0.4-0.5	✓	✓	✓	✓

The '✓' indicates the testing you have requested. **THIS IS NOT A REPORT OF THE RESULTS.**

Additional Info

Sample storage - Waters are routinely disposed of approximately 1 month and soils approximately 2 months from receipt.
Requests for longer term sample storage must be received in writing.
Please contact the laboratory immediately if observed settled sediment present in water samples is to be included in the extraction and/or analysis (exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS analysis where solids are included by default.
TAT for Micro is dependent on incubation. This varies from 3 to 6 days.

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12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
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CERTIFICATE OF ANALYSIS 236059

Client Details

Client	Douglas Partners Pty Ltd
Attention	Nerilee Edwards
Address	96 Hermitage Rd, West Ryde, NSW, 2114

Sample Details

Your Reference	**99554.01, Glebe**
Number of Samples	1 Soil
Date samples received	05/02/2020
Date completed instructions received	05/02/2020

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Report Details

Date results requested by	12/02/2020
Date of Issue	12/02/2020

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

Results Approved By
Jaimie Loa-Kum-Cheung, Metals Supervisor
Steven Luong, Organics Supervisor

Authorised By

Nancy Zhang, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil		
Our Reference		236059-1
Your Reference	UNITS	4
Depth		0.4-0.5
Date Sampled		20/01/2020
Type of sample		Soil
Date extracted	-	06/02/2020
Date analysed	-	06/02/2020
TRH C_6 - C_9	mg/kg	<25
TRH C_6 - C_{10}	mg/kg	<25
vTPH C_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
Total +ve Xylenes	mg/kg	<3
Surrogate aaa-Trifluorotoluene	%	106

svTRH (C10-C40) in Soil		
Our Reference		236059-1
Your Reference	UNITS	4
Depth		0.4-0.5
Date Sampled		20/01/2020
Type of sample		Soil
Date extracted	-	06/02/2020
Date analysed	-	08/02/2020
TRH C_{10} - C_{14}	mg/kg	<50
TRH C_{15} - C_{28}	mg/kg	110
TRH C_{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	160
TRH >C_{34} -C_{40}	mg/kg	<100
Total +ve TRH (>C10-C40)	mg/kg	160
Surrogate o-Terphenyl	%	65

PAHs in Soil		
Our Reference		236059-1
Your Reference	UNITS	4
Depth		0.4-0.5
Date Sampled		20/01/2020
Type of sample		Soil
Date extracted	-	06/02/2020
Date analysed	-	08/02/2020
Naphthalene	mg/kg	0.1
Acenaphthylene	mg/kg	0.6
Acenaphthene	mg/kg	0.1
Fluorene	mg/kg	0.5
Phenanthrene	mg/kg	3.5
Anthracene	mg/kg	1.2
Fluoranthene	mg/kg	5.7
Pyrene	mg/kg	4.8
Benzo(a)anthracene	mg/kg	2.9
Chrysene	mg/kg	2.2
Benzo(b,j+k)fluoranthene	mg/kg	8.0
Benzo(a)pyrene	mg/kg	2.6
Indeno(1,2,3-c,d)pyrene	mg/kg	1.3
Dibenzo(a,h)anthracene	mg/kg	0.3
Benzo(g,h,i)perylene	mg/kg	1.5
Total +ve PAH's	mg/kg	35
Benzo(a)pyrene TEQ calc (zero)	mg/kg	4.2
Benzo(a)pyrene TEQ calc(half)	mg/kg	4.2
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	4.2
Surrogate p-Terphenyl-d14	%	78

Acid Extractable metals in soil		
Our Reference		236059-1
Your Reference	UNITS	4
Depth		0.4-0.5
Date Sampled		20/01/2020
Type of sample		Soil
Date prepared	-	05/02/2020
Date analysed	-	06/02/2020
Arsenic	mg/kg	9
Beryllium	mg/kg	<1
Boron	mg/kg	4
Cadmium	mg/kg	0.5
Chromium	mg/kg	12
Cobalt	mg/kg	4
Copper	mg/kg	97
Iron	mg/kg	18,000
Lead	mg/kg	1,100
Manganese	mg/kg	180
Mercury	mg/kg	1.9
Molybdenum	mg/kg	1
Nickel	mg/kg	9
Selenium	mg/kg	<2
Silver	mg/kg	<1
Zinc	mg/kg	360

Moisture		
Our Reference		236059-1
Your Reference	UNITS	4
Depth		0.4-0.5
Date Sampled		20/01/2020
Type of sample		Soil
Date prepared	-	06/02/2020
Date analysed	-	07/02/2020
Moisture	%	13

Method ID	Methodology Summary
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
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. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).
Org-012/017	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS and/or GC-MS/MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013. For soil results:- 1. 'EQ PQL'values are assuming all contributing PAHs reported as <PQL are actually at the PQL. This is the most conservative approach and can give false positive TEQs given that PAHs that contribute to the TEQ calculation may not be present. 2. 'EQ zero'values are assuming all contributing PAHs reported as <PQL are zero. This is the least conservative approach and is more susceptible to false negative TEQs when PAHs that contribute to the TEQ calculation are present but below PQL. 3. 'EQ half PQL'values are assuming all contributing PAHs reported as <PQL are half the stipulated PQL. Hence a mid-point between the most and least conservative approaches above. 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-014	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.

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. Note, the Total +ve Xylene PQL is reflective of the lowest individual PQL and is therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes.

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	[NT]
Date extracted	-			06/02/2020	[NT]	[NT]	[NT]	[NT]	06/02/2020	[NT]
Date analysed	-			06/02/2020	[NT]	[NT]	[NT]	[NT]	06/02/2020	[NT]
TRH C_6 - C_9	mg/kg	25	Org-016	<25	[NT]	[NT]	[NT]	[NT]	111	[NT]
TRH C_6 - C_{10}	mg/kg	25	Org-016	<25	[NT]	[NT]	[NT]	[NT]	111	[NT]
Benzene	mg/kg	0.2	Org-016	<0.2	[NT]	[NT]	[NT]	[NT]	106	[NT]
Toluene	mg/kg	0.5	Org-016	<0.5	[NT]	[NT]	[NT]	[NT]	109	[NT]
Ethylbenzene	mg/kg	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	113	[NT]
m+p-xylene	mg/kg	2	Org-016	<2	[NT]	[NT]	[NT]	[NT]	114	[NT]
o-Xylene	mg/kg	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	113	[NT]
naphthalene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	126	[NT]	[NT]	[NT]	[NT]	104	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	[NT]
Date extracted	-			06/02/2020	[NT]	[NT]	[NT]	[NT]	06/02/2020	[NT]
Date analysed	-			08/02/2020	[NT]	[NT]	[NT]	[NT]	08/02/2020	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-003	<50	[NT]	[NT]	[NT]	[NT]	83	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	87	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	86	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-003	<50	[NT]	[NT]	[NT]	[NT]	83	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	87	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	86	[NT]
Surrogate o-Terphenyl	%		Org-003	63	[NT]	[NT]	[NT]	[NT]	82	[NT]

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	[NT]
Date extracted	-			06/02/2020	[NT]	[NT]	[NT]	[NT]	06/02/2020	[NT]
Date analysed	-			08/02/2020	[NT]	[NT]	[NT]	[NT]	08/02/2020	[NT]
Naphthalene	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	88	[NT]
Acenaphthylene	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	84	[NT]
Phenanthrene	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	82	[NT]
Anthracene	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	94	[NT]
Pyrene	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	86	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	72	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-012/017	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-012/017	<0.05	[NT]	[NT]	[NT]	[NT]	88	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012/017	81	[NT]	[NT]	[NT]	[NT]	88	[NT]

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	[NT]
Date prepared	-			05/02/2020	[NT]	[NT]	[NT]	[NT]	05/02/2020	[NT]
Date analysed	-			06/02/2020	[NT]	[NT]	[NT]	[NT]	06/02/2020	[NT]
Arsenic	mg/kg	4	Metals-020	<4	[NT]	[NT]	[NT]	[NT]	104	[NT]
Beryllium	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	105	[NT]
Boron	mg/kg	3	Metals-020	<3	[NT]	[NT]	[NT]	[NT]	96	[NT]
Cadmium	mg/kg	0.4	Metals-020	<0.4	[NT]	[NT]	[NT]	[NT]	101	[NT]
Chromium	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	116	[NT]
Cobalt	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	102	[NT]
Copper	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	108	[NT]
Iron	mg/kg	10	Metals-020	<10	[NT]	[NT]	[NT]	[NT]	99	[NT]
Lead	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	116	[NT]
Manganese	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	107	[NT]
Mercury	mg/kg	0.1	Metals-021	<0.1	[NT]	[NT]	[NT]	[NT]	104	[NT]
Molybdenum	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	110	[NT]
Nickel	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	102	[NT]
Selenium	mg/kg	2	Metals-020	<2	[NT]	[NT]	[NT]	[NT]	98	[NT]
Silver	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	104	[NT]
Zinc	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	112	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

The recommended maximums for analytes in urine are taken from “2018 TLVs and BEIs”, as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.

Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2

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: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

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CERTIFICATE OF ANALYSIS 236059-A

Client Details

Client	Douglas Partners Pty Ltd
Attention	Nerilee Edwards
Address	96 Hermitage Rd, West Ryde, NSW, 2114

Sample Details

Your Reference	**99554.01, Glebe**
Number of Samples	1 Soil
Date samples received	05/02/2020
Date completed instructions received	11/02/2020

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	18/02/2020
Date of Issue	18/02/2020

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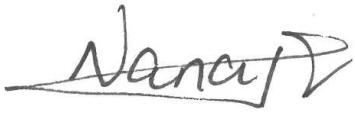
Results Approved By
Josh Williams, Senior Chemist
Loren Bardwell, Senior Chemist

Authorised By



Nancy Zhang, Laboratory Manager

Metals in TCLP USEPA1311		
Our Reference		236059-A-1
Your Reference	UNITS	4
Depth		0.4-0.5
Date Sampled		20/01/2020
Type of sample		Soil
Date extracted	-	17/02/2020
Date analysed	-	17/02/2020
pH of soil for fluid# determ.	pH units	9.4
pH of soil TCLP (after HCl)	pH units	2.0
Extraction fluid used	-	1
pH of final Leachate	pH units	5.1
Arsenic in TCLP	mg/L	<0.05
Beryllium in TCLP	mg/L	<0.01
Boron in TCLP	mg/L	<0.2
Cadmium in TCLP	mg/L	<0.01
Chromium in TCLP	mg/L	<0.01
Cobalt in TCLP	mg/L	<0.02
Copper in TCLP	mg/L	0.03
Iron in TCLP	mg/L	0.05
Lead in TCLP	mg/L	0.89
Manganese in TCLP	mg/L	0.2
Mercury in TCLP	mg/L	<0.0005
Molybdenum in TCLP	mg/L	<0.03
Nickel in TCLP	mg/L	<0.02
Selenium in TCLP	mg/L	<0.12
Silver	µg/swab	<0.5
Zinc in TCLP	mg/L	3.0

PAHs in TCLP (USEPA 1311)		
Our Reference		236059-A-1
Your Reference	UNITS	4
Depth		0.4-0.5
Date Sampled		20/01/2020
Type of sample		Soil
Date extracted	-	14/02/2020
Date analysed	-	17/02/2020
Naphthalene in TCLP	mg/L	<0.001
Acenaphthylene in TCLP	mg/L	<0.001
Acenaphthene in TCLP	mg/L	<0.001
Fluorene in TCLP	mg/L	<0.001
Phenanthrene in TCLP	mg/L	<0.001
Anthracene in TCLP	mg/L	<0.001
Fluoranthene in TCLP	mg/L	<0.001
Pyrene in TCLP	mg/L	<0.001
Benzo(a)anthracene in TCLP	mg/L	<0.001
Chrysene in TCLP	mg/L	<0.001
Benzo(bjk)fluoranthene in TCLP	mg/L	<0.002
Benzo(a)pyrene in TCLP	mg/L	<0.001
Indeno(1,2,3-c,d)pyrene - TCLP	mg/L	<0.001
Dibenzo(a,h)anthracene in TCLP	mg/L	<0.001
Benzo(g,h,i)perylene in TCLP	mg/L	<0.001
Total +ve PAH's	mg/L	NIL (+)VE
Surrogate p-Terphenyl-d14	%	92

Method ID	Methodology Summary
EXTRACT.7	Toxicity Characteristic Leaching Procedure (TCLP) using Zero Headspace Extraction (zHE) using AS4439 and USEPA 1311.
Inorg-001	pH - Measured using pH meter and electrode in accordance with APHA latest edition, 4500-H+. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times.
Inorg-004	Toxicity Characteristic Leaching Procedure (TCLP) using in house method INORG-004. Please note that the mass used may be scaled down from the default based on sample mass available.
Metals-005	Digestion of Dust wipes/swabs and /or miscellaneous samples for Metals determination by ICP-AES/MS and/or CV-AAS
Metals-020 ICP-AES	Determination of various metals by ICP-AES.
Metals-021 CV-AAS	Determination of Mercury by Cold Vapour AAS.
Org-012/017	Leachates are extracted with Dichloromethane and analysed by GC-MS and/or GC-MS/MS.

QUALITY CONTROL: Metals in TCLP USEPA1311					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			17/02/2020	[NT]	[NT]	[NT]	[NT]	17/02/2020	[NT]
Date analysed	-			17/02/2020	[NT]	[NT]	[NT]	[NT]	17/02/2020	[NT]
Arsenic in TCLP	mg/L	0.05	Metals-020 ICP-AES	<0.05	[NT]	[NT]	[NT]	[NT]	113	[NT]
Beryllium in TCLP	mg/L	0.01	Metals-020 ICP-AES	<0.01	[NT]	[NT]	[NT]	[NT]	95	[NT]
Boron in TCLP	mg/L	0.2	Metals-020 ICP-AES	<0.2	[NT]	[NT]	[NT]	[NT]	110	[NT]
Cadmium in TCLP	mg/L	0.01	Metals-020 ICP-AES	<0.01	[NT]	[NT]	[NT]	[NT]	100	[NT]
Chromium in TCLP	mg/L	0.01	Metals-020 ICP-AES	<0.01	[NT]	[NT]	[NT]	[NT]	98	[NT]
Cobalt in TCLP	mg/L	0.02	Metals-020 ICP-AES	<0.02	[NT]	[NT]	[NT]	[NT]	97	[NT]
Copper in TCLP	mg/L	0.01	Metals-020 ICP-AES	<0.01	[NT]	[NT]	[NT]	[NT]	105	[NT]
Iron in TCLP	mg/L	0.02	Metals-020 ICP-AES	<0.02	[NT]	[NT]	[NT]	[NT]	98	[NT]
Lead in TCLP	mg/L	0.03	Metals-020 ICP-AES	<0.03	[NT]	[NT]	[NT]	[NT]	101	[NT]
Manganese in TCLP	mg/L	0.01	Metals-020 ICP-AES	<0.01	[NT]	[NT]	[NT]	[NT]	99	[NT]
Mercury in TCLP	mg/L	0.0005	Metals-021 CV-AAS	<0.0005	[NT]	[NT]	[NT]	[NT]	95	[NT]
Molybdenum in TCLP	mg/L	0.03	Metals-020 ICP-AES	<0.03	[NT]	[NT]	[NT]	[NT]	84	[NT]
Nickel in TCLP	mg/L	0.02	Metals-020 ICP-AES	<0.02	[NT]	[NT]	[NT]	[NT]	96	[NT]
Selenium in TCLP	mg/L	0.12	Metals-020 ICP-AES	<0.12	[NT]	[NT]	[NT]	[NT]	112	[NT]
Silver	µg/swab	0.5	Metals-005	<0.5	[NT]	[NT]	[NT]	[NT]	102	[NT]
Zinc in TCLP	mg/L	0.02	Metals-020 ICP-AES	<0.02	[NT]	[NT]	[NT]	[NT]	101	[NT]

QUALITY CONTROL: PAHs in TCLP (USEPA 1311)						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			14/02/2020	[NT]	[NT]	[NT]	[NT]	14/02/2020	[NT]
Date analysed	-			17/02/2020	[NT]	[NT]	[NT]	[NT]	17/02/2020	[NT]
Naphthalene in TCLP	mg/L	0.001	Org-012/017	<0.001	[NT]	[NT]	[NT]	[NT]	101	[NT]
Acenaphthylene in TCLP	mg/L	0.001	Org-012/017	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene in TCLP	mg/L	0.001	Org-012/017	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluorene in TCLP	mg/L	0.001	Org-012/017	<0.001	[NT]	[NT]	[NT]	[NT]	93	[NT]
Phenanthrene in TCLP	mg/L	0.001	Org-012/017	<0.001	[NT]	[NT]	[NT]	[NT]	92	[NT]
Anthracene in TCLP	mg/L	0.001	Org-012/017	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene in TCLP	mg/L	0.001	Org-012/017	<0.001	[NT]	[NT]	[NT]	[NT]	92	[NT]
Pyrene in TCLP	mg/L	0.001	Org-012/017	<0.001	[NT]	[NT]	[NT]	[NT]	97	[NT]
Benzo(a)anthracene in TCLP	mg/L	0.001	Org-012/017	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene in TCLP	mg/L	0.001	Org-012/017	<0.001	[NT]	[NT]	[NT]	[NT]	120	[NT]
Benzo(bjk)fluoranthene in TCLP	mg/L	0.002	Org-012/017	<0.002	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene in TCLP	mg/L	0.001	Org-012/017	<0.001	[NT]	[NT]	[NT]	[NT]	75	[NT]
Indeno(1,2,3-c,d)pyrene - TCLP	mg/L	0.001	Org-012/017	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene in TCLP	mg/L	0.001	Org-012/017	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene in TCLP	mg/L	0.001	Org-012/017	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012/017	113	[NT]	[NT]	[NT]	[NT]	82	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
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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.
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Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

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Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2

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: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-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.

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Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

Report Comments

Samples received in good order: Holding time exceedance

Appendix L

Data Quality Assessment

DATA QUALITY ASSESSMENT

Q1. Data Quality Objectives

The scope for the current assessment 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).

(1) State the Problem

The problem to be addressed is that the site history and the extent and nature of potential contamination, if any, on the site is unknown; and it is therefore unclear whether the site is suitable for the proposed mixed development use from a contamination perspective. The objective of the investigation is to assess the potential for contamination, and its nature and extent of contamination, if any, at the site and, if confirmed, to make recommendations for further investigations and/or remediation to render the site suitable for the proposed use. The proposed development may include bulk excavation of soil and, therefore, waste classification and an acid sulphate assessment are also included in the current assessment.

(2) Identify the Decision/Goal of the Study

Potential sources of contamination and associated contaminants have been identified in Section 6, along with potential exposure pathways and receptors. The goal of the investigation was to assess the site with respect to these potential contamination sources.

The following specific decisions were made, as appropriate:

- What are potential sources of contamination at the site?
- 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 Remediation Action Plan (RAP) and/or Environmental Management Plan (EMP) should the data suggest these are required?
- What is the waste classification of soils for off-site disposal?

Given the proposed landuse, the analytical data was compared to health-based investigation and screening levels as well as management limits for a generic residential land use with limited access to soil. The suitability of the site for the proposed land use was based on a comparison of the analytical results to the adopted site assessment criteria and, if necessary, statistical analysis, including comparison of the 95% UCL of the mean concentrations.

Groundwater was assessed with respect to two potential receptors, namely marine water ecosystems in Blackwattle Bay and Recreational users of Sydney Harbour.

(3) Identify Information Inputs

Inputs into the decisions were as follows:

- The site history;
- Geology, topography and hydrogeology;
- Field observations and results;
- Laboratory results;
- Field and laboratory QA/QC data were assessed the suitability of the environmental data for the assessment;
- The assessment criteria; and
- The proposed site use.

(4) Define the Study Boundaries

The site area is described in Section 3.1 and shown on Drawing 1, Appendix A. The study is limited in depth to the depth of the boreholes.

(5) Develop the Analytical Approach (or decision rule)

The information obtained during the investigation was used to assess the site in terms of contamination issues and risk to human health and the environment. The decision rules used in assessing the site were follows:

- EPA endorsed criteria were adopted for assessment criteria for laboratory results;
- Laboratory test results were assessed individually as an initial screen and statistically, if considered appropriate, to determine the standard deviation and the 95% upper confidence level (UCL) of the mean concentration for each analyte or analyte group (of like materials);
- The contaminant concentrations in soil/filling material meet the following criteria or further investigation or remedial action was required if:
    - Results of more than 250% of the adopted screening or investigation level were considered ‘hotspots’;
    - Results above the Management Limits, were applicable, were considered to be ‘hotspots’;
    - The calculated 95% Upper Confidence Limit (95% UCL) of average concentrations (excluding any ‘hotspot’ concentrations) exceeded the adopted [screening or investigation level or thresholds; and
    - The standard deviation of the results was greater than 50% of the [screening or investigation levels].

- The groundwater was not considered significantly impacted by a particular contaminant if there was no notable or significant increase in site conditions from background concentrations and/or there are no analyte concentrations in the groundwater samples significantly exceeding the adopted investigation or screening level; and
- Further investigation, remediation and/or management was recommended if the site is found to be contaminated or containing contamination "hotspots" or significantly impacted groundwater.

Field and laboratory test results were 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

Decision errors for the respective contaminants for filling/soil were:

1. *Deciding that the site's fill/soil exceeds the SAC when they truly do not; and*
2. *Deciding that the site's fill/soils are within the SAC when they are truly not.*

Considering that the assessment of groundwater is intended to determine if the site is impacting negatively on groundwater quality, the decision errors for each respective COPC were:

1. *Deciding that the groundwater quality exceeds the GIL when it truly does not; and*
2. *Deciding that the groundwater quality is within the GIL, when it truly is not.*

Decision errors for the proposed assessment was minimised and measured by the following:

- The sampling regime targeted materials/ locations considered to have the highest potential for contamination (e.g. fill, near surface soils, fill with signs of contamination concern);
- The sampling regime included various material types identified to account for site variability;
- Sample collection and handling techniques were in accordance with DP's Field Procedures Manual and this SAQP;
- Samples were prepared and analysed by a NATA-accredited laboratory 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 was based on the available site history, past site activities and site features. The potential for contaminants other than those proposed to be analysed was considered to be low;

- The assessment criteria were adopted from established and EPA endorsed guidelines. Where not available, recognised national and international guidelines were used. The assessment criteria have risk probabilities already incorporated;
- A significance level of 0.05 was adopted for data with statistical analysis of 95% Upper Confidence Limit (95% UCL) of average concentrations; and
- Only NATA accredited laboratories using NATA endorsed methods was used to perform laboratory analysis. Where NATA endorsed methods are not used, the reasons were stated. The effect of using non-NATA methods on the decision making process were explained.

(7) Optimise the design for obtaining data

Sampling design and procedures that was implemented to optimise data collection for achieving the DQOs include the following;

- Only NATA accredited laboratories using NATA endorsed methods were used to perform laboratory analysis whenever possible*;*
- Soil sampling locations aimed to provide even coverage of the site, taking into account access restrictions;
- To optimise the selection of soil samples for chemical analysis, samples collected were screened using a photo-ionisation detector (PID) allowing for site assessment and sample selection. In addition, additional soil samples were collected but kept 'on hold' pending details of initial analysis and will be analysed if further delineation was required; and
- Adequately experienced environmental scientists/engineers were chosen to conduct field work and sample analysis interpretation.

Q2. Field And Laboratory Quality Control

Q2.1 Summary

The field and laboratory QC procedures and results are summarised in the following Table Q1. Reference should be made to the fieldwork and analysis procedures in Section 7 and the laboratory results certificates in Appendix K for further details.

Table Q1: Field and Laboratory QC

Item	Evaluation / Acceptance Criteria	Achievement
Analytical laboratories used	NATA accreditation	yes
Holding times	Various based on type of analysis	yes
Intra-laboratory replicates	5% of primary samples; <50% RPD (>5 x PQL)	yes[1]
Inter-laboratory replicates	5% of primary samples; <50% RPD (10-20 x PQL)	no[2]
Trip Spikes	1 per sampling event; 60-140% recovery	yes
Trip Blanks	1 per sampling event; <PQL	yes
Rinsates	1 per sampling event; <PQL	No[2]
Laboratory / Reagant Blanks	1 per batch; <PQL	yes
Matrix Spikes	1 per lab batch; 70-130% recovery (inorganics); 60-140% recovery (organics)	yes
Surrogate Spikes	All organics analysis; 70-130% recovery (inorganics); 60-140% recovery (organics)	yes
Control Samples	1 per lab batch; 70-130% recovery (inorganics); 60-140% recovery (organics)	yes

NOTE: 1 Qualitative assessment of RPD results overall

2 inter-laboratory replicates not analysed due to the small dataset. Intra-laboratory replicates were analysed to assess replicability of sampling;

3 Not assessed. New, disposable sampling equipment was collected were possible. All re-used sampling equipment was decontaminated between samples.

In summary, the QC data is determined to be of sufficient quality to be considered acceptable for the assessment.

Q2.2 Field Replicates

Replicate samples were collected in the field as a measure of accuracy, precision and repeatability of the results.

Field replicate samples for soil were collected from the same location and an identical depth to the primary sample. Equal portions of the subject material were placed into the primary and replicate sampling jars and sealed. The sample was not homogenised so as to minimise the possible loss of volatiles. Replicate samples were labelled with a DP identification number, recorded on DP's bore logs, so as to conceal their relationship to their primary sample from the analytical laboratory.

A measure of the consistency of results is derived by the calculation of relative percentage differences (RPDs) for replicate samples. A RPD of +/- 30% is generally considered acceptable for inorganic analytes by the industry, although in general a wider RPD range (50%) may be acceptable for organic

analytes. RPDs above the generally acceptable limits (if applicable) are shown in **bold** in Tables Q2 and Q3 below.

The calculated RPD values were within the acceptable range with the exception of results indicated in bold in the tables. However, this is not considered to be significant because:

- The results for a number of analytes with elevated RPDs, including all of the elevated groundwater RPDs were recorded close the laboratory practical quantitation limit, with actual differences being small; and
- the fill sample was collected in heterogenous fill, with the recorded variability considered likely to be indicative of actual fill characteristics.

Overall, the intra-laboratory replicate comparisons indicate that the sampling techniques were generally consistent and repeatable.

Table Q2: Relative Percentage Difference Results – Metals

Sample ID		Date	Media	Units	Metals															
					Arsenic	Cadmium	Total Chromium	Copper	Lead	Mercury (inorganic)	Nickel	Zinc	Manganese	Beryllium	Boron	Cobalt	Iron	Molybdenum	Selenium	Silver
BD1/200120		20/01/2020	fill	mg/kg	12	<0.4	19	530	890	8.9	11	540	140	<1	<3	4	28000	2	<2	<1
4	0.9 - 1m	20/01/2020	fill	mg/kg	13	0.6	12	910	670	2.5	16	450	340	<1	5	6	34000	1	<2	<1
Difference				mg/kg	1	0.2	7	380	220	6.4	5	90	200	0	2	2	6000	1	0	0
RPD				%	8%	**40%**	**45%**	**53%**	28%	**112%**	**37%**	18%	**83%**	0%	**50%**	**40%**	19%	**67%**	0%	0%
BD1/050220		5/02/20	water	µg/L	1	<0.1	<1	<1	<1	<0.05	<1	3	190	<0.5	2400	3	9300	3	<1	<1
GW4/050220		5/02/20	water	µg/L	1	<0.1	<1	<1	<1	<0.05	<1	1	150	<0.5	2600	2	7100	3	<1	<1
Difference				µg/L	0	0	0	0	0	0	0	2	40	0	200	1	2200	0	0	0
RPD				%	0	0%	0%	0%	0%	0%	0%	**100%**	24%	0%	8%	**40%**	27%	0%	0%	0%

Table Q3: Relative Percentage Difference Results – Organic Analytes

Sample ID		Date	Media	Units	PAH			TRH				BTEX			
					Naphthalene	Benzo(a)pyrene (BaP)	Total PAHs	TRH C6 - C10	TRH >C10-C16	F3 (>C16-C34)	F4 (>C34-C40)	Benzene	Toluene	Ethylbenzene	Total Xylenes
BD1/200120		20/01/2020	fill	mg/kg	<1	1.4	18	<25	<50	230	120	<0.2	<0.5	<1	<1
4	0.9 - 1m	20/01/2020	fill	mg/kg	<1	1.6	16	<25	<50	280	140	<0.2	<0.5	<1	<1
Difference				mg/kg	0	0.2	2	0	0	50	20	0	0	0	0
RPD				%	0%	13%	12%	0%	0%	20%	15%	0%	0%	0%	0%
BD1/050220		5/02/20	water	µg/L	<0.2	<0.1	<PQL	-	-	-	-	-	-	-	-
GW4/050220		5/02/20	water	µg/L	<0.2	<0.1	<PQL	-	-	-	-	-	-	-	-
Difference				µg/L	0	0	0	-	-	-	-	-	-	-	-
RPD				%	0%	0%	0%	-	-	-	-	-	-	-	-

Q2.3 Trip Blank Samples

The purpose of a trip blank is to assess the potential for transfer of contaminants into samples had occurred between the time of collection and analysis of the sample by the laboratory. Laboratory prepared soil field blanks were taken out to the field unopened, subjected to the same preservation methods as the field samples, then analysed for the purposes of determining whether transfer of contaminants into the blank sample had occurred prior to reaching the laboratory.

The concentrations of the analytes were all below laboratory detection limits, as summarised in Table Q4, indicating that significant cross contamination had not occurred during the course of the round trip from the site to the laboratory.

Table Q4: Trip Blank Sample Results

Sample Id	Date	Media	Units	Benzene	Toluene	Ethylbenzene	m+p-Xylene	o-Xylene	TRH C6 - C10	Naphthalene
TB1/200120	20/01/2020	soil	mg/kg	<0.2	<0.5	<1	<2	<1	-	-
TB1/220120	22/01/2020	soil	mg/kg	<0.2	<0.5	<1	<2	<1	-	-
TB1/050220	05/02/2020	water	µg/L	<1	<1	<1	<2	<1	<10	<1

Q2.4 Trip Spike Samples

The purpose of a trip spike is to assess the potential loss of volatile analytes that may have occurred between the time of collection and analysis of the sample by the laboratory.

For soils, laboratory preparation of the trip spike involved putting 1mL of BTEX (using a 1500ppm BTEX trip spike standard) into two jars which were cross referenced and labelled ‘trip spike’ and ‘control’. Both jars were sealed. The trip spike was taken onto site and subject to the same jar storage and transfer as the field samples. The control stayed refrigerated in the laboratory. Following receipt of the trip spike and field samples, the trip spike and corresponding control are both analysed with results of the trip spike being expressed as the % difference from the control sample.

The generally acceptance limit for trip spikes is 60-140% in difference compared to the control or standard. The results recorded recoveries as shown in Table Q5, below, are within the acceptance limits indicating that the percentage loss for BTEX during the trip was minimal and therefore appropriate preservation techniques were employed.

Table Q5: Trip Spike Sample Results

Sample Id	Date	Media	Units	Benzene	Toluene	Ethylbenzene	m+p-Xylene	o-Xylene
TS1/200120	20/01/2020	soil	%	89%	91%	88%	89%	88%
TS1/220120	22/01/2020	soil	%	91%	90%	90%	91%	91%
TS1/050220	05/02/2020	water	%	126%	126%	107%	106%	112%

Q2.5 Field Instrument Calibration

The photoionisation detector (PID) fitted with a 11.7 volt lamp was calibrated in the field with isobutylene gas.

The water quality meter was calibrated prior to use.

Q3. QA/QC Data Evaluation

The following Table Q6 provides a list of the data quality indicators adopted for the DSI and the methods adopted in complying with the data quality indicators. Reference should be made to all previous sections and referenced Appendices for specific details.

Table Q6: QA/QC Data Evaluation

Data Quality Indicator	Method(s) of Achievement
Completeness	Systematic locations sampled, subject to site accessibility limitations; Preparation of borehole logs, sample location plan and chain of custody 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 chain of custody (COC) documentation; NATA accredited laboratory results certificates provided by the laboratory; Satisfactory frequency and results for field and laboratory quality control (QC) samples as discussed in Section Q2.
Comparability	Using appropriate techniques for sample recovery, storage and transportation, which were the same for the duration of the project; Experienced sampler(s) used; 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; 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 COC.
Precision	Field staff followed standard operating procedures; Acceptable RPD between original samples and replicates; Satisfactory results for all other field and laboratory QC samples.
Accuracy	Field staff followed standard operating procedures; Satisfactory results for all field and laboratory QC samples.