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Chelsea Newman
Queanbeyan Palerang Regional Council
256 Crawford Street
Queanbeyan NSW 2620

Our ref: 23/16004
Your ref:
Date: 27/10/2017

Dear Chelsea,

Queanbeyan East Public School

Proposed New Learning Centre

This letter is to confirm that the Schematic Design has been undertaken in association with the Department of Communities, Asset Management Directorate and complies generally with the requirements of the Educational Facilities Standards and Guidelines, as applicable to the current level of design.

Sincerely
GHD Woodhead Pty Ltd

Paul Thatcher
Project Director / Principal Architect
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Chelsea Newman
Queanbeyan Palerang Regional Council
256 Crawford Street
Queanbeyan NSW 2620

Our ref: 23/16004
Your ref:
Date: 26 Oct 2017

Dear Chelsea,

Queanbeyan East Public School

Proposed New Learning Centre Landscape Design

This letter is to confirm that the Schematic Landscape Design has been undertaken in association with the Department of Communities, Asset Management Directorate and complies generally with the requirements of the Queanbeyan Local Environmental Plan (2012) and the Educational Facilities Standards and Guidelines, as applicable to the current level of design.

Sincerely
GHD Woodhead Pty Ltd

Steve Hansen
Associate Landscape Architect
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Douglas Partners
Geotechnics / Environment / Groundwater

Integrated Practical Solutions

Report on
Preliminary Geotechnical Investigation

Proposed Additional Classrooms
10 Yass Road, Queanbeyan

Prepared for
GHD Woodhead Architecture Pty Ltd

Project 88406.00
March 2017

Douglas Partners
Geotechnics / Environment / Groundwater

Document History

Document details

Project No.	88406.00	Document No.	R.001.DftA
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Draft A	1	0	GHD Woodhead Architecture Pty Ltd

The undersigned, on behalf of Douglas Partners Pty Ltd, confirm that this document and all attached drawings, logs and test results have been checked and reviewed for errors, omissions and inaccuracies.

	Signature	Date
Author		20 March 2017
Reviewer		20 March 2017

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Results of Fieldwork (Pits 1 – 10)

Appendix D: Results of Laboratory Testing (1 sheet)

Report on Preliminary Geotechnical Investigation
Proposed Additional Classrooms
10 Yass Road, Queanbeyan

1. Introduction

This report presents the results of a preliminary geotechnical investigation undertaken for proposed additional classrooms at 10 Yass Road, Queanbeyan. The investigation was commissioned in an email dated 17 February 2017 by Farhad Edibam of GHD Woodhead Architecture Pty Ltd and was undertaken in accordance with Douglas Partners' proposal CAN160289 dated 25 November 2016.

It is understood that the future development is to comprise the construction of additional classrooms at yet to be determined locations. It is further understood that additional subsurface investigation will be required once the location of the classrooms have been finalised.

Site investigation was carried out to broadly evaluate the subsurface strata across the site including groundwater conditions and provide preliminary comments on:

- Site classification;
- Site preparation measures;
- Excavation conditions and support;
- Suitable footing systems and likely bearing pressures; and
- Pavement design parameters.

The investigation comprised the logging and sampling of test pits, laboratory testing followed by engineering analysis and reporting. Details of the work undertaken and the results obtained are given in the report.

The assessment was undertaken in conjunction with a preliminary site investigation with limited sampling (contamination assessment) entitled: *Preliminary Site Investigation with Limited Sampling, Proposed Additional Classrooms, 10 Yass Road, Queanbeyan*; Project 88406.01, dated March 2017 [DP 2017]) which has been reported separately.

Details provided by the client for the investigation included a survey drawing of the site.

This report must be read in conjunction with the notes *About this Report* included in Appendix A.

2. Background Information

A geotechnical investigation was undertaken within part of the site by Douglas Partners Pty Ltd (DP) with the results presented in a report entitled: *Geotechnical Investigation* , dated October 2010 (DP, 2010), for a proposed hall and covered outdoor learning area (C.O.L.A).

The investigation comprised the observation of site subsurface profiles which were based on the examination of the existing excavations for the perimeter retaining wall and several pad footings. The strata was broadly summarised as follows:

- FILL: hard, dry to moist, low to medium plasticity gravelly sandy clay with some siltstone and sandstone gravel to 30 mm size to depths between 0.1 and 0.3 m below ground level (bgl).
- SLOPEWASH: very stiff to hard, moist, dark grey-brown, low plasticity sandy silty clay and medium dense, moist, pale yellow grey sandy clayey silt to depths between 0.3 and 0.6 m bgl.
- ALLUVIUM: very stiff to hard, high plasticity sandy clay and gravelly sandy clay to depths between 0.4 and greater than 1.2 m.

No free groundwater was observed during excavation.

3. Site Description

The site comprises a triangular shaped area of about 23,000 m^2 with maximum dimensions of 220 m and 210 m. The site is bounded by Thurralilly Street to the north, Yass Road to the west and Mulloon Street to the south and east.

The site is occupied by a number of buildings in the central northern portion of the site. The buildings are used as office space and classrooms for the Queanbeyan East Public School. A number of mature trees surround the buildings with paved pathways allowing access between them. A large separate building within the centre of the site is used as a hall. An asphalted car park is located at the northern boundary allowing access to the site.

Figure 1 shows the general conditions of the northern portion looking from the centre of the site.

Figure 1: View of northern part of site.

Drainage lines are noted at the north western (flowing in an east to west direction) and north eastern (flowing in a north to south direction) corners of the site. A third drainage line is visible along the western boundary in a southern direction.

Large grassed areas are observed within the eastern, western and southern portions of the site. There are mature trees lining the boundaries of the site. The north eastern portion has only minor areas of grass with a cluster of trees. A playground with a sand pit is located at the southern end and a second playground is located near to the central eastern boundary.

The site slightly slopes to the west and south from around 592 m AHD in the northeast corner of the site to about 582 m AHD in the southern corner of the site.

Figure 2 shows the general conditions of the southern portion looking from the centre of the site.

Figure 2: View of southern part of site.

4. Site Geology

Reference to the Canberra 1:100 000 Geology of Canberra Geological Series Sheet (Ref 1) indicates that the site is underlain by Pittman Formation units which was formed as part of the Monaro Basin of the mid-late Ordovician period. The Pittman Formation units typically comprise interbedded sandstone, siltstone, shale and minor black shale, chert and impure calcareous sandstone (distal quartz turbidites).

The investigation confirmed the presence of sandstone underlying parts of the site.

5. Field Work Methods

The current field work comprised the excavation of ten test pits (Pits 1 – 10) using a Kubota U17-3 mini-excavator fitted with a 300 mm wide toothed bucket to depths of 1.1 – 2.2 m. Dynamic cone penetrometer tests (AS1289 6.3.2) were undertaken adjacent to the pit locations to provide an assessment of the in-situ strength of site soils. The test pits were logged onsite by a geo-environmental scientist and incorporated the collection of disturbed and bulk samples to assist in strata identification and for laboratory testing.

The test location coordinates and surface levels relative to AHD are provided on the test pit logs and were interpolated from the survey drawing provided by the client and must be considered approximate only (± 5 m). The approximate test locations are shown on Drawing 1 in Appendix B.

6. Field Work Results

The test pit logs are given in Appendix C together with notes that define classification methods and descriptive terms. The test pits encountered variable subsurface conditions underlying the site with the principal succession of strata broadly summarised below.

- TANBARK/MULCH: Tanbark and mulch present to a depth of 0.01 m in Pit 2.
- TOPSOIL FILLING: generally comprising dry to moist, sandy silt topsoil filling with varying amounts of gravels, cobbles and rootlets to depths of 0.1 – 0.2 m. A piece of terracotta pipe was observed in Pit 3 and food wrappers were observed in Pit 5.
- FILLING: generally comprising very stiff to hard, dry to moist gravelly clay, sandy clay, silty clay and silty sand with varying amounts of gravels, cobbles and rootlets in Pits 1 – 5, and 7 – 10 to depths of 0.3 – 2.1 m. Concrete pieces were observed in Pits 3 and 5.
- SILT: hard, dry to moist, pale brown, low plasticity sandy silt with varying amounts of roots and rootlets to depths of 0.25 – 1.2 m in Pits 2, 3 and 5 – 7.
- CLAY: stiff to hard dry to moist clay with varying amounts of sand, silt and gravel to depths of 0.7 – 2.2 m. Pits 4 and 7 – 10 to the limit of investigation depths of 2.0 – 2.2 m.
- SAND: medium dense to very dense, dry to moist, cemented clayey sand with some gravel to depths of 0.6 – 2.1 m in Pits 2, 3, 5, 8 and 9. Pit 3 was terminated at the limit of investigation depth of 2.1 and Pits 2 and 5 were terminated at slow progress depths of 1.7 m and 1.9 m respectively.
- SANDSTONE: medium to very high strength, moderately weathered to slightly weathered, highly fractured sandstone in Pits 1 and 6 from depths of 1.8 m and 0.7 m to the limit of investigation depths of 2.0 m and 1.1 m, respectively.

No free groundwater was observed during excavation of the test pits. However the pits were backfilled immediately following excavation precluding longer term monitoring of groundwater levels. Groundwater conditions rarely remain constant and can change seasonally due to variations in rainfall, temperature and soil permeability. For these reasons, it is noted that the moisture condition of the site soils may vary considerably from the time of the investigation compared to at the time of construction.

7. Laboratory Testing

Two (2) samples collected from the test pits were tested in the laboratory for measurement of shrink swell properties. The detailed laboratory test report sheets are given in Appendix D with the results summarised in Table 1 below.

Table 1: Summary of Laboratory Testing.

Pit No	Depth (m)	I_{ss} (%)	Field Description
1	0.7 – 1.2	0.6	Sandy Clay
3	0.6 – 1.1	0.4	Sandy Clay

Where: I_{ss} = Shrink/swell index

It must be noted that the test results are lower than expected possibly as a result of the moderately cracked nature of the samples.

8. Proposed Development

It is understood that the future development of the site is to comprise additional classrooms. Building locations, design levels and loadings were not available at the time of reporting.

9. Comments

9.1 General

The comments below are provided to assist in preliminary planning and cannot be considered comprehensive. They are based on preliminary geotechnical investigation of a limited number of investigation locations with no detail on the proposed development. Development specific investigation will be required to be undertaken at an appropriate time to enable more detailed and specific comment.

9.2 Site Classification

Site classification in accordance with AS2870 - 2011 'Residential Slabs and Footings' (Ref 2) provides guidance on the patterns and magnitude of moisture related seasonal ground movements that must be considered in design.

The subsurface conditions underlying the site at the time of the investigation indicate that due to the presence of undocumented filling greater than 0.4 m depth, and the potential for adverse water conditions arising from the presence of trees, the overall site is classified as Class P (problem site) in accordance with the requirements of AS 2870 – 2011 (Ref 2). The main requirement for Class P sites is for design to be undertaken by a structural engineer using sound engineering principles.

Notwithstanding the above P classification, parts of the site would be equivalent to Class M (moderately reactive) conditions or Class H1 (highly reactive). Further assessment will be required once development details are known to delineate areas.

It is noted that the classification is appropriate for the undeveloped site and is independent of the proposed site preparation measures and construction. Reclassification must be undertaken should the site levels be modified by cutting or filling.

9.3 Site Preparation and Earthworks

The extent of site preparation and earthworks will be dependent on the specifics of the proposed development and at this stage only broad/minimalistic comments can be provided.

To prepare the sites for subgrade support for slabs and footings, the following procedures are suggested:

- Strip all filling, topsoils and other deleterious materials (such as vegetation including tree roots) and remove to spoil or stockpile for use for landscaping purposes or disposal.
- Test roll the exposed subgrade with a smooth drum roller of at least 12 tonnes static deadweight capacity allowing for inspection by a geotechnical engineer after a minimum of six passes of the roller.
- Where soft spots or unacceptable subgrade conditions are encountered, remove the unsuitable material to a further 300 mm and inspect. Place approved low plasticity (granular) filling in layers of 250 mm maximum loose thickness and compact to at least 98% standard dry density ratio with moisture contents maintained within 2% of standard optimum values.
- Where localised areas of filling are required to achieve design levels, the fill material should be of low plasticity and should be compacted to achieve at least 98% standard maximum dry density ratio in the building area and 100% standard maximum dry density ratio in pavement areas, with moisture contents maintained within 2% of standard optimum values.

Filling should not contain vegetation or other organic matter. The site preparation works and all filling placement should be under controlled conditions with reference made to AS 3798 – 2007 (Ref 3) where appropriate.

9.4 Excavation Conditions and Support

The filling and natural soils could be expected to be removed using conventional earthmoving plant and as such no difficulties are anticipated with the exception of any large particles present in the filling matrix. If excavation is required within the underlying bedrock, additional investigation and comment will be required.

Whilst no free groundwater was observed during the field work, it is noted that the extent of groundwater inflow would be dependent on prior weather conditions and must be anticipated following periods of rainfall.

For permanent excavations in the topsoil, filling and natural soils, maximum gradients of 3H:1V (horizontal:vertical) are recommended. To minimise surface erosion, the batters should be protected with toe and spoon drains and vegetated as soon as possible after construction. For temporary excavations less than 1 m in height, maximum gradients of 1H:1V are suggested for filling and natural soils and possibly flatter in areas of sands or collapsing soil.

Should retaining walls be required, design parameters will depend on the proposed height and surcharge loading and at this stage cannot be discussed in detail.

9.5 Foundations

Depending on the extent of site earthworks and the type/size of structural loading, foundations for the future buildings/structures could take the form of pad or strip footings or bored piers supported on future controlled filling, natural soils or weathered rock. Suggested allowable base bearing pressures are as follows:

- Controlled filling: 100 kPa
- Stiff to very stiff/medium dense natural soils 100 kPa
- Medium strength bedrock 2500 kPa (limited locations)

All footings must found within a uniform bearing stratum and must extend below any uncontrolled filling and underlying topsoil should those strata layers be left in place.

Where footings are to extend through the existing uncontrolled filling, it is noted that some obstructions (such as concrete rubble in Pit 3) would be encountered during piling/excavation which would require removal by bucket excavation followed by backfilling to allow piling/excavation to proceed. Should bored piers be used, the uncontrolled fill at the site (within proposed building areas) possibly could be deemed suitable to be left in place, however it must be noted that floor slabs constructed on uncontrolled fill may undergo non uniform settlement depending upon the eventual loads that have to be accommodated. The use of flexible joints in service pipes would have to be allowed for to accommodate likely movements. The use of pier liners cannot be discounted.

All footing excavations must be inspected by a suitably qualified engineer prior to placement of reinforcing steel and pouring of concrete to verify design assumptions.

9.6 Pavement Design Conditions

The design of future pavements on the site must take into consideration the geotechnical constraints such as uncontrolled filling and potential for shrinkage/swelling of clayey soils in order to obtain a suitable subgrade to support pavements.

Based on the results of the field investigation, laboratory testing and previous experience, it is suggested that preliminary design of pavements be based on a CBR of 3%. Subgrade replacement will be required in areas where the design CBR cannot be obtained.

Surface and subsoil drainage must be installed and maintained to protect the pavement and subgrade. Subsoil drains should be located at a minimum of 0.5 m depth below the subgrade level.

10. Further Investigation

Following determination of design details (location, earthworks and loading), further geotechnical investigation must be undertaken to provide more detailed comments. It would be prudent for the future designers to consult with Douglas Partners during the conceptual design stage such that the geotechnical issues known at this stage are incorporated into the design.

11. References

1. Geology of Canberra 1:10 000 Engineering Geology Series Sheet 208 – 600, Bureau of Mineral Resources, Geology and Geophysics, (1985).
2. Australian Standard AS 2870 – 2011 Residential Slabs and Footings.
3. AS 3798-2007 'Guidelines on Earthworks for Commercial and Residential Developments', Standards Association of Australia.

12. Limitations

Douglas Partners (DP) has prepared this report for this project at 10 Yass Road, Queanbeyan in accordance with DP's proposal dated 25 November 2016 and email acceptance from GHD Woodhead Architecture Pty Ltd dated 17 February 2017. The work was carried out under DP's Conditions of Engagement. This report is provided for the exclusive use of GHD Woodhead Architecture Pty Ltd for this project only and for the purposes as described in the report. It should not be used by or relied upon for other projects or purposes on the same or other site or by a third party. Any party so relying upon this report beyond its exclusive use and purpose as stated above, and without the express written consent of DP, does so entirely at its own risk and without recourse to DP for any loss or damage. In preparing this report DP has necessarily relied upon information provided by the client and/or their agents.

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

DP's advice is based upon the conditions encountered during this investigation. The accuracy of the advice provided by DP in this report may be affected by undetected variations in ground conditions across the site between and beyond the sampling and/or testing locations. The advice may also be limited by budget constraints imposed by others or by site accessibility.

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

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

The scope for work for this investigation/report did not include the assessment of surface or sub-surface materials or groundwater for contaminants, within or adjacent to the site. As evidence of filling of unknown origin is noted in the report, and in particular the presence of building demolition materials, it should be recognised that there may be some risk that such filling may contain contaminants and hazardous building materials.

The contents of this report do not constitute formal design components such as are required, by the Health and Safety Legislation and Regulations, to be included in a Safety Report specifying the hazards likely to be encountered during construction and the controls required to mitigate risk. This design process requires risk assessment to be undertaken, with such assessment being dependent upon factors relating to likelihood of occurrence and consequences of damage to property and to life. This, in turn, requires project data and analysis presently beyond the knowledge and project role respectively of DP. DP may be able, however, to assist the client in carrying out a risk assessment of potential hazards contained in the Comments section of this report, as an extension to the current scope of works, if so requested, and provided that suitable additional information is made available to DP. Any such risk assessment would, however, be necessarily restricted to the geotechnical components set out in this report and to their application by the project designers to project design, construction, maintenance and demolition.

Douglas Partners Pty Ltd

Appendix A

About This Report

About this Report

Douglas Partners

Introduction

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

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

Copyright

Borehole and Test Pit Logs

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

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

Groundwater

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

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

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

Reports

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

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

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

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

About this Report

Site Anomalies

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

Information for Contractual Purposes

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

Site Inspection

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

Appendix B

Drawing 1 – Test Location Plan

Locality Plan

LEGEND

- Approximate Site Boundary
- 1 Approximate Test Pit Locations

0 10 20 50
Approximate Scale (m)

NOTE: Base drawing from nearmap.com

Douglas Partners
Geotechnics / Environment / Groundwater

CLIENT: GHD Woodhead Architecture Pty Ltd		TITLE: **Test Location Plan**	PROJECT No: 88401.00
OFFICE: Canberra	DRAWN BY: ESS	**Proposed Additional Classrooms**	DRAWING No: 1
SCALE: As shown	DATE: 21.02.2017	**10 Yass Road, Queanbeyan**	REVISION: 0

Appendix C

Explanatory Notes
Results of Field Work (Pits 1 – 10)

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.

Description and Classification Methods

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

Soil Types

Soil types are described according to the predominant particle size, qualified by the grading of other particles present:

Type	Particle size (mm)
Boulder	>200
Cobble	63 - 200
Gravel	2.36 - 63
Sand	0.075 - 2.36
Silt	0.002 - 0.075
Clay	<0.002

The sand and gravel sizes can be further subdivided as follows:

Type	Particle size (mm)
Coarse gravel	20 - 63
Medium gravel	6 - 20
Fine gravel	2.36 - 6
Coarse sand	0.6 - 2.36
Medium sand	0.2 - 0.6
Fine sand	0.075 - 0.2

The proportions of secondary constituents of soils are described as:

Term	Proportion	Example
And	Specify	Clay (60%) and Sand (40%)
Adjective	20 - 35%	Sandy Clay
Slightly	12 - 20%	Slightly Sandy Clay
With some	5 - 12%	Clay with some sand
With a trace of	0 - 5%	Clay with a trace of sand

Definitions of grading terms used are:

- Well graded - a good representation of all particle sizes
- Poorly graded - an excess or deficiency of particular sizes within the specified range
- Uniformly graded - an excess of a particular particle size
- Gap graded - a deficiency of a particular particle size with the range

Cohesive Soils

Cohesive soils, such as clays, are classified on the basis of undrained shear strength. The strength may be measured by laboratory testing, or estimated by field tests or engineering examination. The strength terms are defined as follows:

Description	Abbreviation	Undrained shear strength (kPa)
Very soft	vs	<12
Soft	s	12 - 25
Firm	f	25 - 50
Stiff	st	50 - 100
Very stiff	vst	100 - 200
Hard	h	>200

Cohesionless Soils

Cohesionless soils, such as clean sands, are classified on the basis of relative density, generally from the results of standard penetration tests (SPT), cone penetration tests (CPT) or dynamic penetrometers (PSP). The relative density terms are given below:

Relative Density	Abbreviation	SPT N value	CPT qc value (MPa)
Very loose	vl	<4	<2
Loose	l	4 - 10	2 -5
Medium dense	md	10 - 30	5 - 15
Dense	d	30 - 50	15 - 25
Very dense	vd	>50	>25

Soil Descriptions

Soil Origin

It is often difficult to accurately determine the origin of a soil. Soils can generally be classified as:

- Residual soil - derived from in-situ weathering of the underlying rock;
- Transported soils - formed somewhere else and transported by nature to the site; or
- Filling - moved by man.

Transported soils may be further subdivided into:

- Alluvium - river deposits
- Lacustrine - lake deposits
- Aeolian - wind deposits
- Littoral - beach deposits
- Estuarine - tidal river deposits
- Talus - scree or coarse colluvium
- Slopewash or Colluvium - transported downslope by gravity assisted by water. Often includes angular rock fragments and boulders.

Rock Strength

Rock strength is defined by the Point Load Strength Index ($Is_{(50)}$) and refers to the strength of the rock substance and not the strength of the overall rock mass, which may be considerably weaker due to defects. The test procedure is described by Australian Standard 4133.4.1 - 1993. The terms used to describe rock strength are as follows:

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

* Assumes a ratio of 20:1 for UCS to $Is_{(50)}$

Degree of Weathering

The degree of weathering of rock is classified as follows:

Term	Abbreviation	Description
Extremely weathered	EW	Rock substance has soil properties, i.e. it can be remoulded and classified as a soil but the texture of the original rock is still evident.
Highly weathered	HW	Limonite staining or bleaching affects whole of rock substance and other signs of decomposition are evident. Porosity and strength may be altered as a result of iron leaching or deposition. Colour and strength of original fresh rock is not recognisable
Moderately weathered	MW	Staining and discolouration of rock substance has taken place
Slightly weathered	SW	Rock substance is slightly discoloured but shows little or no change of strength from fresh rock
Fresh stained	Fs	Rock substance unaffected by weathering but staining visible along defects
Fresh	Fr	No signs of decomposition or staining

Degree of Fracturing

The following classification applies to the spacing of natural fractures in diamond drill cores. It includes bedding plane partings, joints and other defects, but excludes drilling breaks.

Term	Description
Fragmented	Fragments of <20 mm
Highly Fractured	Core lengths of 20-40 mm with some fragments
Fractured	Core lengths of 40-200 mm with some shorter and longer sections
Slightly Fractured	Core lengths of 200-1000 mm with some shorter and loner sections
Unbroken	Core lengths mostly > 1000 mm

Rock Descriptions

Rock Quality Designation

The quality of the cored rock can be measured using the Rock Quality Designation (RQD) index, defined as:

$$\text{RQD \%} = \frac{\text{cumulative length of 'sound' core sections} \geq \text{100 mm long}}{\text{total drilled length of section being assessed}}$$

where 'sound' rock is assessed to be rock of low strength or better. The RQD applies only to natural fractures. If the core is broken by drilling or handling (i.e. drilling breaks) then the broken pieces are fitted back together and are not included in the calculation of RQD.

Stratification Spacing

For sedimentary rocks the following terms may be used to describe the spacing of bedding partings:

Term	Separation of Stratification Planes
Thinly laminated	< 6 mm
Laminated	6 mm to 20 mm
Very thinly bedded	20 mm to 60 mm
Thinly bedded	60 mm to 0.2 m
Medium bedded	0.2 m to 0.6 m
Thickly bedded	0.6 m to 2 m
Very thickly bedded	> 2 m

Symbols & Abbreviations

Douglas Partners

Introduction

These notes summarise abbreviations commonly used on borehole logs and test pit reports.

Drilling or Excavation Methods

C	Core Drilling
R	Rotary drilling
SFA	Spiral flight augers
NMLC	Diamond core - 52 mm dia
NQ	Diamond core - 47 mm dia
HQ	Diamond core - 63 mm dia
PQ	Diamond core - 81 mm dia

Water

▷	Water seep
▽	Water level

Sampling and Testing

A	Auger sample
B	Bulk sample
D	Disturbed sample
E	Environmental sample
U_{50}	Undisturbed tube sample (50mm)
W	Water sample
pp	pocket penetrometer (kPa)
PID	Photo ionisation detector
PL	Point load strength Is(50) MPa
S	Standard Penetration Test
V	Shear vane (kPa)

Description of Defects in Rock

The abbreviated descriptions of the defects should be in the following order: Depth, Type, Orientation, Coating, Shape, Roughness and Other. Drilling and handling breaks are not usually included on the logs.

Defect Type

B	Bedding plane
Cs	Clay seam
Cv	Cleavage
Cz	Crushed zone
Ds	Decomposed seam
F	Fault
J	Joint
Lam	lamination
Pt	Parting
Sz	Sheared Zone
V	Vein

Orientation

The inclination of defects is always measured from the perpendicular to the core axis.

h	horizontal
v	vertical
sh	sub-horizontal
sv	sub-vertical

Coating or Infilling Term

cln	clean
co	coating
he	healed
inf	infilled
stn	stained
ti	tight
vn	veneer

Coating Descriptor

ca	calcite
cbs	carbonaceous
cly	clay
fe	iron oxide
mn	manganese
slt	silty

Shape

cu	curved
ir	irregular
pl	planar
st	stepped
un	undulating

Roughness

po	polished
ro	rough
sl	slickensided
sm	smooth
vr	very rough

Other

fg	fragmented
bnd	band
qtz	quartz

Symbols & Abbreviations

Graphic Symbols for Soil and Rock

General


Asphalt


Road base


Concrete


Filling

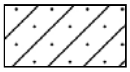
Soils


Topsoil

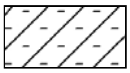

Peat


Clay

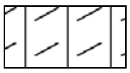

Silty clay

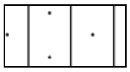

Sandy clay

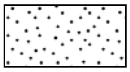

Gravelly clay

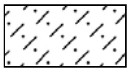

Shaly clay

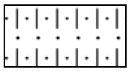

Silt


Clayey silt


Sandy silt


Sand

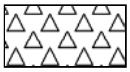

Clayey sand


Silty sand


Gravel


Sandy gravel


Cobbles, boulders

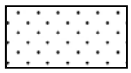

Talus

Sedimentary Rocks

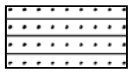

Boulder conglomerate

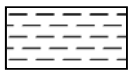

Conglomerate


Conglomeratic sandstone

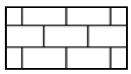

Sandstone


Siltstone


Laminite

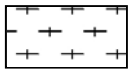

Mudstone, claystone, shale

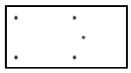

Coal


Limestone

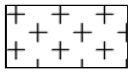
Metamorphic Rocks

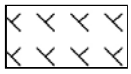

Slate, phyllite, schist

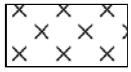

Gneiss

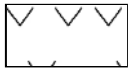

Quartzite

Igneous Rocks


Granite


Dolerite, basalt, andesite


Dacite, epidote


Tuff, breccia


Porphyry

TEST PIT LOG

CLIENT: GHD Woodhead Architecture Pty Ltd
PROJECT: Proposed Additional Classrooms
LOCATION: 10 Yass Road, Queanbeyan

SURFACE LEVEL: 585 m AHD
EASTING: 704034
NORTHING: 6086427

PIT No: 1
PROJECT No: 88406.01
DATE: 28/2/2017
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)
585	0.1	TOPSOIL FILLING-dry to moist, light brown sandy silt, abundant rootlets, trace gravels		E	0.05				
		FILLING-stiff to very stiff, dry to moist, pale brown sand silt with some gravels and rootlets		E	0.2				
				D	0.3				
	0.4	FILLING-very stiff to hard, dry to most, orange brown, medium plasticity sandy clay, some gravels		E	0.4				
				U	0.5				
	0.9	SANDY CLAY-hard, dry to moist, orange/red brown, medium plasticity sandy clay, some gravels, quartz gravel, fine grained sand							
584	1			E	1.0				1
	1.6	SILTY SANDY CLAY-hard, dry to moist, pale red brown, medium plasticity silty sandy clay							
	1.8	SANDSTONE-medium to high strength, moderately weathered, highly fractured, light brown, fine grained sandstone, possible volcanic intrusion							
583	2 2.0	Pit discontinued at 2.0m -limit of investigation		E	2.0				2

RIG: Kubota U17-3 fitted with a 300mm diameter bucket

LOGGED: SDG

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No groundwater observed

REMARKS:

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

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: GHD Woodhead Architecture Pty Ltd
PROJECT: Proposed Additional Classrooms
LOCATION: 10 Yass Road, Queanbeyan

SURFACE LEVEL: 590 m AHD
EASTING: 704118
NORTHING: 6086420

PIT No: 2
PROJECT No: 88406.01
DATE: 28/2/2017
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
590	0.01	TANBARK/MULCH		E	0.05				
	0.15	TOPSOIL FILLING-dry to moist, brown sandy silt with rootlets		E	0.2				
	0.25	FILLING-medium dense, dry to moist, brown gravelly silty sand with cobbles and rootlets							
		SAND-dense, dry to moist, orange brown sand, fine to medium grained cemented sand, with some gravel		E	0.5				
	0.6	SANDY SILT-hard, dry to moist, pale brown, low plasticity sandy silt							
589	1			E	1.0				1
	1.2	SANDY CLAY-hard, dry to moist, orange /red brown, medium plasticity sandy clay, some sandstone cobbles and quartz gravels							
	1.6	CLAYEY SAND-cemented, dry to moist, yellow pale brown clayey sand, fine to medium grained, with gravels and sandstone cobbles		E	1.7				
	1.9	Pit discontinued at 1.9m -slow progress							
588	2								2

Dynamic Penetrometer Test (blows per mm): 5, 10, 15, 20

RIG: Kubota U17-3 fitted with a 300mm diameter bucket

LOGGED: SDG

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No groundwater observed

REMARKS:

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

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: GHD Woodhead Architecture Pty Ltd
PROJECT: Proposed Additional Classrooms
LOCATION: 10 Yass Road, Queanbeyan

SURFACE LEVEL: 590.5 m AHD
EASTING: 704183
NORTHING: 6086408

PIT No: 3
PROJECT No: 88406.01
DATE: 28/2/2017
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 100mm)
590	0.1	TOPSOIL FILLING-dry to moist, orange brown silty sand with rootlets, cobbles and terracotta pipe		E	0.05				
		FILLING-very stiff to hard, dry to moist, medium plasticity silty sandy clay with cobbles, a piece of concrete (300 x 200 x 200mm)		E	0.2				
				D	0.3				
				E	0.5				
	0.6	SANDY SILT-hard, dry to moist, pale brown, low plasticity sandy silt							
	0.8	SANDY CLAY-hard, dry to moist, orange brown with grey mottle, medium plasticity sandy clay with some gravels			0.8				
589	1			E U	1.0				1
				D	1.2				
					1.3				
	1.7	CLAYEY SAND-cemented, dry to moist, yellow brown clayey sand, fine to coarse grained		D	1.8				
	2			E	2.0				2
588	2.1	Pit discontinued at 2.1m -limit of investigation							

RIG: Kubota U17-3 fitted with a 300mm diameter bucket

LOGGED: SDG

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No groundwater observed

REMARKS: large mature gum tress in area

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

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: GHD Woodhead Architecture Pty Ltd
PROJECT: Proposed Additional Classrooms
LOCATION: 10 Yass Road, Queanbeyan

SURFACE LEVEL: 585 m AHD
EASTING: 704039
NORTHING: 6186377

PIT No: 4
PROJECT No: 88406.01
DATE: 28/2/2017
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)
585	0.1	TOPSOIL FILLING-dry to moist, brown silty sand with rootlets		E	0.05				
		FILLING-hard, dry to moist, pale brown grey, low plasticity gravelly silt with some rootlets		D	0.1				
				E	0.2				
	0.35	FILLING-hard, dry to moist, red brown, medium plasticity gravelly silty clay with some gravel		E	0.5				
	0.6	SANDY CLAY-stiff to hard, dry to moist, red brown dark grey, medium to high plasticity sandy clay with some gravels		U	0.6				
584	1			E	1.0				1
					1.1				
	1.6	SILTY SANDY CLAY-very stiff, dry to moist, yellow brown/grey brown, medium plasticity silty sandy clay with some gravels							
583	2 2.0	Pit discontinued at 2.0m -limit of investigation		E	2.0				2

Dynamic Penetrometer Test (blows per 150mm): 5 10 15 20

RIG: Kubota U17-3 fitted with a 300mm diameter bucket

LOGGED: SDG

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No groundwater observed

REMARKS:

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

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics | Environment | Groundwater

TEST PIT LOG

CLIENT: GHD Woodhead Architecture Pty Ltd
PROJECT: Proposed Additional Classrooms
LOCATION: 10 Yass Road, Queanbeyan

SURFACE LEVEL: 587 m AHD
EASTING: 704083
NORTHING: 6086377

PIT No: 5
PROJECT No: 88406.01
DATE: 28/2/2017
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)
587	0.1	TOPSOIL FILLING-dry to moist, brown silty sand with rootlets and rubbish (food wrappers)		E	0.05				
		FILLING-soft to hard, dry to moist, light brown sandy silt with a piece of concrete (150mm)		E	0.2				
	0.25	SANDY SILT-hard, dry to moist, pale brown, low plasticity sandy silt with roots and rootlets		E	0.5				
	0.7	SANDY SILTY CLAY-hard, dry to moist, red brown, medium plasticity sandy silty clay with rootlets		D	0.8				
586	1			E	1.0				1
	1.2	CLAYEY SAND-cemented, dry to moist, yellow brown clayey sand, fine to coarse grain with some gravels							
	1.7	Pit discontinued at 1.7m -slow progress		E	1.7				
585	2								2

Dynamic Penetrometer Test (blows per 150mm): 5, 10, 15, 20

RIG: Kubota U17-3 fitted with a 300mm diameter bucket

LOGGED: SDG

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No groundwater observed

REMARKS: large trees

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

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: GHD Woodhead Architecture Pty Ltd
PROJECT: Proposed Additional Classrooms
LOCATION: 10 Yass Road, Queanbeyan

SURFACE LEVEL: 587 m AHD
EASTING: 704139
NORTHING: 6086345

PIT No: 6
PROJECT No: 88406.01
DATE: 28/2/2017
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 500mm)
587		TOPSOIL FILLING-dry to moist, orange brown sandy silt with rootlets		E	0.05				
	0.15	SILTY SANDY CLAY-very stiff to hard, dry to moist, orange brown, medium plasticity silty sandy clay (possible filling)		E	0.2				
		-large roots encountered at 0.3m			0.3		pp=>400		
	0.4	SANDY SILT-hard, dry to moist, pale brown, low plasticity sandy silt with roots		D E	0.5		pp=>400		
	0.6	SANDY CLAY-hard, dry to moist, yellow/grey brown, low plasticity sandy clay							
	0.7	SANDSTONE-medium to high strength, moderately to slightly weathered highly fractured, grey brown sandstone							
586	1	- from 1.0 m a very high strength quartz vein		D E	1.0				1
	1.1	Pit discontinued at 1.1m -bucket refusal							
585	2								2

RIG: Kubota U17-3 fitted with a 300mm diameter bucket

LOGGED: SDG

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No groundwater observed

REMARKS:

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

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: GHD Woodhead Architecture Pty Ltd
PROJECT: Proposed Additional Classrooms
LOCATION: 10 Yass Road, Queanbeyan

SURFACE LEVEL: 583.7 m AHD
EASTING: 704039
NORTHING: 6088331

PIT No: 7
PROJECT No: 88406.01
DATE: 28/2/2017
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 100mm)
583	0.1	TOPSOIL FILLING-dry to moist, brown silty sand with rootlets		E	0.05				
		FILLING-very stiff to hard, dry to moist, light brown, low plasticity sandy silt with some gravels and rootlets		E	0.2				
	0.4	SANDY SILT-hard, dry to moist, low plasticity sandy silty with some rootlets		E	0.5				
		-from 0.8m, pale brown							
	0.9	SANDY CLAY-hard, dry to moist, red brown, medium plasticity sandy clay with some ironstone nodules and gravels, coarse grained gravels		E	1.0				1
582	1			D	1.5				
	1.8	SANDY SILTY CLAY-stiff, moist, red brown with grey mottle sandy silty clay with some quartz cobbles and gravels		D E	2.0				2
	2								
	2.2	Pit discontinued at 2.2m -limit of investigation							
581									

RIG: Kubota U17-3 fitted with a 300mm diameter bucket

LOGGED: SDG

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No groundwater observed

REMARKS:

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

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: GHD Woodhead Architecture Pty Ltd
PROJECT: Proposed Additional Classrooms
LOCATION: 10 Yass Road, Queanbeyan

SURFACE LEVEL: 585 m AHD
EASTING: 704084
NORTHING: 6086304

PIT No: 8
PROJECT No: 88406.01
DATE: 28/2/2017
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 110mm)
585	0.1	TOPSOIL FILLING-dry to moist, brown silty sandy with rootlets		E	0.05				
		FILLING-very stiff to hard, dry to moist, light brown gravelly silty clay with rootlets		E	0.2				
				D					
		-from 0.3m, gravelly silt with cobbles			0.3				
				E	0.5				
				D					
					0.6				
584	1			E	1.0				1
	1.2	CLAYEY SAND-medium dense to dense, red brown clayey sand, medium to coarse grained, some gravels							
				E	1.5				
				D					
	1.6	SANDY CLAY-stiff to very stiff, grey brown, medium plasticity sandy clay, some gravels and silt			1.6				
				D	1.9				
583	2 2.0	Pit discontinued at 2.0m -limit of investigation			2.0				2

RIG: Kubota U17-3 fitted with a 300mm diameter bucket

LOGGED: SDG

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No groundwater observed

REMARKS:

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

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: GHD Woodhead Architecture Pty Ltd
PROJECT: Proposed Additional Classrooms
LOCATION: 10 Yass Road, Queanbeyan

SURFACE LEVEL: 584 m AHD
EASTING: 704050
NORTHING: 6086310

PIT No: 9
PROJECT No: 88406.01
DATE: 28/2/2017
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 110mm)
584		TOPSOIL FILLING-dry to moist, light brown silty sand with rootlets		E	0.05				
	0.15	FILLING-hard, dry to moist, low plasticity sandy gravelly clay, some cobbles		E	0.2				
				D	0.3				
		-from 0.4m, pale brown gravelly silt		E	0.5				
				D	0.6				
		-from 0.8m, red brown gravelly clay		E	1.0				
583	1								1
	1.4	CLAYEY SAND-dense to medium dense, dry to most, red brown clayey sand with some silt and gravel		E	1.5				
				D	1.6				
	1.8	SANDY CLAY-stiff to very stiff, grey brown, medium plasticity sandy clay, some gravel and silt		D	1.9				
582	2 2.0	Pit discontinued at 2.0m -limit of investigation			2.0				2

RIG: Kubota U17-3 fitted with a 300mm diameter bucket

LOGGED: SDG

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No groundwater observed

REMARKS:

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

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: GHD Woodhead Architecture Pty Ltd
PROJECT: Proposed Additional Classrooms
LOCATION: 10 Yass Road, Queanbeyan

SURFACE LEVEL: 583 m AHD
EASTING: 704046
NORTHING: 6086254

PIT No: 10
PROJECT No: 88406.01
DATE: 28/2/2017
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)
583	0.1	TOPSOIL-dry to moist, light brown silty sand with some gravels and rootlets		E	0.05				
		FILLING-dry to moist, light brown, low plasticity sandy silt with some rootlets		E	0.2				
				D	0.3				
	0.4	FILLING-dry to moist, red brown, low plasticity gravelly sandy clay with some cobbles, silt and rootlets		E	0.5				
582	1			E	1.0				1
	1.1	FILLING-very stiff to hard, dry to moist, low plasticity gravelly clay with cobbles							
				E	1.5				
581	2								2
	2.1	GRAVELLY SANDY CLAY-hard, dry to moist, red brown, low plasticity gravelly sand clay with ironstone nodules and some fine to coarse grained sand							
	2.2	Pit discontinued at 2.2m -limit of investigation		E	2.2				

RIG: Kubota U17-3 fitted with a 300mm diameter bucket

LOGGED: SDG

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No groundwater observed

REMARKS:

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

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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Appendix D

Results of Laboratory Tests (1 sheet)

Material Test Report

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Douglas Partners Pty Ltd
Unanderra Laboratory
Unit 1/1 Luso Drive UNANDERRA NSW 2526
Phone: (02) 4271 1836
Fax: (02) 4271 1897
Email: simon.richards@douglaspartners.com.au

Accredited for compliance with ISO/IEC 17025 - Testing

Approved Signatory: Simon Richards
Nata Accredited Laboratory Number: 828

Report Number: **88406.00-1**
Issue Number: 1
Date Issued: 10/03/2017
Client: GHD Woodhead Architecture Pty Ltd
Level 7, 16 Marcus Clarke Street, Canberra ACT 2601
Contact: Farhad Edibam
Project Number: 88406.00
Project Name: Proposed Additional Classrooms
Project Location: 10 Yass Road, Queanbeyan
Work Request: 583
Date Sampled: 02/03/2017
Sampling Method: Sampled by Engineering Department

Shrink Swell Index AS 1289 7.1.1 & 2.1.1		
Sample Number	17-583A	17-583B
Sampling Method	Sampled by Engineering Department	Sampled by Engineering Department
Date Sampled	02/03/2017	02/03/2017
Date Tested	07/03/2017	07/03/2017
Material Source	**	**
Sample Location	Pit 1 (0.7 - 1.2m)	Pit 3 (0.6 - 1.1m)
Inert Material Estimate (%)	15	5
Pocket Penetrometer before (kPa)	600 +	600+
Pocket Penetrometer after (kPa)	130	210
Shrinkage Moisture Content (%)	12.4	10.4
Shrinkage (%)	**1.1**	**0.5**
Swell Moisture Content Before (%))	9.1	12.6
Swell Moisture Content After (%)	18.1	15.7
Swell (%)	**-0.3**	**0.5**
Shrink Swell Index Iss (%)	**0.6**	**0.4**
Visual Description	Brown mottled Orange gravelly sandy clay	Brown mottled Orange sandy silty clay
Cracking	Moderately Cracked	Moderately Cracked
Crumbling	No	No
Remarks	**	**

Shrink Swell Index (Iss) reported as the percentage vertical strain per pF change in suction.
NATA Accreditation does not cover the performance of pocket penetrometer readings.

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Integrated Practical Solutions

Report on
Preliminary Site Investigation with Limited Sampling

Proposed Additional Classrooms
10 Yass Road, Queanbeyan

Prepared for
GHD Woodhead Architecture Pty Ltd

Project 88406.01
April 2017

Douglas Partners
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Document History

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Revision 0	1	0	GHD Woodhead Architecture Pty Ltd

The undersigned, on behalf of Douglas Partners Pty Ltd, confirm that this document and all attached drawings, logs and test results have been checked and reviewed for errors, omissions and inaccuracies.

	Signature		Date
Author			19 April 2017
Reviewer		For Tim Wright	19 April 2017

bsi. ISO 9001 Quality Management

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Executive Summary

This report presents the results of a preliminary site investigation with limited sampling (PSI) undertaken for proposed additional classrooms at 10 Yass Road, Queanbeyan (the Queanbeyan East Public School – The School) referred to as 'the site'. The site comprises Lots 105 and 106 D.P.729079, Lots A and B D.P.412056, and Lots 8, 9 and 11 Section 49 D.P.758862. The investigation was commissioned in an email dated 17 February 2017 by GHD Woodhead Architecture Pty Ltd and was undertaken in accordance with Douglas Partners' proposal CAN160290 dated 24 November 2016. This PSI will support the planning application for the proposed development of additional classrooms at the site (i.e. a primary school therefore equivalent to a low density residential land use). It is understood that the site will remain as a school and the existing buildings will not be demolished.

The objectives of the PSI were to:

- Assess the potential for contamination at the site based on past and present site uses;
- Identify potential areas of environmental concern (PAEC);
- Determine the contaminants of concern; and
- Comment on the need for further investigation and/or management (if required) in order to determine the compatibility of the site for the proposed development of additional classrooms at the site.

This PSI comprised a review of historical information, a site walkover to identify potential sources of contamination, and a limited investigation with sampling and laboratory testing of soil. The sampling was undertaken in conjunction with a geotechnical investigation reported separately in DP *Report on Preliminary Geotechnical Investigation, Proposed Additional Classrooms, 10 Yass Road, Queanbeyan*, Project Number 88406.00, dated March 2017.

The site comprises a triangular shaped area of approximately 23,000 m^2. A number of buildings used as classrooms and office space occupy the north central portion of the site. An asphalted car park is located along the northern boundary allowing access to the site. Mature trees surround the buildings with paved pathways allowing access between them. A large separate building within the centre of the site is used as a hall.

Grassed areas are located within the eastern, western and southern portions of the site with mature trees lining the boundaries. The north eastern portion has only minor areas of grass within a cluster of trees. A playground with a sand pit is located at the southern end of the site and a second playground is located near to the central eastern boundary. The site slopes to the west and south from 592 mAHD in the north east corner to 583 mAHD in the southern corner of the site.

The site is bounded by Yass Road to the west, Mulloon Street to the south and east and Thurralilly Street to the north. The surrounding land uses are residential to the south and east, public and private recreational to the west and commercial to the north. The commercial properties include a metal fabrication workshop and a joinery.

The site history review and walkover indicated that the site was unoccupied land prior to 1961. The Queanbeyan East Public School was established between 1961 and 1968. The gully line noted in the 1961 Aerial Photograph was filled in during the construction of the school. The site remained

generally unchanged from 1968 until a new central building (the Hall) was constructed in 2011 and can be observed in the *2012 Aerial Photograph*.

At the time of the walkover the northeast corner of the site was used as a storage area for various items including stockpiles of gardening resources and building material including tanbark, gravel, topsoil, pots, bags of topsoil and timber. It was considered that these items stored were inert and non-hazardous. Vehicle trafficking was also observed in the north eastern corner of the site. The stockpiles of topsoil and gravel are considered unlikely to have residual contamination that could impact the site as the material appears to have been recently placed and is a minor amount.

No asbestos-containing material was noted during the site walkover. However, considering the age of the buildings it is possible of that hazardous materials including asbestos were used during construction. Buried services were noted within the northern and eastern portions of the site.

A metal fabrication workshop and a joinery which both involve the treatment of metal are located 30 m north and up-gradient from the site. The details of the processes undertaken at the workshops are not known. Considering these workshops appear to be on a hardstand surface and that surface water is controlled at Thuralilly Street the potential for impact is considered to be minor but it is possible that migration could have occurred to the site through groundwater.

Based on observations made during the site history review and site walkover the main sources of potential contamination are considered to be:

- Potential impacts from filling associated with the construction of buildings, paved areas, asphalted car park, and infilled gully line. Potential contaminants associated with fill from unknown and contaminated sources are: metals: arsenic (As), cadmium (Cd), chromium (Cr), copper (Cu), lead (Pb), mercury (Hg), nickel (Ni), zinc (Zn); total recoverable hydrocarbons (TRH); benzene, toluene, ethylbenzene, xylene (BTEX); polycyclic aromatic hydrocarbons (PAH); polychlorinated biphenyls (PCB); organochloride pesticides (OCP); organophosphate pesticides (OPP); phenols and asbestos.
- Potential impacts from buried services on the site. Potential contaminants associated with buried services are asbestos-containing materials (ACM).
- Potential impacts from hazardous building materials associated with the buildings on the site. Potential contaminants associated with hazardous building materials are: asbestos, Pb, PCB and synthetic mineral fibres (SMF).
- Potential offsite impacts from the metal workshops to the north of the site. Potential contaminants associated with metal treatment are: metals, cyanide, acids, lubricants and solvents.

Areas that may be impacted by potential contamination were identified on the basis of the available site information, site walkover and results of the limit subsurface investigation. Based on the findings of the assessment, the potential for gross contamination to be present within the site is considered to be low.

The results of the PSI indicate that the site is generally suitable for the intended land use as a site for additional classrooms (i.e. equivalent to low density residential land use) subject to the following:

- Installation of groundwater monitoring wells along the northern boundary of the site targeting the offsite workshops; and

- The implementation of an unexpected finds protocol (UFP) to address potential contamination, including any ACM which is encountered during site works, and a “safe working methodology” if disturbance of any underground infrastructure occurs.

Considering the age of the existing buildings it is considered likely that they may contain hazardous building materials (HBM) such as asbestos, lead paint or PCB in fluorescent light fittings. It is understood that the buildings will remain as they are now, however, it is recommended that if any future disturbance or demolition to the buildings is to occur then a hazardous building materials survey should be carried out prior to any major refurbishment.

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Report on Preliminary Site Investigation with Limited Sampling
Proposed Additional Classrooms
10 Yass Road, Queanbeyan

1. Introduction

This report presents the results of a preliminary site investigation with limited sampling (PSI) undertaken for proposed additional classrooms at 10 Yass Road, Queanbeyan (the Queanbeyan East Public School – The School) referred to as 'the site'. The site comprises Lots 105 and 106 D.P.729079, Lots A and B D.P.412056, and Lots 8, 9 and 11 Section 49 D.P.758862. The investigation was commissioned in an email dated 17 February 2017 by GHD Woodhead Architecture Pty Ltd and was undertaken in accordance with Douglas Partners' proposal CAN160290 dated 24 November 2016. This PSI will support the planning application for the proposed development of additional classrooms at the site (i.e. a primary school therefore equivalent to a low density residential land use). It is understood that the site will remain as a school and the existing buildings will not be demolished.

The objectives of the PSI were to:

- Assess the potential for contamination at the site based on past and present site uses;
- Identify potential areas of environmental concern (PAEC);
- Determine the contaminants of concern; and
- Comment on the need for further investigation and/or management (if required) in order to determine the compatibility of the site for the proposed development of additional classrooms at the site.

This PSI comprised a review of historical information, a site walkover to identify potential sources of contamination, and a limited investigation with sampling and laboratory testing of soil. The sampling was undertaken in conjunction with a geotechnical investigation reported separately in DP *Report on Preliminary Geotechnical Investigation, Proposed Additional Classrooms, 10 Yass Road, Queanbeyan*, Project Number 88406.00, dated March 2017.

This report must be read in conjunction with the notes *About this Report* which are included in Appendix A.

2. Scope of Work

The following scope of work was conducted for the investigation:

- A desktop study of available maps and plans;
- Review of site history information comprising:
  - A search of the Contaminated Land Register for notices issued under the CLM and POEO Acts;

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- A search of the dangerous good database held by SafeWork NSW;
- Review of section 149 planning certificate;
- Review of historical land titles with respect to the Deposited Plan (D.P.) to identify previous site owners; and
- A review of selected historical aerial photography archived with the NSW Land and Property Information Agency.

- Site walkover by an environmental engineer;
- Limited subsurface investigation with sampling and laboratory testing of soil for a suite of contaminants of potential concern as outlined Sections 11 and 12; and
- Preparation of this report presenting the findings of the PSI, identification of potential sources of contamination, and an assessment of the need for further investigations and/or management.

3. Site Identification and Description

3.1 Site Identification

The site identification information is summarised as follows:

Table 1: Site Identification Details

Item	Details
Site Owner	Queanbeyan East Public School
Site Address	10 Yass Road, Queanbeyan NSW
Current land use	Public primary school
Lot and Deposited Plan (see Drawing 1, Appendix B)	Lots 105 and 106 D.P. 729079 Lots A and B D.P. 412056 Lots 8, 9 and 11 Section 49 D.P. 758862
Territory Plan Zoning	R3: Medium Density Residential
Council	Queanbeyan-Palerang Regional Council
Approximate Site Area	23,000 m^2
Proposed future land-use	Additional classrooms

3.2 Site Layout and Description

The general layout of the site is provided on Drawing 1, Appendix B. The site comprises a triangular shaped area of approximately 23,000 m^2. A number of buildings used as classrooms and office space occupy the north central portion of the site. An asphalted car park is located along the northern boundary allowing access to the site. Mature trees surround the buildings with paved pathways allowing access between them. A large separate building within the centre of the site is used as a hall.

Grassed areas are located within the eastern, western and southern portions of the site with mature trees lining the boundaries. The north eastern portion has only minor areas of grass within a cluster of trees. A playground with a sand pit is located at the southern end of the site and a second playground is located near to the central eastern boundary. The site slopes to the west and south from 592 mAHD in the north east corner to 583 mAHD in the southern corner of the site.

The site is bounded by Yass Road to the west, Mulloon Street to the south and east and Thurralilly Street to the north. The surrounding land uses are residential to the south and east, public and private recreational to the west and commercial to the north. The commercial properties include a metal fabrication workshop and a joinery.

4. Geotechnical Investigation (DP, 2010)

A geotechnical investigation was undertaken on 10 Yass Road, Queanbeyan by Douglas Partners Pty Ltd with the results presented in a report entitled: *Geotechnical Investigation – 8 October 2010, New Hall and C.O.L.A., Queanbeyan East Public School*, Project number 50589.00, dated October 2010 (DP, 2010), for a proposed Hall and covered outdoor learning area (C.O.L.A).

The investigation comprised the observation of the site subsurface profile which was based on the examination of the existing excavations for the perimeter retaining wall and several pad footings. The strata was broadly summarised as follows:

- FILL: hard, dry to moist, low to medium plasticity gravelly sandy clay with some siltstone and sandstone gravel to 30mm size to depths of between 0.1 m and 0.3 m below ground level (bgl).
- SLOPEWASH: very stiff to hard, moist, dark grey-brown, low plasticity sandy silty clay and medium dense, moist, pale yellow grey sandy clayey silt to depths of between 0.3 m and 0.6 m bgl.
- ALLUVIUM: very stiff to hard, high plasticity sandy clay and gravelly sandy clay to depths of between 0.4 m and greater than 1.2 m.

No free groundwater was in the excavations.

5. Regional Soils, Geology and Hydrogeology

5.1 Regional Soils

Reference to the 1:100 000 Canberra Soil Landscape Series Sheet 8727 (Ref 1) indicated that the majority of the site is mapped as being on the Winnunga Soil Group.

The Winnunga Soil Group is characterised by waning slopes and alluvial fans on Ordovician metasediments. Relief varies between 9 m and 30 m with slopes of between 3 % and 10 %. Small lower slope scalded areas are common with extensively cleared woodland.

Soils are variably shallow, moderately well drained Tenosols (Lithosols) on crests and upper slopes, moderately deep, moderately well drained Red Chromosols (Red Podzolic Soils) and Brown

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Chromosols (Yellow Podozolic Soils) on side slopes, and moderaterly deep to deep, imperfectly drained Mottled Magnesic Sodosols (Solodic Soils) on lower slopes and drainage lines.

Limitations include strongly acid infertile topsoils, dispersible subsoils, complex terrain, permanently high water tables (localised), sheet and gully erosion risks, salinity, seepage scalds and seasonal waterlogging.

A small section of the north eastern corner of the site is mapped as being on the Queanbeyan Soil Group. The Queanbeyan Soil Group is characterised by low hills on Ordovician metasediments. Local relief varies between 30 m and 90 m and moderately inclined slopes that vary between 10 % and 25%. Landscape features also include extensively cleared open-forest woodland with surface stone.

Soils generally vary with shallow, well-drained Rudosols (Lithosols) on crests and upper slopes, moderately deep, moderately well-drained Red Kurosols (Red Podzolic Soils) on sideslopes, and moderately deep to deep, imperfectly drained Magnesic Brown Chromosols (Yellow Podzolic Soils) in drainage lines.

Limitiations include strongly acid shallow soils (localised) of moderate aluminium toxicity potential, low fertility, low available waterholding capacity, sheet and gully erosion risks, imperfect drainage, rock outcrop and surface stone, and localised and seasonal waterlogging.

5.2 Regional Geology

Reference to the 1:100 000 Geological Series Sheet for Canberra (Ref 2) indicated that the site is underlain by the Pittman Formation of middle to late Ordovician age. The Pittman Formation typically comprises interbedded sandstone, siltstone, shale and minor black shale, chert and impure calcareous sandstone (distal quartz turbidites).

5.3 Hydrogeology

The nearest surface water receptor is the Queanbeyan River approximately 530 m to the west and south of the site. The regional groundwater flow is considered likely to be west and south towards the Queanbeyan River following the topographical slope.

The 1:100,000 map Hydrogeology of the Australian Capital Territory and Environs (Ref 3) indicated that the site is underlain by geological units of Ordovician to late Early Silurian age. These typically include: quartz arenite, siltstone, shale, sandstone, greywacke and minor black shale. The unit is typically fractured, higher yielding zones are associated with the lower parts of high relief areas. The likely yield of the groundwater aquifer is indicated to be greater than 1.0 L/s with total dissolved solids (TDS) of between 500 and 1000 mg/L.

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5.4 Groundwater Bore Search

A search of the groundwater bore database was conducted through the NSW Department of Primary Industries. Based on the database, there are approximately 38 groundwater abstraction bores registered within a 1 kilometre radial search area of the site. Further information was available through the database for all 38 bores as follows:

Table 2: Groundwater Bores

Groundwater Bore Number	Distance to site (m)	Private/Public	Groundwater Usage	Depth (m)	Depth to standing water level (m)	Yield (L/s)
GW047857	265 W	Private	Recreation (Groundwater)	16	Unknown	Unknown
GW047856	265 W	Private	Recreation (Groundwater)	27	Unknown	Unknown
GW047855	265 W	Private	Recreation (Groundwater)	36	Unknown	Unknown
GW101204	500 N	Unknown	Monitoring Bore	16.2	9	Unknown
GW401203	500 N	Unknown	Monitoring Bore	16.2	10.15	Unknown
GW401202	500 N	Unknown	Monitoring Bore	16.5	9.2	Unknown
GW402234	500 N	Unknown	Monitoring Bore	16.8	9.2	Unknown
GW402235	500 N	Unknown	Monitoring Bore	16.2	10.15	Unknown
GW402236	500 N	Unknown	Monitoring Bore	16.2	9	Unknown
GW404681	600 N	Private	Monitoring Bore	1.9	Unknown	Unknown
GW404682	600 N	Private	Monitoring Bore	5	Unknown	Unknown
GW404692	600 N	Private	Monitoring Bore	1.4	Unknown	Unknown
GW404683	600 N	Private	Monitoring Bore	5.1	Unknown	Unknown
GW404691	600 N	Private	Monitoring Bore	3	Unknown	Unknown
GW404690	600 N	Private	Monitoring Bore	1.6	Unknown	Unknown
GW404693	600 N	Private	Monitoring Bore	15	Unknown	Unknown
GW404686	600 N	Private	Monitoring Bore	2	Unknown	Unknown
GW404684	600 N	Private	Monitoring Bore	3.7	Unknown	Unknown
GW404687	600 N	Private	Monitoring Bore	2.6	Unknown	Unknown
GW404688	600 N	Private	Monitoring Bore	1.4	Unknown	Unknown
GW404689	600 N	Private	Monitoring Bore	2.7	Unknown	Unknown
GW404685	600 N	Private	Monitoring Bore	3.2	Unknown	Unknown

GW414562	870 NW	Private	Monitoring Bore	20	14.71	Unknown
GW414564	870 NW	Private	Monitoring Bore	18	Unknown	Unknown
GW414563	870 NW	Private	Monitoring Bore	20	Unknown	Unknown
GW414565	870 NW	Private	Monitoring Bore	12	Unknown	Unknown
GW414569	870 NW	Private	Monitoring Bore	11.5	Unknown	Unknown
GW414570	870 NW	Private	Monitoring Bore	9	Unknown	Unknown
GW414566	950 NW	Private	Monitoring Bore	15	Unknown	Unknown
GW414571	950 NW	Private	Monitoring Bore	15	Unknown	Unknown
GW414567	950 NW	Private	Monitoring Bore	15	Unknown	Unknown
GW414568	950 NW	Private	Monitoring Bore	15	Unknown	Unknown
GW414572	950 NW	Private	Monitoring Bore	6	Unknown	Unknown
GW414573	950 NW	Private	Monitoring Bore	11.5	Unknown	Unknown
GW414574	950 NW	Private	Monitoring Bore	15	Unknown	Unknown
GW404060	990 E	Private	Domestic	66	29	3
GW415903	990 E	Private	Domestic	72	39	0.6
GW402542	990 E	Unknown	Stock, Domestic	73	38	1

It is noted that based on the inferred groundwater flow direction to the west and south following the topography, there are three registered bores between the site and Queanbeyan River located approximately 265 m downgradient of the site.

6. Site History

The following sections describe the methodology and outcomes of the brief site history review.

6.1 Regulatory Notice Search Under the CLM and POEO Acts

A search on 20 February 2017 for Statutory Notices issued under the *Contaminated Land Management Act 1997* (CLM) and *Protection of the Environment Operation Act 1997* (POEO) available on the NSW Environment Protection Agency (EPA) website indicated that there have been no notices issued on the site.

6.2 NSW SafeWork Records Search

A search of the NSW SafeWork's records of the Stored Chemical Information Database (SCID) (letter dated 5 April 2017, refer to Appendix C) indicated that there are no records held for 10 Yass Road, Queanbeyan, NSW under the current SCID.

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6.3 Section 149 (2 and 5) Planning Certificate

The Section 149 Certificate was obtained for Lots 105 and 106 D.P. 729079, Lots A and B D.P. 412056, and Lots 8, 9 and 11 Section 49 D.P. 758862. The site is located within the local government area of Queanbeyan-Palerang Regional Council. Lots 105 and 106 D.P. 729079, Lots A and B D.P. 412056, and Lots 8, 9 and 11 Section 49 D.P. 758862 are zoned as R3 medium residential zone.

According to the Section 149 (2) Planning Certificate, the 'land to which this certificate relates is:
(a) Not significantly contaminated land within the meaning of that Act
(b) Not subject to a management order within the meaning of that Act
(c) Not subject of an approved voluntary management proposal within the meaning of that Act
(d) Not subject to an ongoing maintenance order within the meaning of that Act
(e) Not subject of a site audit statement within the meaning of that Act

The Section 149 (2 and 5) Planning Certificate is included in Appendix C.

6.4 Historical Title Search

A historical title deed search was undertaken to cover approximately the past 100 years and has been summarised in this section. Determination of the ownership or occupancy of the property, including company names, can assist in the identification of previous land uses and therefore assists in establishing potentially contaminating activities. The land title certificates are included in Appendix C.

The site is currently owned by Minister for Education (NSW), who were registered as proprietors since 1994. Ownership of the property prior to this time is summarised in Tables 3 to 11, below, together with the occupation of the owner given in the title and the possible use of the site or nature of the business of the site/owner

Table 3: Lot 105 D.P. 729079 (part 1 of site, refer to Appendix C)

Date of Acquisition and term held	Registered Proprietor(s) & Occupations	Landuse
15.05.1886 (1886 – 1961)	Crown Reserve No. 215 for Access	Unknown
24.12.1961 (1961 - 1998)	Dedicated for Public School Site	School
05.06.1998 (1998 - Date)	Minister for Education and Training	School

Table 4: Lot 105 D.P. 729079 (part 2 and 3 of site, refer to Appendix C)

Date of Acquisition and term held	Registered Proprietor(s) & Occupations	Landuse
Unknown	Crown Roads	Unknown
17.11.1961	Roads now closed	Unknown

Date of Acquisition and term held	Registered Proprietor(s) & Occupations	Landuse
(1961 - 1961)		
24.12.1961 (1961 – 1998)	Dedicated for Public School Site	School
05.06.1988 (1998 - Date)	Minister for Education and Training	School

Table 5: Lot 105 D.P. 729079 (parts 4 and 5 of site, refer to Appendix C)

Date of Acquisition and term held	Registered Proprietor(s) & Occupations	Landuse
22.12.1925 (1925 – 1957)	Sale at Queanbeyan	Unknown
1957 & 1958 (1957 – 1958 and 1958 – 1961)	Crown Tenures Special Lease 1957/15 & Special Lease 1958/6 To William Caesar Kelly Heinz Frerker	Unknown
24.12.1961 (1961 – 1998)	Dedicated for Public School Site	School
05.06.1998 (1998 – Date)	Minister for Education and Training	School

Table 6: Lot 106 D.P. 729079

Date of Acquisition and term held	Registered Proprietor(s) & Occupations	Landuse
Unknown	Crown Road	Unknown
26.11.1965 (1965 – 1966)	Roads now closed	Unknown
15.04.1966 (1966 – 1998)	Dedicated for Public School Site addition	School
05.06.1998 (1998 – Date)	Minister for Education and Training	School

Table 7: Lot A D.P. 412056

Date of Acquisition and term held	Registered Proprietor(s) & Occupations	Landuse
15.04.1930 (1930 to 1930)	James George Harris (Estate Agent)	Unknown
23.07.1930 (1930 to 1958)	James Barnett Lodge (Engine Driver)	Unknown

Date of Acquisition and term held	Registered Proprietor(s) & Occupations	Landuse
20.06.1958 (1958 to 1961)	Beatrix Eve Southwell (Married Woman)	Unknown
17.11.1961 (1961 to 1994)	Her Most Gracious Majesty Queen Elizabeth the Second	School
14.07.1994 (1994 to date)	Minister for Education	School

Table 8: Lot B D.P. 412056

Date of Acquisition and term held	Registered Proprietor(s) & Occupations	Landuse
15.04.1930 (1930 to 1930)	James George Harris (Estate Agent)	Unknown
23.07.1930 (1930 to 1958)	James Barnett Lodge (Engine Driver)	Unknown
20.06.1958 (1958 to 1958)	Beatrix Eve Southwell (Married Woman)	Unknown
14.10.1958 (1958 to 1961)	Otto Schultz (Forestry Worker)	Unknown
24.07.1961 (1961 to 1994)	Her Most Gracious Majesty Queen Elizabeth the Second	School
14.07.1994 (1994 to date)	Minister for Education	School

An easement for drainage was registered for part Lot B on 2 March 1959.

Table 9: Lot 8 Section 11 D.P. 758862

Date of Acquisition and term held	Registered Proprietor(s) & Occupations	Landuse
23.10.1928 (1928 to 1960)	Dinah Jane Jeffs (Married Woman)	Unknown
13.10.1960 (1960 to 1964)	Phyllis Doreen Mortlock (Widow) (Section 94 Application not investigated)	Unknown
15.05.1964 (1964 to 1994)	Her Most Gracious Majesty Queen Elizabeth the Second	School
22.03.1994 (1994 to date)	Minister for Education	School

Table 10: Lot 9 Section 11 D.P. 758862

Date of Acquisition and term held	Registered Proprietor(s) & Occupations	Landuse
09.09.1918 (1918 to 1960)	Dinah Jane Jeffs (Married Woman)	Unknown
13.10.1960 (1960 to 1962)	Horace James Edmonds Jeffs (Labourer)	Unknown
19.04.1962 (1962 to 1994)	Her Most Gracious Majesty Queen Elizabeth the Second (Resumed for Public School)	School
22.03.1994 (1994 to date)	Minister for Education (Resumed for Public School)	School

Table 11: Lot 11 Section 11 D.P. 758862

Date of Acquisition and term held	Registered Proprietor(s) & Occupations	Landuse
09.09.1918 (1918 to 1960)	Dinah Jane Jeffs (Married Woman)	Unknown
13.10.1960 (1960 to 1962)	Horace James Edmonds Jeffs (Labourer)	Unknown
19.04.1962 (1962 to 1994)	Her Most Gracious Majesty Queen Elizabeth the Second (Resumed for Public School)	School
22.03.1994 (1994 to date)	Minister for Education (Resumed for Public School)	School

6.5 Historical Aerial Photography

Historical aerial photographs from seven periods of photography, archived by the NSW Planning and Information and from Google Earth and ACTmapi were reviewed (refer to Aerial Photograph Plates D1 to D7 in Appendix D). The photographs indicated that the site has undergone changes in layout since the earliest available aerial photograph dated 1961. Aerial photographs examined were as follows:

- 5 November 1961 (Run 3C, 1:42,500, B/W);
- 22 November 1968 (Run 3C, 1:46,100, B/W);
- 23 April 1976 (Run 5, 1:48,000, B/W);
- 10 February 1985 (Run 6, 1:40,000, B/W);
- 24 October 1992 (Run 9, 1:25,000, Colour);
- 22 December 2002 (Google Earth,1:900, Colour);
- April 2012 (ACTmapi, 1:7,500, Colour).

The historical aerial photographs were examined for signs of potential areas of environmental concern such as planting patterns, previous structures which may have subsequently been removed, existing structures, stripped soil or areas of fill or disturbance or other signs of a potentially contaminating

nature. The findings of the review are summarised below and have been illustrated on Drawing 1, Appendix B:

1961 Aerial Photograph (Plate D1):

- The site and surrounding area were unoccupied land;
- A gully line appeared to have flowed along part of the eastern boundary in a north east to south west orientation;
- Yass Road and Thurralilly Street were constructed at the western and northern boundaries of the site;
- The surrounding areas appeared to have been cleared for development; and
- Further west of the site, development had occurred with land clearing and establishment of dirt roads and residential properties.

1968 Aerial Photograph (Plate D2):

- The School had been constructed on the site with much of the north eastern portion disturbed during development;
- The gully line was no longer visible and appeared to have been filled;
- The construction of Mulloon Street was noted at the eastern boundary of the site; and
- The surrounding areas had been developed as part of a residential and commercial suburb of Queanbeyan East.

1976 Aerial Photograph (Plate D3):

- The site and surrounding area remained generally the same as the *1968 Aerial Photograph*

1985 Aerial Photograph (Plate D4):

- The site and surrounding area remained generally the same as the *1976 Aerial Photograph;* and
- A few mature trees appeared to have been established within the site.

1992 Aerial Photograph (Plate D5):

- The site and surrounding area remained generally the same as the *1985 Aerial Photograph*.

2002 Aerial Photograph (Plate D6):

- An additional building had been constructed to the west of the existing building; and
- The site and surrounding area remained generally the same as the *1992 Aerial Photograph*.

2012 Aerial Photograph (Plate D7):

- The site and surrounding area remained generally the same as the *2002 Aerial Photograph;* and
- A large building (the Hall) had been established in the centre of the site.

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6.6 Underground Services

A Dial Before you Dig (DBYD) search and service locating were conducted to access available services plans to give an indication of potential conduit lines for migration of contamination off-site. The services within or at the boundary of the site were noted as follows:

- Gas:
  - One line enters the site from the east into the northeast corner of the site, connecting to the school in an east to west orientation.
  - An additional gas line runs along the eastern side of the school in a north to south orientation and then runs in an east to west orientation connecting to the large building in the centre of the site.
- Electricity:
  - One line enters the site from the north into the northeast corner of the site in a north to south orientation.
- Telecommunications:
  - Internet and telecommunications enter the site from the north into the north east corner of the site adjacent to the east side of the school office. Both lines run in a north to south orientation.
  - Telecommunications also run along the northern boundary, north west boundary and south east boundary of the site.

7. Site Walkover

A site walkover was undertaken on 22 February 2017. The site walkover was undertaken to check and identify (where possible) the likely presence, or otherwise, of potential sources of contamination with reference to the site history review, and to identify and comment on additional potential sources of contamination which were encountered/observed. Drawing 1 (Appendix B) and Photographs 1 to 10 (Appendix E) show the layout of the site. The findings of the site walkover are also shown on Drawing 1, Appendix B.

The site walkover confirmed that the site is currently occupied by a number of small to large sized buildings within the northern central portion that are used as office space and classrooms for the Queanbeyan East Public School. The buildings comprise both structures constructed on a concrete slab and raised demountables. A large separate building within the centre of the site is used as the Hall. The School can be accessed off Thurralilly Street with a small asphalted car park area located on the northern boundary. The area around the buildings includes pavement, small grassed areas and mature trees. Garden beds, and mature trees were noted along the northern boundary of the site.

A drainage line was noted in the north eastern corner flowing in a north to south orientation. Other observations in the north eastern corner included piles garden waste, construction materials (comprising of piles of timber and a metal beam for a flying fox), three stockpiles each of tanbark (approximately 86 m^3), topsoil (approximately 0.8 m^3) and gravel (approximately 1 m^3), a small garden shed/enclosure with potting mix, one compost bin, bricks and potted plants, and vehicle trafficking. It was noted that there was no sign of any potential storage of pesticides or herbicides within the garden shed/enclosure. A service entry track and a playground with a recycled rubber base were also observed the eastern portion of the site; see Photographs 1 to 5, Appendix E.

The southern section of the site comprised large grassed areas, a playground with a tanbark base, a sandbox (approximately 1.9 m^3) and a few mature trees towards the most southern end of the southern section.

The western section of the site comprised a grassed sporting field with a stormwater drain running through it from the northwest corner of the large central building in a southeast to northwest orientation. Mature trees lined the western boundary and drainage lines were observed at the western boundary and the north western corner of the site. Areas of the site were noted to have been disturbed due to the various school activities; see Photographs 6 to10, Appendix E.

No asbestos-containing material was noted during the site walkover. Buried services were noted at the site.

The site is bounded by Thurralilly Street to the north, Mulloon Street to the south and east, and Yass Road to the west. The surrounding land uses are, residential properties to the east and south, recreational areas to the west and commercial properties to the north. The commercial properties include a metal fabrication workshop and a joinery which both involve the treatment of metal. These workshops are located 30 m north and up-gradient from the site. The details of the processes undertaken at the workshops are not known. It is considered that the potential for migration of contaminants onto the site from current adjacent land uses is low to moderate.

8. Potential for Contamination

The site history review and walkover indicated that the site was unoccupied land prior to 1961. The Queanbeyan East Public School was established between 1961 and 1968. The gully line noted in the 1961 Aerial Photograph was filled in during the construction of the school. The site remained generally unchanged from 1968 until a new central building (the Hall) was constructed in 2011 and can be observed in the *2012 Aerial Photograph*.

At the time of the walkover the northeast corner of the site was used as a storage area for various items including stockpiles of gardening resources and building material including tanbark, gravel, topsoil, pots, bags of topsoil and timber. It was considered that these items stored were inert and non-hazardous. Vehicle trafficking was also observed in the north eastern corner of the site. The stockpiles of topsoil and gravel are considered unlikely to have residual contamination that could impact the site as the material appears to have been recently placed and is a minor amount.

No asbestos-containing material was noted during the site walkover. However, considering the age of the buildings it is possible of that hazardous materials including asbestos were used during construction. Buried services were noted within the northern and eastern portions of the site.

A metal fabrication workshop and a joinery which both involve the treatment of metal are located 30 m north and up-gradient from the site. The details of the processes undertaken at the workshops are not known. Considering these workshops appear to be on a hardstand surface and that surface water is controlled at Thuralilly Street the potential for impact is considered to be minor but it is possible that migration could have occurred to the site through groundwater.

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Based on observations made during the site history review and site walkover the main sources of potential contamination are considered to be:

- Potential impacts from filling associated with the construction of buildings, paved areas, asphalted car park, and infilled gully line. Potential contaminants associated with fill from unknown and contaminated sources are: metals: arsenic (As), cadmium (Cd), chromium (Cr), copper (Cu), lead (Pb), mercury (Hg), nickel (Ni), zinc (Zn); total recoverable hydrocarbons (TRH); benzene, toluene, ethylbenzene, xylene (BTEX); polycyclic aromatic hydrocarbons (PAH); polychlorinated biphenyls (PCB); organochloride pesticides (OCP); organophosphate pesticides (OPP); phenols and asbestos.
- Potential impacts from buried services on the site. Potential contaminants associated with buried services are asbestos-containing materials (ACM).
- Potential impacts from hazardous building materials associated with the buildings on the site. Potential contaminants associated with hazardous building materials are: asbestos, Pb, PCB and synthetic mineral fibres (SMF).
- Potential offsite impacts from the metal workshops to the north of the site. Potential contaminants associated with metal treatment are: metals, cyanide, acids, lubricants and solvents.

Potential sources of contamination observed on site are shown on Drawing 1, Appendix B. However, it should be noted that other fill areas not identifiable on aerial photographs or via surface walkover, could be present.

9. Preliminary Conceptual Site Model

A conceptual site model (CSM) is a representation of site-related information regarding potential contamination sources, receptors and exposure pathways between those sources and receptors. The CSM provides the framework for identifying how the site became contaminated and how potential receptors may be exposed to contamination either in the present or the future i.e. it enables an assessment of the potential source – pathway – receptor linkages (complete pathways).

9.1 Potential Contamination Sources

Based on Section 7 the potential contamination sources are as follows:
S1 – Filling (metals, TRH, BTEX, PAH, PCB, OCP, OPP, phenols and asbestos)
S2 – Offsite metal workshops (metals, cyanide, acids, lubricants and solvents)
S3 – Buried service infrastructure and hazardous building materials (asbestos, Pb, PCB and SMF)

9.2 Potential Receptors

9.2.1 Human Health Receptors

Potential human health receptors include the following:
R1 – Current users (students and workers).
R2 – Construction and maintenance workers.
R3 – End users (students and workers).

R4 – Land users in adjacent areas (commercial, residential and recreational).

9.2.2 Environmental Receptors

Potential environmental receptors include the following:
R5 – Groundwater
R6 – Terrestrial ecology
R7 – Surface water.

9.3 Potential Pathways

Potential pathways for contamination present include the following:
P1 – Ingestion and dermal contact.
P2 – Inhalation of dust and/or vapours.
P3 – Surface water run-off.
P4 – Leaching of contaminants and vertical mitigation into groundwater.
P5 – Lateral migration of groundwater providing baseflow to watercourses.
P6 – Direct contact with terrestrial ecology.

There are a number of underground services that cross through the eastern and northern portion of site. The potential offsite impacts from the metal workshops could migrate to the site along these preferential pathways.

9.4 Summary of Potential Complete Pathways

A 'source–pathway–receptor' approach has been used to assess the potential risks of harm being caused to human, water or environmental receptors from contamination sources on or in the vicinity of the site, via transport pathways (potential complete pathways). The possible pathways between the above sources (S1, S2 and S3) and receptors (R1 to R7) are provided below in Table 12.

Table 12: Summary of Potential Complete Pathways

Source	Transport Pathway	Receptor	Comments
S1 – Filling: metals, TRH, BTEX, PAH, PCB, OCP, OPP, phenols and asbestos. S2 – Offsite metal workshops: metals, cyanide, acids, lubricants and solvents	P1 – Ingestion and dermal contact. P2 – Inhalation of dust and/or vapours.	R1 – Current users (students and workers). R2 – Construction and maintenance workers. R3 –End users (students and workers).	A limited intrusive investigation in accessible areas is required to assess possible contamination including chemical testing of the soils. Included in this PSI. See Note 1.
	P2 – Inhalation of dust and/or vapours.	R4 – Land users in adjacent areas (commercial, residential and recreational).	
	P4 – Leaching of contaminants and vertical mitigation into groundwater.	R5 – Groundwater.	
	P3 – Surface water runoff P5 – Lateral migration of groundwater providing baseflow to watercourses	R7 – Surface water (Queanbeyan River approximately 530 m west of the site)	An investigation is required to assess the impacts on surface water if the site is found to be contaminated. See Note 2
	P6 – Direct contact with terrestrial ecology	R6 – Terrestrial ecology	An intrusive investigation is required to assess possible contamination including chemical testing of the soils. Included in this PSI.
S3 – Hazardous building materials and buried service infrastructure Asbestos, lead, PCB and SMF.	P1 – Ingestion and dermal contact. P2 – Inhalation of dust and/or vapours.	R1 – Current users (students and workers). R2 – Construction and maintenance workers. R3 – Final end users (students and workers).	If a building is to be refurbished or demolished in the future a pre-demolition hazardous building materials survey of the building is required prior to the refurbishment or demolition of the building. For any future development a construction environmental management plan (CEMP) is recommended and should include an "unexpected finds protocol" to address potential bonded ACM encountered and a "safe working methodology" if disturbance of the underground infrastructure is proposed.

1. It is proposed that leachability testing will be undertaken only if a viable complete pathway between on-site soil contamination and groundwater is identified. Should testing indicate a viable complete pathway between on-site soil contamination and groundwater via a leachable migration pathway then leachability testing (ASLP) may be required.
2. The nearest surface water receptor Queanbeyan River is approximately 530 m to the west of the site. Should testing indicate a viable complete pathway between on-site soil contamination and surface water, testing of surface water may be required.

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10. Site Assessment Criteria

The proposed development at the site is additional classrooms as part of the primary school (i.e. considered to be a low density residential land use). The specific construction details are not known at this stage.

The Site Assessment Criteria (SAC) applied in the current investigation are informed by the CSM (refer to Section 9) which identified 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 ACT EPA under the *Environment Protection Act* 1997. Petroleum based health screening levels for direct contact and vapour inhalation from the *Cooperative Research Centre for Contamination Assessment and Remediation of the Environment (CRC CARE) Technical Report no.10 Health screening levels for petroleum hydrocarbons in soil and groundwater* (2011) as referenced by NEPC (2013) have not been considered in this assessment as these values are significantly higher than the soil vapour HSL adopted.

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

The investigation and screening levels applied in the current investigation comprise levels adopted for a generic low density residential land use scenario.

10.1 Health Investigation and Screening Levels

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

HILs are applicable to assessing health risk arising via all relevant pathways of exposure for a range of metals and organic substances. The HIL are generic to all soil types and apply generally to a depth of 3 m below the surface for residential use. A depth of 3 m below the surface has been adopted for this investigation for a low density residential land use.

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

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-A/HSL-A** – residential with garden/accessible soil, which also includes children's day care centres, preschools and primary school sites

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In addition, the HSL adopted are predicated on the inputs summarised in Table 13.

Table 13: Inputs to the Derivation of HSLs

Variable	Input	Rationale
Potential exposure pathway	Soil vapour intrusion (inhalation)	Potential exposure pathways include vapour intrusion through concrete slabs from potentially contaminated fill material beneath the slab. There is also the risk of soil vapours during any excavation of potentially contaminated fill material.
Soil Type	Sand	A mixture of sand, silt and clay was encountered during the PSI (Section 13). Sand has been adopted as an initial conservative screen.
Depth to contamination	0 m to <1 m	A conservative approach has been adopted for this PSI.

The adopted soil HIL and HSL for the potential contaminants of concern are presented in Table 14.

Table 14: Health Investigation and Screening Levels (HIL and HSL) in mg/kg unless otherwise indicated

Contaminants		HIL-A	HSL- A Vapour Intrusion
Metals	**Arsenic**	100	NC
	Cadmium	20	NC
	Chromium (VI)	100	NC
	Copper	6000	NC
	Lead	300	NC
	Mercury (inorganic)	40	NC
	Nickel	400	NC
	Zinc	7400	NC
PAH	**Benzo(a)pyrene TEQ**[1]	3	NC
	Naphthalene	NC	3
	Total PAH	300	NC
TRH	**C6 – C10 (less BTEX) [F1]**	NC	45
	>C10-C16 (less Naphthalene) [F2]	NC	110
	>C16-C34 [F3]	NC	NC
	>C34-C40 [F4]	NC	NC
BTEX	**Benzene**	NC	0.5
	Toluene	NC	160

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Contaminants		HIL-A	HSL- A Vapour Intrusion
	Ethylbenzene	NC	55
	Xylenes	NC	40
Phenol	**Pentachlorophenol (used as an initial screen)**	100	NC
OCP	**Aldrin + Dieldrin**	6	NC
	Chlordane	50	NC
	DDT+DDE+DDD	240	NC
	Endosulfan	270	NC
	Endrin	10	NC
	Heptachlor	6	NC
	HCB	10	NC
	Methoxychlor	300	NC
OPP	**Chlorpyrifos**	160	NC
PCB [2]		1	NC

Notes:

1 sum of carcinogenic PAH

2 non dioxin-like PCBs only.

3 The soil saturation concentration (Csat) is defined as the soil concentration at which the porewater phase cannot dissolve any more of an individual chemical. The soil vapour that is in equilibrium with the porewater will be at its maximum. If the derived soil HSL exceeds Csat, a soil vapour source concentration for a petroleum mixture could not exceed a level that would results in the maximum allowable vapour risk for the given scenario. For these scenarios, no HSL is presented for these chemicals and the HSL is shown as 'not limiting' or 'NL'.]

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

The adopted EIL, derived from the *Interactive (Excel) Calculation Spreadsheet* are shown in the following Table 15. The following site specific data and assumptions have been used to determine the EILs:

- A protection level of 80% for urban residential areas and public open space has been adopted;
- The EILs will apply to the top 2m of the soil profile;
- Given the likely source of soil contaminants (i.e. historical fill) the contamination is considered as "aged" (>2 years);
- ABCs have been derived using the *Interactive (Excel) Calculation Spreadsheet* using input parameters of NSW for the State in which the site is in, and high for traffic volumes. No background concentration is assumed for lead (conservative);
- Site specific pH, CEC and clay content values will be used as input parameters in the *Interactive (Excel) Calculation Spreadsheet*. Based on average pH, CEC and clay content values for soils collected across the site, the following values have been used for the soil profile: pH = 6.9 (range 6.8 to 7.0), CEC = 8.8 $cmol_c/kg$ (range 7.8 $cmol_c/kg$ to 10 $cmol_c/kg$) and clay content = 10.7% (range 10% to 11%). The Calculation Spreadsheets are included in Appendix H.

Table 15: Ecological Investigation Levels (EIL) in mg/kg

Analyte		EIL	Comments
Metals	**Arsenic**	100	Adopted pH of 6.9, CEC of 8.8 $cmol_c/kg$ and clay content 10.7%
	Copper	190	
	Nickel	130	
	Chromium III	410	
	Lead	1100	
	Zinc	440	
PAH	**Naphthalene**	170	
OCP	**DDT**	180	

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10.3 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 16 have been used to determine the ESL. The adopted ESL, from Table 1B(6), Schedule B1 of NEPC (2013) are shown in Table 17.

Table 16: Inputs to the derivation of ESL

Variable	Input	Rationale
Depth of ESL application	Top 2 m of the soil profile	The top 2 m depth below ground level corresponds to the root zone and habitation zone of many species.
Land use	Residential	It has been assumed for this PSI that the activities on site will be a low density residential use
Soil Texture	Coarse	A mixture of sand, silt and clay was encountered during the PSI (Section 13). Sand (coarse) has been adopted as an initial conservative screen.

Table 17: Ecological Screening Levels (ESL) in mg/kg

Analyte		ESL	Comments
TRH	**C6 – C10 (less BTEX) [F1]**	180*	All ESLs are low reliability apart from those marked with * which are moderate reliability
	>C10-C16 (less Naphthalene) [F2]	120*	
	>C16-C34 [F3]	300	
	>C34-C40 [F4]	2800	
BTEX	**Benzene**	50	
	Toluene	85	
	Ethylbenzene	70	
	Xylenes	105	
PAH	**Benzo(a)pyrene**	0.7	

10.4 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 the following Table 18. 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 low residential apply;
- A mixture of sand, silt and clay was encountered during the PSI (Section 13). Sand (coarse) has been adopted as an initial conservative screen.

Table 18: Management Limits in mg/kg

Analyte		Management Limit
TRH	**$C_6 - C_{10}$ (F1) #**	700
	$>C_{10}$-C_{16} (F2) #	1000
	$>C_{16}$-C_{34} (F3)	2500
	$>C_{34}$-C_{40} (F4)	10000

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

10.5 Asbestos in Soil

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

- Inadequate removal and disposal practices during demolition of buildings containing asbestos products;
- Widespread dumping of asbestos products and asbestos containing fill on vacant land and development sites; and
- Commonly occurring in historical fill containing unsorted demolition materials.

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

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

A detailed asbestos assessment was not undertaken as part of these works as asbestos was not an identified as a contaminant of concern at the time of writing the proposal. 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.

11. Fieldwork

11.1 Sampling Rationale

The site area is understood to be approximately 23,000 m^2. For the purpose of this PSI, a limited grid based sampling of the site in conjunction with the geotechnical investigation was considered appropriate given that the investigation is preliminary. Ten sampling locations were selected to provide a general coverage of the site and to target possible impact from previous site activities (i.e. unknown filling). Samples were selected for analysis in order to gain a general representation of the soil/fill conditions across the site.

11.2 Methods and Sampling Locations

The fieldwork comprised the excavation of ten test pits (Pits 1 to 10) to depths of between 1.1 m and 2.2 m below ground level (bgl) using a Kubota KX057-4 mini-excavator fitted a 300 mm wide bucket. Samples were collected directly from the walls of the test pit or from the excavator bucket at regular intervals. All test locations were selected for the collection of soil samples.

Fieldwork was undertaken on 28 February and 1 March 2017 by an environmental engineer and environmental scientist who undertook the following:

- Setting out of the test locations;
- Logging of the subsurface profile; and
- Collection of samples to assist in strata identification and for laboratory testing purposes.

A calibrated photo-ionisation detector (PID) was used during the fieldwork to screen the collected soil samples to assess whether volatile organic compounds were present. The approximate test locations are shown on Drawing 3 in Appendix B. Sampling depths are shown on the test pit logs in Appendix G.

11.3 Soil Sampling Procedure

All sample locations were checked for underground services by a review of dial before you dig (DBYD) plans and by a services locator. Sample locations on the eastern and central portions of the site were checked for gas lines by a hydrovacuum truck.

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

- Decontamination of sampling equipment using a 3% solution of phosphate free detergent (Decon 90) and tap water prior to collecting each sample;
- The use of disposable gloves for each sampling event;
- Transfer of samples into laboratory-prepared glass jars, and capping immediately;
- Collection of replicate soil samples in zip-lock plastic bags at each depth for PID screening;
- Collection of replicate samples for QA/QC purposes;
- Labelling of sample containers with individual and unique identification, including project number, sample location and sample depth;
- Placement of the sample jars and replicate sample bags into a cooled, insulated and sealed container for transport to the laboratory; and
- Use of chain of custody (C-O-C) documentation so that sample tracking and custody could be cross-checked at any point in the transfer of samples from the field to the laboratory.

Samples for environmental purposes were generally collected from the near surface, and at regular depth intervals or changes in strata within each test pit.

Soil samples were collected directly from the side walls of the test pit or from the excavator bucket. Care was taken whilst collecting the samples to remove any extraneous material deposited on the pit walls or soil removed from the pits during the excavation process.

Envirolab Services Pty Ltd (NATA accreditation number: 2901) was used for the analysis of soil samples. The laboratory is required to carry out routine in-house QC procedures.

Field replicates were recovered and analysed by intra-laboratory analysis for a limited suite of contaminants with reference to standard industry practice and guidelines. The comparative results are outlined in Appendix F together with other QA/QC evaluations of the assessment, C-O-C documentation (Field and Laboratory) and sample receipt information.

12. Laboratory Testing

The analytical scheme was designed to obtain an indication of the presence of contaminants of potential concern (COPC) that may be attributable to past and present activities and features within the site, as discussed in Section 8. Selected primary soil samples were analysed for the various COPC namely metals (As, Cd, Cr, Cu, Pb, Hg, Ni, Zn), TRH, BTEX, PAH, PCB, OCP, OPP, phenols and asbestos.

Laboratory analytical methods are as stated in the certificate of analysis in Appendix H.

Selected samples were also tested for cation exchange capacity (CEC), pH and clay content to assist with the calculation of ecological investigation levels (EIL).

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13. Results of the Investigation

13.1 Subsurface Observations

Details of the subsurface conditions encountered during the test pit excavation are included on the logs, Appendix G, which must be read in conjunction with the included explanatory notes that define classification methods and terms used to describe the soils and rocks. In summary, the test pits encountered slightly variable subsurface conditions underlying the site with the principal succession of strata broadly summarised as follows:

- TANBARK/MULCH: Tanbark and mulch present to a depth of 0.01 m in Pit 2.
- TOPSOIL FILLING: generally comprising dry to moist, brown sandy silt topsoil filling with varying amounts of gravel, cobbles and rootlets to depths of between 0.1 m and 0.2 m. A piece of terracotta pipe was observed in Pit 3 and food wrappers were observed in Pit 5.
- FILLING: generally comprising very stiff to hard, dry to moist, red and brown gravelly clay, sandy clay, silty clay and silty sand with varying amounts of gravel, cobbles and rootlets in Pits 1 to 5, and 7 to 10 to depths of between 0.3 m and 2.1 m. Concrete pieces were observed in Pits 3 and 5.
- SILT: hard, dry to moist, pale brown, low plasticity sandy silt with varying amounts of roots and rootlets to depths of between 0.25 m and 1.2 m in Pits 2, 3 and 5 to 7.
- CLAY: stiff to hard dry to moist clay with varying amounts of orange, red, yellow, grey and brown sand, silt and gravel to depths of between 0.7 m and 2.2 m. Pits 4 and 7 to 10 to the limit of investigation depths of between 2.0 m and 2.2 m.
- SAND: medium dense to very dense, dry to moist, orange, brown and yellow cemented clayey sand with some gravel to depths of between 0.6 m and 2.1 m in Pits 2, 3, 5, 8 and 9. Pit 3 was terminated at the limit of investigation depth of 2.1 m and Pits 2 and 5 were terminated at slow progress depths of 1.7 m and 1.9 m respectively.
- SANDSTONE: medium to very high strength, moderately weathered to slightly weathered, highly fractured, grey and brown sandstone in Pits 1 and 6 from depths of 1.8 m and 0.7 m to the limit of investigation depths of 2.0 m and 1.1 m, respectively.

The results of the PID screening testing are included on the test pit logs. The screening tests indicated that the subsurface conditions were generally absent of volatile organic compounds with all samples recording a value less than 1 ppm.

No free groundwater was observed during excavation of the test pits. However, the pits were backfilled immediately following excavation precluding longer term monitoring of groundwater levels. Groundwater conditions rarely remain constant and can change seasonally due to variations in rainfall, temperature and soil permeability. For these reasons, it is noted that the moisture condition of the site soils may vary considerably from the time of the investigation compared to at the time of construction.

13.2 Contamination Observations

Observations of potential contamination (anthropogenic inclusions) within the test pits are summarised in Table 19 below:

Table 19: Contaminant Observations within Test Pits

Test Pit/Depth	Potential Contaminant Observation
Pit 3 <0.6 m	Pieces of concrete (up to 300 mm by 200 mm by 200 mm)
Pit 3 <0.1 m	Piece of terracotta
Pit 5 < 0.1 m	Food wrapper rubbish
Pit 5 < 0.25 m	Piece of concrete (150 mm by 150 mm by 50 mm)

There was no visual or olfactory evidence (i.e. staining or odours) to suggest the presence of gross contamination within the soils investigated.

13.3 Analytical Results

A summary of the results of the laboratory analysis undertaken on the soil samples is presented in Tables H1 to H4 in Appendix H along with the laboratory certificate for the current assessment.

13.4 Assessment of Laboratory Results

The reported soil chemical analysis results for BTEX, PAH, OCP, OPP, PCB and asbestos were all at or below the laboratory's practical quantitation limit (PQL). The reported soil chemical analysis results for metals and TRH were either below the PQL or below the SAC with the exception of the F2 (230 mg/kg) and F3 (600 mg/kg) which were above the ESL (120 mg/kg and 300 mg/kg respectively) in sample Pit 5/0.2-0.25.

Silica gel clean up was requested for the sample Pit 5/0.2-0.25. The reported TRH results for Pit 5/0.2-0.25 after the silica gel clean up were below the PQL. Therefore it is considered that the exceedances above the ESL and PQL are due to organic matter in the sample. The TRH reported above the PQL in Pit 6 are also considered likely to be due to organic matter in the sample.

14. Revised Conceptual Site Model

The preliminary CSM in Section 9 has been updated to incorporate the findings of this PSI.

A 'source–pathway–receptor' approach has been used to assess the potential risks of harm being caused to human, water or environmental receptors from contamination sources on or in the vicinity of the site, via transport pathways.

The results of the subsurface investigation and laboratory analysis indicate an absence of gross contamination within the soil encountered with the concentrations of COPC all less than the adopted SAC. Therefore, based on the results, the risk to human and environmental receptors from the soil encountered is considered to be low.

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Groundwater testing has not been undertaken as part of this PSI, however, the results of the subsurface investigation and laboratory analysis indicate an absence of gross contamination within the soil/filling encountered. Therefore the risk to groundwater and surface water from the site is considered low. However there is the possibility of contaminants within the groundwater migrating onto site from the workshops to the north of the site.

15. Conclusions and Recommendations

Areas that may be impacted by potential contamination were identified on the basis of the available site information, site walkover and results of the limit subsurface investigation. Based on the findings of the assessment, the potential for gross contamination to be present within the site is considered to be low.

The results of the PSI indicate that the site is generally suitable for the intended land use as a site for additional classrooms (i.e. equivalent to low density residential land use) subject to the following:

- Installation of groundwater monitoring wells along the northern boundary of the site targeting the offsite workshops; and
- The implementation of an unexpected finds protocol (UFP) to address potential contamination, including any ACM which is encountered during site works, and a “safe working methodology” if disturbance of any underground infrastructure occurs.

Considering the age of the existing buildings it is considered likely that they may contain hazardous building materials (HBM) such as asbestos, lead paint or PCB in fluorescent light fittings. It is understood that the buildings will remain as they are now, however, it is recommended that if any future disturbance or demolition to the buildings is to occur then a hazardous building materials survey should be carried out prior to any major refurbishment.

If soil is proposed to be removed from the site it must be stockpiled first and tested for the listed contaminants and subjected to a formal waste classification assessment with reference to the NSW EPA’s *Waste Classification Guidelines, Parts 1: Classifying Waste* (Ref 4).

16. References

1 NSW Department of Land and Water Conservation (2000): *Canberra Soil Landscape Series Sheet 8727* 1:100 000 scale map.

2 Bureau of Mineral Resources (1992): *Geology of Canberra Geological Series Sheet 8727, 1:100 000 scale map.*

3 Bureau of Mineral Resources, Geology and Geophysics (1984): *Hydrogeology of the Australian Capital Territory and Environs* 1:100,000 scale map.

4 NSW EPA (2014): Waste Classification Guidelines, Part 1: Classifying Waste.

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17. Limitations

Douglas Partners (DP) has prepared this report for 10 Yass Road, Queanbeyan in accordance with DP's proposal dated 24 November 2016, and acceptance from GHD Woodhead Architecture Pty Ltd on 17 February 2017. This report is provided for the exclusive use of GHD Woodhead Architecture Pty Ltd for this project only and for the purposes as described in the report. It should not be used by or relied upon for other projects or purposes on the same or other site or by a third party. Any party so relying upon this report beyond its exclusive use and purpose as stated above, and without the express written consent of DP, does so entirely at its own risk and without recourse to DP for any loss or damage. In preparing this report DP has necessarily relied upon information provided by the client and/or their agents.

DP's advice is based upon the conditions observed at the site surface during this investigation. The accuracy of the advice provided by DP in this report may be affected by unobserved variations in ground conditions across the site. The advice may also be limited by budget constraints imposed by others or by site accessibility.

Asbestos-containing materials (ACM) have not been detected by observation on the surface of the site. The possible presence of hazardous building materials (HBM) including ACM, cannot be precluded in unobserved or untested parts of the site and hence no warranty can be given that HBM is not present.

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

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

The contents of this report do not constitute formal design components such as are required, by the Health and Safety Legislation and Regulations, to be included in a Safety Report specifying the hazards likely to be encountered during construction and the controls required to mitigate risk. This design process requires risk assessment to be undertaken, with such assessment being dependent upon factors relating to likelihood of occurrence and consequences of damage to property and to life. This, in turn, requires project data and analysis presently beyond the knowledge and project role respectively of DP. DP may be able, however, to assist the client in carrying out a risk assessment of potential hazards contained in the Comments section of this report, as an extension to the current scope of works, if so requested, and provided that suitable additional information is made available to DP. Any such risk assessment would, however, be necessarily restricted to the environmental components set out in this report and to their application by the project designers to project design, construction, maintenance and demolition.

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Appendix A

About This Report

About this Report

Douglas Partners

Introduction

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

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

Copyright

Borehole and Test Pit Logs

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

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

Groundwater

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

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

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

Reports

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

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

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

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

About this Report

Site Anomalies

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

Information for Contractual Purposes

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

Site Inspection

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

Appendix B

Drawing 1 – Site Features and Observations
Drawing 2 – Test Pit Locations

Locality Plan

LEGEND

- Approximate Site Boundary
- Approximate Drainage Lines
- Approximate Former Creek/Gully Line
- Garden Shed/Enclosure
- Tanbark/Mulch Stockpiles
- Building Material/Garden Waste
- Topsoil Stockpile
- Gravel Stockpile
- P1 Photograph Location & Orientation
- Surface Water Flow Direction
- Metal Fabrication Workshop & Joinery

0 10 20 50
Approximate Scale (m)

NOTE: Base drawing from nearmap.com

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CLIENT: GHD Woodhead Architecture Pty Ltd		
OFFICE: Canberra	DRAWN BY: ESS	
SCALE: As shown	DATE: 21.02.2017	

TITLE: **Site Features and Observations**
Proposed Additional Classrooms
10 Yass Road, Queanbeyan, NSW

N

PROJECT No:	88401.01
DRAWING No:	1
REVISION:	0

Locality Plan

LEGEND

- Approximate Site Boundary
- 1 Approximate Test Pit Locations
- Approximate Drainage Lines
- Approximate Former Creek/Gully Line
- Garden Shed/Enclosure
- Tanbark/Mulch Stockpiles
- Building Material/Garden Waste
- Topsoil Stockpile
- Gravel Stockpile
- Surface Water Flow Direction
- Metal Fabrication Workshop & Joinery

0 10 20 50
Approximate Scale (m)

NOTE: Base drawing from nearmap.com

Douglas Partners
Geotechnics | Environment | Groundwater

CLIENT: GHD Woodhead Architecture Pty Ltd		TITLE: **Test Location Plan**	PROJECT No: 88401.01
OFFICE: Canberra	DRAWN BY: ESS	**Proposed Additional Classrooms**	DRAWING No: 2
SCALE: As shown	DATE: 21.02.2017	**10 Yass Road, Queanbeyan, NSW**	REVISION: 0

N

Appendix C

Site History Searches

QPRC
Queanbeyan-Palerang Regional Council

Section 149(2) Planning Certificate

Applicant's Name:	Shannon Goodsell	**Certificate No:**	289- 2017
Applicant's Address:	2/73 Sheppard Street Hume ACT 2620	**Fee:**	133.00
Email Address:	shannon.goodsell@douglaspartners.com.au	**Fee Receipt No:** **Your Reference:**	1743115 88406.01:15387

Description of land

House No. or Name:	10 Yass Road, QUEANBEYAN EAST NSW 2620
Lot, Unit or Portion No, DP or SP:	PT LOT A DP 412056, PT LOT B DP 412056, LOT 105 DP 729079, LOT 106 DP 729079, PT LOT 8 SEC 49 DP 758862, PT LOT 9 SEC 49 DP 758862, PT LOT 11 SEC 49 DP 758862, LOT 104 DP 729079
Owner:	Department Of Education
Owner Address:	C/- The Principal PO Box 562 QUEANBEYAN NSW 2620

1. Names of relevant planning instruments and DCPs

(1)	The name of each environmental planning instrument that applies to the carrying out of development on the land.	Queanbeyan Local Environmental Plan 2012 (as amended) State Environmental Planning Policies Refer to attached Schedule 3 for SEPPs.
(2)	The name of each proposed environmental planning instrument that will apply to the carrying out of development on the land and that is or has been the subject of community consultation or on public exhibition under the Act (unless the Director-General has notified the council that the making of the proposed instrument has been deferred indefinitely or has not been approved).	None Apply
(3)	The name of each development control plan that applies to the carrying out of development on the land.	Queanbeyan Development Control Plan 2012 Refer to attached Schedule 3
(4)	*In this clause, proposed environmental planning instrument includes a planning proposal for a LEP or a draft environmental planning instrument.*	

2. Zoning and land use under relevant LEPs

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

(a)	the identity of the zone, whether by reference to a name (such as "Residential Zone" or "Heritage Area") or by reference to a number (such as "Zone No 2 (a)"),	Current Zoning SP2 Infrastructure R3 Medium Density Residential
(b)	the purposes for which the instrument provides that development may be carried out within the zone without the need for development consent,	Refer to attached Schedule 4
(c)	the purposes for which the instrument provides that development may not be carried out within the zone except with development consent,	Refer to attached Schedule 4
(d)	the purposes for which the instrument provides that development is prohibited within the zone,	Refer to attached Schedule 4
(e)	whether any development standards applying to the land fix minimum land dimensions for the erection of a dwelling-house on the land and, if so, the minimum land dimensions so fixed,	YES Refer to attached Schedule 5.
(f)	whether the land includes or comprises critical habitat,	NO
(g)	whether the land is in a conservation area (however described),	NO
(h)	whether an item of environmental heritage (however described) is situated on the land.	NO

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

To the extent that the land is within any zone (however described) under: (a) Part 3 of the State Environmental Planning Policy (Sydney Region Growth Centres) 2006 (the 2006 SEPP), or (b) a Precinct Plan (within the meaning of the 2006 SEPP), or (c) a proposed Precinct Plan that is or has been the subject of community consultation or on public exhibition under the Act, the particulars referred to in clause 2 (a)–(h) in relation to that land (with a reference to "the instrument" in any of those paragraphs being read as a reference to Part 3 of the 2006 SEPP, or the Precinct Plan or proposed Precinct Plan, as the case requires).	NO The land is not within any zone under Part 3 of the State Environmental Planning Policy (Sydney Region Growth Centres) 2006 or a Precinct Plan or proposed Precinct Plan.

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.	Complying development **cannot be** carried out on **part** of the land under the following codes: • General Housing Code; • Rural Housing Code; and • Commercial and Industrial (New Buildings and Additions) Code; as **part** of the land is affected by one or more of the provisions of clause 1.19 of *State Environmental Planning Policy (Exempt and Complying Development Codes) 2008*, being: land that is reserved for a public purpose by an environmental planning instrument. Complying development **may be able** to be carried out on the **part** of the land that is not affected by the provisions of clause 1.19 under the following codes: • Housing Alterations Code; • General Development Code; • Commercial and Industrial Alterations Code; • Subdivision Code; • Demolition Code; and • Fire Safety Code Note: Each code must be checked to see if particular types of Complying Development may be carried out on the land.

4. Coastal protection

Whether or not the land is affected by the operation of section 38 or 39 of the *Coastal Protection Act 1979*, but only to the extent that the council has been so notified by the Department of Finance Services and Innovation.	NO

4A. Certain information relating to beaches and coasts

(1)	In relation to a coastal council—whether an order has been made under Part 4D of the *Coastal Protection Act 1979* in relation to temporary coastal protection works (within the meaning of that Act) on the land (or on public land adjacent to that land), except where the council is satisfied that such an order has been fully complied with.	NO
(2)	In relation to a coastal council: (a) whether the council has been notified under section 55X of the *Coastal Protection Act 1979* that temporary coastal protection works (within the meaning of that Act) have been placed on the land (or on public land adjacent to that land), and (b) if works have been so placed—whether the council is satisfied that the works have been removed and the land restored in accordance with that Act.	NO

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

In relation to a coastal council—whether the owner (or any previous owner) of the land has consented in writing to the land being subject to annual charges under section 496B of the *Local Government Act 1993* for coastal protection services that relate to existing coastal protection works (within the meaning of section 553B of that Act).	NO
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

Whether or not the land is proclaimed to be a mine subsidence district within the meaning of Section 15 of the *Mine Subsidence Compensation Act 1961*.	NO

6. Road widening and road realignment

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

(a)	Division 2 of Part 3 of the *Roads Act 1993*, or	NO
(b)	any environmental planning instrument, or	NO
(c)	any resolution of the council.	NO

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

Whether or not the land is affected by a policy:

(a) adopted by the council, or (b) adopted by any other public authority and notified to the council for the express purpose of its adoption by that authority being referred to in planning certificates issued by the council, that restricts the development of the land because of the likelihood of land slip, bushfire, tidal inundation, subsidence, acid sulphate soils or any other risk (other than flooding.)	YES All land within the Queanbeyan Local Government Area is affected by policies adopted by the council relating to contaminated land and bushfire prone land as described below. CONTAMINATED LAND Council has adopted by resolution a policy on contaminated land. This policy is triggered when rezoning or land use changes are proposed on lands which have previously been used for certain purposes which could have involved the use of contaminants. As at the date of the Certificate this land has not been assessed by Council either by considering its past use or the results from systematic testing. Accordingly, it is not known whether or not consideration of Clause 2.4 – Contaminated Land Management of Queanbeyan Development Control Plan 2012 and the application of provisions under relevant State Legislation is warranted. Refer to attached Schedule 7. BUSHFIRE On land that is bushfire prone certain development may require further consideration under Section 79BA or Section 91 of the Environmental Planning and Assessment Act 1979, and under Section 100B of the Rural Fires Act 1997 with respect to bushfire matters. Refer to Question 11 to see if the land is bush fire prone.

7 A. Flood related development controls information

(1)	Whether or not development on that land or part of the land for the purposes of dwelling houses, dual occupancies, multi dwelling housing or residential flat buildings (not including development for the purposes of group homes or seniors housing) is subject to flood related development controls.	NO
(2)	Whether or not development on that land or part of the land for any other purpose is subject to flood related development controls.	NO
(3)	Words and expressions in this clause have the same meanings as in the instrument set out in the Schedule to the Standard Instrument (Local Environmental Plans) Order 2006.	

8. Land reserved for acquisition

Whether or not any environmental planning instrument or proposed environmental planning instrument referred to in clause 1 makes provision in relation to the acquisition of the land by a public authority, as referred to in section 27 of the Act.	NO

9. Contributions plans

The name of each contributions plan applying to the land.	Queanbeyan City Council Section 94 Contributions Plan 2011 Effective from 16 March 2012 Queanbeyan Section 94 Contributions Plan for Extractive Industry 2014 Effective from 1 July 2014

9A. Biodiversity certified land

If the land is biodiversity certified land (within the meaning of Part 7AA of the *Threatened Species Conservation Act 1995)*, a statement to that effect.	NO

10. Biobanking agreements

If the land is land to which a biobanking agreement under Part 7A of the *Threatened Species Conservation Act 1995* relates, a statement to that effect (but only if the council has been notified of the existence of an agreement by the Chief Executive of the Office of Environment and Heritage).	NO

11. Bush fire prone land

If any of the land is bush fire prone land (as defined in the Act), a statement that all or, as the case may be, some of the land is bush fire prone land. If none of the land is bush fire prone land, a statement to that effect.	The land is not shown as bushfire prone land in accordance with the Environmental Planning and Assessment Act 1979.

12. Property Vegetation Plans

If the land is land to which a property vegetation plan under the *Native Vegetation Act 2003* applies, a statement to that effect (but only if the council has been notified of the existence of the plan by the person or body that approved the plan under that Act).	NO

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

Whether an order has been made under the *Trees (Disputes Between Neighbours) Act 2006* to carry out work in relation to a tree on the land (but only if the council has been notified of the order).	NO

14. Directions under Part 3A

If there is a direction by the Minister in force under section 75P (2) (c1) of the Act that a provision of an environmental planning instrument prohibiting or restricting the carrying out of a project or a stage of a project on the land under Part 4 of the Act does not have effect, a statement to that effect identifying the provision that does not have effect.	NO

15. Site compatibility certificates and conditions for seniors housing

If the land is land to which *State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004* applies:	
(a) a statement of whether there is a current site compatibility certificate (seniors housing), of which the council is aware, in respect of proposed development on the land, and if there is a certificate, the statement is to include: (i) the period for which the certificate is valid, and (ii) that a copy may be obtained from the head office of the Department, and (b) a statement setting out any terms of a kind referred to in clause 18 (2) of that Policy that have been imposed as a condition of consent to a development application granted after 11 October 2007 in respect of the land.	NO Council is not aware of the existence of a current site compatibility certificate for the land.

16. Site compatibility certificates for infrastructure

A statement of whether there is a valid site compatibility certificate (infrastructure), of which the council is aware, in respect of proposed development on the land and, if there is a certificate, the statement is to include: (a) the period for which the certificate is valid, and (b) that a copy may be obtained from the head office of the Department.	NO Council is not aware of the existence of a current site compatibility certificate for the land.

17. Site compatibility certificates and conditions for affordable rental housing

A statement of whether there is a current site compatibility certificate (affordable rental housing), of which the council is aware, in respect of proposed development on the land and, if there is a certificate, the statement is to include: (a) the period for which the certificate is current, and (b) that a copy may be obtained from the head office of the Department of Planning. A statement setting out any terms of a kind referred to in clause 17 (1) or 38 (1) of *State Environmental Planning Policy (Affordable Rental Housing) 2009* that have been imposed as a condition of consent to a development application in respect of the land.	NO Council is not aware of the existence of a current site compatibility certificate for the land.

18. Paper subdivision information

(1) The name of any development plan adopted by a relevant authority that applies to the land or that is proposed to be subject to a consent ballot.	NO As at the date of the Certificate Council is not aware of the existence of a development plan adopted by a relevant authority that applies to the land or is proposed to be subject to a consent ballot.
(2) The date of any subdivision order that applies to the land.	NO As at the date of the Certificate Council is not aware of any subdivision order that applies to the land.
(3) Words and expressions used in this clause have the same meaning as they have in Part 16C of this Regulation.	

19. Site verification certificates

A statement of whether there is a current site verification certificate, of which the council is aware, in respect of the land and, if there is a certificate, the statement is to include: (a) the matter certified by the certificate, and (b) the date on which the certificate ceases to be current (if any), and (c) that a copy may be obtained from the head office of the Department of Planning. **Note.** A site verification certificate sets out the Director-General's opinion as to whether the land concerned is or is not biophysical strategic agricultural land or critical industry cluster land—see Division 3 of Part 4AA of *State Environmental Planning Policy* (*Mining, Petroleum Production and Extractive Industries) 2007.*	NO Council is not aware of the existence of a current site verification certificate for the land.

20. Loose-fill asbestos insulation

If the land includes any residential premises (within the meaning of Division 1A of Part 8 of the *Home Building Act 1989)* that are listed on the register that is required to be maintained under that Division, a statement to that effect.	NO

Loose-fill asbestos insulation

Some buildings located in the Queanbeyan-Palerang Local Government Area have been identified as containing loose-fill asbestos insulation, for example in the roof space. NSW Fair Trading maintains a Register of homes that are affected by loose-fill asbestos insulation.

You should make your own enquiries as to the age of the buildings on the land to which this certificate relates and, if it contains a building constructed prior to 1980, the Council strongly recommends that any potential purchaser obtain advice from a licensed asbestos assessor to determine whether loose-fill asbestos is present in any building on the land and, if so, the health risks (if any) this may pose for the building's occupants. Contact NSW Fair Trading for further information.

Loose fill asbestos is easy to disturb and can become airborne and it is then easily inhaled. Inhaling asbestos fibres can result in serious illness including asbestosis, lung cancer and mesothelioma.
Note: Nothing in this statement relates to information about the presence of bonded asbestos materials such as asbestos cement sheeting which may have been used at this site.

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)	that the land to which the certificate relates is significantly contaminated land within the meaning of that Act —if the land (or part of the land) is significantly contaminated land at the date when the certificate is issued,	NO
(b)	that the land to which the certificate relates is subject to a management order within the meaning of that Act —if it is subject to such an order at the date when the certificate is issued,	NO
(c)	that the land to which the certificate relates is the subject of an approved voluntary management proposal within the meaning of that Act —if it is the subject of such an approved proposal at the date when the certificate is issued,	NO
(d)	that the land to which the certificate relates is subject to an ongoing maintenance order within the meaning of that Act —if it is subject to such an order at the date when the certificate is issued,	NO
(e)	that the land to which the certificate relates is the subject of a site audit statement within the meaning of that Act —if a copy of such statement has been provided at any time to the local authority issuing the certificate.	NO

Note. This certificate utilises data and information from third party sources for some responses, such as (but not necessarily limited to): NSW Office of Environment and Heritage (9A,10); NSW Roads and Maritime Services (Q.6 a); NSW Rural Fire Service (Q.11); Murrumbidgee Catchment Management Authority (Q.12); NSW Land and Environment Court (Q.13); NSW Department of Planning and Infrastructure (Q.14-19); and the NSW Environment Protection Authority (Note re; *Contaminated Land Management Act 1997*).

Information reproduced is provided from the latest information supplied to Council, however should be verified and checked with these agencies prior to relying on this information.

Planning Certificate No.: 289-2017

Checked: JR

Date: 06-Mar-2017

M J Thompson
Director
Environment, Planning and Development

Per ……..

Any request for further information in connection with the above should be marked for the attention of

Queanbeyan-Palerang Regional Council
Environment, Planning and Development
PO Box 90
256 Crawford Street
Queanbeyan NSW 2620
Telephone: (02) 6285 6244

Queanbeyan-Palerang Regional Council

Section 149(5) Planning Certificate

Description of land

House No. or Name:	10 Yass Road, QUEANBEYAN EAST NSW 2620
Lot, Unit or Portion No, DP or SP:	PT LOT A DP 412056, PT LOT B DP 412056, LOT 105 DP 729079, LOT 106 DP 729079, PT LOT 8 SEC 49 DP 758862, PT LOT 9 SEC 49 DP 758862, PT LOT 11 SEC 49 DP 758862, LOT 104 DP 729079
Owner:	Department Of Education
Owner Address:	C/- The Principal PO Box 562 QUEANBEYAN NSW 2620

(a)	Has the Council information which would indicate that the land is subject to the risk of flooding or tidal inundation?	NO
(b)	Has the Council information which would indicate that the land is subject to slip or subsidence?	NO
(c)	Is the land affected by a residential district proclamation?	NO
(d)	Is the land affected by a tree preservation order?	YES Refer to Clause 5.9 of Queanbeyan Local Environmental Plan 2012 (as amended)
(e)	Is the land affected by any road widening or road realignments under section 262 of the Local Government Act, under any environmental planning instrument or under any resolution of the Council?	NO
(f)	Is the land affected by any resolution of the Council to seek amendment to any environmental planning instrument or draft environmental planning instrument applying to the land?	NO

(g)	Is the subject property located either wholly or partially under a flight path and is within the 20-25 ANEF contour?	NO

The above information has been taken from the Council's records but Council cannot accept responsibility for any omission or inaccuracy.

Planning Certificate No.: 2892017

Checked: JR

Date: 06-Mar-2017

M J Thompson
Director
Environment, Planning and Development

Per ……..

Any request for further information in connection with the above should be marked for the attention of

Queanbeyan-Palerang Regional Council
Environment, Planning and Development
PO Box 90
256 Crawford Street
Queanbeyan NSW 2620
Telephone: (02) 6285 6244

Schedule 3
Queanbeyan Development Control Plans,
Council Codes and State Environmental Planning Policies

DEVELOPMENT CONTROL PLANS

The following Development Control Plans can be viewed on Council's web site at www.qcc.nsw.gov.au

QUEANBEYAN DEVELOPMENT CONTROL PLAN 2012
The purpose of this development control plan is to provide detailed provisions relating to matters of environmental planning significance for Queanbeyan to be taken into consideration by Queanbeyan City Council when exercising its environmental assessment and planning functions under the *Environmental Planning and Assessment Act 1979*.

GOOGONG DEVELOPMENT CONTROL PLAN
This development control plan provides background, objectives, controls and design criteria to achieve desirable development outcomes in line with Council's vision for the new town of Googong.

SOUTH JERRABOMBERRA DEVELOPMENT CONTROL PLAN
This development control plan provides background, objectives, controls and design criteria to achieve desirable development outcomes in line with Council's vision for South Jerrabomberra.

STATE ENVIRONMENTAL PLANNING POLICIES

State environmental planning policies (SEPPs) deal with issues significant to the State and people of New South Wales. They are made by the Minister for Planning and may be exhibited in draft form for public comment before being gazetted as a legal document.

This list is intended for use as a summary guide only. Please refer to the relevant policy for full details. Further information is available from the NSW Department of Planning and Infrastructure. http://www.planning.nsw.gov.au/

SEPP No. 1 — Development Standards
Gazetted 17.10.80.
Makes development standards more flexible. It allows councils to approve a development proposal that does not comply with a set standard where this can be shown to be unreasonable or unnecessary.

SEPP No. 21 — Caravan Parks
Gazetted 24.4.92. Replaces SEPP No. 21 — Moveable Dwellings gazetted 28.11.86.
Ensures that where caravan parks or camping grounds are permitted under an environmental planning instrument, movable dwellings, as defined in the *Local Government Act 199*3, are also permitted. The specific kinds of movable dwellings allowed under the Local Government Act in caravan parks and camping grounds are subject to the provisions of the Caravan Parks Regulation.
The policy ensures that development consent is required for new caravan parks and camping grounds and for additional long-term sites in existing caravan parks. It also enables, with the council's consent, long-term sites in caravan parks to be subdivided by leases of up to 20 years.

SEPP No. 30 — Intensive Agriculture
Gazetted 8.12.89.
Requires development consent for cattle feedlots having a capacity of 50 or more cattle or piggeries having a capacity of 200 or more pigs. The policy sets out information and public notification requirements to ensure there are effective planning control over this export-driven rural industry. The policy does not alter if, and where, such development is permitted, or the functions of the consent authority.

SEPP No. 33 — Hazardous and Offensive Development
Gazetted 13.3.92
Provides new definitions for 'hazardous industry', 'hazardous storage establishment', 'offensive industry' and 'offensive storage establishment'. The definitions apply to all planning instruments, existing and future. The new definitions enable decisions to approve or refuse a development to be based on the merit of proposal. The consent authority must careful consider the specifics the case, the location and the way in which the proposed activity is to be carried out. The policy also requires specified matters to be considered for proposals that are 'potentially hazardous' or 'potentially offensive' as defined in the policy. For example, any application to carry out a potentially hazardous or potentially offensive development is to be advertised for public comment, and applications to carry out potentially hazardous development must be supported by a preliminary hazard analysis (PHA). The policy does not change the role of councils as consent authorities, land zoning, or the designated development provisions of the *Environmental Planning and Assessment Act 197*9.

SEPP No. 36 — Manufactured Home Estates
Gazetted 16.7.93.
Helps establish well-designed and properly serviced manufactured home estates (MHEs) in suitable locations. Affordability and security of tenure for residents are important aspects. The policy applies to Gosford, Wyong and all local government areas outside the Sydney Region. To enable the immediate development of estates, the policy allows MHEs to be located on certain land where caravan parks are permitted. There are however, criteria that a proposal must satisfy before the local council can approved development. The policy also permits, with consent, the subdivision of estates either by community title or by leases of up to 20 years. A section 117 direction issued in conjunction with the policy guides councils in preparing local environmental plans for MHEs, enabling them to be excluded from the policy.

SEPP No 44—Koala Habitat Protection
Gazetted 6.1.1995.
This policy encourages the conservation and management of natural vegetation areas that provide habitat for kolas to ensure permanent free-living populations will be maintained over the present range. Local councils cannot approve development in an area affected by the policy without an investigation of core koala habitat. The policy provides a state-wide approach needed to enable appropriate development to continue while ensuring the ongoing protection of koalas and their habitat.

SEPP No. 50 – Canal Estate Development
Gazetted 10.11.97
This Policy aims to prohibit canal estate development as described in this Policy in order to ensure that the environment is not adversely affected by the creation of new developments of this kind.

SEPP No. 55 - Remediation of Land
Gazetted 28.8.98.
Introduces statewide 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 Guideline*s.

SEPP No.62 – Sustainable Aquaculture
Gazetted 25.8.00
The aim of this policy is to encourage the sustainable expansion of the industry in NSW. The policy implements the regional strategies already developed by creating a simple approach to identify and categorise aquaculture development on the basis of its potential environmental impact. The SEPP also identifies aquaculture development as designated development only where there are potential environmental risks.

SEPP No. 64 - Advertising and Signage
Gazetted 16.3.01.
SEPP 64 aims to ensure that outdoor advertising is compatible with the desired amenity and visual character of an area. This SEPP also permits and regulates outdoor advertising in transport corridors.

SEPP No. 65-Design Quality of Residential Flat Development
Gazetted 26.7.02.
Provides design criteria for residential flat development of three storeys or greater.

SEPP (Housing for Seniors or People with a Disability) 2004
Gazetted 31.3.04 (SEPP Seniors Living).
Encourages the development of high quality accommodation for our ageing population and for people who have disabilities – housing that is in keeping with the local neighbourhood.

SEPP (State Significant Precincts) 2005
Gazetted on 25.5.05 (SEPP State Significant Development) 2005.
This policy facilitates the development, redevelopment or protection or important urban, costal and regional sites of economic, environment or social significance to the State so as to facilitate the orderly use, development or conservation of those State significant sites for the benefit of the state. This policy also aims to facilitate service delivery outcomes for a range of public services and to provide for the development of major sites for a public purpose or redevelopment of major sites no longer appropriate or suitable for public purposes.

SEPP (Building Sustainability Index: BASIX) 2004
Gazetted 25.6.04.
This SEPP operates in conjunction with Environment Planning and Assessment Amendment (Building Sustainability Index: BASIX) Regulation 2004 to ensure the effective introduction of BASIX in NSW. The SEPP ensures consistency in the implementation of BASIX across the state by overriding competing provision in other environmental planning instruments and development control plans and specifying that SEPP 1 does not apply in relation to any development standard arising under BASIX.

BASIX affected buildings:

a) A dwelling-house (that is a building comprising one dwelling and nothing else but ancillary structures to the dwelling) or
b) A dual occupancy building (that is, a building comprising two dwellings and nothing else but structures ancillary to those dwellings)
c) A guest house, boarding house, lodging house or hostel (including a backpackers hostel), being a building with a gross floor area of less than 300 square metres, but does not include:
d) One of 3 or more dwellings-houses (comprising a single development) to be erected on land the subject of a development application or development consent for subdivision under:
    i. The Strata Schemes (Freehold Development) Act 1973, and
    ii. The Strata Schemes (Leasehold Development) Act 1986,

So as to create a separated lot for each such dwelling house or

e) One of 2 of more dual occupancy buildings (comprising a single development) to be erected on land the subject of a development application or development consent for the subdivision under:
    i. The Strata Schemes (Freehold Development) Act 1973, and
    ii. The Strata Schemes (Leasehold Development) Act 1986,

So as to create a separate lot for each such dwelling

SEPP (Mining, Petroleum Production and Extractive Industries) 2007
Gazetted 16.07.07

The SEPP applies State-wide. The SEPP aims to provide for the proper management and development of mining, petroleum production and extractive material resources; to facilitate the orderly use and development of areas where the resources are located; and, to establish appropriate planning controls to encourage sustainable management of these resources.

SEPP (Infrastructure) 2007
Gazetted 21.12.07.
This policy aims to provide a consistent planning regime for infrastructure and for the provision of services across NSW, as well as providing for the consultation with the relevant public authorities during the assessment process. This policy aims to provide greater flexibility in the location of infrastructure and services and improved regulatory certainty and efficiency.

SEPP (Rural Lands) 2008
Gazetted 09.05.08
Aims of Policy
The aim of this policy is to facilitate the orderly and economic use and development or rural lands for rural and related purposes and to assist in the proper management, development and protection of rural lands for the purpose of promoting the social, economic and environmental welfare of the state. This policy also aims to reduce land use conflicts. This policy applies to local government areas not listed in clause 4.

SEPP (Miscellaneous Consent Provisions) 2007
Gazetted 26.10.07
This policy ensures the erection of temporary structures is permissible with consent and ensures that the suitable provisions are made to ensure the safety of persons using the temporary structures. This policy also aims to protect the environment at the location and in the vicinity of the temporary structures by specifying relevant matters for consideration. The name of this policy was formerly known as SEPP (Temporary Structures) 2007 and SEPP (Temporary Structures and Places of Public Entertainment) 2007.

SEPP (Exempt and Complying Development Codes) 2008
Gazetted 12.12.08.
This policy streamlines assessment processes for development that complies with specific development standards. The policy provides exempt and complying development codes that have state wide application. Types of development that are of minimal environmental impact may be carried out without the need for development consent under the General Exempt Development Code. Additionally under 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.

SEPP (Affordable Rental Housing) 2009
Gazetted 31.07.09
This policy aims to establish 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.

SEPP (Urban Renewal) 2010
Gazetted 15.12.10
Aims of Policy
The aims of this policy are to establish the process for assessing and identifying sites as urban renewal precincts and to facilitate the orderly and economic development and redevelopment of sites in and around urban renewal precincts. This policy also aims to facilitate the 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 Published: 28.9.2011
The aims of this Policy are to identify development that is State significant development, to identify development that is State significant infrastructure and critical State significant infrastructure and to confer functions on joint regional planning panels to determine development application.

Schedule 4
Land Use Table
Zone SP2 Infrastructure
Queanbeyan Local Environmental Plan 2012

Zone SP2 Infrastructure

1 Objectives of zone

- To provide for infrastructure and related uses.
- To prevent development that is not compatible with or that may detract from the provision of infrastructure.

2 Permitted without consent

Environmental protection works

3 Permitted with consent

Roads; The purpose shown on the Land Zoning Map, including any development that is ordinarily incidental or ancillary to development for that purpose

4 Prohibited

Any development not specified in item 2 or 3

2.5 Additional permitted uses for particular land

(1) Development on particular land that is described or referred to in Schedule 1 may be carried out:
   a) With development consent, or
   b) if the Schedule so provides—without development consent, in accordance with the conditions (if any) specified in that Schedule in relation to that development.

(2) This clause has effect despite anything to the contrary in the Land Use Table or other provision of this Plan.

Schedule 1 Additional permitted uses (Clause 2.5)

1 Use of certain land at Carwoola

(1) This clause applies to the following land at Carwoola:
   a) 149 Wanna Wanna Road, being Lot 87, DP 1051143 and Lots 87, 88, 122, 126 and 127, DP 754875,
   b) 352 Wanna Wanna Road, being Lot 89, DP 754875,
   c) 370 Wanna Wanna Road, being Lot 146, DP 48277,
   d) 517 Wanna Wanna Road, being Lot 83, DP 754922.

(2) Development for the purpose of a dwelling house is permitted on each lot with development consent.

2 Use of certain land at 67 Lorn Road, Crestwood

(1) This clause applies to land at 67 Lorn Road, Crestwood, being Lots 21 and 22, DP 225012.

(2) Development for the purpose of an educational establishment is permitted with development consent.

3 Use of certain land at 135 Uriarra Road, Crestwood

(1) This clause applies to land at 135 Uriarra Road, Crestwood, being Lot 4, DP 1060200.

(2) Development for the purposes of commercial premises is permitted with development consent.

4 Use of certain land at Googong

(1) This clause applies to land identified as “Additional Development Area” on the Googong Map.

(2) Development for the purposes of advertising structures, business identification signs, business premises, food and drink premises, hotel or motel accommodation, kiosks, markets, office premises, service stations and shops is permitted with development consent.

5 Use of certain land at Googong Common, Googong

(1) This clause applies to land identified as “Googong Common” on the Googong Map.

(2) Development for the purposes of cellar door premises, depots, entertainment facilities, function centres, garden centres, horticulture, landscaping material supplies, plant nurseries, resource recovery facilities, viticulture, waste or resource transfer stations and water recreation structures is permitted with development consent.

5A Use of certain land at Googong for studio dwellings

(1) This clause applies to land to which clause 4.1D applies.

(2) Development consent may be granted to a single development application for development on land to which this clause applies that is both:

(a) the subdivision of land in accordance with subclause 4.1D (3), and

(b) the erection of a studio dwelling on a lot resulting from the subdivision.

(3) Development consent must not be granted under this clause if:

(a) the ratio of studio dwellings to lots resulting from the subdivision is greater than 1:3, and

(b) the dwelling in conjunction with which the studio dwelling is to be established is located on a lot that has an area of less than 225 m2.

6 Use of certain land at 64 Googong Road, Googong

(1) This clause applies to 64 Googong Road, Googong, being Lot 10, DP 754881.

(2) Development for the purposes of garden centres, horticulture, landscaping material supplies and plant nurseries is permitted with development consent.

7 Use of certain land at 140 Googong Road, Googong

(1) This clause applies to land at 140 Googong Road, Googong, being Lot 12, DP 1164687.

(2) Development for the purposes of advertising structures and real estate signs within 10m of the boundary of Old Cooma Road, with a maximum area of 20m2 and a maximum height of 8m from the ground (existing) is permitted with development consent.

8 Use of certain land at 23 Mol Crescent, Googong

(1) This clause applies to 23 Mol Crescent, Googong, being Lot 2, DP 826105.

(2) Development for the purposes of a dwelling house is permitted with development consent.

9 Use of certain land at 663 and 1368 Old Cooma Road, Googong

(1) This clause applies to land at 663 and 1368 Old Cooma Road, Googong, being Lots 8 and 13, DP 219695.

(2) Development for the purpose of a dwelling house on each lot is permitted with development consent.

10 Use of certain land at 1400 Old Cooma Road, Googong

(1) This clause applies to land at 1400 Old Cooma Road, Googong, being Lot 3, DP 827344.

(2) Development for the purposes of a high technology industry is permitted with development consent.

11 Use of certain land at 229 Wickerslack Lane, Googong

(1) This clause applies to land at 229 Wickerslack Lane, Googong, being Lots 7, 32, 92, 102, 104, 111 and 112, DP 754875 and Lot 2, DP 375866.

(2) Development for the purposes of farm buildings is permitted with development consent.

12 Use of certain land at 250 Lanyon Drive, Jerrabomberra

(1) This clause applies to Lots 7328–7332, DP 1153148 and Lot 1, DP 1111489, being Crown Land reserved for a cemetery.

(2) Development for the purposes of a kiosk is permitted with development consent.

13 Use of certain land at Jerrabomberra

(1) This clause applies to the following land at Jerrabomberra:
   a) 12 Balcombe Street, being Lot 10, DP 1101885,
   b) 63 Ironbark Circuit, being Lot 118, DP 1007170,
   c) 2 Sweetgum Place, being Lot 179, DP 1007170,
   d) 4 Walter Close, being Lot 1378, DP 1051143,
   e) 127 Waterfall Drive, being Lot 126, DP 1041324.

(2) Development for the purposes of dual occupancies is permitted with development consent.

14 Use of certain land at Jerrabomberra

(1) This clause applies to the following land at Jerrabomberra:
   a) 61, 65 and 68 Brudenell Drive, being Lots 65, 66 and 77, DP 775666,
   b) 1, 3, 5, 7, 9 and 11 Coachwood Avenue, being Lots 759–761 and 763–765, DP 829470,
   c) 13, 15 and 22–26 Coral Drive, being Lots 739–743, 757 and 758, DP 835596,
   d) 3–6, 8, 10, 12, 14 and 20 Laurel Place, being Lots 745–750 and 753–755, DP 835596,
   e) 8 and 32 Walker Crescent, being Lots 39 and 51, DP 775666.

(2) Development for the purposes of dual occupancies (attached) is permitted with development consent.

15 Use of certain land at 59 Cooma Street, Queanbeyan

(1) This clause applies to land at 59 Cooma Street, Queanbeyan, being Lot 2, DP 815688.

(2) Development for the purposes of business premises and office premises is permitted with development consent.

16 Use of certain land at 1 Bungendore Road, Queanbeyan East

(1) This clause applies to land at 1 Bungendore Road, Queanbeyan East, being Lot 1, DP 835570.

(2) Development for the purposes of a take away food and drink premises is permitted with development consent.

17 Use of certain land at 1 Buttle Street, Queanbeyan East

(1) This clause applies to land at 1 Buttle Street, Queanbeyan East, being Lots 1–6, SP 40615.

(2) Development for the purposes of commercial premises is permitted with development consent.

18 Use of certain land at 53 Tharwa Road, Queanbeyan West

(1) This clause applies to land at 53 Tharwa Road, Queanbeyan West, being Lot 441, DP 623510.

(2) Development for the purposes of hotel or motel accommodation is permitted with development consent.

19 Use of certain land at 1738 Old Cooma Road, Royalla

(1) This clause applies to land at 1738 Old Cooma Road, Royalla, being Lots 1 and 2, DP 555380 and Lot 152, DP 754912.

(2) Development for the purposes of farm buildings is permitted with development consent.

20 Use of certain land at 1738 Old Cooma Road, Royalla

(1) This clause applies to land at 1738 Old Cooma Road, Royalla, being Lot, 2 DP 555380.
(2) Development for the purposes of a dwelling house is permitted with development consent.

21 Use of certain land at 1865A Old Cooma Road, Royalla

(1) This clause applies to land at 1865A Old Cooma Road, Royalla, being Lot 186, DP 754871.
(2) Development for the purposes of a dwelling house is permitted with development consent.

22 Use of certain land at 101 Alderson Place, Tralee

(1) This clause applies to land at 101 Alderson Place, Tralee, being Lots 3, 5, 6, 8, 9, 11 and 12, DP 17224, Lots 9–11, DP 130626, Lot 100, DP 131036 and Lot 1, DP 1001136.
(2) Development for the purposes of farm buildings is permitted with development consent.

23 Use of certain land at 223A Alderson Place, Tralee

(1) This clause applies to land at 223A Alderson Place, Tralee, being Lot 2, DP 1039904.
(2) Development for the purposes of a dwelling house is permitted with development consent.

Schedule 4
Land Use Table
Zone R3 Medium Density Residential
Queanbeyan Local Environmental Plan 2012

Zone R3 Medium Density Residential

1 Objectives of zone

- To provide for the housing needs of the community within a medium density residential environment.
- To provide a variety of housing types within a medium density residential environment.
- To enable other land uses that provides facilities or services to meet the day to day needs of residents.
- To encourage development that considers the medium density amenity of existing and future residents.

2 Permitted without consent

Nil

3 Permitted with consent

Attached dwellings; Bed and breakfast accommodation; Boarding houses; Building identification signs; Business identification signs; Caravan parks; Child care centres; Community facilities; Dual occupancies; Dwelling houses; Environmental facilities; Environmental protection works; Exhibition homes; Exhibition villages; Flood mitigation works; Group homes; Home businesses; Home industries; Hostels; Information and education facilities; Multi dwelling housing; Neighbourhood shops; Places of public worship; Recreation areas; Recreation facilities (outdoor); Registered clubs; Respite day care centres; Roads; Secondary dwellings; Semi-detached dwellings; Seniors housing; Serviced apartments; Shop top housing; Water reticulation systems

4 Prohibited

Any development not specified in item 2 or 3

2.5 Additional permitted uses for particular land

(1) Development on particular land that is described or referred to in Schedule 1 may be carried out:
   a) With development consent, or
   b) if the Schedule so provides—without development consent, in accordance with the conditions (if any) specified in that Schedule in relation to that development.

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(1) This clause applies to land to which clause 4.1D applies.

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(3) Development consent must not be granted under this clause if:
  (a) the ratio of studio dwellings to lots resulting from the subdivision is greater than 1:3, and
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(1) This clause applies to land at 223A Alderson Place, Tralee, being Lot 2, DP 1039904.
(2) Development for the purposes of a dwelling house is permitted with development consent.

Schedule 5
Minimum Subdivision Lot Size
Queanbeyan Local Environmental Plan 2012

4.1 Minimum subdivision lot size

(1) The objectives of this clause are as follows:
   a) to ensure subdivision is sensitive to land, heritage and environmental characteristics (including water quality, native flora and fauna and places or items of Aboriginal and European heritage value),
   b) to ensure subdivision does not adversely impact on the functions and safety of main roads,
   c) to provide lots with areas and dimensions that enable the appropriate siting and construction of a building and associated works to minimise and avoid the threat of natural hazard (including bush fire, soil instability and flooding) and to protect significant vegetation and prominent or significant landscape qualities,
   d) to ensure new lots have an adequate water supply and can be provided with an effective means of disposal of domestic waste and adequately serviced,
   e) to create lots that are compatible with the existing predominant lot pattern or desired future character of the locality and to minimise the likely adverse impact on the amenity of adjoining developments.

(2) This clause applies to a subdivision of any land shown on the Lot Size Map that requires development consent and that is carried out after the commencement of this Plan.

(3) The size of any lot resulting from a subdivision of land to which this clause applies is not to be less than the minimum size shown on the Lot Size Map in relation to that land.

(4) This clause does not apply in relation to the subdivision of individual lots in a strata plan or community title scheme.

4.1B Minimum lot sizes for dual occupancies, multi dwelling housing and residential flat buildings

(1) The objective of this clause is to achieve planned residential density in certain zones.

(2) Development consent may be granted for development on a lot in a zone shown in Column 2 of the Table to this clause for a purpose shown in Column 1 of the Table opposite that zone, if the area of the lot is equal to or greater than the area specified for that purpose and shown in Column 3 of the Table.

Column 1	Column 2	Column 3
Dual occupancies	Zone R3 Medium Density	600 square metres
Dual occupancies	Zone R4 High Density	600 square metres
Multi dwelling housing	Zone R3 Medium Density	750 square metres
Multi dwelling housing	Zone R4 High Density	750 square metres
Residential flat buildings	Zone R4 High Density	1,000 square metres

4.1D Variation to minimum subdivision lot size

(1) The objective of this clause is to provide opportunities for affordable medium density housing in appropriate locations.
(2) This clause applies to the following land:
    a) land within 200 metres of any land within Zone B2 Local Centre,
    b) land identified as "Additional Development Area" on the Googong Map.
(3) Despite clause 4.1, development consent may be granted for the subdivision of land to which this clause applies to create lots with an area of at least 170 square metres if the development application proposes the creation of at least 4 lots and includes a dwelling design for each lot.

4.2A Erection of dwelling houses and secondary dwellings on land in certain rural and environmental protection zones

(1) The objectives of this clause are as follows:
    (a) to minimise unplanned rural residential development,
    (b) to enable the replacement of lawfully erected dwelling houses in rural and environmental protection zones.
(2) This clause applies to land in the following zones:
    (a) Zone RU2 Rural Landscape,
    (b) Zone R5 Large Lot Residential,
    (c) Zone E3 Environmental Management,
    (d) Zone E4 Environmental Living.
(3) Development consent must not be granted for the erection of a dwelling house on land to which this clause applies, and on which no dwelling house has been erected, unless the land:
    (a) is a lot that is at least the minimum lot size shown on the Lot Size Map in relation to that land, or
    (b) is a lot created under this Plan (other than under clause 4.2 (3)), or
    (c) is a lot resulting from a subdivision for which development consent (or equivalent) was granted before this Plan commenced and on which the erection of a dwelling house would have been permissible if the plan of subdivision had been registered before that commencement, or
    (d) would have been a lot referred to in paragraph (a), (b) or (c) had it not been affected by:
        (i) a minor realignment of its boundaries that did not create an additional lot, or
        (ii) a subdivision creating or widening a public road or public reserve or for another public purpose.

Note. A dwelling cannot be erected on a lot created under clause 9 of *State Environmental Planning Policy (Rural Lands) 2008* or clause 4.2.

(4) Development consent must not be granted for the erection of a secondary dwelling on land to which this clause applies unless the land:
    (a) is a lot that is at least the minimum lot size shown on the Lot Size Map in relation to that land, or
    (b) is identified as "Lot Averaging" on the Lot Averaging Map and is a lot with an area of at least 2 hectares.
(5) Development consent may be granted for the erection of a dwelling house on land to which this clause applies if there is a lawfully erected dwelling house on the land and the dwelling house to be erected is intended only to replace the existing dwelling house.

Schedule 7
Excerpt From Contaminated Land Management Policy

Contaminated Land Management

Introduction
This policy applies to all development and outlines requirements relating to the use and/or development of land that is or may potentially be contaminated. This policy should be read in conjunction with *State Environmental Planning Policy (SEPP) No. 55 – Remediation of Land,* and the relevant *Queanbeyan Local Environmental Plan* clause relating to earthworks.

Objectives
(1) Enable Council to more adequately identify record and manage known and potentially contaminated land.
(2) Provide direction for Council in the gathering and assessment of information in relation to previous land use activities that may have resulted in contamination.
(3) Assist Council in the discharge of its functions and responsibilities in relation to existing and potential land contamination with reasonable care and due diligence to minimise potential risk to both public health and the environment.
(4) Inform the community, particularly those interested or involved in the planning and development process, of Council's procedures relating to existing or potential land contamination.
(5) Ensure that all stakeholders are aware of their responsibilities for the ongoing management of contaminated land.

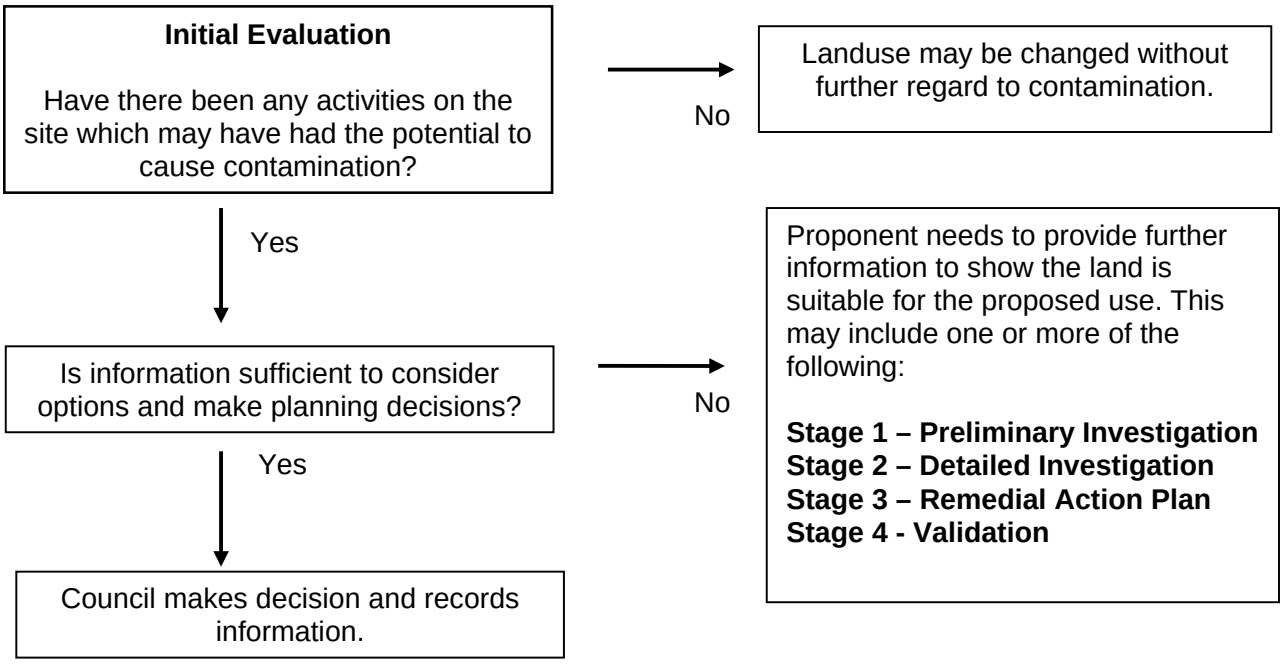
Relationship to Other Plans, Council Policies and the Like
State Environmental Planning Policy 55 – Remediation of Land must be referred to in conjunction with this element.

Duty to Report Contamination
The *Contaminated Land Management Act 1997* requires persons to notify the Environment Protection Authority (EPA) if they become aware that their activities have contaminated land so as to present a significant risk of harm to human health or the environment. Clause 60(3) of the *Contaminated Land Management Act 1997* states that a person is required to notify the EPA if:
i. The substance contaminating the land (the contaminant) or any by-product of the contaminant has entered or will foreseeably enter neighbouring land, the atmosphere, groundwater or surface water;
ii. the regulations prescribe for the purposes of this subparagraph, or the guidelines specify, a level of the contaminant or by-product in the neighbouring land, atmosphere, groundwater or surface water;
iii. the level of the contaminant or by-product after that entry is, or will foreseeably be, above the level prescribed or specified and will foreseeably continue to remain above that level.

Council's Decision Making Process
In determining all rezoning, subdivision and development applications, Council must consider the possibility of land contamination and the implications it has for any proposed or permissible future uses of the land.

If contamination is, or may be present, the proponent must investigate the site and provide Council with the information it needs to carry out its planning functions. Figure 1 below outlines process when Council is assessing potential impacts of contamination on a site.

Figure 1 Contaminated Land



Note: The information contained in this Schedule is an excerpt from Council's policy on contaminated land management and is intended only as an overview.

For further information please refer to Part 2.4 – Contaminated Land Management of the Queanbeyan Development Control Plan 2012 and State Environmental Planning Policy No. 55 – Remediation of Land.

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Level 14, 135 King Street, Sydney
Sydney 2000
GPO Box 4103 Sydney NSW 2001
DX 967 Sydney

Summary of Owners Report

LPI **Sydney**

Address: - 10 Yass Road, Queanbeyan

Description: - Lots 105 and 106 D.P. 729079, Part of Lots A & B D.P. 412056
Also
Part of Lots 8, 9 & 11 Section 49 D.P. 758862

As regards Lot 105 D.P. 729079

The early title to this land is Crown Title

We are aware of the following events: -

As regards the part tinted yellow and numbered (1) on the attached cadastre

Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available	Reference to Title at Acquisition and sale
15.05.1886	Crown Reserve No. 215 for Access	Now revoked ? 24.12.1961
24.12.1961	Dedicated for Public School Site	Revoked 05.06.1998
05.06.1998	# Minister for Education and Training (Acquired for the Education Reform Act, 1990)	Government Gazette Now 105/729079

# Denotes Current Registered Proprietor

As regards the parts tinted yellow and numbered (2) and (3) on the attached cadastre

Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available	Reference to Title at Acquisition and sale
	Crown Roads	
17.11.1961	Roads now closed	Government Gazette 17.11.1961 Folio 3694
24.12.1961	Dedicated for Public School Site	Revoked 05.06.1998
05.06.1998	# Minister for Education and Training (Acquired for the Education Reform Act, 1990)	Government Gazette Now 105/729079

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DX 967 Sydney

As regards the parts tinted yellow and numbered (4) and (5) on the attached cadastre

Date of Acquisition and term held	**Registered Proprietor(s) & Occupations where available**	**Reference to Title at Acquisition and sale**
22.12.1925	Sale at Queanbeyan	Refused 1926
1957 & 1958	Crown Tenures Special Lease 1957/15 & Special Lease 1958/6 To William Caesar Kelly Heinz Frerker	Withdrawn 20.10.1961
24.12.1961	Dedicated for Public School Site	Revoked 05.06.1998
05.06.1998	# Minister for Education and Training (Acquired for the Education Reform Act, 1990)	Government Gazette Now 105/729079

# Denotes Current Registered Proprietor

Leases & Easements: - NIL

As regards Lot 106 D.P. 729079

The early title to this land is Crown Title

We are aware of the following events: -

Date of Acquisition and term held	**Registered Proprietor(s) & Occupations where available**	**Reference to Title at Acquisition and sale**
	Crown Road	
26.11.1965	Roads now closed	Government Gazette 26.11.1965 Folio 3909
15.04.1966	Dedicated for Public School Site addition	Revoked 05.06.1998
05.06.1998	# Minister for Education and Training (Acquired for the Education Reform Act, 1990)	Government Gazette Now 106/729079

# Denotes Current Registered Proprietor

Leases & Easements: - NIL

---

scottASHWOOD PTY.LTD
An InfoTrack Company

ABN: 42 166 543 255
Ph: 02 9099 7400
Fax: 02 9232 7141
(Ph: 0412 199 304)

Level 14, 135 King Street, Sydney
Sydney 2000
GPO Box 4103 Sydney NSW 2001
DX 967 Sydney

As regards part Lot A D.P. 412056

Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available	Reference to Title at Acquisition and sale
15.04.1930 (1930 to 1930)	James George Harris (Estate Agent)	Vol 4394 Fol 98 (Grant Title)
23.07.1930 (1930 to 1958)	James Barnett Lodge (Engine Driver)	Vol 4394 Fol 98
20.06.1958 (1958 to 1961)	Beatrix Eve Southwell (Married Woman)	Vol 4394 Fol 98
17.11.1961 (1961 to 1994)	Her Most Gracious Majesty Queen Elizabeth the Second	Vol 4394 Fol 98 Now A/412056
14.07.1994 (1994 to date)	# Minister for Education	A/412056

# Denotes Current Registered Proprietor

Leases & Easements: - NIL

As regards part Lot B D.P. 412056

Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available	Reference to Title at Acquisition and sale
15.04.1930 (1930 to 1930)	James George Harris (Estate Agent)	Vol 4394 Fol 98 (Grant Title)
23.07.1930 (1930 to 1958)	James Barnett Lodge (Engine Driver)	Vol 4394 Fol 98
20.06.1958 (1958 to 1958)	Beatrix Eve Southwell (Married Woman)	Vol 4394 Fol 98
14.10.1958 (1958 to 1961)	Otto Schultz (Forestry Worker)	Vol 4394 Fol 98 Now Vol 7843 Fol 182
24.07.1961 (1961 to 1994)	Her Most Gracious Majesty Queen Elizabeth the Second	Vol 7843 Fol 182 Now B/412056
14.07.1994 (1994 to date)	# Minister for Education	B/412056

# Denotes Current Registered Proprietor

Leases: - NIL

Easements: -

- 02.03.1959 (H 203024) Easement for Drainage

---

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An InfoTrack Company

ABN: 42 166 543 255
Ph: 02 9099 7400
Fax: 02 9232 7141
(Ph: 0412 199 304)

Level 14, 135 King Street, Sydney
Sydney 2000
GPO Box 4103 Sydney NSW 2001
DX 967 Sydney

As regards part Lot 8 Section 11 D.P. 758862

Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available	Reference to Title at Acquisition and sale
23.10.1928 (1928 to 1960)	Dinah Jane Jeffs (Married Woman)	Vol 4206 Fol 242 (Grant Title)
13.10.1960 (1960 to 1964)	Phyllis Doreen Mortlock (Widow) (Section 94 Application not investigated)	Vol 4206 Fol 242
15.05.1964 (1964 to 1994)	Her Most Gracious Majesty Queen Elizabeth the Second	Vol 4206 Fol 242 Now 8/49/758862
22.03.1994 (1994 to date)	# Minister for Education	8/49/758862

# Denotes Current Registered Proprietor

Leases & Easements: - NIL

As regards part Lot 9 Section 11 D.P. 758862

Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available	Reference to Title at Acquisition and sale
09.09.1918 (1918 to 1960)	Dinah Jane Jeffs (Married Woman)	Vol 1091 Fol 102
13.10.1960 (1960 to 1962)	Horace James Edmonds Jeffs (Labourer)	Vol 1091 Fol 102
19.04.1962 (1962 to 1994)	Her Most Gracious Majesty Queen Elizabeth the Second (Resumed for Public School)	Vol 1091 Fol 102 Now 9/49/758862
22.03.1994 (1994 to date)	# Minister for Education (Resumed for Public School)	9/49/758862

# Denotes Current Registered Proprietor

Leases & Easements: - NIL

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scottASHWOOD PTY.LTD
An InfoTrack Company

ABN: 42 166 543 255
Ph: 02 9099 7400
Fax: 02 9232 7141
(Ph: 0412 199 304)

Level 14, 135 King Street, Sydney
Sydney 2000
GPO Box 4103 Sydney NSW 2001
DX 967 Sydney

As regards part Lot 11 Section 11 D.P. 758862

Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available	Reference to Title at Acquisition and sale
23.10.1928 (1928 to 1948)	William Horace James Jeffs (Labourer)	Vol 4206 Fol 243 (Grant Title)
04.08.1948 (1948 to 1962)	Horace James Edmonds Jeffs (Labourer) (Transmission Application not investigated)	Vol 4206 Fol 243
19.04.1962 (1962 to 1994)	Her Most Gracious Majesty Queen Elizabeth the Second (Resumed for Public School)	Vol 4206 Fol 243 Now 11/49/758862
22.03.1994 (1994 to date)	# Minister for Education (Resumed for Public School)	11/49/758862

# Denotes Current Registered Proprietor

Leases & Easements: - NIL

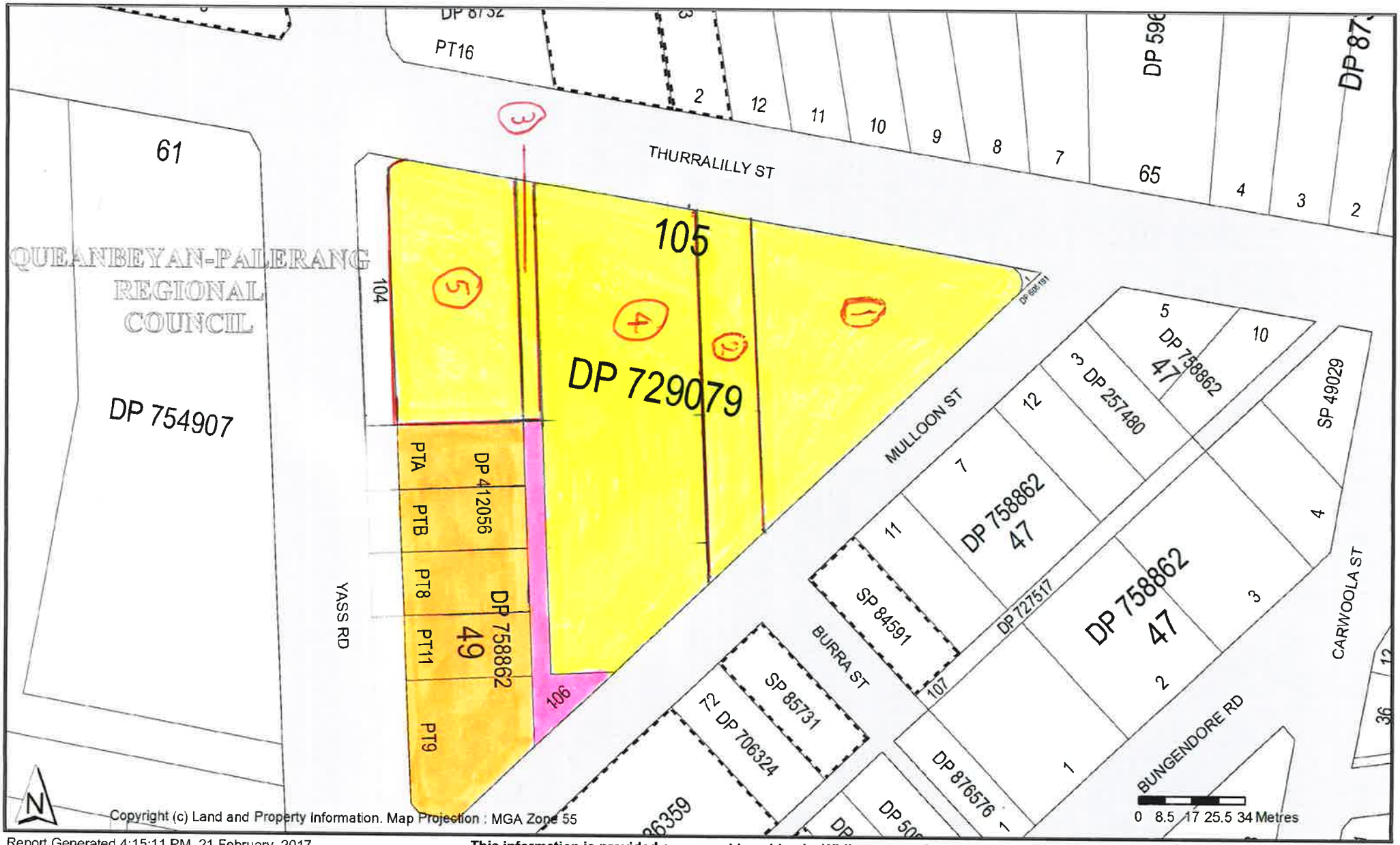
Yours Sincerely
Mark Groll
2 March 2017

Land & Property Information

Cadastral Records Enquiry Report

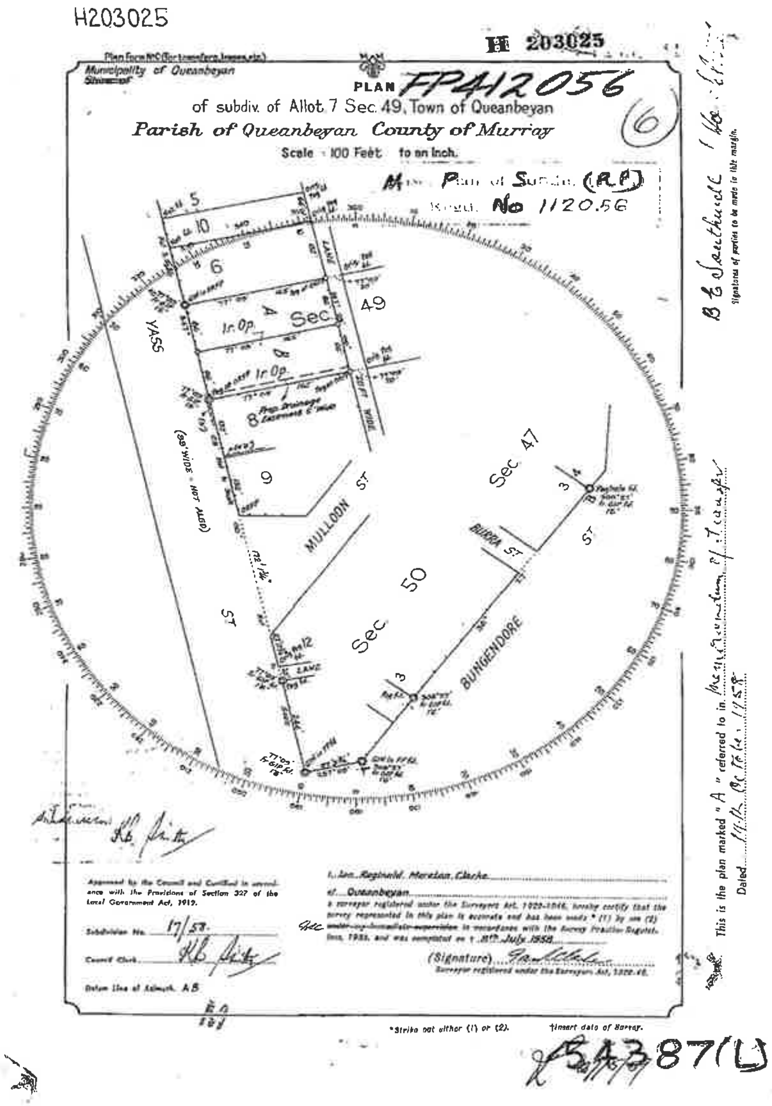
Requested Parcel : Lot 105 DP 729079 **Identified Parcel** : Lot 105 DP 729079

Locality : QUEANBEYAN EAST **LGA** : QUEANBEYAN-PALERANG REGIONAL **Parish** : QUEANBEYAN **County** : MURRAY



Report Generated 4:15:11 PM, 21 February, 2017

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



CONVERSION TABLE ADDED IN DEPARTMENT OF LANDS

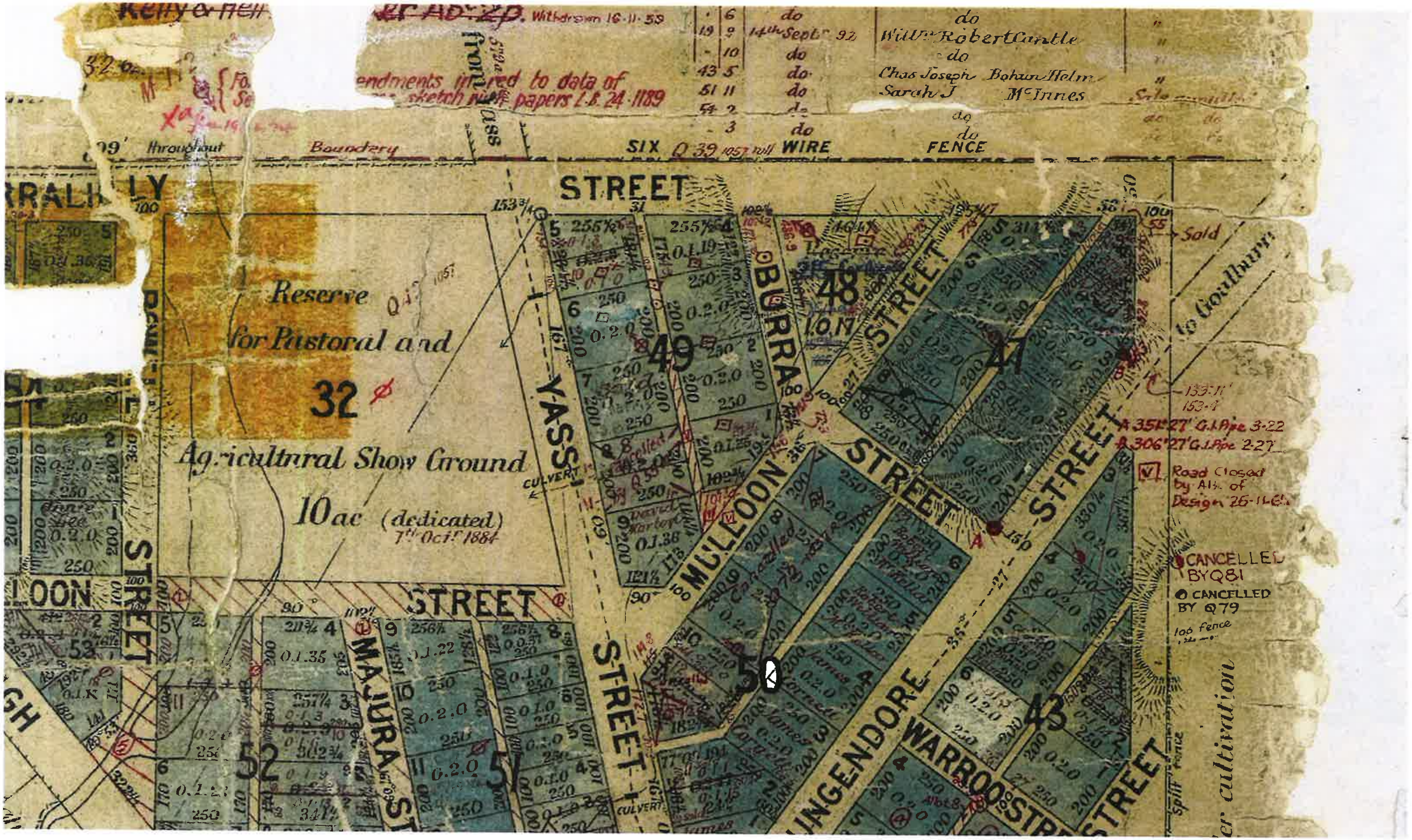
DP 412056

FEET	INCHES	METRES
-	3	0.076
1	6	0.457
2	-	0.610
4	6	1.372
20	-	6.096
66	-	20.117
66	1	20.142
97	3 3/4	29.661
99	-	30.175
113	11 1/4	34.728
113	11 3/4	34.741
132	-	40.234
165	-	50.292
172	1 3/4	52.470
244	-	74.371

AC	RD	P	SQ M
-	1	-	1012

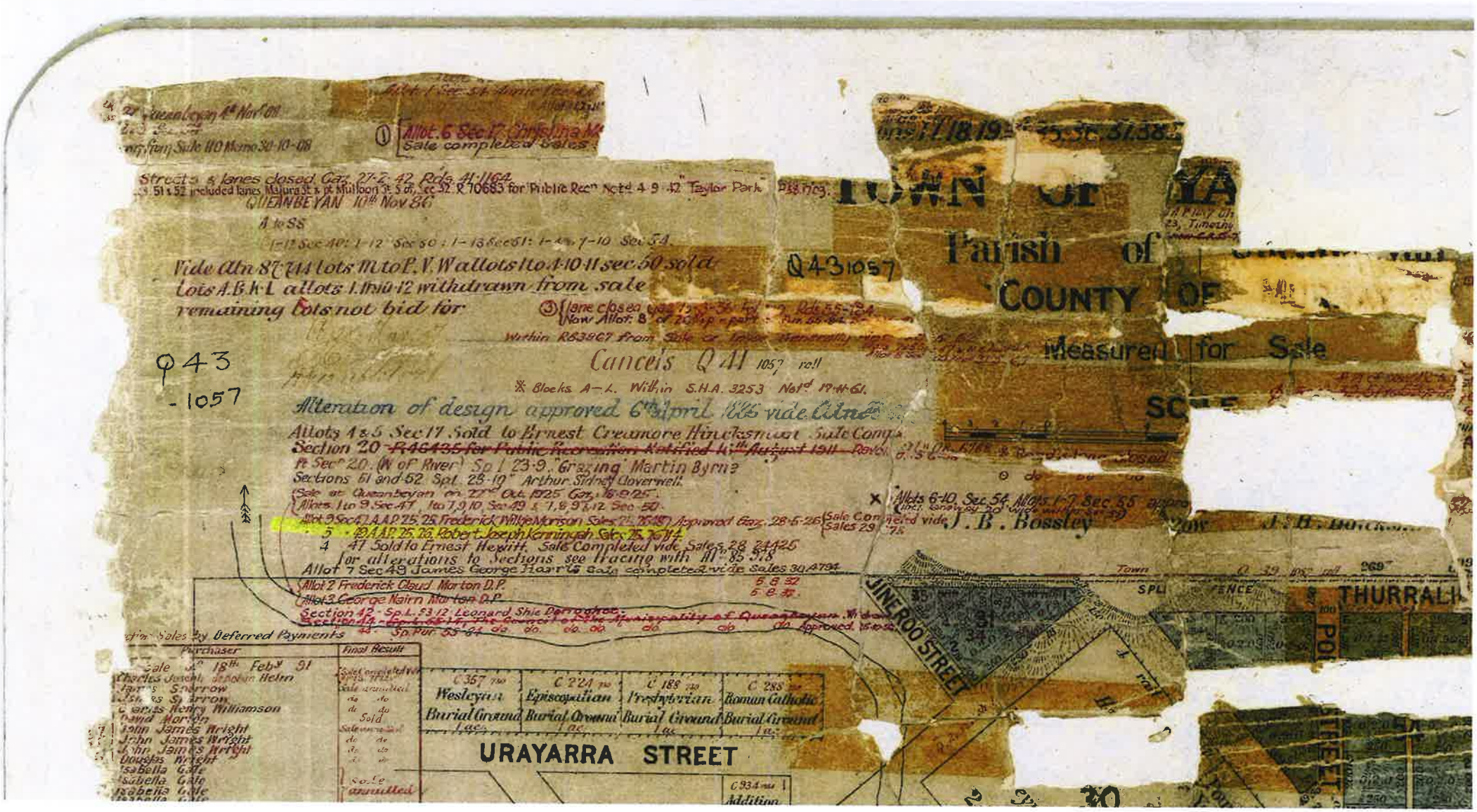
AMENDMENTS AND/OR ADDITIONS NOTED ON PLAN IN REGISTRAR GENERAL'S OFFICE.

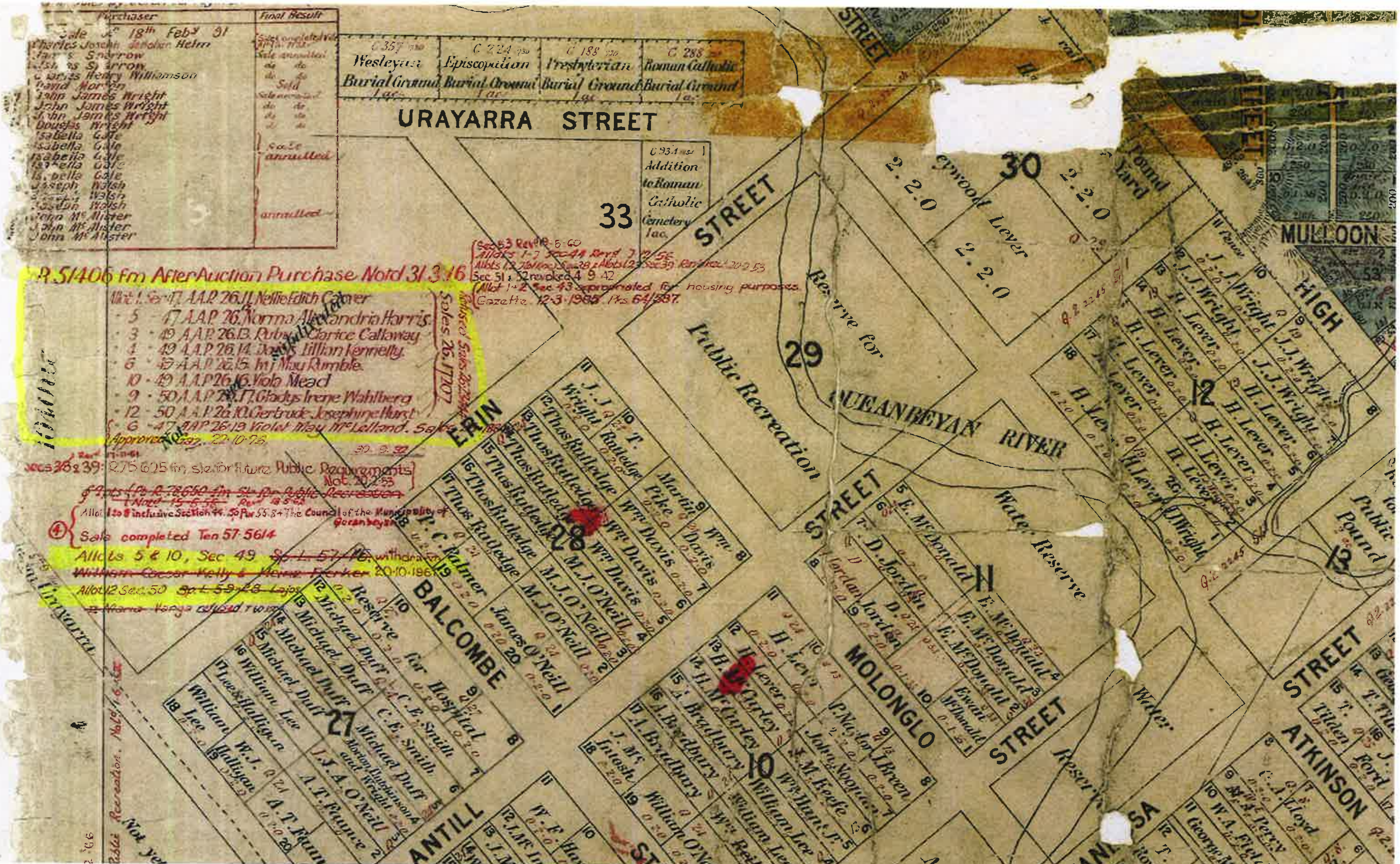
I, Bruce Richard Davies, Registrar General for New South Wales, certify that this negative is a photograph made as a permanent record of a document in my custody this 21st day of April, 1980



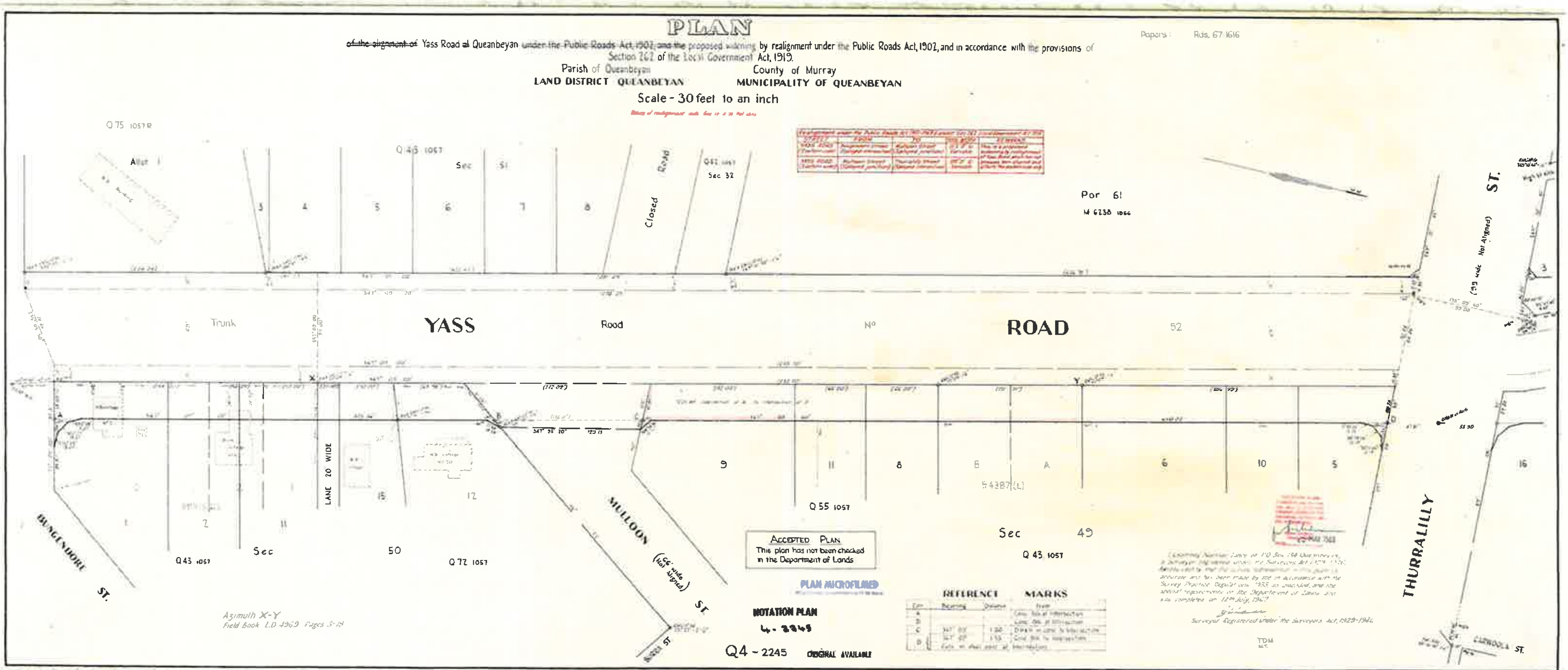
Reserve for Pastoral and Agricultural Show Ground
32
10ac (dedicated)
7th Octr 1884
STREET
YASS STREET
MULLOON STREET
BURRA STREET
MAJURA
WARROO STREET
SIX WIRE FENCE
Boundary
throughout
49
48
47
50
52
51
53
43
CULVERT
to Goulburn
Sold
Road Closed by Alt. of Design 26-11-65
CANCELLED BY Q81
CANCELLED BY Q79
Withdrawn 16-11-59
14th Septr 92
Willm Robert Cantle
Chas Joseph Bohun Holm
Sarah J McInnes
Split fence
cultivation

Req:R286525 /Doc:CP 00043-1057 P /Rev:29-Nov-2012 /Sts:OK.OK /Prt:02-Mar-2017 09:42 /Seq:1 of 1
Ref:queanbeyan /Src:M





URAYARRA STREET
Wesleyan Burial Ground
Episcopalian Burial Ground
Presbyterian Burial Ground
Roman Catholic Burial Ground
Addition to Roman Catholic Cemetery
R.51406 fm After Auction Purchase Notd 31.3.16
Sales 26.1.1707
Sale completed Ten 57 5614
Allots 5 & 10, Sec 49
Public Recreation
Reserve for Public Recreation
QUEANBEYAN RIVER
Water Reserve
ERIN
BALCOMBE
MOLONGLO
STREET
ATKINSON
ANTILL
HIGH
MULLOON
Reserve for Hospital
Pound Yard
33
29
30
28
27
12
11
10
13


PLAN
of the alignment of Yass Road at Queanbeyan under the Public Roads Act, 1902, and the proposed widening by realignment under the Public Roads Act, 1902, and in accordance with the provisions of Section 262 of the Local Government Act, 1919.
Parish of Queanbeyan
County of Murray
LAND DISTRICT QUEANBEYAN
MUNICIPALITY OF QUEANBEYAN
Scale - 30 feet to an inch
Papers: Rds. 67 1616
Q 75 1057R
Allot 1
Q 43 1057
Sec 51
Closed Road
Q 42 1057
Sec 32
Por 61
M 6238 1066
Trunk
YASS
Road
No
ROAD
52
LANE 20 WIDE
BUNGENDORE ST.
MULLOON ST
THURRALILLY
ST.
CARWOOLA ST.
Sec
50
Q 43 1057
Q 72 1057
Q 55 1057
Sec 49
Q 43 1057
54387(L)
ACCEPTED PLAN
This plan has not been checked in the Department of Lands
PLAN MICROFILMED
NOTATION PLAN
4-2245
Q4 - 2245
ORIGINAL AVAILABLE
REFERENCE MARKS
Azimuth X-Y
Field Book L.D 4969 Pages 3-19

Title Search

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - TITLE SEARCH

FOLIO: 105/729079

SEARCH DATE	TIME	EDITION NO	DATE
2/3/2017	9:55 AM	1	7/11/2003

LAND

LOT 105 IN DEPOSITED PLAN 729079
AT QUEANBEYAN
LOCAL GOVERNMENT AREA QUEANBEYAN-PALERANG REGIONAL
PARISH OF QUEANBEYAN COUNTY OF MURRAY
TITLE DIAGRAM DP729079

FIRST SCHEDULE

MINISTER FOR EDUCATION AND TRAINING (R AA21916)

SECOND SCHEDULE (1 NOTIFICATION)

1 LIMITED TITLE. LIMITATION PURSUANT TO SECTION 28T(4) OF THE REAL PROPERTY ACT, 1900. THE BOUNDARIES OF THE LAND COMPRISED HEREIN HAVE NOT BEEN INVESTIGATED BY THE REGISTRAR GENERAL.

NOTATIONS

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

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

Title Search

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - TITLE SEARCH

FOLIO: 106/729079

SEARCH DATE	TIME	EDITION NO	DATE
2/3/2017	9:55 AM	1	7/11/2003

LAND

LOT 106 IN DEPOSITED PLAN 729079
AT QUEANBEYAN
LOCAL GOVERNMENT AREA QUEANBEYAN-PALERANG REGIONAL
PARISH OF QUEANBEYAN COUNTY OF MURRAY
TITLE DIAGRAM DP729079

FIRST SCHEDULE

MINISTER FOR EDUCATION AND TRAINING (R AA21916)

SECOND SCHEDULE (1 NOTIFICATION)

1 LIMITED TITLE. LIMITATION PURSUANT TO SECTION 28T(4) OF THE REAL PROPERTY ACT, 1900. THE BOUNDARIES OF THE LAND COMPRISED HEREIN HAVE NOT BEEN INVESTIGATED BY THE REGISTRAR GENERAL.

NOTATIONS

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

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

Historical Title

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - HISTORICAL SEARCH

SEARCH DATE
2/3/2017 10:56AM

FOLIO: A/412056

First Title(s): SEE PRIOR TITLE(S)
Prior Title(s): VOL 8339 FOL 169

Recorded	Number	Type of Instrument	C.T. Issue
31/8/1989		TITLE AUTOMATION PROJECT	LOT RECORDED FOLIO NOT CREATED
18/6/1992		CONVERTED TO COMPUTER FOLIO	FOLIO CREATED CT NOT ISSUED
22/3/1994	U119973	APPLICATION	EDITION 1

*** END OF SEARCH ***

queanbeyan PRINTED ON 2/3/2017

Title Search

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - TITLE SEARCH

FOLIO: A/412056

SEARCH DATE	TIME	EDITION NO	DATE
2/3/2017	9:55 AM	1	22/3/1994

LAND

LOT A IN DEPOSITED PLAN 412056
LOCAL GOVERNMENT AREA QUEANBEYAN-PALERANG REGIONAL
PARISH OF QUEANBEYAN COUNTY OF MURRAY
TITLE DIAGRAM DP412056

FIRST SCHEDULE

MINISTER FOR EDUCATION (AP U119973)

SECOND SCHEDULE (2 NOTIFICATIONS)

1 LAND EXCLUDES MINERALS AND IS SUBJECT TO RESERVATIONS AND CONDITIONS IN FAVOUR OF THE CROWN - SEE CROWN GRANT(S)
2 LAND EXCLUDES THE ROAD(S) SHOWN IN CROWN PLAN 4.2245

NOTATIONS

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

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

Historical Title

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - HISTORICAL SEARCH

SEARCH DATE
2/3/2017 10:56AM

FOLIO: B/412056

First Title(s): OLD SYSTEM
Prior Title(s): VOL 7843 FOL 182

Recorded	Number	Type of Instrument	C.T. Issue
31/8/1989		TITLE AUTOMATION PROJECT	LOT RECORDED FOLIO NOT CREATED
14/7/1994	U119979	APPLICATION	FOLIO CREATED CT NOT ISSUED
21/7/1994	U119979	APPLICATION	EDITION 1

*** END OF SEARCH ***

queanbeyan PRINTED ON 2/3/2017

Title Search

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - TITLE SEARCH

FOLIO: B/412056

SEARCH DATE	TIME	EDITION NO	DATE
2/3/2017	9:55 AM	1	21/7/1994

LAND

LOT B IN DEPOSITED PLAN 412056
AT QUEANBEYAN
LOCAL GOVERNMENT AREA QUEANBEYAN-PALERANG REGIONAL
PARISH OF QUEANBEYAN COUNTY OF MURRAY
TITLE DIAGRAM DP412056

FIRST SCHEDULE

MINISTER FOR EDUCATION (AP U119979)

SECOND SCHEDULE (3 NOTIFICATIONS)

1 LAND EXCLUDES MINERALS AND IS SUBJECT TO RESERVATIONS AND CONDITIONS IN FAVOUR OF THE CROWN - SEE CROWN GRANT(S)
2 EASEMENT FOR DRAINAGE AFFECTING PART OF THE LAND ABOVE DESCRIBED SHOWN AS "PROPOSED DRAINAGE EASEMENT 1.82 WIDE" IN THE TITLE DIAGRAM
3 LAND EXCLUDES THE ROAD(S) SHOWN IN CROWN PLAN 4.2245

NOTATIONS

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

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

Historical Title

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - HISTORICAL SEARCH

SEARCH DATE
2/3/2017 10:56AM

FOLIO: 8/49/758862

First Title(s): SEE PRIOR TITLE(S)
Prior Title(s): VOL 4206 FOL 242

Recorded	Number	Type of Instrument	C.T. Issue
23/3/1990		TITLE AUTOMATION PROJECT	LOT RECORDED FOLIO NOT CREATED
24/6/1993		CONVERTED TO COMPUTER FOLIO	FOLIO CREATED CT NOT ISSUED
22/3/1994	U119973	APPLICATION	EDITION 1
25/11/1994		AMENDMENT: TITLE DIAGRAM	

*** END OF SEARCH ***

queanbeyan PRINTED ON 2/3/2017

Title Search

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - TITLE SEARCH

FOLIO: 8/49/758862

SEARCH DATE	TIME	EDITION NO	DATE
2/3/2017	9:55 AM	1	22/3/1994

LAND

LOT 8 OF SECTION 49 IN DEPOSITED PLAN 758862
AT QUEANBEYAN
LOCAL GOVERNMENT AREA QUEANBEYAN-PALERANG REGIONAL
PARISH OF QUEANBEYAN COUNTY OF MURRAY
(FORMERLY KNOWN AS ALLOTMENT 8 OF SECTION 49)
TITLE DIAGRAM CROWN PLAN 155.1057

FIRST SCHEDULE

MINISTER FOR EDUCATION (AP U119973)

SECOND SCHEDULE (2 NOTIFICATIONS)

1 LAND EXCLUDES MINERALS AND IS SUBJECT TO RESERVATIONS AND CONDITIONS IN FAVOUR OF THE CROWN - SEE CROWN GRANT(S)
2 EXCEPTING THE ROAD IN TRANSFER Q812016 AS SHOWN IN VOL 4206 FOL 242

NOTATIONS

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

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

Historical Title

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - HISTORICAL SEARCH

SEARCH DATE
2/3/2017 10:56AM

FOLIO: 9/49/758862

First Title(s): SEE PRIOR TITLE(S)
Prior Title(s): VOL 1091 FOL 102

Recorded	Number	Type of Instrument	C.T. Issue
23/3/1990		TITLE AUTOMATION PROJECT	LOT RECORDED FOLIO NOT CREATED
3/10/1990		CONVERTED TO COMPUTER FOLIO	FOLIO CREATED CT NOT ISSUED
6/6/1991		AMENDMENT: TITLE DIAGRAM	
22/3/1994	U119973	APPLICATION	EDITION 1

*** END OF SEARCH ***

queanbeyan PRINTED ON 2/3/2017

Title Search

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - TITLE SEARCH

FOLIO: 9/49/758862

SEARCH DATE	TIME	EDITION NO	DATE
2/3/2017	9:55 AM	1	22/3/1994

LAND

LOT 9 OF SECTION 49 IN DEPOSITED PLAN 758862
AT QUEANBEYAN
LOCAL GOVERNMENT AREA QUEANBEYAN-PALERANG REGIONAL
PARISH OF QUEANBEYAN COUNTY OF MURRAY
(FORMERLY KNOWN AS ALLOTMENT 9 OF SECTION 49)
TITLE DIAGRAM CROWN PLAN 55.1057

FIRST SCHEDULE

MINISTER FOR EDUCATION (AP U119973)

SECOND SCHEDULE (3 NOTIFICATIONS)

1 LAND EXCLUDES MINERALS IN THE CROWN GRANT
2 J377453 LAND EXCLUDES MINERALS (S.141 PUBLIC WORKS ACT, 1912)
3 LAND EXCLUDES THE ROAD SHOWN IN VOL 1091 FOL 102 SEE Q812016

NOTATIONS

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

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

Historical Title

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - HISTORICAL SEARCH

SEARCH DATE
2/3/2017 10:56AM

FOLIO: 11/49/758862

First Title(s): SEE PRIOR TITLE(S)
Prior Title(s): VOL 4206 FOL 243

Recorded	Number	Type of Instrument	C.T. Issue
23/3/1990		TITLE AUTOMATION PROJECT	LOT RECORDED FOLIO NOT CREATED
15/7/1993		CONVERTED TO COMPUTER FOLIO	FOLIO CREATED CT NOT ISSUED
22/3/1994	U119973	APPLICATION	EDITION 1
25/11/1994		AMENDMENT: TITLE DIAGRAM	

*** END OF SEARCH ***

queanbeyan PRINTED ON 2/3/2017

Title Search

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - TITLE SEARCH

FOLIO: 11/49/758862

SEARCH DATE	TIME	EDITION NO	DATE
2/3/2017	9:55 AM	1	22/3/1994

LAND

LOT 11 OF SECTION 49 IN DEPOSITED PLAN 758862
AT QUEANBEYAN
LOCAL GOVERNMENT AREA QUEANBEYAN-PALERANG REGIONAL
PARISH OF QUEANBEYAN COUNTY OF MURRAY
(FORMERLY KNOWN AS ALLOTMENT 11 OF SECTION 49)
TITLE DIAGRAM CROWN PLAN 155.1057

FIRST SCHEDULE

MINISTER FOR EDUCATION (AP U119973)

SECOND SCHEDULE (3 NOTIFICATIONS)

1 LAND EXCLUDES MINERALS RESERVED BY THE CROWN GRANT
2 J377453 LAND EXCLUDES MINERALS (S.141 PUBLIC WORKS ACT, 1912)
3 EXCEPTING THE ROAD IN TRANSFER Q812016 AS SHOWN IN VOL 4206 FOL 243

NOTATIONS

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

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

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: D17/106957
Your Ref: Elyse Storr

5 April 2017

Attention: Elyse Storr
Douglas Partners
PO BOX 1487
Fyshwick ACT 2609

Dear Ms Storr

RE SITE: 10 Yass Rd Queanbeyan East NSW

I refer to your site search request received by SafeWork NSW on 22 March 2017 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.au

Yours sincerely

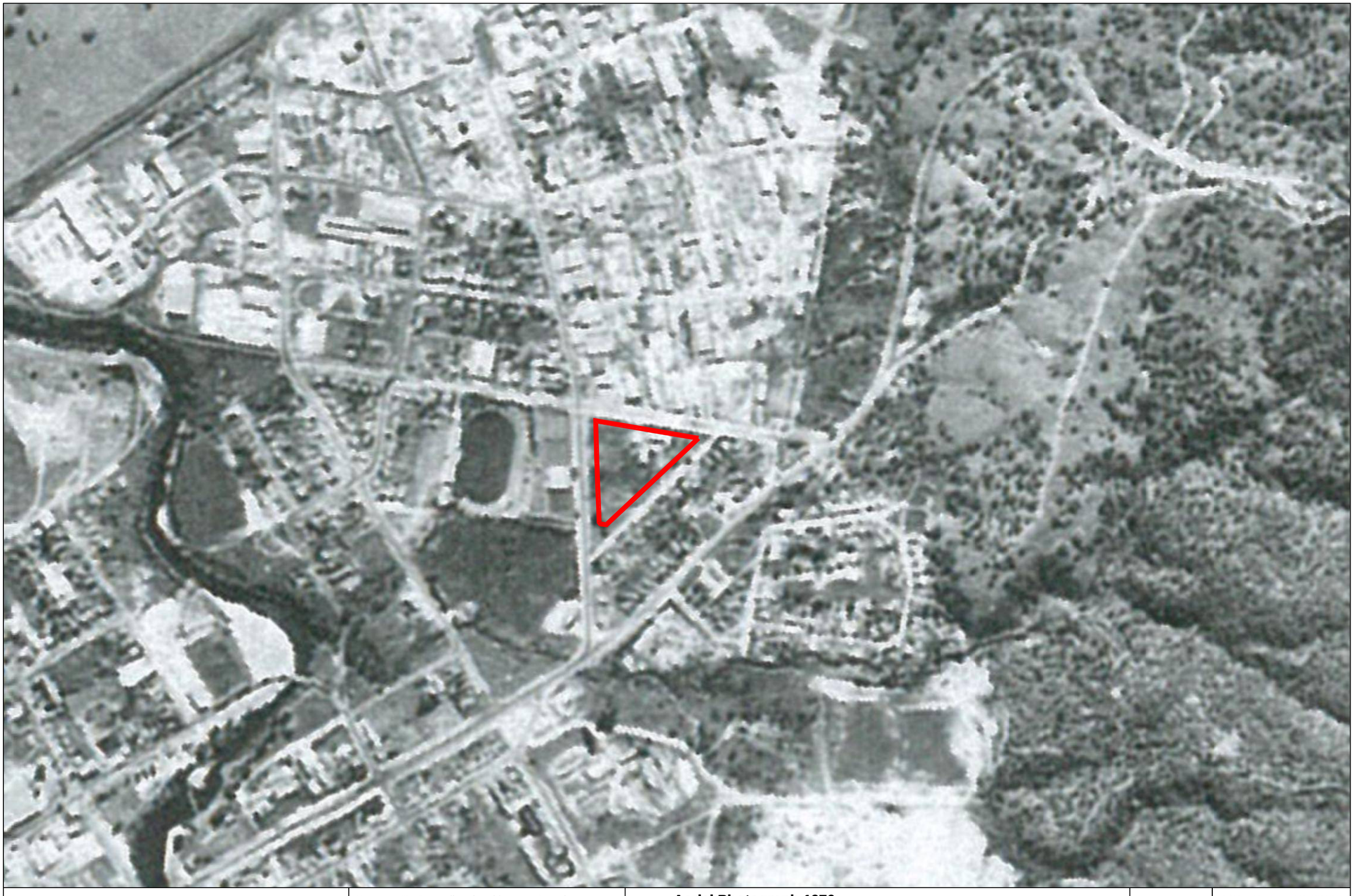
Customer Service Officer
Customer Experience - Operations
SafeWork NSW

Appendix D

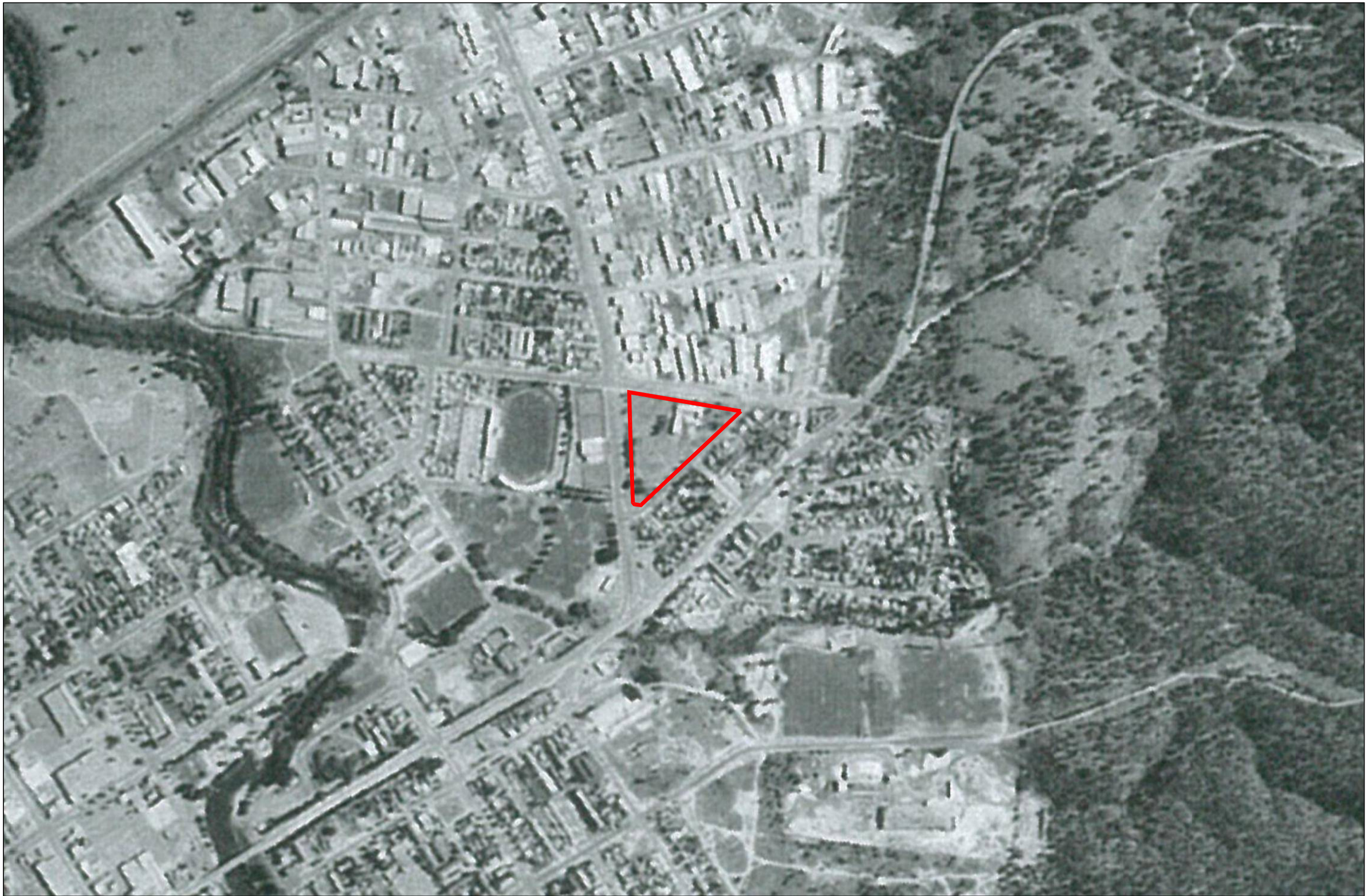
Historical Aerial Photographs (Seven Plates)

Douglas Partners Geotechnics / Environment / Groundwater	CLIENT: GHD Woodhead Architecture Pty Ltd		TITLE: **Aerial Photograph 1961** **Proposed Additional Classrooms** **10 Yass Road, Queanbeyan East, NSW**	N	PROJECT No: 88406.01
	OFFICE: Canberra	DRAWN BY: ESS			PLATE No: D1
	SCALE: NTS	DATE: 21.02.2017			REVISION: 0

Douglas Partners Geotechnics / Environment / Groundwater	CLIENT: GHD Woodhead Architecture Pty Ltd	TITLE: **Aerial Photograph 1968** **Proposed Additional Classrooms** **10 Yass Road, Queanbeyan East, NSW**	PROJECT No: 88406.01
	OFFICE: Canberra / DRAWN BY: ESS		PLATE No: D2
	SCALE: NTS / DATE: 21.02.2017		REVISION: 0



Douglas Partners Geotechnics / Environment / Groundwater	CLIENT: GHD Woodhead Architecture Pty Ltd	TITLE: **Aerial Photograph 1976** **Proposed Additional Classrooms** **10 Yass Road, Queanbeyan East, NSW**	PROJECT No: 88406.01
	OFFICE: Canberra / DRAWN BY: ESS		PLATE No: D3
	SCALE: NTS / DATE: 21.02.2017		REVISION: 0



Douglas Partners Geotechnics / Environment / Groundwater	CLIENT: GHD Woodhead Architecture Pty Ltd		TITLE: **Aerial Photograph 1985** **Proposed Additional Classrooms** **10 Yass Road, Queanbeyan East, NSW**	N	PROJECT No: 88406.01
	OFFICE: Canberra	DRAWN BY: ESS			PLATE No: D4
	SCALE: NTS	DATE: 21.02.2017			REVISION: 0

Douglas Partners Geotechnics / Environment / Groundwater	CLIENT: GHD Woodhead Architecture Pty Ltd	TITLE: **Aerial Photograph 1992** **Proposed Additional Classrooms** **10 Yass Road, Queanbeyan East, NSW**	PROJECT No: 88406.01
	OFFICE: Canberra / DRAWN BY: ESS		PLATE No: D5
	SCALE: NTS / DATE: 21.02.2017		REVISION: 0

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CLIENT: GHD Woodhead Architecture Pty Ltd		TITLE: **Aerial Photograph 2002**	PROJECT No: 88406.01
OFFICE: Canberra	DRAWN BY: ESS	**Proposed Additional Classrooms**	PLATE No: D6
SCALE: NTS	DATE: 21.02.2017	**10 Yass Road, Queanbeyan East, NSW**	REVISION: 0

Douglas Partners
Geotechnics / Environment / Groundwater

CLIENT: GHD Woodhead Architecture Pty Ltd		TITLE: **Aerial Photograph 2012**	PROJECT No: 88406.01
OFFICE: Canberra	DRAWN BY: ESS	**Proposed Additional Classrooms**	PLATE No: D7
SCALE: NTS	DATE: 21.02.2017	**10 Yass Road, Queanbeyan East, NSW**	REVISION: 0

Appendix E

Site Photographs (Five Plates)

Photo 1 – Stockpiles and building material located in the north east corner of the site.

Photo 2 – Stockpile of gravel.

Douglas Partners Geotechnics / Environment / Groundwater	**Site Photographs**	PROJECT:	88406.01
	Proposed Additional Classrooms	PLATE No:	1
	10 Yass Road, Queanbeyan East, NSW	REV:	0
	CLIENT: GHD Woodhead Architecture Pty Ltd	DATE:	28-Feb-17

Photo 3 – Stockpile of topsoil

Photo 4 – Garden enclosure and contents, located in the north east corner of the site.

Douglas Partners Geotechnics / Environment / Groundwater	**Site Photographs**	PROJECT:	88406.01
	Proposed Additional Classrooms	PLATE No:	2
	10 Yass Road, Queanbeyan East, NSW	REV:	0
	CLIENT: GHD Woodhead Architecture Pty Ltd	DATE:	28-Feb-17

Photo 5 – Garden enclosure and contents located in the north east corner of the site

Photo 6 – School playing field, facing southwards.

Douglas Partners Geotechnics / Environment / Groundwater	**Site Photographs**	PROJECT:	88406.01
	Proposed Additional Classrooms	PLATE No:	3
	10 Yass Road, Queanbeyan East, NSW	REV:	0
	CLIENT: GHD Woodhead Architecture Pty Ltd	DATE:	28-Feb-17

Photo 7 – School playing field facing northwards.

Photo 8 – Centre of the school yard, facing northwards.

Douglas Partners Geotechnics / Environment / Groundwater	**Site Photographs**	PROJECT:	88406.01
	Proposed Additional Classrooms	PLATE No:	4
	10 Yass Road, Queanbeyan East, NSW	REV:	0
	CLIENT: GHD Woodhead Architecture Pty Ltd	DATE:	28-Feb-17

Photo 9 – Centre of the school yard facing eastwards.

Photo 10 – Large central building

Douglas Partners Geotechnics / Environment / Groundwater	**Site Photographs**	PROJECT:	88406.01
	Proposed Additional Classrooms	PLATE No:	5
	10 Yass Road, Queanbeyan East, NSW	REV:	0
	CLIENT: GHD Woodhead Architecture Pty Ltd	DATE:	28-Feb-17

Appendix F

Data Quality Assessment
Chain of Custody (Field and Laboratory)
Sample Receipt

DATA QUALITY ASSESSMENT

Q1. Data Quality Objectives

The Preliminary Site Investigation (PSI) was prepared with reference to the seven step data quality objective (DQO) process which is provided in Appendix B, Schedule B2 of the *National Environment Protection (Assessment of Site Contamination) Measure* 1999 as amended 2013 (NEPC, 2013). The DQO process is outlined as follows:

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

The DQOs have been addressed within the report as shown in Table Q1.

Table Q1: Data Quality Objectives

Data Quality Objective	Report Section where Addressed
State the Problem	S1 Introduction
Identify the Decision	S15 Conclusions and Recommendations
Identify Inputs to the Decision	S1 Introduction S3 Site Identification and Description S4 Geotechnical Investigation S5 Regional Soils, Geology and Hydrogeology S6 Site History S7 Site Walkover S8 Potential for Contamination S9 Preliminary Conceptual Site Model S10 Site Assessment Criteria S13 Results of Investigation S14 Revised Conceptual Site Model
Define the Boundary of the Assessment	S3 Site Identification and Description Drawing 1 – Appendix B
Develop a Decision Rule	S10 Site Assessment Criteria
Specify Acceptable Limits on Decision Errors	S10 Site Assessment Criteria S11 Fieldwork QA/QC Procedures and Results – Sections Q2, Q3
Optimise the Design for Obtaining Data	S2 Scope of Work

	S9 Preliminary Conceptual Site Model S11 Fieldwork QA/QC Procedures and Results – Sections Q2, Q3

Q2. FIELD AND LABORATORY QUALITY CONTROL

The field and laboratory quality control (QC) procedures and results are summarised in Tables Q2 and Q3. Reference should be made to the fieldwork and analysis procedures in Section 10 and the laboratory results certificates in Appendix H for further details.

Table Q2: Field QC

Item	Frequency	Acceptance Criteria	Achievement
Intra-laboratory replicates	5% primary samples	RPD <30% inorganics), <50% (organics)	yes
Trip Spikes	1 per field batch	60-140% recovery	yes
Trip Blanks	1 per field batch	<PQL/LOR	yes

NOTES: 1 qualitative assessment of RPD results overall; refer Section Q2.1

Table Q3: Laboratory QC

Item	Frequency	Acceptance Criteria	Achievement
Analytical laboratories used		NATA accreditation	yes
Holding times		In accordance with NEPC (2013) which references various Australian and international standards	yes
Laboratory / Reagant Blanks	1 per lab batch	<PQL	yes
Laboratory duplicates	10% primary samples	<5xPQL – any RPD; >5xPQL – 0-50%RPD	yes
Matrix Spikes	1 per lab batch	70-130% recovery (inorganics); 60-140% (organics); 10-140% (SVOC, speciated phenols)	yes
Surrogate Spikes	organics by GC	70-130% recovery (inorganics); 60-140% (organics); 10-140% (SVOC, speciated phenols)	yes
Control Samples	1 per lab batch	70-130% recovery (inorganics); 60-140% (organics); 10-140% (SVOC, speciated phenols)	yes

In summary, the QC data is considered to be of sufficient quality to be acceptable for the assessment.

Q2.1 Intra-Laboratory Replicates

Intra-laboratory replicates were analysed as an internal check of the reproducibility within the primary laboratory Envirolab Services Pty Ltd (Envirolab) and as a measure of consistency of sampling

techniques. The comparative results of analysis between original and intra-laboratory replicate samples are summarised in Table Q4.

Note that, where both samples are below LOR/PQL the difference and RPD has been given as zero. Where one sample is reported below LOR/PQL, but a concentration is reported for the other, the LOR/PQL value has been used for calculation of the RPD for the less than LOR/PQL sample.

Table Q4: Relative Percentage Difference Results – Intra-laboratory Replicates

Lab	Sample ID	Date Sampled	Media	Units	Metals								PAH				TRH			
					As	Cd	Cr	Cu	Pb	Hg	Ni	Zn	Total	BaP TEQ	BaP	Naphthalene	F1	F2	F3	F4
Envirolab	Pit 5/0.2-0.25	1/03/2017	soil	mg/kg	<PQL	<PQL	16	14	19	<PQL	9	110	<PQL	<PQL	<PQL	<PQL	<PQL	230	600	140
Envirolab	R2/1032017	1/03/2017	soil	mg/kg	<PQL	<PQL	18	6	10	<PQL	12	74	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL
Difference				mg/kg	0	0	2	8	9	0	3	36	0	0	0	0	0	0	0	0
RPD				%	0	0	12	**80**	**62**	0	21	**39**	0	0	0	0	0	0	0	0

Table Q4 continued: Relative Percentage Difference Results – Intra-laboratory Replicates

Lab	Sample ID	Date Sampled	Media	Units	BTEX				Phenol	OCPs									OPPs	PCBs
					Benzene	Toluene	Ethylbenzene	xylene	Phenol	DDT +DDD +DDE	Aldrin + Dieldrin	Chlordane	Endosulfan	Endrin	Heptachlor	HCB	Methoxychlor	Total OCPs	Total	Total
Envirolab	Pit 5/0.2-0.25	1/03/2017	soil	mg/kg	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL
Envirolab	R2/1032017	1/03/2017	soil	mg/kg	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL
Difference				mg/kg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
RPD				%	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

The calculated RPD values were within the acceptable range of ± 30 for inorganic analytes and ± 50% for organics with the with the exception of those in bold. However, this is not considered to be significant because:

- Most of the recorded concentrations being at/ close to the practical quantitation limit;
- The replicate pair being collected from fill soils which were heterogeneous in nature;
- The majority of RPDs within a replicate pair being within the acceptable limits [the result for Pb of 62% is above the recommended RPD but the difference between results is minimal 19 mg/kg and 10 mg/kg respectively, the result for Zn of 39% is above the recommended RPD but the difference between results is minimal 110 mg/kg and 74 mg/kg respectively, and the result for Cu of 80% is above the recommended RPD but the difference between results is minimal 14 mg/kg and 6 mg/kg respectively]; and
- All other QA/QC parameters met the DQIs.

Overall, the intra-laboratory replicate comparisons indicate that the sampling techniques were generally consistent and repeatable.

Q3. Data Quality Indicators

The reliability of field procedures and analytical results was assessed against the following data quality indicators (DQIs):

- Completeness – a measure of the amount of usable data from a data collection activity;
- Comparability – the confidence (qualitative) that data may be considered to be equivalent for each sampling and analytical event;
- Representativeness – the confidence (qualitative) of data representativeness of media present on-site;
- Precision – a measure of variability or reproducibility of data; and
- Accuracy – a measure of closeness of the data to the 'true' value.

The DQIs were assessed as outlined in the following Table Q5.

Table Q5: Data Quality Indicators

Data Quality Indicator	Method(s) of Achievement
Completeness	Planned systematic and selected target locations sampled; Preparation of field logs, sample location plan and chain of custody (COC) records; Preparation of field groundwater sampling sheets; Laboratory sample receipt information received confirming receipt of samples intact and appropriateness of the chain of custody; Samples analysed for contaminants of potential concern (COPC) identified in the Conceptual Site Model (CSM); Completion of COC documentation; NATA endorsed laboratory certificates provided by the laboratory; Satisfactory frequency and results for field and laboratory QC samples as discussed in Section Q2.
Comparability	Using appropriate techniques for sample recovery, storage and transportation, which were the same for the duration of the project; Works undertaken by appropriately experienced and trained DP environmental scientist / engineer; Use of NATA registered laboratories, with test methods the same or similar between laboratories; Satisfactory results for field and laboratory QC samples.
Representativeness	Target media sampled; Spatial and temporal distribution of sample locations;

	Sample numbers recovered and analysed are considered to be representative of the target media and complying with DQOs; Samples were extracted and analysed within holding times; Samples were analysed in accordance with the analysis request.
Precision	Acceptable RPD between original samples and replicates; Satisfactory results for all other field and laboratory QC samples.
Accuracy	Satisfactory results for all field and laboratory QC samples.

Based on the above, it is considered that the DQIs have been complied with. As such, it is concluded that the field and laboratory test data obtained are reliable and useable for this assessment.

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CHAIN OF CUSTODY FIELD SHEET

Project No:	88406.01	**Client Project Name:**	Proposed Additional Classrooms
Client:	GHD Woodhead Architecture	**Location:**	10 Yass Rd, Queanbeyan
Project Manager:	Elyse Storr	**DP Lab Received**	By: Date:

Do samples contain 'potential' HBM? Yes ☐ No ☑ (If YES, then handle, transport and store in accordance with FPM HAZID)

Field									DP Lab	For Despatch to			Notes
Sample ID	Depth (m)	Duplicate Sample	Sample Type S - soil W - water	Container Type G - glass P - plastic	ASS Samples	Sampling By	Sampling Date	Sampling Time	Storage Locn *	Lab 1 [A] Date	Lab 2 [B] Date	Lab 3 [C] Date	
Pit 1	0.05-0.1		S	G		ESS	25/2/17		fridge	2/3/17 ✓			
"	0.2-0.3		"	"		"			"				
"	0.5-0.6		"	"		"			"				
"	1.0-1.1		"	"		"			"				
"	1.9-2.0		"	"					"				
Pit 2	0.05-0.1		"	"		SOG	1/3/17		"				
"	0.2-0.25		"	"		"			"	✓			
"	0.5-0.6		"	"		"			"				
"	1.0-1.1		"	"		"			"				
"	1.6-1.7		"	"		"			"				
Pit 3	0.05-0.1		"	"		"			"				
"	0.2-0.3	R3	"	"		"			"	✓			
"	0.5-0.6		"	"		"			"				
"	1.0-1.1		"	"		"			"				
"	2.0-2.1		"	"		"			"				
Pit 4	0.05-0.1		"	"		ESS	25/2/17		"				
"	0.2-0.3		"	"		"			"				

* **Default storage:** **glass containers in fridge, plastic containers shelved, ASS in freezer, water samples in fridge**

A Provide name of Lab 1 ENVIROLAB B Provide name of Lab 2 C Provide name of Lab 3

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CHAIN OF CUSTODY FIELD SHEET

Project No:	88406.01	**Client Project Name:**	Proposed Additional Classrooms
Client:	GHD Woodhead Architecture	**Location:**	10 Yass Rd, Queanbeyan
Project Manager:	Elyse Storr	**DP Lab Received**	By: Date:

Do samples contain 'potential' HBM? Yes ☐ No ☑ (If YES, then handle, transport and store in accordance with FPM HAZID)

Field									DP Lab	For Despatch to			Notes
Sample ID	Depth (m)	Duplicate Sample	Sample Type S - soil W - water	Container Type G - glass P - plastic	ASS Samples	Sampling By	Sampling Date	Sampling Time	Storage Locn *	Lab 1 [A] Date	Lab 2 [B] Date	Lab 3 [C] Date	
Pit 4	0.5-0.6		S	G		ESS	28/2/17		fridge	2/3/17			
↓	1.0-1.1		↓	↓		↓	↓		↓				
	1.9-2.0												
Pit 5	0.05-0.1					SOG	1/3/17						
	0.2-0.25	R2								✓✓			
	0.5-0.6												
	1.0-1.1												
↓	1.6-1.7					↓							
Pit 6	0.05-0.1					ESS				✓			
	0.2-0.3												
	0.5-0.6												
↓	1.0-1.1					↓							
Pit 7	0.05-0.1												
	0.2-0.3									✓			
	0.5-0.6												
	1.0-1.1												
↓	2.0-2.1		↓	↓		↓	↓		↓				

* **Default storage:** **glass containers in fridge,** **plastic containers shelved,** **ASS in freezer,** **water samples in fridge**

A Provide name of Lab 1 ENVIROLAB B Provide name of Lab 2 C Provide name of Lab 3

Douglas Partners
Geotechnics / Environment / Groundwater

CHAIN OF CUSTODY FIELD SHEET

Project No:	**88406.01**	**Client Project Name:**	**Proposed Additional Classrooms**
Client:	**GHD Woodhead Architecture**	**Location:**	**10 Yass Rd, Queanbeyan**
Project Manager:	**Elyse Storr**	**DP Lab Received**	By: Date:

Do samples contain 'potential' HBM? Yes ☐ No ☑ (If YES, then handle, transport and store in accordance with FPM HAZID)

Field										DP Lab	For Despatch to			Notes
Sample ID	Depth (m)	Duplicate Sample	Sample Type S - soil W - water	Container Type G - glass P - plastic	ASS Samples	Sampling By	Sampling Date	Sampling Time		Storage Locn *	Lab 1 [A] Date	Lab 2 [B] Date	Lab 3 [C] Date	
Pit 8	0.05-0.1	R1	S	G		ESS	28/2/17			fridge	2/3/17			
	0.2-0.3													
	0.5-0.6													
	1.0-1.1										✓			
	1.5-1.6													
Pit 9	0.05-0.1										✓			
	0.2-0.3													
	0.5-0.6													
	1.0-1.1													
	1.5-1.6													
Pit 10	0.05-0.1													
	0.2-0.3													
	0.5-0.6										✓			
	1.0-1.1													
	1.5-1.6													
	2.1-2.2													

* **Default storage: glass containers in fridge, plastic containers shelved, ASS in freezer, water samples in fridge**

A Provide name of Lab 1 Envirolab B Provide name of Lab 2 C Provide name of Lab 3

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CHAIN OF CUSTODY DESPATCH SHEET

Project Name: Proposed Additional Classrooms
Project No: 58406.01 DP Order No: 129624
DP Contact Person: Elyse Starr
Prior Storage: esky / fridge / shelved (circle)

To: Envirolab Services Pty Ltd
12 Ashley Street
CHATSWOOD NSW 2067
Ph: (02) 9910 6200
Attn: Jacinta Hurst

Sample ID	Date Sampled	Sample Type S-soil W-water	Lab ID	Analytes: Combination 8a			LCC	pH	clay content		TRH C6-C9	BTEX					TCLP	Notes
Pit1/0.05	28/2/17	S	1	X														
Pit2/0.2	1/3/17		2															
Pit3/0.2	1/3/17		3				X	X	X									
Pit4/0.05	28/2/17		4				X	X	X									
Pit5/0.2	1/3/17		5															
Pit6/0.05	1/3/17		6															
Pit7/0.2	1/3/17		7															
Pit8/1.0	28/2/17		8				X	X	X									
Pit9/0.05	28/2/17		9															
Pit10/0.5	28/2/17		10															
R2	1/3/17		11															
TS	28/2/17		12								X	X						
PQL (S)		mg/kg																
PQL (W)		mg/L																

ENVIROLAB

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

Job No: 163063
Date Received: 7.3
Time Received: 11:00
Received by: JAG
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

PQL = practical quantitation limit *As per Laboratory Method (Detection Limit)
# - Metals to Analyse (Please circle): As Cd Cr Cu Pb Zn Hg Ni Mn Fe
Date relinquished: 6/3/17
Total number of samples in container: 13
Results required by:
TAT (Circle): Standard 72 hr 48hr 24hr

SAMPLES RECEIVED
Please sign and date to acknowledge receipt of samples and return by fax
Signature:
Date: 7.3 Lab Ref: 163063

Send results to:
Douglas Partners Pty Ltd
Address:
PO BOX 1487 FYSHWICK
ACT 2609
Fax: (02) 6260 1147

Douglas Partners
Geotechnics · Environment · Groundwater

CHAIN OF CUSTODY DESPATCH SHEET

Project Name: Proposed Additional Classrooms
Project No: 84406.01 DP Order No: 129623
DP Contact Person: Elyse Starr
Prior Storage: esky / fridge / shelved (circle)

To: Envirolab Services Pty Ltd
12 Ashley Street
CHATSWOOD NSW 2067
Ph: (02) 9910 6200
Attn: Jacinta Hurst

Sample ID	Date Sampled	Sample Type S-soil W-water	Lab ID	Analytes														Notes
				TRH C6-C9	BTEX												TCLP	
TB	28/2/17	S	13	X	X													
PQL (S)		mg/kg																
PQL (W)		mg/L																

PQL = practical quantitation limit *As per Laboratory Method (Detection Limit)
# - Metals to Analyse (Please circle): As Cd Cr Cu Pb Zn Hg Ni Mn Fe
Date relinquished: 6/3/17
Total number of samples in container: 13
Results required by:
TAT (Circle): Standard 72 hr 48hr 24hr

SAMPLES RECEIVED
Please sign and date to acknowledge receipt of samples and return by fax
Signature:
Date: 7.3 Lab Ref: 163063

Send results to:
Douglas Partners Pty Ltd
Address:
PO BOX 1487 FYSHWICK
ACT 2609
Fax: (02) 6260 1147

Simon Song

From: Nancy Zhang
Sent: Friday, 17 March 2017 1:22 PM
To: Elyse Storr
Cc: Customer Service
Subject: RE: Results for Registration 163063 88406.01, Proposed Additional Classrooms

Hi Elyse,

No problem.

163063-A
Due: 24/3/17
Std TAT

Regards,

Nancy Zhang | Assistant Lab Manager | Envirolab Services Pty Ltd

Great Science, Great Service.

12 Ashley Street Chatswood NSW 2067
T 612 9910 6200 **F** 612 9910 6201
E nzhang@envirolab.com.au | **W** www.envirolab.com.au

From: Elyse Storr [mailto:Elyse.Storr@douglaspartners.com.au]
Sent: Friday, 17 March 2017 1:18 PM
To: Nancy Zhang <NZhang@envirolab.com.au>
Subject: RE: Results for Registration 163063 88406.01, Proposed Additional Classrooms

Hi Nancy,

(5)

Could I please request silica gel clean up on the sample Pit 5/0.2 (163063-5)?

Thanks,
Elyse

Elyse Storr | Environmental Engineer
Douglas Partners Pty Ltd | ABN 75 053 980 117 | www.douglaspartners.com.au
Unit 2 73 Sheppard Street Hume ACT 2620 | PO Box 1487 Fyshwick ACT 2609
P: 02 6260 2788 | F: 02 6260 1147 | E: Elyse.Storr@douglaspartners.com.au

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

SAMPLE RECEIPT ADVICE

Client Details	
Client	Douglas Partners Canberra
Attention	Elyse Storr

Sample Login Details	
Your Reference	88406.01, Proposed Additional Classrooms
Envirolab Reference	**163063**
Date Sample Received	07/03/2017
Date Instructions Received	07/03/2017
Date Results Expected to be Reported	**14/03/2017**

Sample Condition	
Samples received in appropriate condition for analysis	YES
No. of Samples Provided	13 soils
Turnaround Time Requested	Standard
Temperature on receipt (°C)	19.5
Cooling Method	Ice
Sampling Date Provided	YES

Comments
Samples will be held for 1 month for water samples and 2 months for soil samples from date of receipt of samples

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@envirolabservices.com.au	Email: jhurst@envirolabservices.com.au

Sample and Testing Details on 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
enquiries@envirolabservices.com.au
www.envirolabservices.com.au

Sample Id	*vTRH(C6-C10)/BTEXN in Soil*	*svTRH (C10-C40) in Soil*	*PAHs in Soil*	*Organochlorine Pesticides in soil*	*Organophosphorus Pesticides*	*PCBs in Soil*	*Acid Extractable metals in soil*	*Total Phenolics (as Phenol)*	*Asbestos ID - soils*	*pH 1:5 soil:water*	*Clay 50-120g*	*CEC*
Pit 1-0.05	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Pit 2-0.2	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Pit 3-0.2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Pit 4-0.05	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Pit 5-0.2	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Pit 6-0.05	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Pit 7-0.2	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Pit 8-1.0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Pit 9-0.05	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Pit 10-0.5	✓	✓	✓	✓	✓	✓	✓	✓	✓			
R2	✓	✓	✓	✓	✓	✓	✓	✓	✓			
TS	✓											
TB	✓											

Appendix G

Explanatory Notes
Test Pit Logs (Pits 1 to 10)

Sampling Methods

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Sampling

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

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

Undisturbed samples are taken by pushing a thin-walled sample tube into the soil and withdrawing it to obtain a sample of the soil in a relatively undisturbed state. Such samples yield information on structure and strength, and are necessary for laboratory determination of shear strength and compressibility. Undisturbed sampling is generally effective only in cohesive soils.

Test Pits

Test pits are usually excavated with a backhoe or an excavator, allowing close examination of the in-situ soil if it is safe to enter into the pit. The depth of excavation is limited to about 3 m for a backhoe and up to 6 m for a large excavator. A potential disadvantage of this investigation method is the larger area of disturbance to the site.

Large Diameter Augers

Boreholes can be drilled using a rotating plate or short spiral auger, generally 300 mm or larger in diameter commonly mounted on a standard piling rig. The cuttings are returned to the surface at intervals (generally not more than 0.5 m) and are disturbed but usually unchanged in moisture content. Identification of soil strata is generally much more reliable than with continuous spiral flight augers, and is usually supplemented by occasional undisturbed tube samples.

Continuous Spiral Flight Augers

The borehole is advanced using 90-115 mm diameter continuous spiral flight augers which are withdrawn at intervals to allow sampling or in-situ testing. This is a relatively economical means of drilling in clays and sands above the water table. Samples are returned to the surface, or may be collected after withdrawal of the auger flights, but they are disturbed and may be mixed with soils from the sides of the hole. Information from the drilling (as distinct from specific sampling by SPTs or undisturbed samples) is of relatively low reliability, due to the remoulding, possible mixing or softening of samples by groundwater.

Non-core Rotary Drilling

The borehole is advanced using a rotary bit, with water or drilling mud being pumped down the drill rods and returned up the annulus, carrying the drill cuttings. Only major changes in stratification can be determined from the cuttings, together with some information from the rate of penetration. Where drilling mud is used this can mask the cuttings and reliable identification is only possible from separate sampling such as SPTs.

Continuous Core Drilling

A continuous core sample can be obtained using a diamond tipped core barrel, usually with a 50 mm internal diameter. Provided full core recovery is achieved (which is not always possible in weak rocks and granular soils), this technique provides a very reliable method of investigation.

Standard Penetration Tests

Standard penetration tests (SPT) are used as a means of estimating the density or strength of soils and also of obtaining a relatively undisturbed sample. The test procedure is described in Australian Standard 1289, Methods of Testing Soils for Engineering Purposes - Test 6.3.1.

The test is carried out in a borehole by driving a 50 mm diameter split sample tube under the impact of a 63 kg hammer with a free fall of 760 mm. It is normal for the tube to be driven in three successive 150 mm increments and the 'N' value is taken as the number of blows for the last 300 mm. In dense sands, very hard clays or weak rock, the full 450 mm penetration may not be practicable and the test is discontinued.

The test results are reported in the following form.

- In the case where full penetration is obtained with successive blow counts for each 150 mm of, say, 4, 6 and 7 as:

  4,6,7
  N=13

- In the case where the test is discontinued before the full penetration depth, say after 15 blows for the first 150 mm and 30 blows for the next 40 mm as:

  15, 30/40 mm

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

Dynamic Cone Penetrometer Tests / Perth Sand Penetrometer Tests

Dynamic penetrometer tests (DCP or PSP) are carried out by driving a steel rod into the ground using a standard weight of hammer falling a specified distance. As the rod penetrates the soil the number of blows required to penetrate each successive 150 mm depth are recorded. Normally there is a depth limitation of 1.2 m, but this may be extended in certain conditions by the use of extension rods. Two types of penetrometer are commonly used.

- Perth sand penetrometer - a 16 mm diameter flat ended rod is driven using a 9 kg hammer dropping 600 mm (AS 1289, Test 6.3.3). This test was developed for testing the density of sands and is mainly used in granular soils and filling.
- Cone penetrometer - a 16 mm diameter rod with a 20 mm diameter cone end is driven using a 9 kg hammer dropping 510 mm (AS 1289, Test 6.3.2). This test was developed initially for pavement subgrade investigations, and correlations of the test results with California Bearing Ratio have been published by various road authorities.

Description and Classification Methods

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

Soil Types

Soil types are described according to the predominant particle size, qualified by the grading of other particles present:

Type	Particle size (mm)
Boulder	>200
Cobble	63 - 200
Gravel	2.36 - 63
Sand	0.075 - 2.36
Silt	0.002 - 0.075
Clay	<0.002

The sand and gravel sizes can be further subdivided as follows:

Type	Particle size (mm)
Coarse gravel	20 - 63
Medium gravel	6 - 20
Fine gravel	2.36 - 6
Coarse sand	0.6 - 2.36
Medium sand	0.2 - 0.6
Fine sand	0.075 - 0.2

The proportions of secondary constituents of soils are described as:

Term	Proportion	Example
And	Specify	Clay (60%) and Sand (40%)
Adjective	20 - 35%	Sandy Clay
Slightly	12 - 20%	Slightly Sandy Clay
With some	5 - 12%	Clay with some sand
With a trace of	0 - 5%	Clay with a trace of sand

Definitions of grading terms used are:

- Well graded - a good representation of all particle sizes
- Poorly graded - an excess or deficiency of particular sizes within the specified range
- Uniformly graded - an excess of a particular particle size
- Gap graded - a deficiency of a particular particle size with the range

Cohesive Soils

Cohesive soils, such as clays, are classified on the basis of undrained shear strength. The strength may be measured by laboratory testing, or estimated by field tests or engineering examination. The strength terms are defined as follows:

Description	Abbreviation	Undrained shear strength (kPa)
Very soft	vs	<12
Soft	s	12 - 25
Firm	f	25 - 50
Stiff	st	50 - 100
Very stiff	vst	100 - 200
Hard	h	>200

Cohesionless Soils

Cohesionless soils, such as clean sands, are classified on the basis of relative density, generally from the results of standard penetration tests (SPT), cone penetration tests (CPT) or dynamic penetrometers (PSP). The relative density terms are given below:

Relative Density	Abbreviation	SPT N value	CPT qc value (MPa)
Very loose	vl	<4	<2
Loose	l	4 - 10	2 -5
Medium dense	md	10 - 30	5 - 15
Dense	d	30 - 50	15 - 25
Very dense	vd	>50	>25

Soil Descriptions

Soil Origin

It is often difficult to accurately determine the origin of a soil. Soils can generally be classified as:

- Residual soil - derived from in-situ weathering of the underlying rock;
- Transported soils - formed somewhere else and transported by nature to the site; or
- Filling - moved by man.

Transported soils may be further subdivided into:

- Alluvium - river deposits
- Lacustrine - lake deposits
- Aeolian - wind deposits
- Littoral - beach deposits
- Estuarine - tidal river deposits
- Talus - scree or coarse colluvium
- Slopewash or Colluvium - transported downslope by gravity assisted by water. Often includes angular rock fragments and boulders.

Rock Strength

Rock strength is defined by the Point Load Strength Index ($Is_{(50)}$) and refers to the strength of the rock substance and not the strength of the overall rock mass, which may be considerably weaker due to defects. The test procedure is described by Australian Standard 4133.4.1 - 1993. The terms used to describe rock strength are as follows:

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

* Assumes a ratio of 20:1 for UCS to $Is_{(50)}$

Degree of Weathering

The degree of weathering of rock is classified as follows:

Term	Abbreviation	Description
Extremely weathered	EW	Rock substance has soil properties, i.e. it can be remoulded and classified as a soil but the texture of the original rock is still evident.
Highly weathered	HW	Limonite staining or bleaching affects whole of rock substance and other signs of decomposition are evident. Porosity and strength may be altered as a result of iron leaching or deposition. Colour and strength of original fresh rock is not recognisable
Moderately weathered	MW	Staining and discolouration of rock substance has taken place
Slightly weathered	SW	Rock substance is slightly discoloured but shows little or no change of strength from fresh rock
Fresh stained	Fs	Rock substance unaffected by weathering but staining visible along defects
Fresh	Fr	No signs of decomposition or staining

Degree of Fracturing

The following classification applies to the spacing of natural fractures in diamond drill cores. It includes bedding plane partings, joints and other defects, but excludes drilling breaks.

Term	Description
Fragmented	Fragments of <20 mm
Highly Fractured	Core lengths of 20-40 mm with some fragments
Fractured	Core lengths of 40-200 mm with some shorter and longer sections
Slightly Fractured	Core lengths of 200-1000 mm with some shorter and loner sections
Unbroken	Core lengths mostly > 1000 mm

Rock Descriptions

Rock Quality Designation

The quality of the cored rock can be measured using the Rock Quality Designation (RQD) index, defined as:

$$\text{RQD \%} = \frac{\text{cumulative length of 'sound' core sections} \geq \text{100 mm long}}{\text{total drilled length of section being assessed}}$$

where 'sound' rock is assessed to be rock of low strength or better. The RQD applies only to natural fractures. If the core is broken by drilling or handling (i.e. drilling breaks) then the broken pieces are fitted back together and are not included in the calculation of RQD.

Stratification Spacing

For sedimentary rocks the following terms may be used to describe the spacing of bedding partings:

Term	Separation of Stratification Planes
Thinly laminated	< 6 mm
Laminated	6 mm to 20 mm
Very thinly bedded	20 mm to 60 mm
Thinly bedded	60 mm to 0.2 m
Medium bedded	0.2 m to 0.6 m
Thickly bedded	0.6 m to 2 m
Very thickly bedded	> 2 m

TEST PIT LOG

CLIENT: GHD Woodhead Architecture Pty Ltd
PROJECT: Proposed Additional Classrooms
LOCATION: 10 Yass Road, Queanbeyan

SURFACE LEVEL: 585 m AHD
EASTING: 704034
NORTHING: 6086427

PIT No: 1
PROJECT No: 88406.00
DATE: 28/2/2017
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)
585	0.1	TOPSOIL FILLING-dry to moist, light brown sandy silt, abundant rootlets, trace gravels		E	0.05		PID<1		
		FILLING-stiff to very stiff, dry to moist, pale brown sand silt with some gravels and rootlets			0.1				
				E	0.2		PID<1		
				D	0.3				
	0.4	FILLING-very stiff to hard, dry to most, orange brown, medium plasticity sandy clay, some gravels			0.4				
					0.5		PID<1		
					0.6				
				U					
				E					
	0.9	SANDY CLAY-hard, dry to moist, orange/red brown, medium plasticity sandy clay, some gravels, quartz gravel, fine grained sand							
584	1			E	1.0		PID<1		1
					1.1				
	1.6	SILTY SANDY CLAY-hard, dry to moist, pale red brown, medium plasticity silty sandy clay							
	1.8	SANDSTONE-medium to high strength, moderately weathered, highly fractured, light brown, fine grained sandstone, possible volcanic intrusion		E	1.9		PID<1		
583	2 2.0	Pit discontinued at 2.0m -limit of investigation			2.0				2

RIG: Kubota U17-3 fitted with a 300mm diameter bucket

LOGGED: SDG

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No groundwater observed

REMARKS:

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

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: GHD Woodhead Architecture Pty Ltd
PROJECT: Proposed Additional Classrooms
LOCATION: 10 Yass Road, Queanbeyan

SURFACE LEVEL: 590 m AHD
EASTING: 704118
NORTHING: 6086420

PIT No: 2
PROJECT No: 88406.00
DATE: 28/2/2017
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
590	0.01	TANBARK/MULCH		E	0.05		PID<1		
		TOPSOIL FILLING-dry to moist, brown sandy silt with rootlets			0.1				
	0.15	FILLING-medium dense, dry to moist, brown gravelly silty sand with cobbles and rootlets		E	0.2		PID<1		
	0.25	SAND-dense, dry to moist, orange brown sand, fine to medium grained cemented sand, with some gravel			0.25				
				E	0.5		PID<1		
	0.6	SANDY SILT-hard, dry to moist, pale brown, low plasticity sandy silt			0.6				
589	1			E	1.0		PID<1		1
					1.1				
	1.2	SANDY CLAY-hard, dry to moist, orange /red brown, medium plasticity sandy clay, some sandstone cobbles and quartz gravels							
	1.6	CLAYEY SAND-cemented, dry to moist, yellow pale brown clayey sand, fine to medium grained, with gravels and sandstone cobbles		E	1.7		PID<1		
					1.8				
	1.9	Pit discontinued at 1.9m -slow progress							
588	2								2

RIG: Kubota U17-3 fitted with a 300mm diameter bucket

LOGGED: SDG

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No groundwater observed

REMARKS:

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

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: GHD Woodhead Architecture Pty Ltd
PROJECT: Proposed Additional Classrooms
LOCATION: 10 Yass Road, Queanbeyan

SURFACE LEVEL: 590.5 m AHD
EASTING: 704183
NORTHING: 6086408

PIT No: 3
PROJECT No: 88406.00
DATE: 28/2/2017
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 100mm)
590	0.1	TOPSOIL FILLING-dry to moist, orange brown silty sand with rootlets, cobbles and terracotta pipe		E	0.05		PID<1		
		FILLING-very stiff to hard, dry to moist, medium plasticity silty sandy clay with cobbles, a piece of concrete (300 x 200 x 200mm)		E	0.1				
					0.2		PID<1		
				D	0.3				
				E	0.5		PID<1		
	0.6	SANDY SILT-hard, dry to moist, pale brown, low plasticity sandy silt			0.6				
	0.8	SANDY CLAY-hard, dry to moist, orange brown with grey mottle, medium plasticity sandy clay with some gravels			0.8				
589	1			E	1.0		PID<1		1
				U	1.1				
				D	1.2				
					1.3				
	1.7	CLAYEY SAND-cemented, dry to moist, yellow brown clayey sand, fine to coarse grained		D	1.8				
	2			E	2.0		PID<1		2
588	2.1	Pit discontinued at 2.1m -limit of investigation			2.1				

RIG: Kubota U17-3 fitted with a 300mm diameter bucket

LOGGED: SDG

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No groundwater observed

REMARKS: large mature gum tress in area

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

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: GHD Woodhead Architecture Pty Ltd
PROJECT: Proposed Additional Classrooms
LOCATION: 10 Yass Road, Queanbeyan

SURFACE LEVEL: 585 m AHD
EASTING: 704039
NORTHING: 6186377

PIT No: 4
PROJECT No: 88406.00
DATE: 28/2/2017
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)
585	0.1	TOPSOIL FILLING-dry to moist, brown silty sand with rootlets		E	0.05		PID<1		
		FILLING-hard, dry to moist, pale brown grey, low plasticity gravelly silt with some rootlets		D	0.1				
				E	0.2		PID<1		
	0.35	FILLING-hard, dry to moist, red brown, medium plasticity gravelly silty clay with some gravel			0.3				
				E	0.5		PID<1		
	0.6	SANDY CLAY-stiff to hard, dry to moist, red brown dark grey, medium to high plasticity sandy clay with some gravels		U	0.6				
584	1			E	1.0		PID<1		1
					1.1				
	1.6	SILTY SANDY CLAY-very stiff, dry to moist, yellow brown/grey brown, medium plasticity silty sandy clay with some gravels		E	1.9		PID<1		
583	2 2.0	Pit discontinued at 2.0m -limit of investigation			2.0				2

RIG: Kubota U17-3 fitted with a 300mm diameter bucket

LOGGED: SDG

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No groundwater observed

REMARKS:

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

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: GHD Woodhead Architecture Pty Ltd
PROJECT: Proposed Additional Classrooms
LOCATION: 10 Yass Road, Queanbeyan

SURFACE LEVEL: 587 m AHD
EASTING: 704083
NORTHING: 6086377

PIT No: 5
PROJECT No: 88406.00
DATE: 28/2/2017
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)
587	0.1	TOPSOIL FILLING-dry to moist, brown silty sand with rootlets and rubbish (food wrappers)		E	0.05 0.1		PID<1		
	0.25	FILLING-soft to hard, dry to moist, light brown sandy silt with a piece of concrete (150mm)		E	0.2 0.25		PID<1		
		SANDY SILT-hard, dry to moist, pale brown, low plasticity sandy silt with roots and rootlets		E	0.5 0.6		PID<1		
	0.7	SANDY SILTY CLAY-hard, dry to moist, red brown, medium plasticity sandy silty clay with rootlets		D	0.8 0.9				
586	1			E	1.0 1.1		PID<1		1
	1.2	CLAYEY SAND-cemented, dry to moist, yellow brown clayey sand, fine to coarse grain with some gravels		E	1.6		PID<1		
	1.7	Pit discontinued at 1.7m -slow progress			1.7				
585	2								2

RIG: Kubota U17-3 fitted with a 300mm diameter bucket

LOGGED: SDG

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No groundwater observed

REMARKS: large trees

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

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: GHD Woodhead Architecture Pty Ltd
PROJECT: Proposed Additional Classrooms
LOCATION: 10 Yass Road, Queanbeyan

SURFACE LEVEL: 587 m AHD
EASTING: 704139
NORTHING: 6086345

PIT No: 6
PROJECT No: 88406.00
DATE: 28/2/2017
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 500mm)
587		TOPSOIL FILLING-dry to moist, orange brown sandy silt with rootlets		E	0.05 0.1		PID<1		
	0.15	SILTY SANDY CLAY-very stiff to hard, dry to moist, orange brown, medium plasticity silty sandy clay (possible filling)		E	0.2		PID<1		
		-large roots encountered at 0.3m			0.3		pp=>400		
	0.4	SANDY SILT-hard, dry to moist, pale brown, low plasticity sandy silt with roots		D E	0.5		pp=>400 PID<1		
	0.6	SANDY CLAY-hard, dry to moist, yellow/grey brown, low plasticity sandy clay			0.6				
	0.7	SANDSTONE-medium to high strength, moderately to slightly weathered highly fractured, grey brown sandstone							
586	1	- from 1.0 m a very high strength quartz vein		D E	1.0		PID<1		1
	1.1	Pit discontinued at 1.1m -bucket refusal			1.1				
585	2								2

RIG: Kubota U17-3 fitted with a 300mm diameter bucket

LOGGED: SDG

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No groundwater observed

REMARKS:

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

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: GHD Woodhead Architecture Pty Ltd
PROJECT: Proposed Additional Classrooms
LOCATION: 10 Yass Road, Queanbeyan

SURFACE LEVEL: 583.7 m AHD
EASTING: 704039
NORTHING: 6088331

PIT No: 7
PROJECT No: 88406.00
DATE: 28/2/2017
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 100mm)
									5 10 15 20
		TOPSOIL FILLING-dry to moist, brown silty sand with rootlets		E	0.05		PID<1		
	0.1				0.1				
		FILLING-very stiff to hard, dry to moist, light brown, low plasticity sandy silt with some gravels and rootlets							
				E	0.2		PID<1		
					0.3				
	0.4								
583		SANDY SILT-hard, dry to moist, low plasticity sandy silty with some rootlets							
				E	0.5		PID<1		
					0.6				
		-from 0.8m, pale brown							
	0.9								
		SANDY CLAY-hard, dry to moist, red brown, medium plasticity sandy clay with some ironstone nodules and gravels, coarse grained gravels							
	1			E	1.0		PID<1		1
					1.1				
				D	1.5				
582									
	1.8								
		SANDY SILTY CLAY-stiff, moist, red brown with grey mottle sandy silty clay with some quartz cobbles and gravels							
	2			D	2.0		PID<1		2
				E					
					2.1				
	2.2								
		Pit discontinued at 2.2m -limit of investigation							
581									

RIG: Kubota U17-3 fitted with a 300mm diameter bucket

LOGGED: SDG

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No groundwater observed

REMARKS:

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

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: GHD Woodhead Architecture Pty Ltd
PROJECT: Proposed Additional Classrooms
LOCATION: 10 Yass Road, Queanbeyan

SURFACE LEVEL: 585 m AHD
EASTING: 704084
NORTHING: 6086304

PIT No: 8
PROJECT No: 88406.00
DATE: 28/2/2017
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 110mm)
585	0.1	TOPSOIL FILLING-dry to moist, brown silty sandy with rootlets		E	0.05 0.1		PID<1		
		FILLING-very stiff to hard, dry to moist, light brown gravelly silty clay with rootlets			0.2		PID<1		
		-from 0.3m, gravelly silt with cobbles		E D	0.3				
					0.5		PID<1		
				E D	0.6				
584	1				1.0		PID<1		1
				E	1.1				
	1.2	CLAYEY SAND-medium dense to dense, red brown clayey sand, medium to coarse grained, some gravels							
					1.5		PID<1		
				E D	1.6				
	1.6	SANDY CLAY-stiff to very stiff, grey brown, medium plasticity sandy clay, some gravels and silt							
					1.9				
583	2 2.0	Pit discontinued at 2.0m -limit of investigation		D	2.0				2

RIG: Kubota U17-3 fitted with a 300mm diameter bucket

LOGGED: SDG

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No groundwater observed

REMARKS:

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

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: GHD Woodhead Architecture Pty Ltd
PROJECT: Proposed Additional Classrooms
LOCATION: 10 Yass Road, Queanbeyan

SURFACE LEVEL: 584 m AHD
EASTING: 704050
NORTHING: 6086310

PIT No: 9
PROJECT No: 88406.00
DATE: 28/2/2017
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 110mm)
584		TOPSOIL FILLING-dry to moist, light brown silty sand with rootlets		E	0.05 0.1		PID<1		
	0.15	FILLING-hard, dry to moist, low plasticity sandy gravelly clay, some cobbles		E D	0.2 0.3		PID<1		
		-from 0.4m, pale brown gravelly silt		E D	0.5 0.6		PID<1		
		-from 0.8m, red brown gravelly clay							
583	1			E	1.0 1.1		PID<1		1
	1.4	CLAYEY SAND-dense to medium dense, dry to most, red brown clayey sand with some silt and gravel		E D	1.5 1.6		PID<1		
	1.8	SANDY CLAY-stiff to very stiff, grey brown, medium plasticity sandy clay, some gravel and silt		D	1.9				
582	2 2.0	Pit discontinued at 2.0m -limit of investigation			2.0				2

RIG: Kubota U17-3 fitted with a 300mm diameter bucket

LOGGED: SDG

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No groundwater observed

REMARKS:

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

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: GHD Woodhead Architecture Pty Ltd
PROJECT: Proposed Additional Classrooms
LOCATION: 10 Yass Road, Queanbeyan

SURFACE LEVEL: 583 m AHD
EASTING: 704046
NORTHING: 6086254

PIT No: 10
PROJECT No: 88406.00
DATE: 28/2/2017
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)
583	0.1	TOPSOIL-dry to moist, light brown silty sand with some gravels and rootlets		E	0.05 0.1		PID<1		
		FILLING-dry to moist, light brown, low plasticity sandy silt with some rootlets		E D	0.2 0.3		PID<1		
	0.4	FILLING-dry to moist, red brown, low plasticity gravelly sandy clay with some cobbles, silt and rootlets		E	0.5 0.6		PID<1		
582	1			E	1.0		PID<1		1
	1.1	FILLING-very stiff to hard, dry to moist, low plasticity gravelly clay with cobbles		E	1.1 1.5 1.6		PID<1		
581	2								2
	2.1	GRAVELLY SANDY CLAY-hard, dry to moist, red brown, low plasticity gravelly sand clay with ironstone nodules and some fine to coarse grained sand		E	2.1		PID<1		
	2.2	Pit discontinued at 2.2m -limit of investigation			2.2				

RIG: Kubota U17-3 fitted with a 300mm diameter bucket

LOGGED: SDG

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No groundwater observed

REMARKS:

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

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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Appendix H

EIL Calculation Spreadsheets
Tables H1 to H4 (Summary of Laboratory Test Results)
Laboratory Certificates of Analysis

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TABLE H1
SUMMARY OF LABORATORY TEST RESULTS - INORGANICS (mg/kg)

Sample ID	Depth (m)	Sample Date	Material Type	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc
Pit 1	0.05-1.0	28/02/2017	Topsoil Filling (Sandy Silt)	<PQL	<PQL	20	3	13	<PQL	12	25
Pit 2	0.2-0.25	1/03/2017	Filling (Gravelly Silty Sand)	<PQL	<PQL	8	5	5	<PQL	4	9
Pit 3	0.2-0.3	1/03/2017	Filling (Silty Sandy Clay)	5	<PQL	19	11	14	<PQL	9	21
Pit 4	0.05-0.1	28/02/2017	Topsoil Filling (Silty Sand)	6	<PQL	19	8	16	<PQL	8	31
Pit 5	0.2-0.25	1/03/2017	Filling (Sandy Silt)	<PQL	<PQL	16	14	19	<PQL	9	110
R2	0.2-0.25	1/03/2017	Filling (Sandy Silt)	<PQL	<PQL	18	6	10	<PQL	12	74
Pit 6	0.05-0.1	1/03/2017	Topsoil Filling (Sandy Silt)	6	<PQL	28	11	16	<PQL	10	27
Pit 7	0.2-0.3	28/02/2017	Filling (Sandy Silt)	<PQL	<PQL	20	5	7	<PQL	18	20
Pit 8	1.0-1.1	28/02/2017	Filling (Gravelly Silt)	<PQL	<PQL	20	4	6	<PQL	20	22
Pit 9	0.05-0.1	28/02/2017	Topsoil Filling (Gravelly Clay)	5	<PQL	25	10	16	<PQL	11	37
Pit 10	0.5-0.6	28/02/2017	Filling (Gravelly Sandy Clay)	<PQL	<PQL	21	6	7	<PQL	19	25
PQL				4	0.4	1	1	1	0.1	1	1
HIL				100	20	100	6000	300	40	400	7400
EIL				100	NC	410	190	1100	NC	130	440

Notes:
HIL - Health Based Soil Investigation Levels for Low Density Residential Landuse Values
EIL - Environmental Soil Investigation Levels for lower bound Low Density Residential Landuse Values
PQL - Practical Quantitation Limit
NC - No Criteria
NT - Not Tested
R2 - replicate of Pit 5/0.2-0.3

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TABLE H2
SUMMARY OF LABORATORY TEST RESULTS - ORGANICS (PETROLEUM HYDROCARBONS - mg/kg)

Sample ID	Depth (m)	Sample Date	Material Type	Benzene	Toluene	Ethylbenzene	Xylene	F1	F2	F3	F4
Pit 1	0.05-1.0	28/02/2017	Topsoil Filling (Sandy Silt)	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL
Pit 2	0.2-0.25	1/03/2017	Filling (Gravelly Silty Sand)	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL
Pit 3	0.2-0.3	1/03/2017	Filling (Silty Sandy Clay)	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL
Pit 4	0.05-0.1	28/02/2017	Topsoil Filling (Silty Sand)	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL
Pit 5	0.2-0.25	1/03/2017	Filling (Sandy Silt)	<PQL	<PQL	<PQL	<PQL	<PQL	**230**	**600**	140
R2	0.2-0.25	1/03/2017	Filling (Sandy Silt)	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL
Pit 6	0.05-0.1	1/03/2017	Topsoil Filling (Sandy Silt)	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	170	150
Pit 7	0.2-0.3	28/02/2017	Filling (Sandy Silt)	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL
Pit 8	1.0-1.1	28/02/2017	Filling (Gravelly Silt)	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL
Pit 9	0.05-0.1	28/02/2017	Topsoil Filling (Gravelly Clay)	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL
Pit 10	0.5-0.6	28/02/2017	Filling (Gravelly Sandy Clay)	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL
PQL				0.2	0.5	1	3	25	50	100	100
HSL				0.5	160	55	40	45	110	NC	NC
ESL				50	85	70	105	180	120	300	2800
ML				NC	NC	NC	NC	700	1000	2500	10000

Notes:

HSL - Health Based Soil Screening Levels for Low Density Residential Landuse Values
ESL - Environmental Soil Screening Levels for lower bound Low Density Residential Landuse Values
ML - Management Limits for petroleum hydrocarbons
PQL - Practical Quantitation Limit

Bold	- Exceeds the Environmental Soil Screening Levels for lower bound Low Density Residential Landuse Values
NC	- No Criteria
NT	- Not Tested

R2 - replicate of Pit 5/0.2-0.3

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TABLE H3
SUMMARY OF LABORATORY TEST RESULTS - ORGANICS (PAH, Phenol, OCP, OPP, PCB - mg/kg) and ASBESTOS

Sample ID	Depth (m)	Sample Date	Material Type	BaP	BaP TEQ	Naphthalene	Total PAHs	Phenol	DDT+ DDE+ DDD	Aldrin+ dieldrin	Chlordane	Endosulfan	Endrin	Heptachlor	HCB	Methoxychlor	Chlorpyriphos	Total OCPs	Total OPPs	Total PCBs	Asbestos ID in soil <0.1g/kg
Pit 1	0.05-1.0	28/02/2017	Topsoil Filling (Sandy Silt)	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	ND
Pit 2	0.2-0.25	1/03/2017	Filling (Gravelly Silty Sand)	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	ND
Pit 3	0.2-0.3	1/03/2017	Filling (Silty Sandy Clay)	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	ND
Pit 4	0.05-0.1	28/02/2017	Topsoil Filling (Silty Sand)	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	ND
Pit 5	0.2-0.25	1/03/2017	Filling (Sandy Silt)	<PQL	<PQL	<PQL	0.2	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	ND
R2	0.2-0.25	1/03/2017	Filling (Sandy Silt)	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	ND
Pit 6	0.05-0.1	1/03/2017	Topsoil Filling (Sandy Silt)	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	ND
Pit 7	0.2-0.3	28/02/2017	Filling (Sandy Silt)	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	ND
Pit 8	1.0-1.1	28/02/2017	Filling (Gravelly Silt)	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	ND
Pit 9	0.05-0.1	28/02/2017	Topsoil Filling (Gravelly Clay)	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	ND
Pit 10	0.5-0.6	28/02/2017	Filling (Gravelly Sandy Clay)	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	ND
PQL				0.05	0.5	0.1	1.55	5	0.3	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	2	0.8	0.7	0.1
HIL/HSL				NC	3	3	300	100	240	6	50	270	10	6	10	300	160	NC	NC	1	NC
EIL/ESL				0.7	NC	170	NC	NC	180#	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC

Notes:

HIL - Health Based Soil Investigation/Screening Levels for Low Density Residential Landuse Values
EIL - Environmental Soil Investigation/Screening Levels for lower bound Low Density Residential Landuse Values
PQL - Practical Quantitation Limit
- Generic EIL for fresh DDT only
NC - No Criteria
NT - Not Tested
ND - Not Detected
R2 - replicate of Pit 5/0.2-0.3

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TABLE H4
SUMMARY OF LABORATORY TEST RESULTS - RESULTS OF TRH – SILICA GEL CLEANUP ANALYSIS - (mg/kg)

Sample ID	Depth (m)	Sample Date	Material Type	F2	F3	F4
Pit 5	0.2-0.25	1/03/2017	Filling (Sandy Silt)	<PQL	<PQL	<PQL
PQL				50	100	100
HSL				110	NC	NC
ESL				120	300	2800
ML				1000	2500	10000

Notes:

HSL - Health Based Soil Screening Levels for Low Density Residential Landuse Values
ESL - Environmental Soil Screening Levels for lower bound Low Density Residential Landuse Values
ML - Management Limits for petroleum hydrocarbons
PQL - Practical Quantitation Limit

NL	- Non Limiting
NC	- No Criteria
NT	- Not Tested

R2 - replicate of Pit 5/0.2-0.3

Inputs
Select contaminant from list below
As
Below needed to calculate fresh and aged ACLs
Below needed to calculate fresh and aged ABCs
or for fresh ABCs only
or for aged ABCs only

Outputs		
Land use	Arsenic generic EILs (mg contaminant/kg dry soil)	
	Fresh	Aged
National parks and areas of high conservation value	20	40
Urban residential and open public spaces	50	100
Commercial and industrial	80	160

Inputs
Select contaminant from list below
DDT
Below needed to calculate fresh and aged ACLs
Below needed to calculate fresh and aged ABCs
or for fresh ABCs only
or for aged ABCs only

Outputs		
Land use	DDT generic EILs (mg contaminant/kg dry soil)	
	Fresh	Aged
National parks and areas of high conservation value	3	3
Urban residential and open public spaces	180	180
Commercial and industrial	640	640

Inputs
Select contaminant from list below
Naphthalene
Below needed to calculate fresh and aged ACLs
Below needed to calculate fresh and aged ABCs
or for fresh ABCs only
or for aged ABCs only

Outputs		
Land use	Naphthalene generic EILs (mg contaminant/kg dry soil)	
	Fresh	Aged
National parks and areas of high conservation value	10	10
Urban residential and open public spaces	170	170
Commercial and industrial	370	370

Inputs
Select contaminant from list below
Pb
Below needed to calculate fresh and aged ACLs
Below needed to calculate fresh and aged ABCs
or for fresh ABCs only
or for aged ABCs only

Outputs		
Land use	Lead generic EILs (mg contaminant/kg dry soil)	
	Fresh	Aged
National parks and areas of high conservation value	110	470
Urban residential and open public spaces	270	1100
Commercial and industrial	440	1800

Inputs
Select contaminant from list below
Cu
Below needed to calculate fresh and aged ACLs
Enter cation exchange capacity (silver thiourea method) (values from 0 to 100 cmolc/kg dwt)
8.8
Enter soil pH (calcium chloride method) (values from 1 to 14)
6.9
Enter organic carbon content (%OC) (values from 0 to 50%)
1
Below needed to calculate fresh and aged ABCs
Measured background concentration (mg/kg). Leave blank if no measured value
or for fresh ABCs only
Enter iron content (aqua regia method) (values from 0 to 50%) to obtain estimate of background concentration
7
or for aged ABCs only
Enter State (or closest State)
NSW
Enter traffic volume (high or low)
low

Outputs		
Land use	Cu soil-specific EILs (mg contaminant/kg dry soil)	
	Fresh	Aged
National parks and areas of high conservation value	65	75
Urban residential and open public spaces	110	190
Commercial and industrial	150	270

Inputs
Select contaminant from list below
Ni
Below needed to calculate fresh and aged ACLs
Enter cation exchange capacity (silver thiourea method) (values from 0 to 100 cmolc/kg dwt)
8.8
Below needed to calculate fresh and aged ABCs
Measured background concentration (mg/kg). Leave blank if no measured value
or for fresh ABCs only
Enter iron content (aqua regia method) (values from 0 to 50%) to obtain estimate of background concentration
7
or for aged ABCs only
Enter State (or closest State)
NSW
Enter traffic volume (high or low)
low

Outputs		
Land use	Ni soil-specific EILs (mg contaminant/kg dry soil)	
	Fresh	Aged
National parks and areas of high conservation value	30	25
Urban residential and open public spaces	65	130
Commercial and industrial	100	220

Inputs
Select contaminant from list below
Cr_III
Below needed to calculate fresh and aged ACLs
Enter % clay (values from 0 to 100%)
10.7
Below needed to calculate fresh and aged ABCs
Measured background concentration (mg/kg). Leave blank if no measured value
or for fresh ABCs only
Enter iron content (aqua regia method) (values from 0 to 50%) to obtain estimate of background concentration
7
or for aged ABCs only
Enter State (or closest State)
NSW
Enter traffic volume (high or low)
low

Outputs		
Land use	Cr III soil-specific EILs (mg contaminant/kg dry soil)	
	Fresh	Aged
National parks and areas of high conservation value	130	140
Urban residential and open public spaces	240	410
Commercial and industrial	350	690

Inputs
Select contaminant from list below
Zn
Below needed to calculate fresh and aged ACLs
Enter cation exchange capacity (silver thiourea method) (values from 0 to 100 cmolc/kg dwt)
8.8
Enter soil pH (calcium chloride method) (values from 1 to 14)
6.9
Below needed to calculate fresh and aged ABCs
Measured background concentration (mg/kg). Leave blank if no measured value
or for fresh ABCs only
Enter iron content (aqua regia method) (values from 0 to 50%) to obtain estimate of background concentration
7
or for aged ABCs only
Enter State (or closest State)
NSW
Enter traffic volume (high or low)
low

Outputs		
Land use	Zn soil-specific EILs (mg contaminant/kg dry soil)	
	Fresh	Aged
National parks and areas of high conservation value	70	160
Urban residential and open public spaces	170	440
Commercial and industrial	260	640

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Envirolab Services Pty Ltd Sydney | ABN 37 112 535 645

CERTIFICATE OF ANALYSIS 163063

Client:

Douglas Partners Canberra
PO Box 1487
Fyshwick
ACT 2609

Attention: Elyse Storr

Sample log in details:

Your Reference:	**88406.01, Proposed Additional Classrooms**
No. of samples:	13 soils
Date samples received / completed instructions received	07/03/17 / 07/03/17

Analysis Details:

Please refer to the following pages for results, methodology summary and quality control data.
Samples were analysed as received from the client. Results relate specifically to the samples as received.
Results are reported on a dry weight basis for solids and on an as received basis for other matrices.
Please refer to the last page of this report for any comments relating to the results.

Report Details:

Date results requested by: / Issue Date:	14/03/17 / 14/03/17
Date of Preliminary Report:	Not Issued

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

Results Approved By:

David Springer
General Manager

vTRH(C6-C10)/BTEXN in Soil						
Our Reference:	UNITS	163063-1	163063-2	163063-3	163063-4	163063-5
Your Reference	---------- -	Pit 1	Pit 2	Pit 3	Pit 4	Pit 5
Depth	----------	0.05	0.2	0.2	0.05	0.2
Date Sampled		28/02/2017	1/03/2017	1/03/2017	28/02/2017	1/03/2017
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	08/03/2017	08/03/2017	08/03/2017	08/03/2017	08/03/2017
Date analysed	-	09/03/2017	09/03/2017	09/03/2017	09/03/2017	09/03/2017
TRHC$_6$ - C$_9$	mg/kg	<25	<25	<25	<25	<25
TRHC$_6$ - C$_{10}$	mg/kg	<25	<25	<25	<25	<25
vTPHC$_6$ - C$_{10}$ less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	105	113	110	107	93

vTRH(C6-C10)/BTEXN in Soil						
Our Reference:	UNITS	163063-6	163063-7	163063-8	163063-9	163063-10
Your Reference	---------- -	Pit 6	Pit 7	Pit 8	Pit 9	Pit 10
Depth	----------	0.05	0.2	1.0	0.05	0.5
Date Sampled		1/03/2017	1/03/2017	28/02/2017	28/02/2017	28/02/2017
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	08/03/2017	08/03/2017	08/03/2017	08/03/2017	08/03/2017
Date analysed	-	09/03/2017	09/03/2017	09/03/2017	09/03/2017	09/03/2017
TRHC$_6$ - C$_9$	mg/kg	<25	<25	<25	<25	<25
TRHC$_6$ - C$_{10}$	mg/kg	<25	<25	<25	<25	<25
vTPHC$_6$ - C$_{10}$ less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	87	104	89	113	100

vTRH(C6-C10)/BTEXN in Soil				
Our Reference:	UNITS	163063-11	163063-12	163063-13
Your Reference	---------- -	R2	TS	TB
Depth	----------	-	-	-
Date Sampled		1/03/2017	28/02/2017	28/02/2017
Type of sample		soil	soil	soil
Date extracted	-	08/03/2017	08/03/2017	08/03/2017
Date analysed	-	09/03/2017	09/03/2017	09/03/2017
TRHC$_6$ - C$_9$	mg/kg	<25	[NA]	<25
TRHC$_6$ - C$_{10}$	mg/kg	<25	[NA]	<25
vTPHC$_6$ - C$_{10}$ less BTEX (F1)	mg/kg	<25	[NA]	<25
Benzene	mg/kg	<0.2	96%	<0.2
Toluene	mg/kg	<0.5	95%	<0.5
Ethylbenzene	mg/kg	<1	93%	<1
m+p-xylene	mg/kg	<2	93%	<2
o-Xylene	mg/kg	<1	92%	<1
Total +ve Xylenes	mg/kg	<1	[NA]	<1
naphthalene	mg/kg	<1	[NA]	<1
Surrogate aaa-Trifluorotoluene	%	106	94	104

svTRH (C10-C40) in Soil						
Our Reference:	UNITS	163063-1	163063-2	163063-3	163063-4	163063-5
Your Reference	---------- -	Pit 1	Pit 2	Pit 3	Pit 4	Pit 5
Depth	----------	0.05	0.2	0.2	0.05	0.2
Date Sampled		28/02/2017	1/03/2017	1/03/2017	28/02/2017	1/03/2017
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	08/03/2017	08/03/2017	08/03/2017	08/03/2017	08/03/2017
Date analysed	-	08/03/2017	08/03/2017	08/03/2017	08/03/2017	08/03/2017
TRHC$_{10}$ - C$_{14}$	mg/kg	<50	<50	<50	<50	72
TRHC$_{15}$ - C$_{28}$	mg/kg	<100	<100	<100	<100	510
TRHC$_{29}$ - C$_{36}$	mg/kg	<100	<100	<100	<100	360
TRH>C$_{10}$-C$_{16}$	mg/kg	<50	<50	<50	<50	230
TRH>C$_{10}$ - C$_{16}$ less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	230
TRH>C$_{16}$-C$_{34}$	mg/kg	<100	<100	<100	<100	600
TRH>C$_{34}$-C$_{40}$	mg/kg	<100	<100	<100	<100	140
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	970
Surrogate o-Terphenyl	%	99	96	94	98	121

svTRH (C10-C40) in Soil						
Our Reference:	UNITS	163063-6	163063-7	163063-8	163063-9	163063-10
Your Reference	---------- -	Pit 6	Pit 7	Pit 8	Pit 9	Pit 10
Depth	----------	0.05	0.2	1.0	0.05	0.5
Date Sampled		1/03/2017	1/03/2017	28/02/2017	28/02/2017	28/02/2017
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	08/03/2017	08/03/2017	08/03/2017	08/03/2017	08/03/2017
Date analysed	-	08/03/2017	09/03/2017	09/03/2017	09/03/2017	09/03/2017
TRHC$_{10}$ - C$_{14}$	mg/kg	62	<50	<50	<50	<50
TRHC$_{15}$ - C$_{28}$	mg/kg	<100	<100	<100	<100	<100
TRHC$_{29}$ - C$_{36}$	mg/kg	170	<100	<100	<100	<100
TRH>C$_{10}$-C$_{16}$	mg/kg	<50	<50	<50	<50	<50
TRH>C$_{10}$ - C$_{16}$ less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH>C$_{16}$-C$_{34}$	mg/kg	170	<100	<100	<100	<100
TRH>C$_{34}$-C$_{40}$	mg/kg	150	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	320	<50	<50	<50	<50
Surrogate o-Terphenyl	%	99	97	98	98	96

svTRH (C10-C40) in Soil		
Our Reference:	UNITS	163063-11
Your Reference	----------	R2
	-	
Depth	----------	-
Date Sampled		1/03/2017
Type of sample		soil
Date extracted	-	08/03/2017
Date analysed	-	09/03/2017
$TRHC_{10}$ - C_{14}	mg/kg	<50
$TRHC_{15}$ - C_{28}	mg/kg	<100
$TRHC_{29}$ - C_{36}	mg/kg	<100
$TRH>C_{10}$-C_{16}	mg/kg	<50
$TRH>C_{10}$ - C_{16} less Naphthalene (F2)	mg/kg	<50
$TRH>C_{16}$-C_{34}	mg/kg	<100
$TRH>C_{34}$-C_{40}	mg/kg	<100
Total +ve TRH (>C10-C40)	mg/kg	<50
Surrogate o-Terphenyl	%	99

PAHs in Soil Our Reference: Your Reference	UNITS ----------	163063-1 Pit 1	163063-2 Pit 2	163063-3 Pit 3	163063-4 Pit 4	163063-5 Pit 5
Depth	----------	0.05	0.2	0.2	0.05	0.2
Date Sampled		28/02/2017	1/03/2017	1/03/2017	28/02/2017	1/03/2017
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	08/03/2017	08/03/2017	08/03/2017	08/03/2017	08/03/2017
Date analysed	-	08/03/2017	08/03/2017	08/03/2017	08/03/2017	08/03/2017
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Total +ve PAH's	mg/kg	<0.05	<0.05	<0.05	<0.05	0.2
Surrogate p-Terphenyl-d14	%	97	80	88	87	88

PAHs in Soil Our Reference: Your Reference	UNITS ----------	163063-6 Pit 6	163063-7 Pit 7	163063-8 Pit 8	163063-9 Pit 9	163063-10 Pit 10
Depth	----------	0.05	0.2	1.0	0.05	0.5
Date Sampled		1/03/2017	1/03/2017	28/02/2017	28/02/2017	28/02/2017
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	08/03/2017	08/03/2017	08/03/2017	08/03/2017	08/03/2017
Date analysed	-	08/03/2017	08/03/2017	08/03/2017	08/03/2017	08/03/2017
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Total +ve PAH's	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Surrogate p-Terphenyl-d14	%	88	90	86	91	85

PAHs in Soil		
Our Reference:	UNITS	163063-11
Your Reference	----------	R2
	-	
Depth	----------	-
Date Sampled		1/03/2017
Type of sample		soil
Date extracted	-	08/03/2017
Date analysed	-	08/03/2017
Naphthalene	mg/kg	<0.1
Acenaphthylene	mg/kg	<0.1
Acenaphthene	mg/kg	<0.1
Fluorene	mg/kg	<0.1
Phenanthrene	mg/kg	<0.1
Anthracene	mg/kg	<0.1
Fluoranthene	mg/kg	<0.1
Pyrene	mg/kg	<0.1
Benzo(a)anthracene	mg/kg	<0.1
Chrysene	mg/kg	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2
Benzo(a)pyrene	mg/kg	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5
Total +ve PAH's	mg/kg	<0.05
Surrogate p-Terphenyl-d14	%	81

Organochlorine Pesticides in soil						
Our Reference:	UNITS	163063-1	163063-2	163063-3	163063-4	163063-5
Your Reference	----------	Pit 1	Pit 2	Pit 3	Pit 4	Pit 5
	-					
Depth	----------	0.05	0.2	0.2	0.05	0.2
Date Sampled		28/02/2017	1/03/2017	1/03/2017	28/02/2017	1/03/2017
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	08/03/2017	08/03/2017	08/03/2017	08/03/2017	08/03/2017
Date analysed	-	08/03/2017	08/03/2017	08/03/2017	08/03/2017	08/03/2017
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	104	102	103	104	96

Organochlorine Pesticides in soil						
Our Reference:	UNITS	163063-6	163063-7	163063-8	163063-9	163063-10
Your Reference	----------	Pit 6	Pit 7	Pit 8	Pit 9	Pit 10
	-					
Depth	----------	0.05	0.2	1.0	0.05	0.5
Date Sampled		1/03/2017	1/03/2017	28/02/2017	28/02/2017	28/02/2017
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	08/03/2017	08/03/2017	08/03/2017	08/03/2017	08/03/2017
Date analysed	-	08/03/2017	08/03/2017	08/03/2017	08/03/2017	08/03/2017
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	101	104	104	104	104

Organochlorine Pesticides in soil		
Our Reference:	UNITS	163063-11
Your Reference	----------	R2
	-	
Depth	----------	-
Date Sampled		1/03/2017
Type of sample		soil
Date extracted	-	08/03/2017
Date analysed	-	08/03/2017
HCB	mg/kg	<0.1
alpha-BHC	mg/kg	<0.1
gamma-BHC	mg/kg	<0.1
beta-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
pp-DDD	mg/kg	<0.1
Endosulfan II	mg/kg	<0.1
pp-DDT	mg/kg	<0.1
Endrin Aldehyde	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	%	100

Organophosphorus Pesticides						
Our Reference:	UNITS	163063-1	163063-2	163063-3	163063-4	163063-5
Your Reference	---------- -	Pit 1	Pit 2	Pit 3	Pit 4	Pit 5
Depth	----------	0.05	0.2	0.2	0.05	0.2
Date Sampled		28/02/2017	1/03/2017	1/03/2017	28/02/2017	1/03/2017
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	08/03/2017	08/03/2017	08/03/2017	08/03/2017	08/03/2017
Date analysed	-	08/03/2017	08/03/2017	08/03/2017	08/03/2017	08/03/2017
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	104	102	103	104	96

Organophosphorus Pesticides						
Our Reference:	UNITS	163063-6	163063-7	163063-8	163063-9	163063-10
Your Reference	---------- -	Pit 6	Pit 7	Pit 8	Pit 9	Pit 10
Depth	----------	0.05	0.2	1.0	0.05	0.5
Date Sampled		1/03/2017	1/03/2017	28/02/2017	28/02/2017	28/02/2017
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	08/03/2017	08/03/2017	08/03/2017	08/03/2017	08/03/2017
Date analysed	-	08/03/2017	08/03/2017	08/03/2017	08/03/2017	08/03/2017
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	101	104	104	104	104

Organophosphorus Pesticides		
Our Reference:	UNITS	163063-11
Your Reference	----------	R2
	-	
Depth	----------	-
Date Sampled		1/03/2017
Type of sample		soil
Date extracted	-	08/03/2017
Date analysed	-	08/03/2017
Azinphos-methyl (Guthion)	mg/kg	<0.1
Bromophos-ethyl	mg/kg	<0.1
Chlorpyriphos	mg/kg	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1
Diazinon	mg/kg	<0.1
Dichlorvos	mg/kg	<0.1
Dimethoate	mg/kg	<0.1
Ethion	mg/kg	<0.1
Fenitrothion	mg/kg	<0.1
Malathion	mg/kg	<0.1
Parathion	mg/kg	<0.1
Ronnel	mg/kg	<0.1
Surrogate TCMX	%	100

PCBs in Soil						
Our Reference:	UNITS	163063-1	163063-2	163063-3	163063-4	163063-5
Your Reference	---------- -	Pit 1	Pit 2	Pit 3	Pit 4	Pit 5
Depth	----------	0.05	0.2	0.2	0.05	0.2
Date Sampled		28/02/2017	1/03/2017	1/03/2017	28/02/2017	1/03/2017
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	08/03/2017	08/03/2017	08/03/2017	08/03/2017	08/03/2017
Date analysed	-	08/03/2017	08/03/2017	08/03/2017	08/03/2017	08/03/2017
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	104	102	103	104	96

PCBs in Soil						
Our Reference:	UNITS	163063-6	163063-7	163063-8	163063-9	163063-10
Your Reference	---------- -	Pit 6	Pit 7	Pit 8	Pit 9	Pit 10
Depth	----------	0.05	0.2	1.0	0.05	0.5
Date Sampled		1/03/2017	1/03/2017	28/02/2017	28/02/2017	28/02/2017
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	08/03/2017	08/03/2017	08/03/2017	08/03/2017	08/03/2017
Date analysed	-	08/03/2017	08/03/2017	08/03/2017	08/03/2017	08/03/2017
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	101	104	104	104	104

PCBs in Soil		
Our Reference:	UNITS	163063-11
Your Reference	----------	R2
	-	
Depth	----------	-
Date Sampled		1/03/2017
Type of sample		soil
Date extracted	-	08/03/2017
Date analysed	-	08/03/2017
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 TCLMX	%	100

Acid Extractable metals in soil						
Our Reference:	UNITS	163063-1	163063-2	163063-3	163063-4	163063-5
Your Reference	----------	Pit 1	Pit 2	Pit 3	Pit 4	Pit 5
Depth	- ----------	0.05	0.2	0.2	0.05	0.2
Date Sampled		28/02/2017	1/03/2017	1/03/2017	28/02/2017	1/03/2017
Type of sample		soil	soil	soil	soil	soil
Date prepared	-	08/03/2017	08/03/2017	08/03/2017	08/03/2017	08/03/2017
Date analysed	-	09/03/2017	09/03/2017	09/03/2017	09/03/2017	09/03/2017
Arsenic	mg/kg	<4	<4	5	6	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	20	8	19	19	16
Copper	mg/kg	3	5	11	8	14
Lead	mg/kg	13	5	14	16	19
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	12	4	9	8	9
Zinc	mg/kg	25	9	21	31	110

Acid Extractable metals in soil						
Our Reference:	UNITS	163063-6	163063-7	163063-8	163063-9	163063-10
Your Reference	----------	Pit 6	Pit 7	Pit 8	Pit 9	Pit 10
Depth	- ----------	0.05	0.2	1.0	0.05	0.5
Date Sampled		1/03/2017	1/03/2017	28/02/2017	28/02/2017	28/02/2017
Type of sample		soil	soil	soil	soil	soil
Date prepared	-	08/03/2017	08/03/2017	08/03/2017	08/03/2017	08/03/2017
Date analysed	-	09/03/2017	09/03/2017	09/03/2017	09/03/2017	09/03/2017
Arsenic	mg/kg	6	<4	<4	5	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	28	20	20	25	21
Copper	mg/kg	11	5	4	10	6
Lead	mg/kg	16	7	6	16	7
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	10	18	20	11	19
Zinc	mg/kg	27	20	22	37	25

Acid Extractable metals in soil		
Our Reference:	UNITS	163063-11
Your Reference	----------	R2
	-	
Depth	----------	-
Date Sampled		1/03/2017
Type of sample		soil
Date prepared	-	08/03/2017
Date analysed	-	09/03/2017
Arsenic	mg/kg	<4
Cadmium	mg/kg	<0.4
Chromium	mg/kg	18
Copper	mg/kg	6
Lead	mg/kg	10
Mercury	mg/kg	<0.1
Nickel	mg/kg	12
Zinc	mg/kg	74

Misc Soil - Inorg						
Our Reference:	UNITS	163063-1	163063-2	163063-3	163063-4	163063-5
Your Reference	----------	Pit 1	Pit 2	Pit 3	Pit 4	Pit 5
	-					
Depth	----------	0.05	0.2	0.2	0.05	0.2
Date Sampled		28/02/2017	1/03/2017	1/03/2017	28/02/2017	1/03/2017
Type of sample		soil	soil	soil	soil	soil
Date prepared	-	08/03/2017	08/03/2017	08/03/2017	08/03/2017	08/03/2017
Date analysed	-	08/03/2017	08/03/2017	08/03/2017	08/03/2017	08/03/2017
Total Phenolics (as Phenol)	mg/kg	<5	<5	<5	<5	<5

Misc Soil - Inorg						
Our Reference:	UNITS	163063-6	163063-7	163063-8	163063-9	163063-10
Your Reference	----------	Pit 6	Pit 7	Pit 8	Pit 9	Pit 10
	-					
Depth	----------	0.05	0.2	1.0	0.05	0.5
Date Sampled		1/03/2017	1/03/2017	28/02/2017	28/02/2017	28/02/2017
Type of sample		soil	soil	soil	soil	soil
Date prepared	-	08/03/2017	08/03/2017	08/03/2017	08/03/2017	08/03/2017
Date analysed	-	08/03/2017	08/03/2017	08/03/2017	08/03/2017	08/03/2017
Total Phenolics (as Phenol)	mg/kg	<5	<5	<5	<5	<5

Misc Soil - Inorg		
Our Reference:	UNITS	163063-11
Your Reference	----------	R2
	-	
Depth	----------	-
Date Sampled		1/03/2017
Type of sample		soil
Date prepared	-	08/03/2017
Date analysed	-	08/03/2017
Total Phenolics (as Phenol)	mg/kg	<5

Moisture						
Our Reference:	UNITS	163063-1	163063-2	163063-3	163063-4	163063-5
Your Reference	---------- -	Pit 1	Pit 2	Pit 3	Pit 4	Pit 5
Depth	----------	0.05	0.2	0.2	0.05	0.2
Date Sampled		28/02/2017	1/03/2017	1/03/2017	28/02/2017	1/03/2017
Type of sample		soil	soil	soil	soil	soil
Date prepared	-	08/03/2017	08/03/2017	08/03/2017	08/03/2017	08/03/2017
Date analysed	-	09/03/2017	09/03/2017	09/03/2017	09/03/2017	09/03/2017
Moisture	%	1.9	2.6	4.6	1.6	5.2

Moisture						
Our Reference:	UNITS	163063-6	163063-7	163063-8	163063-9	163063-10
Your Reference	---------- -	Pit 6	Pit 7	Pit 8	Pit 9	Pit 10
Depth	----------	0.05	0.2	1.0	0.05	0.5
Date Sampled		1/03/2017	1/03/2017	28/02/2017	28/02/2017	28/02/2017
Type of sample		soil	soil	soil	soil	soil
Date prepared	-	08/03/2017	08/03/2017	08/03/2017	08/03/2017	08/03/2017
Date analysed	-	09/03/2017	09/03/2017	09/03/2017	09/03/2017	09/03/2017
Moisture	%	3.0	3.2	2.3	1.9	5.0

Moisture		
Our Reference:	UNITS	163063-11
Your Reference	---------- -	R2
Depth	----------	-
Date Sampled		1/03/2017
Type of sample		soil
Date prepared	-	08/03/2017
Date analysed	-	09/03/2017
Moisture	%	5.4

Asbestos ID - soils						
Our Reference:	UNITS	163063-1	163063-2	163063-3	163063-4	163063-5
Your Reference	---------- -	Pit 1	Pit 2	Pit 3	Pit 4	Pit 5
Depth	----------	0.05	0.2	0.2	0.05	0.2
Date Sampled		28/02/2017	1/03/2017	1/03/2017	28/02/2017	1/03/2017
Type of sample		soil	soil	soil	soil	soil
Date analysed	-	10/03/2017	10/03/2017	10/03/2017	10/03/2017	10/03/2017
Sample mass tested	g	Approx. 40g	Approx. 40g	Approx. 40g	Approx. 45g	Approx. 35g
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:	UNITS	163063-6	163063-7	163063-8	163063-9	163063-10
Your Reference	---------- -	Pit 6	Pit 7	Pit 8	Pit 9	Pit 10
Depth	----------	0.05	0.2	1.0	0.05	0.5
Date Sampled		1/03/2017	1/03/2017	28/02/2017	28/02/2017	28/02/2017
Type of sample		soil	soil	soil	soil	soil
Date analysed	-	10/03/2017	10/03/2017	10/03/2017	10/03/2017	10/03/2017
Sample mass tested	g	Approx. 35g	Approx. 40g	Approx. 40g	Approx. 40g	Approx. 35g
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:	UNITS	163063-11
Your Reference	----------	R2
	-	
Depth	----------	-
Date Sampled		1/03/2017
Type of sample		soil
Date analysed	-	10/03/2017
Sample mass tested	g	Approx. 35g
Sample Description	-	Brown fine-grained 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:	UNITS	163063-3	163063-4	163063-8
Your Reference	----------	Pit 3	Pit 4	Pit 8
	-			
Depth	----------	0.2	0.05	1.0
Date Sampled		1/03/2017	28/02/2017	28/02/2017
Type of sample		soil	soil	soil
Date prepared	-	13/03/2017	13/03/2017	13/03/2017
Date analysed	-	13/03/2017	13/03/2017	13/03/2017
pH 1:5 soil:water	pH Units	6.9	6.8	7.0

Clay 50-120g Our Reference: Your Reference	UNITS ---------- -	163063-3 Pit 3	163063-4 Pit 4	163063-8 Pit 8
Depth	----------	0.2	0.05	1.0
Date Sampled		1/03/2017	28/02/2017	28/02/2017
Type of sample		soil	soil	soil
Date prepared	-	10/03/2017	10/03/2017	10/03/2017
Date analysed	-	13/03/2017	13/03/2017	13/03/2017
Clay in soils <2µm	% (w/w)	10	11	11

CEC Our Reference: Your Reference	UNITS ---------- -	163063-3 Pit 3	163063-4 Pit 4	163063-8 Pit 8
Depth	----------	0.2	0.05	1.0
Date Sampled		1/03/2017	28/02/2017	28/02/2017
Type of sample		soil	soil	soil
Date prepared	-	13/03/2017	13/03/2017	13/03/2017
Date analysed	-	13/03/2017	13/03/2017	13/03/2017
Exchangeable Ca	meq/100g	6.5	6.4	3.2
Exchangeable K	meq/100g	1.0	0.5	0.2
Exchangeable Mg	meq/100g	2.8	1.5	4.3
Exchangeable Na	meq/100g	<0.1	<0.1	<0.1
Cation Exchange Capacity	meq/100g	10	8.5	7.8

Method ID	Methodology Summary
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-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.
Org-014	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-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	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013. For soil results:- 1. 'TEQ PQL' values are assuming all contributing PAHs reported as <PQL are actually at the PQL. This is the most conservative approach and can give false positive TEQs given that PAHs that contribute to the TEQ calculation may not be present. 2. 'TEQ zero' values are assuming all contributing PAHs reported as <PQL are zero. This is the least conservative approach and is more susceptible to false negative TEQs when PAHs that contribute to the TEQ calculation are present but below PQL. 3. 'TEQ half PQL' values are assuming all contributing PAHs reported as <PQL are half the stipulated PQL. Hence a mid-point between the most and least conservative approaches above. Note, the Total +ve PAHs PQL is reflective of the lowest individual PQL and is therefore" Total +ve PAHs" is simply a sum of the positive individual PAHs.
Org-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Org-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's. 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-008	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
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.

Method ID	Methodology Summary
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Inorg-031	Total Phenolics by segmented flow analyser (in line distillation with colourimetric finish). Solids are extracted in a caustic media prior to analysis.
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.
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.
AS1289.3.6.3	Determination Particle Size Analysis using AS1289.3.6.3 and AS1289.3.6.1 and in house method INORG-107. Clay fraction at <2µm reported.
Metals-009	Determination of exchangeable cations and cation exchange capacity in soils using 1M Ammonium Chloride exchange and ICP-AES analytical finish.

QUALITY CONTROL vTRH(C6-C10)/BTEXN in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base || Duplicate || %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			08/03/2017	163063-1	08/03/2017 || 08/03/2017	LCS-4	08/03/2017
Date analysed	-			09/03/2017	163063-1	09/03/2017 || 09/03/2017	LCS-4	09/03/2017
TRHC$_6$ - C$_9$	mg/kg	25	Org-016	<25	163063-1	<25 || <25	LCS-4	114%
TRHC$_6$ - C$_{10}$	mg/kg	25	Org-016	<25	163063-1	<25 || <25	LCS-4	114%
Benzene	mg/kg	0.2	Org-016	<0.2	163063-1	<0.2 || <0.2	LCS-4	119%
Toluene	mg/kg	0.5	Org-016	<0.5	163063-1	<0.5 || <0.5	LCS-4	115%
Ethylbenzene	mg/kg	1	Org-016	<1	163063-1	<1 || <1	LCS-4	114%
m+p-xylene	mg/kg	2	Org-016	<2	163063-1	<2 || <2	LCS-4	112%
o-Xylene	mg/kg	1	Org-016	<1	163063-1	<1 || <1	LCS-4	114%
naphthalene	mg/kg	1	Org-014	<1	163063-1	<1 || <1	[NR]	[NR]
Surrogate aaa-Trifluorotoluene	%		Org-016	106	163063-1	105 || 100 || RPD: 5	LCS-4	111%

QUALITY CONTROL svTRH (C10-C40) in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base || Duplicate || %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			08/03/2017	163063-1	08/03/2017 || 08/03/2017	LCS-4	08/03/2017
Date analysed	-			08/03/2017	163063-1	08/03/2017 || 08/03/2017	LCS-4	08/03/2017
TRHC$_{10}$ - C$_{14}$	mg/kg	50	Org-003	<50	163063-1	<50 || <50	LCS-4	98%
TRHC$_{15}$ - C$_{28}$	mg/kg	100	Org-003	<100	163063-1	<100 || <100	LCS-4	97%
TRHC$_{29}$ - C$_{36}$	mg/kg	100	Org-003	<100	163063-1	<100 || <100	LCS-4	71%
TRH>C$_{10}$-C$_{16}$	mg/kg	50	Org-003	<50	163063-1	<50 || <50	LCS-4	98%
TRH>C$_{16}$-C$_{34}$	mg/kg	100	Org-003	<100	163063-1	<100 || <100	LCS-4	97%
TRH>C$_{34}$-C$_{40}$	mg/kg	100	Org-003	<100	163063-1	<100 || <100	LCS-4	71%
Surrogate o-Terphenyl	%		Org-003	97	163063-1	99 || 99 || RPD: 0	LCS-4	95%

QUALITY CONTROL PAHs in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base || Duplicate || %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			08/03/2017	163063-1	08/03/2017 || 08/03/2017	LCS-4	08/03/2017
Date analysed	-			08/03/2017	163063-1	08/03/2017 || 08/03/2017	LCS-4	08/03/2017
Naphthalene	mg/kg	0.1	Org-012	<0.1	163063-1	<0.1 || <0.1	LCS-4	87%
Acenaphthylene	mg/kg	0.1	Org-012	<0.1	163063-1	<0.1 || <0.1	[NR]	[NR]
Acenaphthene	mg/kg	0.1	Org-012	<0.1	163063-1	<0.1 || <0.1	[NR]	[NR]
Fluorene	mg/kg	0.1	Org-012	<0.1	163063-1	<0.1 || <0.1	LCS-4	90%
Phenanthrene	mg/kg	0.1	Org-012	<0.1	163063-1	<0.1 || <0.1	LCS-4	104%
Anthracene	mg/kg	0.1	Org-012	<0.1	163063-1	<0.1 || <0.1	[NR]	[NR]
Fluoranthene	mg/kg	0.1	Org-012	<0.1	163063-1	<0.1 || <0.1	LCS-4	100%
Pyrene	mg/kg	0.1	Org-012	<0.1	163063-1	<0.1 || <0.1	LCS-4	101%
Benzo(a)anthracene	mg/kg	0.1	Org-012	<0.1	163063-1	<0.1 || <0.1	[NR]	[NR]
Chrysene	mg/kg	0.1	Org-012	<0.1	163063-1	<0.1 || <0.1	LCS-4	90%
Benzo(b,j +k)fluoranthene	mg/kg	0.2	Org-012	<0.2	163063-1	<0.2 || <0.2	[NR]	[NR]

QUALITY CONTROL PAHs in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Benzo(a)pyrene	mg/kg	0.05	Org-012	<0.05	163063-1	<0.05 || <0.05	LCS-4	99%
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012	<0.1	163063-1	<0.1 || <0.1	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012	<0.1	163063-1	<0.1 || <0.1	[NR]	[NR]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012	<0.1	163063-1	<0.1 || <0.1	[NR]	[NR]
Surrogate p-Terphenyl-d14	%		Org-012	87	163063-1	97 || 80 || RPD: 19	LCS-4	92%
QUALITY CONTROL Organochlorine Pesticides in soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			08/03/2017	163063-1	08/03/2017 || 08/03/2017	LCS-4	08/03/2017
Date analysed	-			08/03/2017	163063-1	08/03/2017 || 08/03/2017	LCS-4	08/03/2017
HCB	mg/kg	0.1	Org-005	<0.1	163063-1	<0.1 || <0.1	[NR]	[NR]
alpha-BHC	mg/kg	0.1	Org-005	<0.1	163063-1	<0.1 || <0.1	LCS-4	88%
gamma-BHC	mg/kg	0.1	Org-005	<0.1	163063-1	<0.1 || <0.1	[NR]	[NR]
beta-BHC	mg/kg	0.1	Org-005	<0.1	163063-1	<0.1 || <0.1	LCS-4	92%
Heptachlor	mg/kg	0.1	Org-005	<0.1	163063-1	<0.1 || <0.1	LCS-4	94%
delta-BHC	mg/kg	0.1	Org-005	<0.1	163063-1	<0.1 || <0.1	[NR]	[NR]
Aldrin	mg/kg	0.1	Org-005	<0.1	163063-1	<0.1 || <0.1	LCS-4	92%
Heptachlor Epoxide	mg/kg	0.1	Org-005	<0.1	163063-1	<0.1 || <0.1	LCS-4	92%
gamma-Chlordane	mg/kg	0.1	Org-005	<0.1	163063-1	<0.1 || <0.1	[NR]	[NR]
alpha-chlordane	mg/kg	0.1	Org-005	<0.1	163063-1	<0.1 || <0.1	[NR]	[NR]
Endosulfan I	mg/kg	0.1	Org-005	<0.1	163063-1	<0.1 || <0.1	[NR]	[NR]
pp-DDE	mg/kg	0.1	Org-005	<0.1	163063-1	<0.1 || <0.1	LCS-4	92%
Dieldrin	mg/kg	0.1	Org-005	<0.1	163063-1	<0.1 || <0.1	LCS-4	106%
Endrin	mg/kg	0.1	Org-005	<0.1	163063-1	<0.1 || <0.1	LCS-4	97%
pp-DDD	mg/kg	0.1	Org-005	<0.1	163063-1	<0.1 || <0.1	LCS-4	88%
Endosulfan II	mg/kg	0.1	Org-005	<0.1	163063-1	<0.1 || <0.1	[NR]	[NR]
pp-DDT	mg/kg	0.1	Org-005	<0.1	163063-1	<0.1 || <0.1	[NR]	[NR]
Endrin Aldehyde	mg/kg	0.1	Org-005	<0.1	163063-1	<0.1 || <0.1	[NR]	[NR]
Endosulfan Sulphate	mg/kg	0.1	Org-005	<0.1	163063-1	<0.1 || <0.1	LCS-4	72%
Methoxychlor	mg/kg	0.1	Org-005	<0.1	163063-1	<0.1 || <0.1	[NR]	[NR]
Surrogate TCMX	%		Org-005	102	163063-1	104 || 104 || RPD: 0	LCS-4	104%

QUALITY CONTROL Organophosphorus Pesticides	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			08/03/2017	163063-1	08/03/2017 || 08/03/2017	LCS-4	08/03/2017
Date analysed	-			08/03/2017	163063-1	08/03/2017 || 08/03/2017	LCS-4	08/03/2017
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-008	<0.1	163063-1	<0.1 || <0.1	[NR]	[NR]
Bromophos-ethyl	mg/kg	0.1	Org-008	<0.1	163063-1	<0.1 || <0.1	[NR]	[NR]
Chlorpyriphos	mg/kg	0.1	Org-008	<0.1	163063-1	<0.1 || <0.1	LCS-4	81%
Chlorpyriphos-methyl	mg/kg	0.1	Org-008	<0.1	163063-1	<0.1 || <0.1	[NR]	[NR]
Diazinon	mg/kg	0.1	Org-008	<0.1	163063-1	<0.1 || <0.1	[NR]	[NR]
Dichlorvos	mg/kg	0.1	Org-008	<0.1	163063-1	<0.1 || <0.1	LCS-4	83%
Dimethoate	mg/kg	0.1	Org-008	<0.1	163063-1	<0.1 || <0.1	[NR]	[NR]
Ethion	mg/kg	0.1	Org-008	<0.1	163063-1	<0.1 || <0.1	LCS-4	84%
Fenitrothion	mg/kg	0.1	Org-008	<0.1	163063-1	<0.1 || <0.1	LCS-4	90%
Malathion	mg/kg	0.1	Org-008	<0.1	163063-1	<0.1 || <0.1	LCS-4	81%
Parathion	mg/kg	0.1	Org-008	<0.1	163063-1	<0.1 || <0.1	LCS-4	94%
Ronnel	mg/kg	0.1	Org-008	<0.1	163063-1	<0.1 || <0.1	LCS-4	77%
Surrogate TCMX	%		Org-008	102	163063-1	104 || 104 || RPD: 0	LCS-4	103%

QUALITY CONTROL PCBs in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			08/03/2017	163063-1	08/03/2017 || 08/03/2017	LCS-4	08/03/2017
Date analysed	-			08/03/2017	163063-1	08/03/2017 || 08/03/2017	LCS-4	08/03/2017
Aroclor 1016	mg/kg	0.1	Org-006	<0.1	163063-1	<0.1 || <0.1	[NR]	[NR]
Aroclor 1221	mg/kg	0.1	Org-006	<0.1	163063-1	<0.1 || <0.1	[NR]	[NR]
Aroclor 1232	mg/kg	0.1	Org-006	<0.1	163063-1	<0.1 || <0.1	[NR]	[NR]
Aroclor 1242	mg/kg	0.1	Org-006	<0.1	163063-1	<0.1 || <0.1	[NR]	[NR]
Aroclor 1248	mg/kg	0.1	Org-006	<0.1	163063-1	<0.1 || <0.1	[NR]	[NR]
Aroclor 1254	mg/kg	0.1	Org-006	<0.1	163063-1	<0.1 || <0.1	LCS-4	100%
Aroclor 1260	mg/kg	0.1	Org-006	<0.1	163063-1	<0.1 || <0.1	[NR]	[NR]
Surrogate TCLMX	%		Org-006	102	163063-1	104 || 104 || RPD: 0	LCS-4	103%

QUALITY CONTROL Acid Extractable metals in soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date prepared	-			08/03/2017	163063-1	08/03/2017 || 08/03/2017	LCS-4	08/03/2017
Date analysed	-			09/03/2017	163063-1	09/03/2017 || 09/03/2017	LCS-4	09/03/2017
Arsenic	mg/kg	4	Metals-020	<4	163063-1	<4 || <4	LCS-4	107%
Cadmium	mg/kg	0.4	Metals-020	<0.4	163063-1	<0.4 || <0.4	LCS-4	94%
Chromium	mg/kg	1	Metals-020	<1	163063-1	20 || 19 || RPD: 5	LCS-4	102%
Copper	mg/kg	1	Metals-020	<1	163063-1	3 || 3 || RPD: 0	LCS-4	101%
Lead	mg/kg	1	Metals-020	<1	163063-1	13 || 12 || RPD: 8	LCS-4	96%
Mercury	mg/kg	0.1	Metals-021	<0.1	163063-1	<0.1 || <0.1	LCS-4	96%
Nickel	mg/kg	1	Metals-020	<1	163063-1	12 || 12 || RPD: 0	LCS-4	93%
Zinc	mg/kg	1	Metals-020	<1	163063-1	25 || 24 || RPD: 4	LCS-4	95%

QUALITY CONTROL Misc Soil - Inorg	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date prepared	-			08/03/2017	163063-1	08/03/2017 || 08/03/2017	LCS-1	08/03/2017
Date analysed	-			08/03/2017	163063-1	08/03/2017 || 08/03/2017	LCS-1	08/03/2017
Total Phenolics (as Phenol)	mg/kg	5	Inorg-031	<5	163063-1	<5 || <5	LCS-1	102%

QUALITY CONTROL Misc Inorg - Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date prepared	-			13/03/2017	[NT]	[NT]	LCS-4	13/03/2017
Date analysed	-			13/03/2017	[NT]	[NT]	LCS-4	13/03/2017
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	[NT]	[NT]	LCS-4	101%

QUALITY CONTROL Clay 50-120g	UNITS	PQL	METHOD	Blank
Date prepared	-			[NT]
Date analysed	-			[NT]
Clay in soils <2µm	% (w/w)		AS1289.3.6.3	[NT]

QUALITY CONTROL CEC	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date prepared	-			13/03/2017	[NT]	[NT]	LCS-4	13/03/2017
Date analysed	-			13/03/2017	[NT]	[NT]	LCS-4	13/03/2017
Exchangeable Ca	meq/100g	0.1	Metals-009	<0.1	[NT]	[NT]	LCS-4	106%
Exchangeable K	meq/100g	0.1	Metals-009	<0.1	[NT]	[NT]	LCS-4	97%
Exchangeable Mg	meq/100g	0.1	Metals-009	<0.1	[NT]	[NT]	LCS-4	106%

QUALITY CONTROL CEC	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Exchangeable Na	meq/100 g	0.1	Metals-009	<0.1	[NT]	[NT]	LCS-4	106%

QUALITY CONTROL vTRH(C6-C10)/BTEXN in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	163063-11	08/03/2017 || 08/03/2017	163063-2	08/03/2017
Date analysed	-	163063-11	09/03/2017 || 09/03/2017	163063-2	09/03/2017
TRHC$_6$ - C$_9$	mg/kg	163063-11	<25 || <25	163063-2	113%
TRHC$_6$ - C$_{10}$	mg/kg	163063-11	<25 || <25	163063-2	113%
Benzene	mg/kg	163063-11	<0.2 || <0.2	163063-2	117%
Toluene	mg/kg	163063-11	<0.5 || <0.5	163063-2	113%
Ethylbenzene	mg/kg	163063-11	<1 || <1	163063-2	113%
m+p-xylene	mg/kg	163063-11	<2 || <2	163063-2	111%
o-Xylene	mg/kg	163063-11	<1 || <1	163063-2	113%
naphthalene	mg/kg	163063-11	<1 || <1	[NR]	[NR]
Surrogate aaa-Trifluorotoluene	%	163063-11	106 || 110 || RPD: 4	163063-2	106%

QUALITY CONTROL svTRH (C10-C40) in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	163063-11	08/03/2017 || 08/03/2017	163063-2	08/03/2017
Date analysed	-	163063-11	09/03/2017 || 09/03/2017	163063-2	08/03/2017
TRHC$_{10}$ - C$_{14}$	mg/kg	163063-11	<50 || <50	163063-2	96%
TRHC$_{15}$ - C$_{28}$	mg/kg	163063-11	<100 || <100	163063-2	94%
TRHC$_{29}$ - C$_{36}$	mg/kg	163063-11	<100 || <100	163063-2	78%
TRH>C$_{10}$-C$_{16}$	mg/kg	163063-11	<50 || 51	163063-2	96%
TRH>C$_{16}$-C$_{34}$	mg/kg	163063-11	<100 || <100	163063-2	94%
TRH>C$_{34}$-C$_{40}$	mg/kg	163063-11	<100 || <100	163063-2	78%
Surrogate o-Terphenyl	%	163063-11	99 || 97 || RPD: 2	163063-2	96%

QUALITY CONTROL PAHs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	163063-11	08/03/2017 || 08/03/2017	163063-2	08/03/2017
Date analysed	-	163063-11	08/03/2017 || 08/03/2017	163063-2	08/03/2017
Naphthalene	mg/kg	163063-11	<0.1 || <0.1	163063-2	89%
Acenaphthylene	mg/kg	163063-11	<0.1 || <0.1	[NR]	[NR]
Acenaphthene	mg/kg	163063-11	<0.1 || <0.1	[NR]	[NR]
Fluorene	mg/kg	163063-11	<0.1 || <0.1	163063-2	92%
Phenanthrene	mg/kg	163063-11	<0.1 || <0.1	163063-2	91%
Anthracene	mg/kg	163063-11	<0.1 || <0.1	[NR]	[NR]
Fluoranthene	mg/kg	163063-11	<0.1 || <0.1	163063-2	91%
Pyrene	mg/kg	163063-11	<0.1 || <0.1	163063-2	98%
Benzo(a)anthracene	mg/kg	163063-11	<0.1 || <0.1	[NR]	[NR]
Chrysene	mg/kg	163063-11	<0.1 || <0.1	163063-2	84%

QUALITY CONTROL PAHs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Benzo(b,j+k)fluoranthene	mg/kg	163063-11	<0.2 || <0.2	[NR]	[NR]
Benzo(a)pyrene	mg/kg	163063-11	<0.05 || <0.05	163063-2	86%
Indeno(1,2,3-c,d)pyrene	mg/kg	163063-11	<0.1 || <0.1	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	163063-11	<0.1 || <0.1	[NR]	[NR]
Benzo(g,h,i)perylene	mg/kg	163063-11	<0.1 || <0.1	[NR]	[NR]
Surrogate p-Terphenyl-d14	%	163063-11	81 || 83 || RPD: 2	163063-2	93%
QUALITY CONTROL Organochlorine Pesticides in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	163063-11	08/03/2017 || 08/03/2017	163063-2	08/03/2017
Date analysed	-	163063-11	08/03/2017 || 08/03/2017	163063-2	08/03/2017
HCB	mg/kg	163063-11	<0.1 || <0.1	[NR]	[NR]
alpha-BHC	mg/kg	163063-11	<0.1 || <0.1	163063-2	93%
gamma-BHC	mg/kg	163063-11	<0.1 || <0.1	[NR]	[NR]
beta-BHC	mg/kg	163063-11	<0.1 || <0.1	163063-2	90%
Heptachlor	mg/kg	163063-11	<0.1 || <0.1	163063-2	94%
delta-BHC	mg/kg	163063-11	<0.1 || <0.1	[NR]	[NR]
Aldrin	mg/kg	163063-11	<0.1 || <0.1	163063-2	93%
Heptachlor Epoxide	mg/kg	163063-11	<0.1 || <0.1	163063-2	92%
gamma-Chlordane	mg/kg	163063-11	<0.1 || <0.1	[NR]	[NR]
alpha-chlordane	mg/kg	163063-11	<0.1 || <0.1	[NR]	[NR]
Endosulfan I	mg/kg	163063-11	<0.1 || <0.1	[NR]	[NR]
pp-DDE	mg/kg	163063-11	<0.1 || <0.1	163063-2	93%
Dieldrin	mg/kg	163063-11	<0.1 || <0.1	163063-2	104%
Endrin	mg/kg	163063-11	<0.1 || <0.1	163063-2	60%
pp-DDD	mg/kg	163063-11	<0.1 || <0.1	163063-2	86%
Endosulfan II	mg/kg	163063-11	<0.1 || <0.1	[NR]	[NR]
pp-DDT	mg/kg	163063-11	<0.1 || <0.1	[NR]	[NR]
Endrin Aldehyde	mg/kg	163063-11	<0.1 || <0.1	[NR]	[NR]
Endosulfan Sulphate	mg/kg	163063-11	<0.1 || <0.1	163063-2	73%
Methoxychlor	mg/kg	163063-11	<0.1 || <0.1	[NR]	[NR]
Surrogate TCMX	%	163063-11	100 || 99 || RPD: 1	163063-2	103%

QUALITY CONTROL Organophosphorus Pesticides	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	163063-11	08/03/2017 || 08/03/2017	163063-2	08/03/2017
Date analysed	-	163063-11	08/03/2017 || 08/03/2017	163063-2	08/03/2017
Azinphos-methyl (Guthion)	mg/kg	163063-11	<0.1 || <0.1	[NR]	[NR]
Bromophos-ethyl	mg/kg	163063-11	<0.1 || <0.1	[NR]	[NR]
Chlorpyriphos	mg/kg	163063-11	<0.1 || <0.1	163063-2	81%
Chlorpyriphos-methyl	mg/kg	163063-11	<0.1 || <0.1	[NR]	[NR]
Diazinon	mg/kg	163063-11	<0.1 || <0.1	[NR]	[NR]
Dichlorvos	mg/kg	163063-11	<0.1 || <0.1	163063-2	83%
Dimethoate	mg/kg	163063-11	<0.1 || <0.1	[NR]	[NR]
Ethion	mg/kg	163063-11	<0.1 || <0.1	163063-2	73%
Fenitrothion	mg/kg	163063-11	<0.1 || <0.1	163063-2	75%
Malathion	mg/kg	163063-11	<0.1 || <0.1	163063-2	71%
Parathion	mg/kg	163063-11	<0.1 || <0.1	163063-2	89%
Ronnel	mg/kg	163063-11	<0.1 || <0.1	163063-2	87%
Surrogate TCMX	%	163063-11	100 || 99 || RPD: 1	163063-2	96%

QUALITY CONTROL PCBs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	163063-11	08/03/2017 || 08/03/2017	163063-2	08/03/2017
Date analysed	-	163063-11	08/03/2017 || 08/03/2017	163063-2	08/03/2017
Aroclor 1016	mg/kg	163063-11	<0.1 || <0.1	[NR]	[NR]
Aroclor 1221	mg/kg	163063-11	<0.1 || <0.1	[NR]	[NR]
Aroclor 1232	mg/kg	163063-11	<0.1 || <0.1	[NR]	[NR]
Aroclor 1242	mg/kg	163063-11	<0.1 || <0.1	[NR]	[NR]
Aroclor 1248	mg/kg	163063-11	<0.1 || <0.1	[NR]	[NR]
Aroclor 1254	mg/kg	163063-11	<0.1 || <0.1	163063-2	102%
Aroclor 1260	mg/kg	163063-11	<0.1 || <0.1	[NR]	[NR]
Surrogate TCLMX	%	163063-11	100 || 99 || RPD: 1	163063-2	102%

QUALITY CONTROL Acid Extractable metals in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date prepared	-	163063-11	08/03/2017 || 08/03/2017	163063-2	08/03/2017
Date analysed	-	163063-11	09/03/2017 || 09/03/2017	163063-2	09/03/2017
Arsenic	mg/kg	163063-11	<4 || <4	163063-2	91%
Cadmium	mg/kg	163063-11	<0.4 || <0.4	163063-2	97%
Chromium	mg/kg	163063-11	18 || 17 || RPD: 6	163063-2	98%
Copper	mg/kg	163063-11	6 || 6 || RPD: 0	163063-2	101%
Lead	mg/kg	163063-11	10 || 12 || RPD: 18	163063-2	96%
Mercury	mg/kg	163063-11	<0.1 || <0.1	163063-2	96%
Nickel	mg/kg	163063-11	12 || 10 || RPD: 18	163063-2	93%
Zinc	mg/kg	163063-11	74 || 80 || RPD: 8	163063-2	94%

QUALITY CONTROL Misc Soil - Inorg	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date prepared	-	163063-11	08/03/2017 || 08/03/2017	163063-2	08/03/2017
Date analysed	-	163063-11	08/03/2017 || 08/03/2017	163063-2	08/03/2017
Total Phenolics (as Phenol)	mg/kg	163063-11	<5 || <5	163063-2	96%

QUALITY CONTROL CEC	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD
Date prepared	-	163063-3	13/03/2017 || 13/03/2017
Date analysed	-	163063-3	13/03/2017 || 13/03/2017
Exchangeable Ca	meq/100 g	163063-3	6.5 || 6.7 || RPD: 3
Exchangeable K	meq/100 g	163063-3	1.0 || 0.8 || RPD: 22
Exchangeable Mg	meq/100 g	163063-3	2.8 || 2.6 || RPD: 7
Exchangeable Na	meq/100 g	163063-3	<0.1 || <0.1

Report Comments:

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 163063- 1 to 11 were sub-sampled from jars provided by the client.

Asbestos ID was analysed by Approved Identifier: Paul Ching
Asbestos ID was authorised by Approved Signatory: Paul Ching

INS: Insufficient sample for this test
NR: Test not required
<: Less than

PQL: Practical Quantitation Limit
RPD: Relative Percent Difference
>: Greater than

NT: Not tested
NA: Test not required
LCS: Laboratory Control Sample

Quality Control Definitions

Blank: This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.

Duplicate: This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.

Matrix Spike : A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

LCS (Laboratory Control Sample) : This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

Surrogate Spike: Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.
Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.
Spikes for Physical and Aggregate Tests are not applicable.
For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.
Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

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

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

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

Measurement Uncertainty estimates are available for most tests upon request.

12 Ashley Street, Chatswood, NSW 2067
tel: +61 2 9910 6200

email: sydney@envirolab.com.au
envirolab.com.au

Envirolab Services Pty Ltd Sydney | ABN 37 112 535 645

CERTIFICATE OF ANALYSIS 163063-A

Client:

Douglas Partners Canberra
PO Box 1487
Fyshwick
ACT 2609

Attention: Elyse Storr

Sample log in details:

Your Reference:	**88406.01, Proposed Additional Classrooms**
No. of samples:	Additional Testing on 1 Soil
Date samples received / completed instructions received	07/03/17 / 17/03/17

Analysis Details:

Please refer to the following pages for results, methodology summary and quality control data.
Samples were analysed as received from the client. Results relate specifically to the samples as received.
Results are reported on a dry weight basis for solids and on an as received basis for other matrices.
Please refer to the last page of this report for any comments relating to the results.

Report Details:

Date results requested by: / Issue Date:	24/03/17 / 22/03/17
Date of Preliminary Report:	Not Issued

NATA accreditation number 2901. This document shall not be reproduced except in full.
Accredited for compliance with ISO/IEC 17025 - Testing **Tests not covered by NATA are denoted with *.**

Results Approved By:

David Springer
General Manager

sTPH in Soil (C10-C40)-Silica		
Our Reference:	UNITS	163063-A-5
Your Reference	---------- -	Pit 5
Depth	----------	0.2
Date Sampled		1/03/2017
Type of sample		soil
Date extracted	-	20/03/2017
Date analysed	-	20/03/2017
TPH C_{10} - C_{14}	mg/kg	<50
TPH C_{15} - C_{28}	mg/kg	<100
TPH C_{29} - C_{36}	mg/kg	<100
TPH >C_{10}-C_{16}	mg/kg	<50
TPH >C_{16}-C_{34}	mg/kg	<100
TPH >C_{34}-C_{40}	mg/kg	<100
Surrogate o-Terphenyl	%	112

Method ID	Methodology Summary
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.

QUALITY CONTROL sTPH in Soil (C10-C40)-Silica	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			20/03/2017	[NT]	[NT]	LCS-2	20/03/2017
Date analysed	-			20/03/2017	[NT]	[NT]	LCS-2	20/03/2017
TPH C_{10} - C_{14}	mg/kg	50	Org-003	<50	[NT]	[NT]	LCS-2	93%
TPH C_{15} - C_{28}	mg/kg	100	Org-003	<100	[NT]	[NT]	LCS-2	93%
TPH C_{29} - C_{36}	mg/kg	100	Org-003	<100	[NT]	[NT]	LCS-2	123%
TPH >C_{10}-C_{16}	mg/kg	50	Org-003	<50	[NT]	[NT]	LCS-2	93%
TPH >C_{16}-C_{34}	mg/kg	100	Org-003	<100	[NT]	[NT]	LCS-2	93%
TPH >C_{34}-C_{40}	mg/kg	100	Org-003	<100	[NT]	[NT]	LCS-2	123%
Surrogate o-Terphenyl	%		Org-003	94	[NT]	[NT]	LCS-2	94%

Report Comments:
Analysed outside of RHT

Asbestos ID was analysed by Approved Identifier:	Not applicable for this job
Asbestos ID was authorised by Approved Signatory:	Not applicable for this job

INS: Insufficient sample for this test	PQL: Practical Quantitation Limit	NT: Not tested
NR: Test not required	RPD: Relative Percent Difference	NA: Test not required
<: Less than	>: Greater than	LCS: Laboratory Control Sample

Quality Control Definitions

Blank: This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.

Duplicate: This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.

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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.

SITE PLAN - DEMOLITION
SCALE 1 : 500

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

DEVELOPMENT APPLICATION

No	Revision	Drawn	Job Manager	Project Director	Date
B	DEVELOPMENT APPLICATION	CA	JK	DB	30.10.2017
A	DA - ISSUED FOR REVIEW	CA	JK	DB	23.10.2017

Note: * indicates signatures on original issue of drawing or last revision of drawing

0 5 10 15 20 25 m
SCALE 1:500 AT ORIGINAL SIZE

NSW GOVERNMENT Education

GHDWOODHEAD
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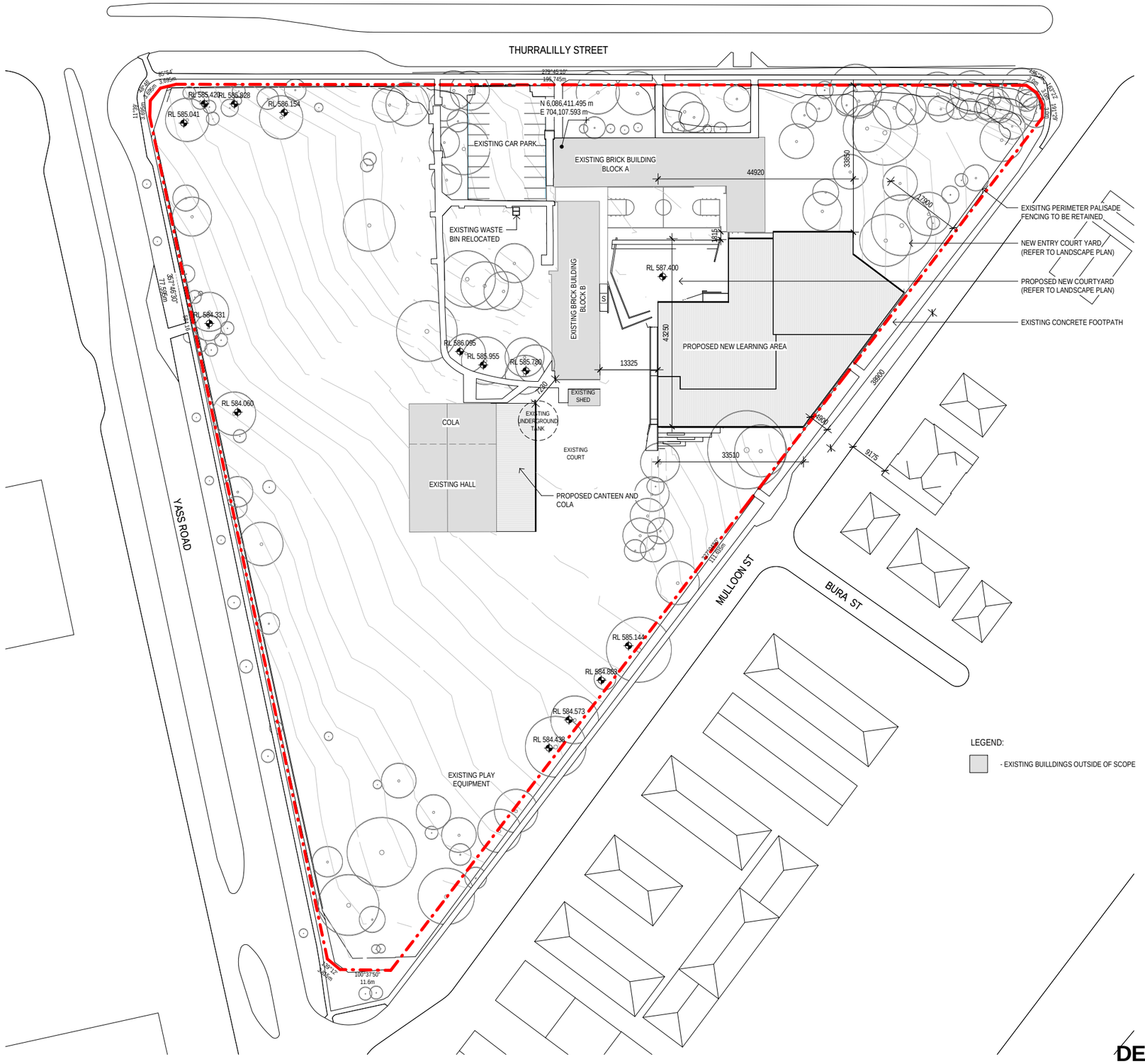
T 61 2 6113 3200 F 61 2 6113 3299
E cbrmail@ghd.com W www.ghd.com

Drawn	P. MARTINEZ	Designer	J. KAIRES
Drafting Check		Design Check	J. KAIRES
Approved (Project Director)	P. THATCHER		
Nominated / Responsible Architect			
Scale	1 : 500	This Drawing must not be used for Construction unless signed as Approved	

Client **QUEANBEYAN EAST PUBLIC SCHOOL**
Project **NEW LEARNING CENTRE**
Title **SITE DEMOLITION PLAN**
Original Size **A1**
Drawing No: **23-16004 - QEPS - DA-AR-0200** Rev: **B**

Plot Date: 30/10/2017 3:47:37 PM
Cad File No: C:\Users\caudley\Documents\Revit 2017 Local Files\23-16004-A-S-R17_caudley.rvt



PROPOSED - SITE PLAN
SCALE 1 : 500

DEVELOPMENT APPLICATION

No	Revision	Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Job Manager	Project Director	Date
B	DEVELOPMENT APPLICATION		CA	JK	PT	30.10.2017
A	DA - ISSUED FOR REVIEW		CA	JK	PT	23.10.2017

0 5 10 15 20 25 m
SCALE 1:500 AT ORIGINAL SIZE

NSW GOVERNMENT Education

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Drawn	C.AUDLEY	Designer	J. KAIRES
Drafting Check		Design Check	J. KAIRES
Approved (Project Director)	P. THATCHER		
Nominated / Responsible Architect			
Scale	1 : 500	This Drawing must not be used for Construction unless signed as Approved	

Client **QUEANBEYAN EAST PUBLIC SCHOOL**
Project **NEW LEARNING CENTRE**
Title **PROPOSED SITE PLAN**
Original Size **A1**
Drawing No: **23-16004 - QEPS - DA-AR-1000** Rev: **B**

Plot Date: 30/10/2017 3:48:09 PM
Cad File No: C:\Users\caudley\Documents\Revit 2017 Local Files\23-16004-A-S-R17_caudley.rvt

30 October 2017

NSW Department of Education & Communities

Our ref: 2316004
Your ref:

Dear Sir/Madam

Queanbeyan East Public School
Waste Management Plan

GHD was requested to prepare a Waste Management Plan (WMP) for upgrading of the Queanbeyan East Public School (the School), which will be capable of accommodating up to 322 students from Years K to 6.

This report has been prepared to accompany the Development Application (DA) for the new learning centre works at the School and will be lodged with Queanbeyan-Palerang Regional Council (the Council).

This WMP addresses only the construction of a new learning centre at the School, and demolition of outdoor areas including the computer lab. Consideration for existing demountables and play equipment is excluded from this WMP as these will be removed for future reuse elsewhere.

The attached Site Demolition Plan shows the demolition work to be undertaken, which is minimal.

1 Council Development Control Plan 2012 Requirements

The Council Development Control Plan (DCP) 2012 outlines the following requirements within Section B – Part 2, item 2.3.5 Waste and Recycling (as part of item 2.3 Environmental Management), which covers the following:

> *Non Residential Development*
>
> *a) Development applications for all non-residential development must be accompanied by a waste management plan…*

1.1 Objectives

Per the Council DCP 2012, the objectives include the following:

> *The minimisation of waste from development can reduce impacts on the public domain, contribute to the amenity of the building and limit the potential harmful impacts to the environment. Waste management refers to all stages of development from construction and use through to demolition and the ongoing generation of waste. It also includes the way in which waste is accessed, stored and collected.*
>
> *1) To minimise waste generation and disposal to landfill with careful source separation, reuse and recycling.*

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2) To minimise the generation of waste through design, material selection, building and best waste management practices.

3) To plan for the types, amount and disposal of waste to be generated during demolition, excavation and construction of the development as well as the ongoing generation of waste.

4) To ensure efficient storage and collection of waste and quality design of facilities.

1.2 Controls

Per the Council DCP 2012, the WMP is to address/control the following:

i) Best practice recycling and reuse of construction and demolition materials.

ii) Use of sustainable building materials that can be reused or recycled at the end of their life.

iii) Handling methods and location of waste storage areas such that handling and storage has no negative impact on the streetscape, building presentation or amenity of occupants and pedestrians.

iv) Storage areas need to be of sufficient size to store and provide access to bins capable of dealing with the types and quantities of waste for the development. For example, a small shop or office may be able to be serviced by Council's normal 240L kerbside collection service. At the opposite extreme a supermarket may require space for a paper/cardboard compactor and storage of bales produced, multiple overhead lift bulk containers and other containers for recyclables.

v) Storage areas for commercial premises which have larger quantities of putrescible waste e.g. food premises or supermarkets need to be provided with wash down facilities connected to sewer. These storage areas need to be roofed to prevent ingress of stormwater to the sewerage system.

vi) Procedures for the ongoing sustainable management of green waste; garbage and recyclables including glass, metals and paper; including access, estimated volumes; required bin capacity and onsite storage requirements.

2 Demolition and Construction Waste

2.1 Demolition Waste

The attached Site Demolition Plan shows that the demolition work comprises removal of a canopy over stair, a COLA roof, a computer lab and some trees.

Demountable buildings and play equipment will be removed for future reuse at other sites and are therefore not considered within this WMP.

2.1.1 Other Council Guidelines

With regard to the generation of demolition waste, a review of the Council DCP 2012 did not identify guidance on typical quantities of demolition waste for non-residential development. As such, a review of other council guidelines was conducted.

The Hills Shire Council DCP 2012 Appendix A provides guidance on typical quantities of demolition waste for office block developments (though not specifically for school developments), segregated by material types as identified in Table 1.

Table 1 Guidance on Typical Quantities of Demolition Waste

Building Type	Concrete	Bricks	Timber/Gyprock	Steel	Other
Office Block	7,410	1,485	124	29	155
Note: Assumed as tonnes per 1,000 square metres (m^2)					

Using the assumption that the computer lab (approximately 65 m^2) is similar to an office block and that the canopy and COLA (combined at approximately 163 m^2) primarily consist of steel/other, Table 2 lists the estimated quantities of construction waste.

Table 2 Estimated Quantities of Demolition Waste

Building Type	Concrete	Bricks	Timber/Gyprock	Steel	Other
Computer Lab	482	97	8	7	35

The total quantity of demolition waste is estimated at 628 tonnes.

If the different materials are kept separate, into the categories outlined above, most of this waste can potentially be recycled.

Further, the equipment within the computer lab (e.g., computers, monitors and peripheral equipment) is likely to be reused at the School.

2.2 Construction Waste

2.2.1 Other Council Guidelines

With regard to the generation of construction waste, a review of the Council DCP 2012 did not identify guidance on typical quantities of construction waste for non-residential development. As such, a review of other council guidelines was conducted.

The Hills Shire Council DCP 2012 Appendix A provides guidance on typical quantities of construction waste for office block developments (though not specifically for school developments), segregated by material types as identified in Table 3.

Table 3 Guidance on Typical Quantities of Construction Waste

Building Type	Timber	Concrete	Bricks	Gyprock	Sand/Soil	Metal	Other
Office Block	5.10	18.8	8.50	8.60	8.80	2.75	5.0
Note: Assumed as tonnes per 1,000 m^2							

Using the assumption that the School is similar to an office block and based on new School area of approximately 2,333 m^2, Table 4 lists the estimated quantities of construction waste.

Table 4 Estimated Quantities of Construction Waste

Building Type	Timber	Concrete	Bricks	Gyprock	Sand/Soil	Metal	Other
The School	11.9	43.9	19.8	20.1	20.5	6.4	11.7

The total quantity of construction waste is estimated at 134 tonnes.

Construction workers may also generate wastes such as food wrappings, gloves, waste food, and packaging. If it is assumed that there are an average of 20 workers employed on site, and each worker generates 1 kg of waste and 1 kg of recyclables per day, this results in an estimated waste and recyclables quantity of 20 kg or 0.02 tonnes each on a daily basis.

At an assumed waste density of 0.3 kg per litre, this amounts to 67 litres of waste and 67 litres of recyclables being generated each day, or 369 litres of each per week (based on an assumed 5.5 day week). These will need to be disposed of by the construction site managers, who will most likely arrange with private contractors for special waste collections at the building site.

Excavation, demolition and building waste materials will be re-used or recycled where possible and residual wastes will be disposed to licenced waste facilities.

3 Operational Waste

3.1 Waste Quantities

The school has advised GHD that they currently use a single covered '3 metre skip' (approximately 3 cubic metres [m^3] capacity) for all wastes, and that this is emptied once weekly.

Recyclable materials are not currently separated from other waste and are therefore comingled with waste. The school has advised GHD that they are looking into contractor quotes for separate collection of recyclables.

The school has advised GHD that they anticipate the continued use of a single covered skip for general waste into the future, and will increase the size of the skip if needed (also will potentially have a separate skip suitably sized for recyclables in future).

3.1.1 Waste Generated Within New Buildings

3.1.2 Other Council Guidelines

With regard to the generation of waste within new buildings, a review of the Council DCP 2012 did not identify guidance on typical quantities of waste for non-residential development. As such, a review of other council guidelines was conducted.

The Lane Cove Council DCP Part Q, Appendix B provides guidance of 10 litres each of waste and recyclable material per 100 m^2 floor area on a daily basis for office blocks (though not specifically for schools).

Using the assumption that the School is similar to an office block and based on a new School area of approximately 2,333 m^2, this suggests that the amount of waste and recyclable material generated by the school will each be 233 litres/day.

3.1.3 Waste Generated by Overall School

Overall waste estimates for the School can be made based upon the number of students. There will be 322 students at the School in the future.

3.1.4 Other Council Guidelines

With regard to the generation of waste within the School, a review of the Council DCP 2012 did not identify guidance on typical quantities of waste for the occupants of a School as part of a non-residential development. As such, a review of other council guidelines was conducted.

The Randwick City Council Waste Management Guidelines for Proposed Developments provides a guidance estimate of 1.5 litres of waste and 0.5 litres of recyclable paper per student on a daily basis. This does not consider recyclable containers, which is possibly another 0.5 litres per student on a daily basis.

Using the Randwick City Council guidance and the total number of students for the School, there would be approximately 483 litres waste/day and approximately 322 litres recyclable material/day.

As such, approximately 27 % of the skip would be filled with comingled waste and recyclable material per day.

On a weekly basis (5 days), approximately 134 % of the skip volume would be filled with comingled waste and recyclable material each week. Therefore, to accommodate the future increase in students from 207 to 322 students, it is likely the size of the skip (will need to be increased or the skip will need to be emptied more often per week. However, introduction of a recyclable material skip would avoid the need to increase the size of this skip.

3.2 Waste Storage

The covered skip is currently located adjacent to the demountable canteen and will be relocated as required for the new learning centre.

3.3 Waste Vehicle Access

The covered skip is accessed by a waste management contractor via Mulloon Street through double gates to the School. This would continue to be the case.

Sincerely
GHD Pty Ltd

David Gamble
Technical Leader – Waste Infrastructure
+61 2 9239 7354

Appendix A – Site Demolition Plan

Appendix B – Proposed Site Plan

BUILDING CODE OF AUSTRALIA 2016
REVIEW REPORT:

Proposed PROPOSED LIBRARY REFURBISHMENT
EXPANSION TO LEARNING AREAS
NEW EXTERNAL AREAS – ACCESS DECKING, STAIRS AND RAMPS

Location: QUEANBEYAN EAST PUBLIC SCHOOL

Prepared By: Nathan Harris
BCA Certifiers Australia

Reviewed By: Ros Pascoe
BCA Certifiers Australia
A1 – Accredited Certifier BPB2220

Client: GHD Woodhead
Level 7, 16 Marcus Clarke Street
Canberra ACT 2601

Date of Report: 13 September 2017

Building Code of Australia 2016 (BCA16) Review Report

BCA Certifiers (AUST) Pty Ltd
Unit 3, 2-6 Shea Street
Phillip ACT

Tel. (02) 6285 1199
Fax. (02) 6285 2795
Email. mail@bcacertifiers.com.au

Introduction

This BCA16 Review Report has been prepared at the request of GHD Woodhead (Architecture, Interior Design & Planning) the proposed redevelopment within the grounds of the Queanbeyan East Public School which is a NSW Department of Education project. It is understood this peer review report is a requirement of the construction contract.

The proposed buildings design have been assessed for compliance with Building Code of Australia 2016 (BCA16). BCA Certifier's note that the Section 109R Certificate of Compliance is to be delivered upon completion of this project.

Subject Building

The following assessment data has been drawn from the provisions of the BCA2016.

Building Use Classification	
School Buildings	Class 9b - *LIBRARY REFURBISHMENT & EXPANSION TO LEARNING AREAS* Class 10a – *COVERED WALKWAYS*.
Number of storeys contained	1
Rise in storeys	1
Type of construction required	Type C construction
Floor Area	*Library 200m2 approx* *New Learning Area 1400m2 approx*
Separation from fire source features	<1m
Building Importance	3
Climate Zone	7

Limitations and Exclusions

The comments contained within this report have been based upon review of the architectural drawings referenced below and supporting information.

Excluded from our assessment are any comments in relation to other Authorities including:

- Town Planning
- Occupational Health and Safety Legislation;
- Water, Drainage, Gas and Electrical Supply Authority;
- Telecommunications;
- Disability Discrimination Act and HEREOC Guidelines
- Work Cover Authority.

Drawing Schedule

- SITE PLAN / SETOUT PLAN 23-16004- AR-1000
- GROUND FLOOR PLAN 23-16004- AR-2000
- BRICK BUILDING - GROUND FLOOR PLAN 23-16004- AR-2001
- ROOF PLAN 23-16004- AR-2002
- FF&E PLAN 23-16004- AR-2401
- REFLECTED CEILING PLAN 23-16004- AR-2501
- BUILDING ELEVATIONS 23-16004- AR-3000
- BUILDING SECTIONS 23-16004- AR-3100

SUMARY BCA 2016 FINDINGS

In summary the proposed design is considered to be capable of achieving compliance with the Deemed to Satisfy provisions of BCA 2016 subject to provision of appropriate installation and design certification from respective design and installation consultants/contractors listed in the report and provision of modified design as outline below.

At the end of the report with have listed documentation to be provided allowing a second pass review, and thereby add clarity to Design's solution standing in terms of DtS compliance.

SECTION C - FIRE RESISTANCE

Spec C1.1 - Fire-resisting construction is required to separate buildings unless united.

Fire Service Installations:

The following fire service installations and special fire services are to be installed:-

- Fire hydrants — AS 2419.1:2005 and Cl.E1.3 (Building > 500m^2)
- Fire hose reels — AS 2441:2005 and Cl. E1.4 (Building > 500m^2)
- Portable fire extinguishers — AS 2444.1: 2001 and Cl.E1.6
- Emergency lighting — AS/NZS 2293.1 and BCA Part E4
- Tactile & Braille Exit Signage. — BCA D3.6.

The Hydraulic consultant is requested provide hydrant design that is *Deemed-to-Satisfy* and provide coverage mark-up

Access for persons with disability:

The DtS provisions of the BCA state that disabled access is required to and within all areas normally used by the occupants, including staff, students and visitors. The drawings reviewed are noted to propose accessible design within buildings, although it is unclear if site pedestrian access is in full accordance. The design solution is required to provide continuous accessible paths of travel between school's buildings and interconnect with pre-existing pedestrian network, and nominate accessible car space(s) onsite.

Construction issue drawing and specifications are request to be fully detailed (drawing notes, threshold details and critical dimensions added etc) to leave no doubt as to standing in terms of building solution being complaint.

Construction issue drawings are encourage to detail critical dimensions around doors (where marginal), and provide detail design notes for threshold ramps to reduce likelihood of construction error. We not door are typically not less than 920mm and hence should comply with AS1288.1 requirement for 850mm clear opening.

It should be noted that AS14288.1 & AS1288 require manifestation of glazing capable of being mistaken for opening. Clause 6.6 of AS 1428.1 requires "visual indicators on glazing', or manifestations.

This clause calls for all frameless or fully glazed doors, sidelights and glazing that could be mistaken for a door or opening to be "clearly marked for their full width with a solid and non-transparent contrasting line." The line

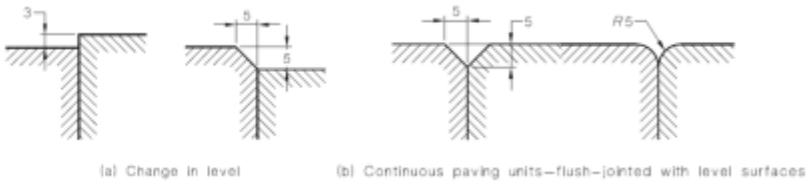
must be at least 75mm wide and extend across the entire width of the glazing. The lower edge of the contrasting line must be between 900mm and 1000mm above the plane of the finished floor level.

Circulation space within accessible toilet facility is must comply with Section 15 and Figure 43 of AS1428.1:2009. Internal layout required.

Applicable Design Standards include:-

1. National Construction Code - Building Code of Australia Volume One 2016 (BCA) – *Particularly Part D, Access and Egress*
2. AS1428.1 (2009) Design for Access and Mobility
3. AS1428.4.1 (2009) Tactile Indicators
4. AS4586 – Slip Resistance of Pedestrian Surface Materials
5. Disability Discrimination Act 1992 (Outside scope of report)
6. Disability (Access to Premises – Buildings) Standards 2010 (Outside scope of report standards are aligned with BCA2016)

Surfaces along accessible paths of travel are to be within tolerances within section 7 of AS 1428.1:2009:

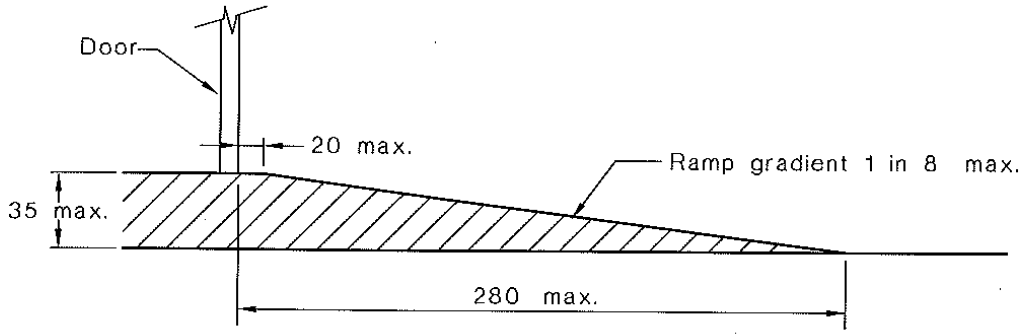


Source – Section 7.2 of AS1428.1-2009

Doorways and doors covered by this requirement will meet the specific size and circulation criteria set out in AS1428.1 (2009) and provide 850mm clear opening width from active leaf. Approaches to doors are required to meet the circulation requirements of AS1428.1 (2009).

Design of the building's entry thresholds are to be in accordance with AS1428.1:2009 Clause 10.5 & FIGURE 21 THRESHOLD RAMP (pages 32-33).

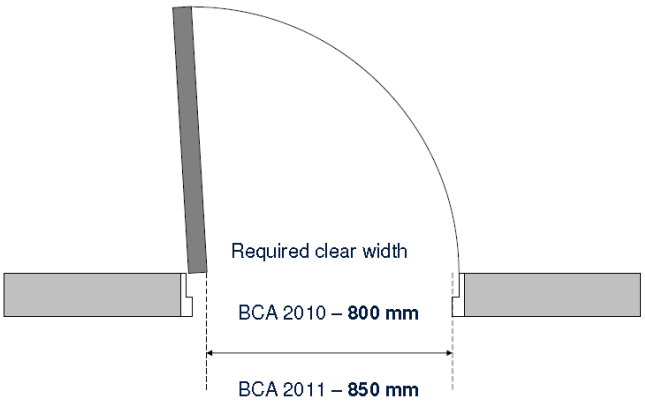
Note: That changes in level are not permitted to exceed 35mm between internal floor and external ground at door threshold.



DIMENSIONS IN MILLIMETRES

FIGURE 21 THRESHOLD RAMP

Doorways and doors along continuous accessible path of travel are to be in accordance with AS1428.1:2009. Particular attention should be given to AS1428.1Clause 13.1 in design of the building's entry doors to ensure requirements for luminance contrast are achieved; and AS1428.1 Clause 13.2 requirement for 850mm clear width opening to be achieved by the active door leaf. Frameless glass doors should be avoided.



General points from AS1428.1:2009 to consider in detail design:

1. A clear opening width of not less than 850mm is required through door openings in accessible areas. (AS1428.1 – Clause 13.3- 13.4 & Fig 31-34)
2. Staircases are required to have contrast nosing's that comply with AS1428.1 Clause 11.1(f).
3. Handrails are required to both sides of stairways. (AS1428.1 - Clause 11.2(b))
4. Diameter of the handrails are to be between 30mm and 50mm (AS1428.1 – Clause 12(b))
5. Handrail requires design with 270o arc free of obstructions to hand grip along the full length of the handrail, stem attachment 15mm max (AS1428.1 – Clause 12(b)
6. Handrails are to have a minimum clearance of 50mm from an adjacent wall or any obstruction (AS1428.1 – Clause 12(h).
7. Handrails at the bottom of the stairs extend at least one tread depth plus horizontally for a minimum of 300mm from the last riser (AS1428.1 – Clause 11.2(d))
8. Handrails at the top of the stairs are to extend horizontally for a minimum of 300mm from the last stair nosing (AS1428.1 – Clause 11.2(e)
9. Handrails are to return back on themselves180 degrees, away to the side wall or turned downwards to the floor(AS1428.1 – Clause 12(g) & figures. 26(C) & 26(D))
10. Handrail height between 865-1000mm above the step nosing(BCA D2.17 & AS1428.1 - Clause 11.2(g) & 12(d))
11. Tactile ground surface indicators are required to warn people with vision impairment that they are approaching a stairway, ramp or escalator (BCA D3.8 and AS1428.4)
12. Continuous accessible paths of travel require minimum width of 1000mm and contain the necessary turning and circulation spaces and gradients and cross falls in accordance with AS1428.1 - Clause 6.
13. Floor surfaces are required to be slip resistant (AS1428.1 Clause 7.1)
14. All doors are to achieve a minimum 30% luminance contrast between the door and adjacent wall, or architrave and wall, or door and architrave, or door leaf and jamb in accordance with AS1428.1-2009 Clause 13.1. Frameless glass doors within frameless glass walls do not tend to achieve compliance with these requirements.

Key points to consider for stairs proposed on external site pedestrian network:-

- Stair nosings are not allowed to project beyond the face of the riser. The riser itself may be vertical or splay backwards to a maximum of 25mm. The nosing profiles may have a sharp intersection, a radius up to 5mm, or up to a 5x5 chamfer.
- One of the key requirements that designers and architects need to be aware of is the need for a 'luminance contrast strip' that provides a strong visual cue of the tread / riser intersection. This strip must be between 50 and 75mm wide, must run across the full width of travel. It cannot be set back from the nosing more than 15mm. The strip needs a luminance contrast of at least 30% with respect to the background material.
- Design solution to additionally provide for ramp access need for persons in wheelchair.

Energy Efficiency:

The provisions of BCA Section J are applicable to the proposal.
Section J EE Report required.

General:

It should be noted BCA Certifier's Pty Ltd will rely upon the Design Statements and reports of suitably experienced consultants to satisfy ourselves of the relevant parts of the Building Code of Australia 2016 i.e. Civil, Structural, Electrical, Hydraulic disciplines.

Requested is that the client (State) confirm populations to be anticipated.

Further details sought with regards to amenities onsite.

BCA 2016 ASSESSMENT

Below is a clause-by-clause review of the proposal against the *Deemed-to-Satisfy* (DtS) provisions of the BCA that demonstrates compliance and indicates requirements for issue of a final statement of compliance of the completed building.

SECTION B – STRUCTURE

Clause	Description	Comments
B1.1	Resistance to actions	The resistance of a building or structure must be greater than the most critical action effect resulting from different combinations of actions. *Structural Engineers design certification and inspection certificate to be relied upon.*
B1.2	Determination of individual actions	The magnitude of individual actions must be determined in accordance with Clause B1.2 of the BCA. The building is considered to have an 'importance level' of 2 noting that where school buildings have a capacity of more than 250 that 'importance level' 3 is recommended. *Structural Engineers design certification and inspection certificate to be relied upon..*
B1.3	Loads	The building or structure must resist loads determined in accordance with AS 1170 Parts 1 to 4 as listed in Clause B1.3. *Structural Engineers design certification and inspection certificate to be relied upon*.
B1.4	Determination of structural resistance of materials and forms of construction	The structural resistance of materials and forms of construction must be determined in accordance with the relevant Australian Standards in accordance with Clause B1.4 of the BCA. *Structural Engineers design certification and inspection certificate to be relied upon.* *&* *Glazing Certificate to be relied upon.* Should timber framed construction be proposed as a primary building element a BCA compliant method of termite protection is required to be documented and implemented.

SECTION C - FIRE RESISTANCE

Clause	Description	Comments
C1.1	Type of construction required	Type C Construction
C1.2	Calculation of rise in storeys	Classified as single storey.
C1.3	Buildings of mixed classification	N/A
C1.4	Mixed Types of construction	N/A
C1.5	Two storey class 2, 3 or 9c buildings	N/A
C1.6	Class 4 portions of a building	N/A
C1.7	Open spectator stands	N/A
C1.8	Lightweight construction	N/A
C1.10	Fire hazard properties	The fire hazard properties of all floor materials, floor coverings, wall and ceiling lining materials must comply with Specification C1.10a. The fire hazard properties of all other materials must comply with Specification C1.10. Specification to reference compliance. Installation contractor to provide copy of test certificate from registered testing laboratory is required to be submitted to BCA Certifiers at the completion of the project. See final certification list requirements below..
C1.12	Non-combustible materials	TO NOTE. Gypsum plasterboard is deemed by BCA16 to be a non-combustible material.
C2.2, C2.3 and C2.4	General floor area and volume limitations	Complies.
C2.5	Class 9a & 9c buildings	N/A
C2.6	Vertical separation	N/A to Type C Construction
C2.7	Separation by fire walls	N/A
C2.8	Separation of classifications in same storey	N/A
C2.9	Separation of classifications in different storeys	N/A
C2.10	Separation of lift shafts	N/A
C2.11	Stairways and lift shafts	N/A
C2.12	Separation of equipment	N/A
C2.13	Electricity supply system	N/A as MSB does not sustain emergency equipment in emergency mode.
C2.14	Public corridors in Class 2 & 3 buildings	N/A
C3.2	Protection of openings	N/A
C3.3	Separation of external walls in different fire compartments	N/A
C3.4	Acceptable method of protection	N/A
C3.5	Doorways in fire walls	N/A

C3.6	Fire doors	N/A
C3.7	Protection of openings in horizontal exits	N/A
C3.8	Openings in fire-isolated exits	N/A
C3.9	Service penetrations in fire-isolated lift shafts	N/A
C3.10	Openings in fire-isolated lift shafts	N/A
C3.11	Bounding construction Class 2, 3 and 4 buildings	N/A
C3.12	Opening in floors and ceilings	N/A
C3.13	Openings in shafts	N/A
C3.15	Openings for service installations	N/A
C3.16	Construction joints	N/A
C3.17	Lightweight protection of columns	N/A
Specificati on C1.1	Fire-resisting construction	Noted
Spec C1.8	Lightweight construction	N/A
Spec C1.10	Fire hazard properties - general	Sarking must comply with Specification C10 requirements. Test certificate from registered testing laboratory is required to be submitted to BCA Certifiers at the completion of the project for all combustible linings and finishes.
Spec. C1.11	Performance of external walls	N/A
Spec. C2.5	Smoke proof walls - Age care buildings	N/A
Spec. C3.4	Fire doors, fire walls and fire windows	N/A
Spec 3.15	Penetration of walls, floors and ceilings	N/A

SECTION D – ACCESS AND EGRESS

Clause	Description	Comments
D1.2	Number of exits	Building design solution compliant with DtS acceptable solutions.
D1.3	Fire-isolated stairs/ramps	N/A
D1.4	Exit travel distances	Building design solution compliant with DtS acceptable solutions.
D1.5	Distance between alternative exits	Building design solution compliant with DtS acceptable solutions.
D1.6	Dimensions of exits	Building design solution compliant with DtS acceptable solutions.
D1.7	Travel by fire-isolated exits	N/A
D1.8	External stairs	N/A
D1.9	Travel by non-fire-isolated exits	N/A
D1.10	Discharge from exits	Building design to comply
D1.11	Horizontal exits	N/A
D1.12	Non-required stairs	N/A
D1.13	Number of persons accommodated	Building designed to comply. LIBRARY REFURB:

<table>
<tr><td></td><td></td><td>~60-65 persons based on 1p.2m^2 and library desk seating plan.

NEW EXPANSION BUILDING.
Population is calculated at 330 persons based on 1p.2m^2 per person within HOME BASE Learning areas.</td></tr>
<tr><td>D1.14</td><td>Measurement of distance</td><td>Informative</td></tr>
<tr><td>D1.15</td><td>Method of measurement</td><td>Informative</td></tr>
<tr><td>D1.16</td><td>Plant rooms and lift machine rooms</td><td>N/A</td></tr>
<tr><td>D1.17</td><td>Access to lift pits</td><td>N/A</td></tr>
<tr><td>D2.2</td><td>Fire-isolated stairs</td><td>N/A</td></tr>
<tr><td>D2.3</td><td>Non-fire-- isolated stairs</td><td>N/A</td></tr>
<tr><td>D2.4</td><td>Separation of rising and going stair flights</td><td>N/A</td></tr>
<tr><td>D2.5</td><td>Open access balconies</td><td>N/A</td></tr>
<tr><td>D2.6</td><td>Smoke lobbies</td><td>N/A</td></tr>
<tr><td>D2.7</td><td>Installations in exits</td><td>NEW COMMS room to be enclosed in non combustible construction and doors leading to it provided non combustible internal lining and fitted with smoke seals.</td></tr>
<tr><td>D2.8</td><td>Enclosure of space under stairs</td><td>N/A</td></tr>
<tr><td>D2.9</td><td>Width of stairs</td><td>N/A</td></tr>
<tr><td>D2.10</td><td>Pedestrian ramps</td><td>N/A</td></tr>
<tr><td>D2.11</td><td>Fire-isolated passages</td><td>N/A</td></tr>
<tr><td>D2.12</td><td>Roof as open space</td><td>N/A</td></tr>
<tr><td>D2.13</td><td>Goings and risers</td><td>Building design to comply</td></tr>
<tr><td></td><td>Table D2.14 SLIP-RESISTANCE</td><td>Stair treads and nosing’s to be slip resistive meeting specified values that are read within BCA 2016 table D2.14 . Slip ratings to externa landings and stair treads is expected to achieve P4 or R11 ratings, evidence of these slip resistance will be required at final.

Table D2.14 SLIP-RESISTANCE CLASSIFICATION
<table><tr><th rowspan="2">Application</th><th colspan="2">Surface conditions</th></tr><tr><th>Dry</th><th>Wet</th></tr><tr><td>Ramp steeper than 1:14</td><td>P4 or R11</td><td>P5 or R12</td></tr><tr><td>Ramp steeper than 1:20 but not steeper than 1:14</td><td>P3 or R10</td><td>P4 or R11</td></tr><tr><td>Tread or landing surface</td><td>P3 or R10</td><td>P4 or R11</td></tr><tr><td>Nosing or landing edge strip</td><td>P3</td><td>P4</td></tr></table></td></tr>
<tr><td>D2.14</td><td>Landings</td><td>Building design to comply</td></tr>
<tr><td>D2.15</td><td>Thresholds</td><td>Building design to comply</td></tr>
</table>

D2.16	Balustrades	Building design to comply
D2.17	Handrails	1000mm clear width required between the handrails. Note that 50mm clearance required between the handrail and the adjacent wall. Jnr handrails to be installed.
D2.18	Fixed platforms etc	N/A
D2.19	Doorways and doors	Building design to comply
D2.20	Swinging doors	Building design to comply
D2.21	Operation of latch	To comply. Additionally handle to comply with AS1428.1:2009 Fig 35(A) &(B) AS 1428.1 Pages 64-66.
D2.22	Re-entry from fire-isolated exits	N/A
D2.23	Signs on doors	N/A
D3.2 D3.3 D3.5	Parts of buildings to be accessible	CD issue is required demonstrate compliance with AS 1428.1.
D3.6	Identification of access facilities, services and features	Clear and legible Braille and tactile signage complying with Specification D3.6 BCA must be provided to all toilets.
D3.7	Hearing augmentation	Where an inbuilt amplification system is installed, a hearing augmentation system complying with AS1428.1 must be provided.

D3.8	Tactile indicators (TGSI's)	The BCA requires tactile ground surface indicators (TGSI's) - Type B Warning type – AS 1428.4 – to warn persons with vision impairment that they are approaching any ramp or where the path of travel meets a vehicular way noting that TGSI's are not required for kerb and step ramps.
Spec D1.12	Non-required stairways and ramps	N/A
Spec D3.6	Braille and tactile signs	To comply. Drawing notes to be added to plans. Amenities & EXIT's to be provided with Braille & Tactile Signage.

SECTION E – SERVICES AND EQUIPMENT

Clause	Description	Comments
E1.3	Fire Hydrants	Fire hydrants are required as the floor area is less than 500m2. Design details sought for second pass review.
E1.4	Hose reels	Fire Hose Reels to areas other than Classrooms are required as the floor area is more than 500m2.
E1.5	Sprinklers	Not required
E1.6	Portable fire extinguishers	Required where fire hose reels are not provided. Installation certificate required by BCA Certifiers at the completion of the project.
E1.8	Fire control centres	N/A
E1.9	Fire precautions during construction	During construction, not less than one fire extinguisher to suit Class A, B and C fires is required.
E1.10	Special hazards	N/A
Spec. E1.5	Sprinkler systems	N/A
Spec. E1.8	Fire control systems	N/A
E2.2	Smoke hazard management	N/A
E2.3 Table E2.3	Provision for special hazards	N/A
Part E3	Lift installations	N/A
Part E4	Emergency lighting and exit signs and warning systems	Building to comply. Design Certificate from Electrical Engineer. Installation certificate required by BCA Certifiers at the completion of the project.

SECTION F – HEALTH AND AMENITY

Clause	Description	Comments
F1.1	Stormwater drainage	Stormwater drainage design shall be in accordance with AS/NZS 3500.3. Required is Design Certificate from Hydraulic Consultant. Installation certificate required by BCA Certifiers at the completion of the project.
F1.5	Roof coverings	Metal sheet roof coverings are to comply with AS 1562. Installation certificate required by BCA Certifiers at the completion of the project.
F1.6	Sarking	Sarking type materials used for weatherproofing of roofs and walls must comply with AS/NZS 4200 Parts 1 and 2 and Specification C1.10 of BCA. Installation certificate required by BCA certifiers at the completion of the project.
F1.7	Waterproofing of wet areas	Wet areas are required to be waterproofed in accordance with AS 3740. Installation certificate required by BCA Certifiers at the completion of the project.
F1.9	Damp-proofing	Builder to provide statement of compliance to BCA Certifiers at the completion of the project.
F1.10	Damp-proofing of floors on the ground	A vapour barrier in accordance with AS 2870 is to be provided beneath the ground floor slab. Installation certificate required to be provided to MCG at the completion of the project
F1.11	Provision of floor wastes	Noted
F1.12	Sub-floor ventilation	N/A
F1.13	Glazed assemblies	Windows in an external wall must comply with AS 2047 requirements for resistance to water penetration. Installation certificate required by BCA Certifiers at the completion of the project.
F2.1	Sanitary facilities	NA
F2.2	Calculation of occupants and numbers	The additional toilets will augment the existing facilities provided at the school.
F2.3	Facilities in class 3-9 buildings	See above
F2.4	Facilities for people with disabilities	See comments in D3.3 above Note toilet layouts and fixtures are required in accordance with AS1428.1 Sections 15 & 16. Self-needed in accessible toilet facility.
F2.5	Construction of sanitary compartments	Doors to *enclosed toilets* are to open outwards, slide or be readily removable from the outside of the sanitary compartment when located less than 1200mm from pans.

Part F3	Room sizes	Building design complies
F4.1	Provision of natural light	Noted
F4.4	Artificial lighting	Artificial lighting required to the building to comply with AS 1680. Lighting is additionally required to comply with the provisions of BCA Part J6. Electrical Engineer to provide an installation certificate to BCA Certifiers at the completion of the project.
F4.5	Ventilation of rooms	Roof vents provided. Minimum of 5% of floor area required for openings.
F4.8/F4.9	Airlocks	N/A
F5.4	Sound insulation of floors	N/A
F5.5	Sound insulation of walls	N/A
F5.6	Sound insulation ratings of services	N/A

SECTION H (NSW) THEATRES, STAGES and PUBLIC HALLS

Clause	Description	Comments
H1.1/ NSW H101.1	Application of Part	N/A
H101.2	Fire separation	N/A
H101.3	Foyer space	N/A
H101.4	Sprinkler systems for common foyers	N/A
H101.5	Conventional stages	N/A
H101.5.1	Extent of stage area	N/A
H101.5.2	Small stages	N/A.
H101.5.3	Large stages	N/A
H101.5.4	Fire separation of stages	N/A
H101.6	Non-conventional stages	N/A
H101.6.1	Small stages	N/A.
H101.6.2	Large stages	N/A
H101.7	Flying scenery	N/A
H101.8	Load notices	N/A
H101.10	Safety curtains	N/A
H101.11	Seating in rows	N/A
H101.11.2	Chairs used for seating	N/A

H101.11.3	Chairs in auditoriums-level floors	N/A
H101.11.4	Chairs in auditoriums-sloping floors	N/A
H101.11.4	Radiating aisles in seating areas	N/A
H101.11.6	Aisles and cross-overs	N/A
H101.11.7	Platforms and steps	N/A
H101.11.8	Stepped platforms	N/A
H101.12	Continental seating	N/A
H101.12.9	Doors	N/A
H101.13	Provision of guardrails	N/A
H101.13.2	Fixed back seats	N/A
H101.13.3	Steps between platforms	N/A
H101.14. 1	Guardrails	N/A
H101.14.2	Balconies and boxes	N/A
H101.14.3	Cross-overs	N/A.
H101.15	Dressing rooms	N/A
H101.16	Storerooms	
H101.17	Projection suites	N/A
H101.17.2	Fire separation	N/A
H101.17.3	Concession for protection of some openings	N/A
H101.18	Basement storeys	N/A
H101.18.1	Basement storeys-more than 2	N/A
H101.19	Electrical mains	N/A
H101.19.1	Main switchboard	N/A
H101.19.2	Circuit protection	N/A
H101.19.3	Separate sub-mains	N/A
H101.20	Lighting	N/A
H101.20.1	Lighting switches	N/A
H101.20.2	Lighting levels	N/A

H101.20.3	Provision of aisle lighting	N/A
H101.20.4	Aisle lighting power supply	N/A
H101.20.5	Aisle lighting alternative power supply	N/A
H101.22	Automatic smoke-and-heat vents for stages	N/A
H101.23	Solid fuel burning stoves and open fire places	N/A
H101.24	Fuel gas cylinders	N/A

SECTION J ENERGY EFFICIENCY

Clause	Description	Comments
Part J1	Building fabric	EE Report required. Installation certificate required by BCA Certifiers at the completion of the project.
Part J2	External glazing	EE Report required Installation certificate required by BCA Certifiers at the completion of the project.
Part J3	Building sealing	To comply N/A should building is not proposed to be a conditioned space.
Part J4	Air movement	N/A
Part J5	Air conditioning and ventilation system	Design statement - Mechanical Consultant. N/A should building not proposed to be a conditioned space.
Part J6	Artificial lighting and power	Design statement - Electrical Consultant. Installation certificate required by BCA Certifiers at the completion of the project.
J7	Hot water supply	Installation certificate required by BCA Certifiers at the completion of the project.
J8	Access for maintenance	Compliance required.

SUMMARY TYPE C CONSTRUCTION REQUIREMENTS
Table 5 Specification C1.1

Type C Construction	
Building element	**Class of building—FRL: (in minutes)**
	Structural adequacy/Integrity/Insulation
	9b
EXTERNAL WALL (including any column and other building element incorporated therein) or other external building element, where the distance from any *fire-source feature* to which it is exposed is—	
less than 1.5m	90/90/90
1.5 to less than 3 m	60/60/60
3m or greater	-/-/-
External Column not incorporated in an external wall, where the distance from any fire-source feature to which it is exposed is-	
Less than 1.5m	90/-/-
1.5 to less than 3m	60/-/-
3m or more	- / - / -
Internal walls between or bounding sole-occupancy units -	60/60/60
ROOFS	- / - / -

SECOND PASS REVIEW:

In order for BCA Certifiers Pty Ltd to be satisfied the building has design solution that is in accordance with the provisions of the Building Code of Australia the following documentation package is requested to be developed.

1. Architectural
    1. Drawing notes and updated to incorporated comments above.
    2. Drawing to detail fire separation methods proposed or unite building.
    3. Pedestrian network detailed in accordance with AS1428.1:2009.
    4. PWD facilities are to be design in accordance with AS1428.1:2009. Design solution to be dimensioned within detail drawings in a recognisable scale.
    5. Handrails are to be proposed to both sides of each external stairways. Jnr handrail required.
    6. Electrical cupboards proposed within public corridors require non-combustible enclosure that is suitably sealed against smoke.
    7. Advise if UPS is proposed and thereby requiring fire rated enclosure.

2. Copies of services details prepared by RPEQ registered Engineering Consultants for
    1) Hydraulic design
    2) Electrical
    3) Mechanical

    Flow and pressure test report.
    To reference design compliance with relevant BCA referenced design standards, energy efficiency report.

3. Structural engineering design package prepared by Registered Practising Structural Engineer.
4. SECTION J - EE Report.
5. Materials data for floor and internal wall linings that are combustible. (Test report: fire hazard properties)
6. School population figures.
7. Disclosure of onsite amenities

Notional Conditional Terms.

In order for BCA Certifiers Pty Ltd to be satisfied the building has been constructed in accordance with the reviewed design documents and the provisions of the Building Code of Australia the following installation certification is required prior to issue of the Certificate of Compliance -

1. Evidence of having provided fire ratings required by report.
    1. Separation of building < 3m.
    2. COMMS Room where having battery (UPS)

2. Installation certificate for spread of flame and smoke developed indices/ Radiant Heat Flux of all finishes and linings demonstrating compliance with Specification C1.10 of BCA16.

3. Installation certification for emergency lighting and exit signage to AS/NZS 2293.1, electrical works generally in accordance with AS3000, separate sub mains to Part H101.19.3 and general lighting to AS 1680 and Part J from electrical contractor.

4. Installation certificate from plumbing contractor confirming all stormwater and guttering has been installed in accordance with AS 3500.

5. Installation certificate from roofing contractor for metal roofing confirming compliance with AS 1562.

6. Installation certificate from wet area proofing contractor confirming compliance with AS 3740.

7. Installation certificate for glazing confirming compliance with AS 1288 and AS 2047.

8. Installation certificate for vapour barrier confirming compliance with AS 2870 for under slab.

9. Installation certificate for Fire rated plasterboard

10. Installation certification for self closing Fire doors confirming compliance with AS 2890.1

11. Structural Engineers inspection certificates for all structural elements within the project.

12. Installation certificate confirming Portable Fire Extinguishers have been installed in accordance with AS 2444.

13. Installation certificate confirming sarking complies with AS4200 and F1.7 BCA16.

14. Confirmation from the builder the requirements of the BCA Section J report have been incorporated into the development.

15. Provide a Fire Safety Certificate for the following essential fire safety measures installed in the building –

    - Fire hydrants — AS 2419.1:2005 and Cl.E1.3 BCA16
    - Fire hose reels — AS 2441:2005 and Cl. E1.4 BCA16
    - Portable fire extinguishers — AS 2444.1: 2001 and Cl.E1.6 BCA16
    - Lightweight construction — Specification C1.8 BCA16

- Fire rated doors AS2890.1
- Emergency lighting AS/NZS 2293.1 and Part E4 BCA16

Asbestos Register

(Hazardous Materials and Risk Assessment)

School :	**Queanbeyan East Public School (4371)**
Region :	**Illawarra and South East**
State Electorate :	**Monaro**
Local Government Area :	**Queanbeyan**

Initial Survey :	**Noel Arnold & Associates : 07 - May - 2008**
Register Issue Date :	**03 - Dec - 2015**

4371 - Queanbeyan East Public School
Site Plan (11534)

Product	Material Description	Extent	Location Reference	Material Condition	Risk Status	Control Priority
	Sample No					**Test Result**

B00A - General Learning/Administration - 1967 - Brick/Block (PSFS: K-Plan)

Exterior

In-fill-panel	Flat AC Sheeting	32m2	South, East, West	Good Condition (1)	Low (1)	Low Priority (2-3)
	4371/B00A/R0028/In-fill-panel/S1					**Chrysotile (white asbestos) , Amosite (brown asbestos)**
Eaves Linings	Flat AC Sheeting	50m2	South, East, West	Good Condition (1)	Low (1)	Low Priority (2-3)
	Assumed Asbestos -					
Ceiling Voids	Requires Inspection					
Underfloor Voids	Requires Inspection					

Interior

B00A - R0001 - Entry Vestibule (16.57 m2)

No Asbestos

B00A - R0002 - Movement (6.66 m2)

No Asbestos

B00A - R0003 - Movement (18.52 m2)

No Asbestos

B00A - R0004 - Clerical Office (16.55 m2)

No Asbestos

B00A - R0005 - Staff Room (40.03 m2)

No Asbestos

B00A - R0006 - Main Switch Board (1.52 m2)

Ceiling Structures/Linings	Flat AC Sheeting	
	4371/B00A/R0025/Ceiling Structures/Linings/S2	**No Asbestos Detected**

B00A - R0007 - Cleaning Distributed Store (2.58 m2)

Ceiling Structures/Linings	Flat AC Sheeting	
	4371/B00A/R0025/Ceiling Structures/Linings/S2	**No Asbestos Detected**

B00A - R0008 - Staff Toilet (3.51 m2)

Ceiling Structures/Linings	Flat AC Sheeting	
	4371/B00A/R0025/Ceiling Structures/Linings/S2	**No Asbestos Detected**

B00A - R0009 - Duplicating Workroom (25.49 m2)

No Asbestos

B00A - R0010 - Staff Toilet (4.81 m2)

Ceiling Structures/Linings	Flat AC Sheeting	
	4371/B00A/R0025/Ceiling Structures/Linings/S2	**No Asbestos Detected**

B00A - R0011 - Movement (2.16 m2)

Ceiling Structures/Linings	Flat AC Sheeting	
	4371/B00A/R0028/Ceiling Structures/Linings/S3	**No Asbestos Detected**

B00A - R0012 - Movement (12.71 m2)

No Asbestos

B00A - R0013 - Sick Bay (8.81 m2)

No Asbestos

B00A - R0014 - Security Store (23.03 m2)

No Asbestos

B00A - R0015 - General Storeroom (9.68 m2)

No Asbestos

B00A - R0016 - Interview (8.86 m2)

No Asbestos

B00A - R0017 - General Storeroom (6.44 m2)

No Asbestos

B00A - R0018 - Staff Room Annexe (11.41 m2)

No Asbestos

B00A - R0019 - Staff Room Annexe (11.7 m2)

No Asbestos

Product	Material Description	Extent	Location Reference	Material Condition	Risk Status	Control Priority
	Sample No					**Test Result**
B00A - R0020 - Principal (17.52 m2)						
No Asbestos						
B00A - R0021 - Personal Effects Storage (12.35 m2)						
No Asbestos						
B00A - R0022 - Movement (3.76 m2)						
Ceiling Structures/Linings	Flat AC Sheeting					
	4371/B00A/R0028/Ceiling Structures/Linings/S3					**No Asbestos Detected**
B00A - R0023 - Home Base (57.04 m2)						
No Asbestos						
B00A - R0024 - Home Base (86.2 m2)						
No Asbestos						
B00A - R0025 - Toilets - Boys/Girls (3.11 m2)						
Ceiling Structures/Linings	Flat AC Sheeting					
	4371/B00A/R0025/Ceiling Structures/Linings/S2					**No Asbestos Detected**
B00A - R0026 - Personal Effects Storage (9.62 m2)						
No Asbestos						
B00A - R0027 - Distribution Board (0.48 m2)						Note: No inspection of live electrical installation.
Wall Linings Internal	Flat AC Sheeting	4m2	Throughout	Good Condition (1)	Low (1)	Low Priority (2-3)
	4371/B00A/R0027/Wall Linings Internal/S7					**Chrysotile (white asbestos) , Amosite (brown asbestos)**
B00A - R0028 - Movement (138.08 m2)						
In-fill-panel	Flat AC Sheeting	22m	South	Good Condition (1)	Low (1)	Low Priority (2-3)
	4371/B00A/R0028/In-fill-panel/S1					**Chrysotile (white asbestos) , Amosite (brown asbestos)**
Ceiling Structures/Linings	Flat AC Sheeting					
	4371/B00A/R0028/Ceiling Structures/Linings/S3					**No Asbestos Detected**
B00A - R0029 - Plant (2.03 m2)						
Wall Linings Internal	Flat AC Sheeting	6m2	North, East	Good Condition (1)	Low (1)	Low Priority (2-3)
	4371/B00A/R0027/Wall Linings Internal/S7					**Chrysotile (white asbestos) , Amosite (brown asbestos)**

Product	Material Description	Extent	Location Reference	Material Condition	Risk Status	Control Priority
	Sample No					**Test Result**

B00B - General Learning/Pupil Facilities - 1967 - Brick/Block (PSFS: K-Plan)

Exterior

In-fill-panel	Flat AC Sheeting	24m2	South, West	Good Condition (1)	Low (1)	Low Priority (2-3)
	4371/B00A/R0028/In-fill-panel/S1					**Chrysotile (white asbestos) , Amosite (brown asbestos)**
Eaves Linings	Flat AC Sheeting					
	4371/B00A/R0028/Ceiling Structures/Linings/S3					**No Asbestos Detected**
Ceiling Voids	Requires Inspection					
Underfloor Voids	Requires Inspection					

Interior

B00B - R0001 - Toilets - Girls (41.43 m2)

Partition Walls (Cubicles)	Compressed AC Sheet	10m2	Throughout	Good Condition (1)	Low (1)	Low Priority (2-3)
	4371/B00B/R0003/Partition Walls (Cubicles)/S9					**Chrysotile (white asbestos)**
Ceiling Structures/Linings	Flat AC Sheeting					
	4371/B00A/R0028/Ceiling Structures/Linings/S3					**No Asbestos Detected**

B00B - R0002 - Cleaning Distributed Store (1.51 m2)

Ceiling Structures/Linings	Flat AC Sheeting					
	4371/B00A/R0028/Ceiling Structures/Linings/S3					**No Asbestos Detected**

B00B - R0003 - Toilets - Boys (43.34 m2)

Partition Walls (Cubicles)	Compressed AC Sheet	6m2	Throughout	Good Condition (1)	Low (1)	Low Priority (2-3)
	4371/B00B/R0003/Partition Walls (Cubicles)/S9					**Chrysotile (white asbestos)**
Ceiling Structures/Linings	Flat AC Sheeting					
	4371/B00A/R0028/Ceiling Structures/Linings/S3					**No Asbestos Detected**

B00B - R0004 - Movement (56.94 m2)

Ceiling Structures/Linings	Flat AC Sheeting					
	4371/B00A/R0028/Ceiling Structures/Linings/S3					**No Asbestos Detected**

B00B - R0005 - Movement (44.43 m2)

Ceiling Structures/Linings	Flat AC Sheeting					
	4371/B00A/R0028/Ceiling Structures/Linings/S3					**No Asbestos Detected**
In-fill-panel	Flat AC Sheeting	20m	South, East, West	Good Condition (1)	Low (1)	Low Priority (2-3)
	4371/B00A/R0028/In-fill-panel/S1					**Chrysotile (white asbestos) , Amosite (brown asbestos)**

B00B - R0006 - Personal Effects Storage (6.91 m2)

No Asbestos

B00B - R0007 - Home Base Store (3.24 m2)

Floor Coverings Res/Textile	Vinyl Tiles					
	4371/B00B/R0007/Floor Coverings Res/Textile/S6					**No Asbestos Detected**

B00B - R0008 - Home Base (88.46 m2)

No Asbestos

B00B - R0009 - Toilets - Boys/Girls (3.5 m2)

No Asbestos

B00B - R0010 - Home Base (59.16 m2)

No Asbestos

B00B - R0011 - Home Base Store (5.92 m2)

No Asbestos

B00B - R0012 - Personal Effects Storage (6.44 m2)

No Asbestos

B00B - R0013 - Distribution Board (0.73 m2)

Note: No inspection of live electrical installation.

Floor Coverings Res/Textile	Vinyl Tiles					
	4371/B00B/R0007/Floor Coverings Res/Textile/S6					**No Asbestos Detected**

B00B - R0014 - Movement (17.75 m2)

Product	Material Description	Extent	Location Reference	Material Condition	Risk Status	Control Priority
	Sample No					**Test Result**
Ceiling Structures/Linings	Flat AC Sheeting					
	4371/B00A/R0028/Ceiling Structures/Linings/S3					**No Asbestos Detected**
B00B - R9001 - Movement (5.06 m2)						
Ceiling Structures/Linings	Flat AC Sheeting					
	4371/B00A/R0028/Ceiling Structures/Linings/S3					**No Asbestos Detected**
B00B - R9002 - Garden Store (7.62 m2)						
Non Accessible	Requires Inspection					
B00B - R9003 - Communal Space (123.94 m2)						
Ceiling Structures/Linings	Vermiculite					
	4371/B00B/R9003/Ceiling Structures/Linings/S8					**No Asbestos Detected**
B00B - R9004 - Craft Store (13.98 m2)						
No Asbestos						
B00B - R9005 - Sports Store (21.63 m2)						
No Asbestos						

Product	Material Description	Extent	Location Reference	Material Condition	Risk Status	Control Priority
	Sample No					**Test Result**

B00C - Building Services - 1987 - Metal Shed (Metal Shed/Garden Shed/Garage)

Exterior

Ceiling Voids	Requires Inspection
Underfloor Voids	Requires Inspection

Interior

B00C - R0001 - General Assistant/Bulk Store (27.71 m2)

No Asbestos

Product	Material Description	Extent	Location Reference	Material Condition	Risk Status	Control Priority
	Sample No					**Test Result**

B00D - General Learning - 1900 - Timber (Timber: Fixed 1947 - 1960s)

Exterior

Ceiling Voids	Requires Inspection
Underfloor Voids	Requires Inspection

Interior

B00D - R0001 - Withdrawal Space - 1hb (4.11 m2)

No Asbestos

B00D - R0002 - Special Programs Room (50.4 m2)

No Asbestos

B00D - R0003 - Personal Effects Storage (14.06 m2)

No Asbestos

Product	Material Description	Extent	Location Reference	Material Condition	Risk Status	Control Priority
	Sample No					**Test Result**

B00E - Pupil Facilities - 1998 - Brick/Veneer (Amenities (Toilet, Shelter))

Exterior

Ceiling Voids	No Asbestos Found
Underfloor Voids	Requires Inspection

Interior

B00E - R0001 - Movement (233.35 m2)

No Asbestos

Product	Material Description	Extent	Location Reference	Material Condition	Risk Status	Control Priority
	Sample No					**Test Result**

B00F - Communal Facilities - 2011 - Brick/Veneer

Exterior

Ceiling Voids	No Asbestos Found
Underfloor Voids	Requires Inspection

Interior

B00F - R0001 - Communal Space (144.04 m2)

No Asbestos

B00F - R0002 - Movement (6.66 m2)

No Asbestos

B00F - R0003 - Raised Platform (62.98 m2)

No Asbestos

B00F - R0004 - Ramp (11.4 m2)

No Asbestos

B00F - R0005 - Movement (12.29 m2)

No Asbestos

B00F - R0006 - Hall Chair Store (9.53 m2)

No Asbestos

B00F - R0007 - Communal/Performance Store (9.53 m2)

No Asbestos

B00F - R0008 - P.E. Store (12.92 m2)

No Asbestos

B00F - R0009 - Toilet - Lobby (2.43 m2)

No Asbestos

B00F - R0010 - Toilets - Girls (7.1 m2)

No Asbestos

B00F - R0011 - Sound Cupboard (2.04 m2)

No Asbestos

B00F - R0012 - Toilets - Boys (5.63 m2)

No Asbestos

B00F - R0013 - Toilet - Lobby (3.45 m2)

No Asbestos

B00F - R0014 - Plant (1.59 m2)

No Asbestos

B00F - R0015 - Cleaning Distributed Store (3.38 m2)

No Asbestos

B00F - R0016 - Access Shower/Toilet (6.95 m2)

No Asbestos

B00F - R0017 - Main Switch Board (3.35 m2)

No Asbestos

B00F - R0018 - Covered Outdoor Learning Area (146.72 m2)

No Asbestos

Product	Material Description	Extent	Location Reference	Material Condition	Risk Status	Control Priority
	Sample No					**Test Result**

Demountables

Demountable details as per the AMS records as of 30 Nov 2015.

OS 801 - D11131 - FSU : Placement Date - 30/06/1995

Exterior

Landing	Compressed AC Sheet	Assumed Asbestos	1.2 m2
Step Treads	Compressed AC Sheet	Assumed Asbestos	1.08 m2
Eave Lining	Flat AC Sheet	Assumed Asbestos	8.64 m2

Interior

R1 - Canteen

End wall panel	Flat AC Sheet	Assumed Asbestos	18 m2
Ceiling	Flat AC Sheet	Assumed Asbestos	45 m2

R2 - Covered Area

End wall panel	Flat AC Sheet	Assumed Asbestos	18 m2
Ceiling	Flat AC Sheet	Assumed Asbestos	10 m2

OS 603 - D12621 - Learning Unit - Standard With P.A.A. A/C : Placement Date - 13/04/2012

Note: This refurbished demountable may have asbestos present in remnant mastic in window frames.

Exterior

No Asbestos Found.

Interior

R1 - Learning space/withdrawal/entry

No Asbestos Found.

R2 - Home Base Store

No Asbestos Found.

OS 602 - D13338 - Learning Unit - Standard With P.A.A. : Placement Date - 4/02/2009

Exterior

Eave Lining	Flat AC Sheet	Assumed Asbestos	11.52 m2
Landing	Compressed AC Sheet	Assumed Asbestos	1.2 m2
Step Treads	Compressed AC Sheet	Assumed Asbestos	1.08 m2

Interior

R1 - Learning space/withdrawal/entry

Ceiling	Flat AC Sheet	Assumed Asbestos	70 m2

R2 - Home Base Store

End wall panel	Flat AC Sheet	Assumed Asbestos	18 m2
Ceiling	Flat AC Sheet	Assumed Asbestos	3 m2

OS 601 - D13482 - Learning Unit - Standard/Withdrawal : Placement Date - 30/06/1995

Exterior

Step Treads	Compressed AC Sheet	Assumed Asbestos	1.08 m2
Landing	Compressed AC Sheet	Assumed Asbestos	1.2 m2
Eave Lining	Flat AC Sheet	Assumed Asbestos	11.52 m2

Product	Material Description	Extent	Location Reference	Material Condition	Risk Status	Control Priority
	Sample No					**Test Result**
Interior						
R1 - Entry						
End wall panel	Flat AC Sheet	Assumed Asbestos				18 m2
Ceiling	Flat AC Sheet	Assumed Asbestos				8 m2
R2 - General Learning Space						
End wall panel	Flat AC Sheet	Assumed Asbestos				18 m2
Ceiling	Flat AC Sheet	Assumed Asbestos				55 m2
R3 - Store						
Ceiling	Flat AC Sheet	Assumed Asbestos				10 m2
OS 534 - D13603 - Library/Group Study/Office/A V Store : Placement Date - 30/06/1995						
Exterior						
Eave Lining	Flat AC Sheet	Assumed Asbestos				23.04 m2
Landing	Compressed AC Sheet	Assumed Asbestos				1.2 m2
Step Treads	Compressed AC Sheet	Assumed Asbestos				1.08 m2
Interior						
R1 - Clerical Office						
End wall panel	Flat AC Sheet	Assumed Asbestos				18 m2
Ceiling	Flat AC Sheet	Assumed Asbestos				8 m2
R2 - Staff Room						
Ceiling	Flat AC Sheet	Assumed Asbestos				36 m2
R3 - Security Store						
Ceiling	Flat AC Sheet	Assumed Asbestos				8 m2
R4 - Principal						
Ceiling	Flat AC Sheet	Assumed Asbestos				16 m2
R5 - Staff Toilet						
Toilet partitions	Compressed AC Sheet	Assumed Asbestos				4 m2
Ceiling	Flat AC Sheet	Assumed Asbestos				5 m2
R6 - Staff Toilet						
Toilet partitions	Compressed AC Sheet	Assumed Asbestos				4 m2
Ceiling	Flat AC Sheet	Assumed Asbestos				5 m2
R7 - Reading Area						
Ceiling	Flat AC Sheet	Assumed Asbestos				54 m2
R8 - Entry						
Ceiling	Flat AC Sheet	Assumed Asbestos				14 m2
OS 601 - D14993 - Learning Unit - Standard/Withdrawal : Placement Date - 30/06/1995						
Exterior						
Eave Lining	Flat AC Sheet	Assumed Asbestos				11.52 m2
Landing	Compressed AC Sheet	Assumed Asbestos				1.2 m2
Step Treads	Compressed AC Sheet	Assumed Asbestos				1.08 m2

Product	Material Description	Extent	Location Reference	Material Condition	Risk Status	Control Priority
	Sample No					**Test Result**
Interior						
R1 - Entry						
End wall panel	Flat AC Sheet	Assumed Asbestos				18 m2
Ceiling	Flat AC Sheet	Assumed Asbestos				8 m2
R2 - General Learning Space						
End wall panel	Flat AC Sheet	Assumed Asbestos				18 m2
Ceiling	Flat AC Sheet	Assumed Asbestos				55 m2
R3 - Store						
Ceiling	Flat AC Sheet	Assumed Asbestos				10 m2
OS 837 - D16503 - Hcap Shower/Change/Toilet : Placement Date - 6/11/2009						
Exterior						
No Asbestos Found.						
Interior						
R1 - Disabled Shower/Toilet						
No Asbestos Found.						

Product	Material Description	Extent	Location Reference	Material Condition	Risk Status	Control Priority
	Sample No					**Test Result**

Listing of Electronic Attachments as of 30/11/2015

There are no asbestos related file attachment(s) for this school.