Douglas Partners
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Report on
Preliminary Site Investigation with Limited Sampling

Proposed Picton High School Redevelopment
480 Argyle Street, Picton, NSW

Prepared for
Billard Leece Partnership Pty Ltd

Project 34252.02
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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	Chamali Na	11 April 2017
Reviewer	FOR J M Nash	11 April 2017

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Douglas Partners Pty Ltd
ABN 75 053 980 117
www.douglaspartners.com.au
18 Waler Crescent
Smeaton Grange NSW 2567
Phone (02) 4647 0075
Fax (02) 4646 1886

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1. Introduction

Douglas Partners Pty Ltd (DP) was commissioned by Billard Leece Partnership Pty Ltd (BLP) to undertake a Preliminary Site Investigation with limited sampling (PSI) for the proposed Picton High School Redevelopment project located at 480 Argyle Street, Picton NSW ('the site', as shown on Drawing 1 - Appendix A). The investigation was carried out in accordance with DP's proposal MAC160384 dated 21 November 2016.

It is understood that the proposed redevelopment at the site includes removal of demountable buildings and construction of new teaching blocks and associated facilities within the site. The proposed permanent buildings are likely to be one or two storey light structures and are expected to be founded on pads/shallow piers and floor slabs.

DP previously completed a Phase 1 Contamination Assessment on the southwest portion of the current site which is further detailed in Section 4. This PSI comprised a review of readily available site history information, a site walkover, limited intrusive sampling, laboratory analysis of soil samples for contaminants of concern and interpretation of results with reference to current NSW Environment Protection Authority (EPA) guidelines. It should be noted that due to access constraints imposed by the school setting (the presence of building structures, underground utility services and fences), test pit locations for the current investigation were selected BLP.

The PSI was conducted concurrently with a geotechnical investigation which has been reported separately in DP report titled *Report on Preliminary Geotechnical Investigation, Proposed Picton High School Redevelopment, Argyle Street, Picton*, Project 34252.02 dated March 2017 (DP, 2017).

1.1 Purpose

The purpose of this PSI is to assess the contamination status of the site and the suitability of the site, from a contamination standpoint, for the proposed redevelopment.

2. Scope of Works

DP carried out the following scope of work as part of the PSI:

- Review of site geology, hydrogeology and topography;
- Review of historical aerial photography obtained through NSW Land and Property Information;
- Search of the NSW EPA public registers established under the Contaminated Land Management Act 1997 (CLM) and the Protection of the Environment Operations Act 1997 (POEO);

- A site walkover to identify potential areas of environmental concern (PAEC) and to assess the site conditions;
- Excavation of ten of the 23 proposed test pits (TP 1 to TP 10) completed in conjunction with the geotechnical investigation (DP, 2017) across the site to a minimum depth of 0.5 m into natural soil. Note that as the final Master Plan of the proposed redevelopment was not available at the time of this PSI, only ten test pits were excavated for a preliminary assessment of site contamination. The remaining 13 test pits will be excavated at a later stage targeting the development area (once the final Master Plan becomes available) and the potential areas of environmental concern (PAEC) identified during this PSI, if considered necessary;
- Collection of representative soil samples from the test pits at regular depth intervals (0.0 - 0.2 m, and 0.4 m - 0.5 m);
- Collection of fragments of potential asbestos-containing material (PACM) identified during field observation and laboratory analysis for asbestos identification;
- Field screening of soil samples using a photo-ionisation detector (PID) for any presence of volatile organic compounds (VOC) in soil;
- Field sampling and laboratory analysis with reference to standard environmental protocols, including a Quality Assurance/Quality Control (QA/QC) plan consisting of 10% replicate sampling, appropriate chain-of-custody procedures and in-house laboratory QA/QC testing;
- Laboratory analysis of selected soil samples (one sample from each test pit) for contaminants of potential concern (COPC) comprising:
    - Heavy metals comprising arsenic (As), cadmium (Cd), chromium (Cr), copper (Cu), lead (Pb), mercury (Hg), nickel (Ni) and zinc (Zn);
    - Polycyclic aromatic hydrocarbons (PAH);
    - Total phenols;
    - Total recoverable hydrocarbons (TRH);
    - Benzene, toluene, ethylbenzene and xylene (BTEX);
    - Organochlorine and organophosphorous pesticides (OCP and OPP);
    - Polychlorinated biphenyls (PCB); and
    - Asbestos.
- Interpretation of laboratory results in accordance with current NSW EPA endorsedguidelines; and
- Preparation of this PSI report detailing the methodology and results of the investigation and assessment of the suitability of the site for the proposed redevelopment.

3. Site Description

3.1 Site Identification

The site is located at 480 Argyle Street, Picton and is identified as Lot 2 Deposited Plan 520158 within the local government area of Wollondilly Shire Council. The site is roughly rectangular shaped and comprises an area of approximately 5.8 ha. The site location and boundaries are shown on Drawing 1, Appendix A.

3.2 Site Description

The site consists predominately of single and multi-storey school buildings and associated classrooms. Multiple demountable single storey building/sheds are present at the northwest and the centre of the site. There is a car park area along the western-most part of the site, adjacent to Argyle Street. The eastern portion of the site includes a grassed playground area/open space, and asphalt basketball courts are located within the south-western portion of the site. There is partial tree cover along the northern and eastern site boundary as well as scattered trees throughout, mainly within the northern half of the site. Access roads around the buildings at the front of the site and parking area are mainly bitumen paved. General site photographs are shown on Photographs 1 and 2 in Photographic Plate 1 of Appendix B. The site conditions encountered during this investigation are discussed in detail in Section 6, with the identified PAEC shown on Drawing 2, Appendix A and in Photographic Plates 1 to 7, Appendix B.

The site is bounded by residential land use to the north; Wonga Road to the east, beyond which is vacant rural land; rural/commercial land use to the south and Argyle Road to the west, beyond which is rural / residential land. Remondis Australia Pty Ltd, a recycling centre, is located to the south east of the site (discussed further in Section 5.2).

Overall topographic relief is approximately 8 m from the highest part (approximately RL218 m, relative to the Australian height datum - AHD) within the eastern and western portions of the site to the lowest part (approximately RL 210 m) within the mid northern portion of the site.

3.3 Soil Landscapes

Reference to the Soil Conservation Service of NSW (1990) *Soil Landscapes of the Wollongong-Port Hacking 1:100,000 Sheet* indicates that the site is underlain by the Blacktown soil landscape (mapping unit bt), characterised by gently undulating rises on Wianamatta Group shales and Hawkesbury sandstone, with local relief to 30 m and slopes usually less than 5%. The landscape is typically represented by broad rounded crests and ridges with gently inclined slopes. Soils range from shallow (<1 m) red-brown podzolic soils - comprising mostly clayey soils on crests and upper slopes - to deep (1.5 - 3 m) yellow-brown clay soils on lower slopes and areas of poor drainage. These soils are typically moderately reactive with low fertility, poor soil drainage and highly plastic subsoil.

3.4 Geology and Hydrogeology

Reference to the Geological Survey of New South Wales (1985), *Wollongong-Port Hacking 1: 100 000 Geological Sheet 9029-9129* indicates the following:

- The majority of the site is underlain by Ashfield Shale (mapping unit Rwa) of the Triassic age. Ashfield Shale typically comprises dark grey to black shale, siltstone and laminite which weathers to a residual clay profile of medium to high plasticity; and
- A small area within the eastern portion of the site is underlain by Hawkesbury sandstone (mapping unit Rh) of the Triassic period, which typically comprise medium to coarse grained quartz sandstone with minor shale and laminate lenses.

A search of the groundwater bore database (maintained by NSW Department of Primary Industries Water) on 21 February 2017 indicated that there was one groundwater bore located within a distance of approximately 1 km, south west of the site. Work summaries from the bore search indicated that the authorised and intended purpose of the bore was for domestic stock watering and had a standing water level of 28 m.

3.5 Hydrology

The site drains towards Redbank Creek located approximately 250 m north east of the site. Redbank Creek joins Stonequarry Creek, approximately 350 m to the east of the site. There is a small dam located approximately 350 m south of the site, and a larger dam further south.

4. Previous Investigation

DP (2010) undertook a Phase 1 Contamination Assessment for the proposed Metals Fabrication Trade School at Picton High School which incorporates the south western portion of the current site. The DP (2010) site boundary is shown on Drawing 1, Appendix A. The investigation was commissioned by NSW Public Works Department of Services, Technology and Administration to assess the potential for contamination of the site to assist in the design and planning of the proposed development.

The scope of works comprised a review of site history information, a site walkover, limited soil sampling and laboratory testing. Fieldwork was undertaken on 9 August 2010, which included completion of four test bores to depths ranging from 1.2 m to 1.9 m using a mini-excavator auger and sampling rig, with 110 mm spiral flight augers. It is noted that due to the presence of the fenced basketball court, a significant proportion of the site could not be accessed with the mini-excavator drilling rig. A total of four samples were analysed for metals (As, Cd, Cr, Cu, Pb, Hg, Ni, Zn), TPH, BTEX, PAH, Phenols, PCB, OCP and asbestos. Concentrations of all contaminants analysed were below the adopted site assessment criteria (SAC). DP (2010) concluded that the site was considered suitable for the proposed development, from a contamination standpoint, subject to the following:

- Should any visual or olfactory indicators of contamination (including asbestos) be identified during initial earthworks, DP should be contacted for assessment;

- Prior to the off-site disposal of any excavated surplus material, an appropriate material classification assessment must be conducted by a qualified environmental consultant in accordance with NSW EPA Waste Classification Guidelines; and
- No soils are to be imported to the site without prior approval from DP. Any imported materials are to be accompanied by a validation certificate/report stating the suitability of the materials for use on a secondary school site.

5. Site History

5.1 Aerial Photograph Review

Historical aerial photographs from 1955 to 1994 were reviewed as part of this PSI to identify past land uses and potential signs of contamination at the site. The historical aerial photographs are presented on Drawings 4 to 7, Appendix A. More recent aerial photographs from 2010 to present were reviewed using *Near Map.* A summary of the aerial photograph review is given below:

1955: The aerial photograph is of poor resolution. The site and surrounding land appears to be mainly comprised of paddocks/open space, most likely used for grazing/agricultural activity. Redbank Creek and Stonequarry Creek appear to the north east and east of the site, respectively. Residential areas can be seen north of the site.

1969: Compared to the 1955 aerial photograph, the most notable difference is that buildings have been constructed on the site, assumed to be buildings associated with the school. The trees within the eastern portion of the site have been cleared. The surrounding land use appears to be agricultural, with increasing rural development to the north and south.

1984: The layout of the school appears similar to the present day and it is apparent that the buildings noted in 1969 have been re-structured. Additional buildings associated with the school have been constructed and the current large playing field can be seen to the east of the site. Towards the southern site boundary, two basketball courts can be seen. Within the south western corner, there is an area of open space and two structures immediately north. A line of trees appears around the majority of the site boundary. Increased (primarily rural) development has occurred in the surrounding area, with rural residential properties evident to the north. A large commercial property is now located to the north west of the site. The majority of the surrounding area appears to still be mainly agricultural.

1994: The aerial photograph is of poor resolution. The two structures noted in the south western portion of the site in the 1984 photograph appear to have been demolished, replaced with a new building. Some new buildings appear to have been added to the north and east of the quadrangle building located in the centre of the site. Scattered trees can be seen across the site. A mixture of commercial/industrial/residential land-use is evident to the north and north-west of the site.

2010 – 2017: With the exception of two structures (possibly demountable buildings) that were constructed in the north western portion of the site in 2014, and a metal shed (most likely used as a maintenance and storage yard) to the southeast of the basketball court, the layout of the school has remained much the same since 2010.

5.2 Search of EPA register

A search of the NSW EPA website on 21 February 2017 indicated that:

- The site and adjacent properties have not been included in the list of NSW contaminated sites notified to EPA;
- No notices or orders made under the Contaminated Land Management (CLM) Act 1997 have been issued for the site or adjacent properties; and
- No licences under Schedule 1 of the Protection of the Environment Operations (POEO) Act 1997 have been issued for the site. However, DP notes that a license has been issued for 'non-thermal treatment of general waste and waste storage' for the adjacent property, Remondis Australia Pty Ltd (Lot 67 Wonga Road, Picton), located approximately 100 m south east of the site.

The NSW EPA website search results are included in Appendix D.

5.3 Asbestos Register

The site maintains an asbestos register that documents any asbestos in building materials at the site. The register confirms that asbestos is present in several structures at the site. A copy of the asbestos register is provided in Appendix D.

6. Site Walkover

A site walkover was conducted by a DP environmental engineer on 23 January 2017. Photographs taken during the site walkover are presented in Photographic Plates 1 to 7, Appendix B, and the PAEC identified based on field observations are shown on Drawing 2, Appendix A. During the walkover, the following observations were noted:

- Rubbish and anthropogenic material including fragments of brick, concrete, plastic and timber were observed in gravelly clayey surface fill in the crawl space underneath multiple demountable buildings (Photograph 3);
- Part of a broken terracotta pipe was found protruding out from fill soil immediately adjacent to one of the demountable building located east of the science laboratory. The surrounding area comprised gravelly clays; with the exception of the pipe. No suspected PACM was observed in the fill soil at this location (Photograph 4);
- A fragment of PACM (confirmed by laboratory to contain asbestos; refer to Appendix G) was observed on the ground surface in a loose gravelly road base fill near the northern site boundary (Photograph 5);
- Loose anthropogenic material including metal posts, rio-bar frame, corrugated tin sheeting, timber and fragments of concrete were stockpiled on the site towards the northern site boundary, behind a retaining wall (Photograph 6);

- Two grease traps (one outside the canteen area and one adjacent south of quadrangle building, within the southern third of the site) were present (Photograph 7);
- Construction and associated materials including drums, metal posts and wooden pallets were noted within the maintenance shed area located near the southern site boundary (Photograph 8);
- A small stack of concrete slabs/wooden pallets was observed on the road verge near the northern site boundary (Photograph 9);
- Road-base type fill (bituminous fill) was observed in various locations at the site including immediately to the north of basketball court (Photograph 10) and in isolated locations within the site;
- Sandy fill was observed behind the goal posts within the playing field in the northeast portion of the site (Photograph 11);
- A former brick and concrete structure was observed in the north east corner of the site; loose construction and demolition-type fill was observed on the surface of the structure (Photograph 12); and
- Gravelly clay fill was noted in the southern portion of the playfield, within the stock pen located at the southeast portion of the site and in a cattle grazing area in the northeast corner of the site (Photograph 13).

7. Preliminary Conceptual Site Model

A conceptual site model (CSM) is a representation of site-related information regarding contamination sources, receptors and exposure pathways between those sources and receptors (linkages). A preliminary CSM provides a framework to identify potential contamination sources 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).

7.1 Potential Sources

Based on the review of site history information and the site walkover, the identified potential sources, description of sources and COPC at the site have been summarised in Table 1 (following page).

Table 1: Potential Contamination Sources and COPC

Potential Source	Description of Potential Source	COPC
Building Demolition (S1)	The aerial photograph review indicates that the school buildings were likely to be constructed in the 1960s. From the 1960s onwards, the layout of the school has changed, and various structures appear to have been demolished. Building demolition rubble is often an indicator of the potential presence of ACM, especially if the structures were constructed before the mid-1980's. One ACM fragment was observed on the site surface during the site walkover. An asbestos register is maintained for the site that identifies asbestos present in several structures at the site. ACM in building materials can over time, and through weathering, fragment and be deposited on the surrounding site surface.	Asbestos
Fill (S2)	Site walkover identified road base and gravelly clay fill at multiple locations. Fill is likely to have been imported to the site during the past development works. Anthropogenic material including building demolition material has been noted in surface fill at numerous locations.	TRH, BTEX, Metals, PAH, OCP, OPP PCB and asbestos

Notes:
Metals: comprising arsenic (As), cadmium (Cd, chromium (Cr), copper (Cu), lead (Pb), mercury (Hg), nickel (Ni) and zinc (Zn);
TRH - Total recoverable hydrocarbons;
BTEX - Benzene, toluene, ethylbenzene and xylene;
PAH - Polycyclic aromatic hydrocarbons;
OCP and OPP - Organochlorine and organophosphorous pesticides;
PCB - Polychlorinated biphenyls;
ACM – Asbestos Containing Material

7.2 Potential Receptors

The following potential human receptors (R) have been identified for the site:

- R1 – Construction and maintenance workers (during site redevelopment);
- R2 – Current and future site users (i.e. students and teachers) during and following redevelopment of the site; and
- R3 – Land users in adjacent areas.

7.3 Potential Pathways

Potential pathways for contamination include the following:

- P1 – Ingestion and dermal contact; and
- P2 – Inhalation of fibres, dust and/or vapours.

7.4 Summary of Potential Complete Pathways

A 'source - pathway - receptor' approach has been used to assess the potential risks of harm being caused to human or ecological receptors from contamination sources on or in the vicinity of the site, via exposure pathways. The possible exposure pathways between the above sources (S1 and S2) and receptors (R1 to R3) are provided in Table 2 below. Assessment of the preliminary CSM was used to determine data gaps and the requirement for further investigation in order to assess the suitability of the site for the proposed redevelopment.

Table 2: Preliminary Conceptual Site Model

Source	Exposure Pathway	Receptor	Requirement for Additional Data and / or Management
S1: Building Demolition Materials; and S2: Fill	P1 – Ingestion and dermal contact; P2 – Inhalation of fibres and/or dust and/or vapours	R1 - Construction and maintenance workers. R2 – Current and Future site users	The demolition of existing structures containing hazardous materials at the site should be carried out by a suitably licensed demolition contractor. An unexpected finds protocol (UXF) should be developed should suspected contamination (including ACM) be observed during demolition and construction works.
	P2 – Inhalation of fibres and/or dust and/or vapours	R3 – Land users in adjacent areas.	A limited (i.e. targeted) intrusive investigation is required to quantify and assess possible contamination including chemical testing of soil (and groundwater if deemed necessary).

8. Field Investigation

8.1 Fieldwork Rationale

Field investigations were undertaken on 23 January 2017 by a DP environmental engineer. The field investigation was designed in accordance with the seven step data quality objective (DQO) process provided in Appendix B, Schedule B2 of the *National Environment Protection (Assessment of Site Contamination) Measure 1999* as amended 2013 (NEPC, 2013). The DQO adopted for this PSI is provided in Appendix E.

Ten test pits (TP1 to TP10) were excavated to a minimum depth of 0.5 m into natural material for both geotechnical and contamination purposes and were extended further to a depth of approximately 2.5 m below ground level (bgl) in order to meet requirements of the geotechnical investigation (refer to DP (2017) for detail). It should be noted that test pit locations were selected by BLP due to access constraints imposed by the school setting, underground utility services and fences. The implication of this limitation is discussed in Section 11. Noting the above constraints the test pit locations were positioned to provide general site coverage.

Soil samples were generally collected from within the test pits at depths of 0.0 m - 0.2 m, 0.4 m - 0.5 m and every 0.5 m interval to the end of investigation. The soil samples were collected targeting fill layers and any change in the soil profile within test pits. The geological profile observed within each test pit was logged. The test pit logs are provided in Appendix F. .All soil samples were screened using a PID for the presence of VOC in soil. Based on the results of PID screening, selected samples (one sample from each test pit location) were submitted to laboratory for analysis of COPC. One suspected PACM fragment found on the ground surface near the northern site boundary during the site walkover was also collected and submitted to the laboratory for analysis. The test pit locations are shown on Drawing 3, Appendix A.

8.2 Field Sampling Procedure

Sampling data was recorded to comply with routine chain-of-custody requirements and DP's standard operating procedures. The general sampling, handling, transport and tracking procedures are detailed below:

- Sample locations were pre-determined using global information system (GIS) prior to field work and were located in the field using a handheld Garmin global positioning system (GPS);
- Disposable nitrile gloves were used to collect all samples. Gloves were replaced prior to the collection of each sample in order to prevent cross-contamination;
- A Takeuchi TB145 excavator fitted with a 300 mm tooth bucket was used to excavate all test pits. Samples were collected from the freshly exposed walls of the test pits for field screening and for laboratory analysis;
- The field screening samples were placed into 50 g zip lock plastic bags and checked with a PID for the presence of volatiles. Samples collected for laboratory analysis were transferred into a new laboratory prepared glass jar, with minimal headspace, and sealed with a Teflon lined lid. Each jar was individually sealed to reduce the potential for cross contamination during transportation to the laboratory;
- Sample containers were labelled with individual and unique identification including project number, sample ID, depth and date of sampling; and
- Logs were completed for all test pits. Test pit logs included, where relevant, sample identification, coordinates, date of collection, a description of the substrate conditions encountered, visual or olfactory evidence of contamination, the depth of samples collected, QA/QC samples collected, the sampler and equipment used.

8.3 Analytical Rationale

Laboratory analysis of primary and intra-laboratory samples was conducted by Envirolab Services Pty Ltd (Envirolab). Envirolab is accredited by the National Association of Testing Authorities (NATA) and are required to conduct in-house QA/QC procedures. These are normally incorporated into every analytical run and include assessment of reagent blanks, spike recovery, surrogate recovery and laboratory duplicates.

Based on the field observations and the results of the PID screening, samples were selected for analysis of COPC. Not all samples collected were analysed. Additional soil samples were kept 'on hold' pending details of initial analysis so that they could be analysed if required. The rationale for sample selection for laboratory analysis is provided below:

- Samples collected from fill (where present) were analysed;
- Where fill was not present, samples collected from the surface (0.0 - 0.1 m) were analysed;
- Two samples of natural shale were analysed;
- The fragment of PACM was analysed to assess the presence/absence of asbestos.

The rationale for the sampling locations and analytes tested is provided in Table 3 below.

Table 3: Summary of Sampling and Analysis Rationale

Location	Sample Depth*	TP depth (m bgl)	Depth of filling (m bgl)	Analytes	Purpose*	Sample Target
TP 1	0.5	2.5	1.0	Metals, TRH, BTEX, PAH, phenols, OCP, OPP, PCB and asbestos	General Site Coverage	Fill
TP 2	0.5	2.5	0.9		General Site Coverage	Fill
TP 3	0.5	2.0	0.6		General Site Coverage	Fill
TP 4	0.5	1.2	0.5		General Site Coverage	Fill
TP 5	0.0 – 0.2	1.0	0.4		General Site Coverage	Fill
TP 6	0.0 – 0.2	1.5	0.9		General Site Coverage	Fill
TP 7	0.0 – 0.2	1.5	0.9		General Site Coverage	Fill
TP 8	0.0 – 0.2	1.0	-		General Site Coverage	Topsoil
TP 9	0.5	0.5	-		General Site Coverage	Shale
TP 10	0.5	1.0	-		General Site Coverage	Shale

Note: As the proposed development area has not been finalised the test pit locations were selected as per advice from BLP covering the general site areas. A further investigation will be required targeting the development area (and PAEC if considered necessary based on the findings of this PSI).

9. Site Assessment Criteria

The SAC applied in this PSI have been informed by the CSM - which identified human receptors to potential contamination on the site (refer to Section 7). Analytical results were assessed (as a Tier 1 assessment) against the investigation and screening levels as per Schedule B1 of NEPC (2013).

Taking into account the current and proposed land use of the site (i.e. school), the investigation and screening levels adopted are consistent with a generic residential land use scenario. The derivation of the SAC is included in Appendix E and the adopted SAC are listed on the analytical results tables in Appendix C.

10. Results

10.1 Field Work Results

The test pit logs are included in Appendix F, together with notes defining classification methods and descriptive terms.

Relatively uniform conditions were encountered across most of the site, with filling observed in the majority of test pit locations. The general strata across the site is summarised as follows:

- FILLING/TOPSOIL – filling was encountered in TP1 to TP7 and generally consisted of brown silty clay with some gravels from the surface to depths ranging between 0.4 - 1. 0 m. Organic material was encountered in fill at depth up to 0.2 m bgl in TP1 to TP4 and TP7. Clayey gravel and gravelly clay was encountered in TP5 and TP6, respectively. Topsoil was encountered in TP8 to TP10 from the surface to depths ranging between 0.1 - 0.3 m.
- CLAY/ROCK – clay or rock was encountered immediately below the fill / topsoil layer. Red brown to grey silty clay of very stiff consistency was encountered in TP1, TP2, TP4 and TP5 while hard, gravelly clay was encountered in TP3 and TP8. In TP6, TP7, TP9 and TP10, filling/topsoil was underlain by rock, typically of very low to low strength, highly weathered orange brown sandstone or brown to grey shale. Extremely low strength shale was encountered in TP10.
- ROCK – typically low to medium strength, highly weathered shale or sandstone was encountered in TP1, TP2, TP4, TP5 and TP8 below the clay layer, from depths between 0.9 - 2.5 m. Siltstone was encountered in TP3 from depths between 1.8 m to 2 m. There was bucket refusal on low to medium strength rock in most test pits.

No free groundwater was observed in any of the test pit locations. It is noted, however, that the pits were immediately backfilled following excavation which precluded longer term monitoring of any groundwater levels that might be present. PID measurements were less than 1.0 ppm for all soil samples screened for VOC in the field.

During the site walkover, a fragment of PACM was observed on the ground surface near the northern site boundary.

10.2 Analytical Results

The analytical results for the soil samples collected during this PSI are summarised in Table C1 of Appendix C, together with the adopted SAC. The laboratory certificate of analysis is provided in Appendix G.

A summary of results is provided below:

- Concentrations of PAH, total phenols, TRH, BTEX, OCP, OPP and PCB were reported below their respective LOR in all samples analysed;
- Concentrations of metals were reported below the LOR and/or SAC in all of the samples analysed;
- Asbestos was not detected at the LOR in the soil samples analysed;
- One PACM fragment submitted for analysis, reported as grey compressed fibre cement material was confirmed to contain chrysotile and amosite asbestos.

10.3 Quality Assurance and Quality Control

A review of the adopted QA / QC procedures and results (Appendix H) indicates that the DQIs have generally been met. On this basis, the sampling and laboratory methods used during the investigation were found to meet the data quality objectives for this project (as discussed in Appendix E).

11. Discussion

The PSI included a review of site history information, soil sampling and laboratory analysis. The previous DP (2010) investigation was undertaken on part of the current site, and overall found the site to have a low potential for contamination. The historical aerial photograph review completed as part of this report indicated that the site was previously used for agricultural activities in the 1950s. The school was most likely constructed in the 1960s, and has undergone progressive development since then.

The site currently maintains an asbestos register (refer to Appendix D) that confirms the presence of asbestos in structures at the site. The demolition and removal of existing structures containing hazardous materials at the site should be carried out by a suitably licensed demolition contractor. There may also be a need to identify other potentially hazardous materials in current structures at the site that will require appropriate disposal (such as lead paint and fluorescent lights). DP therefore recommends a hazardous materials audit is completed prior to demolition works, given the potential for cross contamination of surface soils from hazardous building material during demolition works.

A fragment of ACM was observed near the northern site boundary, on the ground surface. The fragment was submitted for laboratory analysis and was confirmed to contain chrysotile and amosite asbestos. The ACM observed could have been sourced from one of the following:

- Import of fill to the site for site surface levelling;
- Demolition of site structures previously undertaken at the site; or
- Weathering and general wear and tear of the structures over time.

Reference should be made to The NSW Department of Education (DoE), *Asbestos Management Plan for NSW Government Schools*; Section 9.2.2 which provides a flowchart of the action that should be taken in the event of finding a single fragment of ACM on the surface. In summary, access to the area should be restricted, and the DoE should be contacted as soon as practicable. DP has informed BLP of this finding via email correspondence dated 10 March 2017. A further asbestos assessment of surface fill along the northern site boundary should be undertaken.

Anthropogenic materials including brick fragments, concrete, plastic and timber were observed underneath multiple demountable buildings. A fragment of buried terracotta pipe was also observed adjacent to one of the demountable building. However, a detailed inspection of the area was not possible due to access limitations. DP therefore recommends a detailed inspection is completed after removal of the buildings and following provision of an asbestos clearance certificate by a qualified occupational hygienist. Targeted sampling and analysis may be required if fill containing anthropogenic material is observed.

Localised fill material was identified in parts of the site. However, based on visual observations, the fill appear to largely comprise either reworked natural materials or inert materials (i.e. road-base). Notwithstanding DP recommends that an UXF is prepared prior to demolition and construction works at the site, should visual or olfactory indicators of possibly contamination (including ACM) be observed during construction works.

12. Conclusions and Recommendations

Based on the investigation findings, DP considers the following with respect to the suitability of the site for the proposed redevelopment:

- A bonded ACM fragment was observed near the northern site boundary, which should be managed as per The NSW Department of Education, *Asbestos Management Plan for NSW Government Schools*. Given the presence of ACM in structures at the site, DP recommends that the northern site boundary area and the balance of the site (including identified PAEC locations) are subject to a detailed site inspection after demolition of existing structures is completed. The inspection should be completed with reference to NSW EPA endorsed guidelines: Western Australia Department of Health (DoH) *Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia*, May 2009;
- A hazardous material survey should be conducted on the site prior to demolition works and a clearance certificate should be issued by a licenced asbestos assessor;
- All demolition waste should be disposed of at a suitably licenced waste facility;
- The areas under the demountable buildings could not be inspected due to access constraints. Following removal of the demountable buildings, a detailed site walkover should be completed across the footprint areas (and undertake sampling as required) to determine if any fill material is present; and
- The site is considered to have a generally low potential for contamination and is considered suitable, from an environmental perspective, for the proposed residential land use with the exception of hazardous building materials (HBM) which may have impacted the surface as a result of wear and tear of existing structure, previous onsite demolition activities and/or fill import. Any HBM and/or surface soils containing similar materials could be spread during the demolition process if not managed appropriately.

Notwithstanding the above, the potential remains for isolated pockets of contamination to be present in areas of the site. To appropriately manage unexpected potential contamination issues encountered during development works, DP recommends the development and implementation of an UXF protocol prior to the commencement demolition and future construction works at the site.

13. Limitations

Douglas Partners Pty Ltd (DP) has prepared this Preliminary Site Investigation with Limited Sampling report for this project at 480 Argyle Street, Picton NSW in accordance with DP's proposal MAC160384.P.003 dated 21 November 2017. The work was carried out under DP's Conditions of Engagement. This report is provided for the exclusive use of Billard Leece Partnership 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.

Although the sampling plan adopted for this investigation is considered appropriate to achieve the stated project objectives, there are necessarily parts of the site that have not been sampled and analysed. This is either due to undetected variations in ground conditions or to budget constraints (as discussed above), or to vegetation preventing visual inspection and reasonable access. It is therefore considered possible that HBM, including asbestos, may be present in unobserved or untested parts of the site, between and beyond sampling locations, and hence no warranty can be given that asbestos is not present.

Douglas Partners Pty Ltd

Appendix A

About This Report

Drawings

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

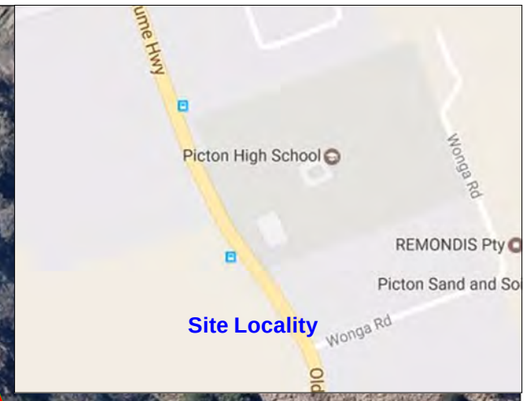
Where information obtained from this report is provided for tendering purposes, it is recommended that all information, including the written report and discussion, be made available. In circumstances where the discussion or comments section is not relevant to the contractual situation, it may be appropriate 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.

Legend

- Existing site boundary
- New site boundary
- RMS Land
- Wollondilly Council land
- Extent of proposed works
- Region



ARGYLE STREET

WONGA ROAD

0 100.0

metres

Douglas Partners
Geotechnics / Environment / Groundwater

CLIENT: Billard Leece Partnership Pty Ltd		TITLE: **Site Locality and Boundary**	PROJECT No: 34252.02
OFFICE: Macarthur	DRAWN BY: CLN/EMG	**Proposed Picton High School Development**	DRAWING No: 1
SCALE: As shown	DATE: 04.04.18	**480 Argyle Street, Picton, NSW**	REVISION: B

N
MGA

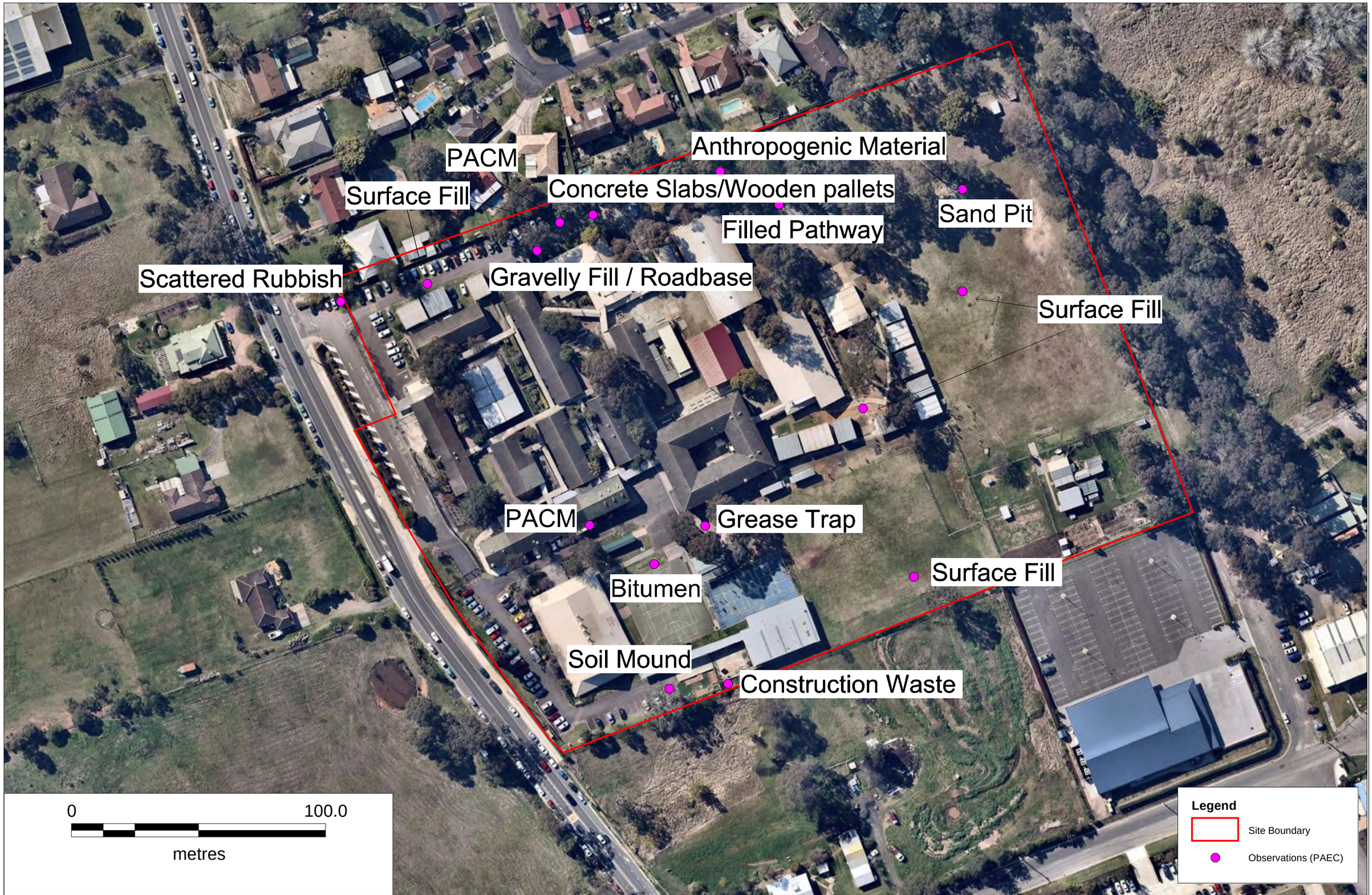
Douglas Partners
Geotechnics / Environment / Groundwater

CLIENT: Billard Leece Partnership Pty Ltd		
OFFICE: Macarthur	DRAWN BY: CLN/EMG	
SCALE: As shown	DATE: 04.04.18	

TITLE: **Test Pit Locations**
Proposed Picton High School Development
480 Argyle Street, Picton, NSW

N
MGA

PROJECT No:	34252.02
DRAWING No:	2
REVISION:	B



Douglas Partners
Geotechnics / Environment / Groundwater

CLIENT: Billard Leece Partnership Pty Ltd		TITLE: **Site Walkover Observations**	PROJECT No: 34252.02
OFFICE: Macarthur	DRAWN BY: CLN/EMG	**Proposed Picton High School Development**	DRAWING No: 3
SCALE: As shown	DATE: 04.04.18	**480 Argyle Street, Picton, NSW**	REVISION: B

N
MGA

Douglas Partners
Geotechnics / Environment / Groundwater

CLIENT: Billard Leece Partnership Pty Ltd
OFFICE: Macarthur
DRAWN BY: CLN
SCALE: As shown
DATE: 02.03.17

TITLE: Historical Aerial Photograph - 1955
Proposed Picton High School Redevelopment
480 Argyle Street, Picton, NSW

N
MGA

PROJECT No: 34252.02
DRAWING No: 4
REVISION: A

Douglas Partners
Geotechnics / Environment / Groundwater

CLIENT: Billard Leece Partnership Pty Ltd

OFFICE: Macarthur | DRAWN BY: CLN

SCALE: As shown | DATE: 02.03.17

TITLE: Historical Aerial Photograph - 1969
Proposed Picton High School Redevelopment
480 Argyle Street, Picton, NSW

MGA

PROJECT No: 34252.02

DRAWING No: 5

REVISION: A

Douglas Partners
Geotechnics | Environment | Groundwater

CLIENT: Billard Leece Partnership Pty Ltd

OFFICE: Macarthur | DRAWN BY: CLN

SCALE: As shown | DATE: 02.03.17

TITLE: Historical Aerial Photograph - 1984
Proposed Picton High School Redevelopment
480 Argyle Street, Picton, NSW

N
MGA

PROJECT No: 34252.02

DRAWING No: 6

REVISION: A

0 100.0

metres

Legend

Site Boundary

Douglas Partners
Geotechnics | Environment | Groundwater

CLIENT: Billard Leece Partnership Pty Ltd		TITLE: Historical Aerial Photograph - 1994 Proposed Picton High School Redevelopment 480 Argyle Street, Picton, NSW	PROJECT No: 34252.02
OFFICE: Macarthur	DRAWN BY: CLN		DRAWING No: 7
SCALE: As shown	DATE: 02.03.17		REVISION: A

N

MGA

Appendix B

Site Photographs

Photoraph 1 - General site photograph. Photograph facing east.

Photograph 2 - General site photograph.

Douglas Partners Geotechnics | Environment | Groundwater	Site Photographs	PROJ:	34252.02
	PSI with Limited Sampling	PLATE:	1
	480 Argyle Street, Picton, NSW	REV:	A
	CLIENT: Billard Leece Partnership Pty Ltd	DATE:	23.01.17

Photograph 3 - Rubbish and anthropogenic material underneath demountable buildings.

Photograph 4 - Terracotta pipe and surrounding fill.

Douglas Partners Geotechnics / Environment / Groundwater	Site Photographs	PROJ:	34252.02
	PSI with Limited Sampling	PLATE:	2
	480 Argyle Street, Picton, NSW	REV:	A
	CLIENT: Billard Leece Partnership Pty Ltd	DATE:	23.01.17

Photograph 5 - Fragment of PACM found on the ground surface near northern site boundary

Photograph 6 - Anthropogenic material found behind the retaining wall in the northern portion of site.

Douglas Partners Geotechnics / Environment / Groundwater	Site Photographs	PROJ:	34252.02
	PSI with Limited Sampling	PLATE:	3
	480 Argyle Street, Picton, NSW	REV:	A
	CLIENT: Billard Leece Partnership Pty Ltd	DATE:	23.01.17

Photograph 7 - Grease trap.

Photograph 8 - Construction materials within the maintenance shed.

Photograph 9 - Stack of concrete slabs / wooden pallets.

Photograph 10 - Patch of bitumenour fill north of basketball court. Photograph facing south.

Douglas Partners Geotechnics / Environment / Groundwater	Site Photographs	PROJ:	34252.02
	PSI with Limited Sampling	PLATE:	5
	480 Argyle Street, Picton, NSW	REV:	A
	CLIENT: Billard Leece Partnership Pty Ltd	DATE:	23.01.17

Photograph 11 - Sandy fill within playing field at the northeast portion of the site.

Photograph 12 - Former brick and concrete structure at northeast corner of site.

Douglas Partners Geotechnics / Environment / Groundwater	Site Photographs PSI with Limited Sampling 480 Argyle Street, Picton, NSW CLIENT: Billard Leece Partnership Pty Ltd	PROJ: PLATE: REV: DATE:	34252.02 6 A 23.01.17

Photograph 13 - Gravelly clay fill within cattle grazing area at the northeast corner of the site.

Appendix C

Laboratory Summary Tables

Table C1 - Summary of Soil and PACM Laboratory Analysis (All results in mg/kg unless otherwise stated)

Test Pit/ Sample ID[a]	Depth	Sampling Date	Soil Type*	Metals								PAH				Phenols	Total Recoverable Hydrocarbons						BTEX				Organochlorine Pesticides (OCP)								OPP	PCB	Asbestos
				Arsenic	Cadmium	Chromium (VI)[b]	Copper	Lead	Mercury	Nickel	Zinc	Naphthalene	Benzo(a) Pyrene (BaP)	BaP TEQ	Total PAH	Pentachlorophenol	TRH C_6-C_{10}	TRH >C_{10}-C_{16}	F1	F2	F3	F4	Benzene	Toluene	Ethylbenzene	Total xylenes	DDT + DDD + DDE	Aldrin and Dieldrin	Chlordane	Endosulfan	Endrin	Heptachlor	HCB	Methoxychlor	Chlorpyrifos	PCB	Asbestos
	Practical Quantitation Limit (PQL)			4	0.4	1	1	1	0.1	1	1	0.1	0.05	0.5	0.05	5	25	50	25	50	100	100	0.2	0.5	1	3	0.3	0.2	0.2	0.3	0.1	0.1	0.1	0.1	0.1	0.7	
Site Assessment Criteria (SAC)																																				
HIL A				100	20	100	6000	300	40	400	7400	-	-	3	300	100	-	-	-	-	-	-	-	-	-	-	240	6	50	270	10	6	10	300	160	1	-
HSL A & B (0 m to <1m)				-	-	-	-	-	-	-	-	4	-	-	-	-	-	-	40	230	-	-	0.6	390	NL	95	-	-	-	-	-	-	-	-	-	-	-
EIL (urban residential and public open space)				100	-	410	120	1100	-	45	310	170	-	-	-	-	-	-	-	-	-	-	-	-	-	-	180	-	-	-	-	-	-	-	-	-	
ESL (Urban residential and public open space)				-	-	-	-	-	-	-	-	-	0.7	-	-	-	-	-	180	120	1300	5600	65	105	125	45	-	-	-	-	-	-	-	-	-	-	-
Test Pit Locations																																				
TP1	0.5	23/01/2017	silt	6	<0.4	22	35	68	<0.1	14	86	<0.1	<0.05	<0.5	<0.05	<5	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.3	<0.2	<0.2	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.7	NAD
TP2	0.5	23/01/2017	silt	10	<0.4	23	17	29	<0.1	16	31	<0.1	<0.05	<0.5	<0.05	<5	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.3	<0.2	<0.2	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.7	NAD
TP3	0.5	23/01/2017	silt	7	<0.4	30	15	26	<0.1	14	26	<0.1	<0.05	<0.5	<0.05	<5	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.3	<0.2	<0.2	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.7	NAD
TP4	0.5	23/01/2017	silt	6	<0.4	20	25	21	<0.1	9	36	<0.1	<0.05	<0.5	<0.05	<5	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.3	<0.2	<0.2	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.7	NAD
TP5	0-0.2	23/01/2017	silt	7	<0.4	28	12	19	<0.1	7	26	<0.1	<0.05	<0.5	<0.05	<5	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.3	<0.2	<0.2	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.7	NAD
BD02/23.1.17	0-0.2	23/01/2017	silt	7	<0.4	28	12	19	<0.1	7	26	-	-	-	-	-	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<3	-	-	-	-	-	-	-	-	-	-	-
TP6	0-0.2	23/01/2017	silt	7	<0.4	21	12	22	<0.1	6	24	<0.1	<0.05	<0.5	<0.05	<5	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.3	<0.2	<0.2	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.7	NAD
TP7	0-0.2	23/01/2017	silt	7	<0.4	15	14	16	<0.1	10	36	<0.1	<0.05	<0.5	<0.05	<5	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.3	<0.2	<0.2	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.7	NAD
TP8	0-0.2	23/01/2017	silt	6	<0.4	15	15	16	<0.1	7	29	<0.1	<0.05	<0.5	<0.05	<5	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.3	<0.2	<0.2	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.7	NAD
TP9	0.5	23/01/2017	silt	7	<0.4	10	9	20	<0.1	2	14	<0.1	<0.05	<0.5	<0.05	<5	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.3	<0.2	<0.2	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.7	NAD
TP10	0.5	23/01/2017	silt	7	<0.4	12	16	20	<0.1	3	24	<0.1	<0.05	<0.5	<0.05	<5	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.3	<0.2	<0.2	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.7	NAD
Fragments																																				
ACM1	-	23/01/2017		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Positive

Notes

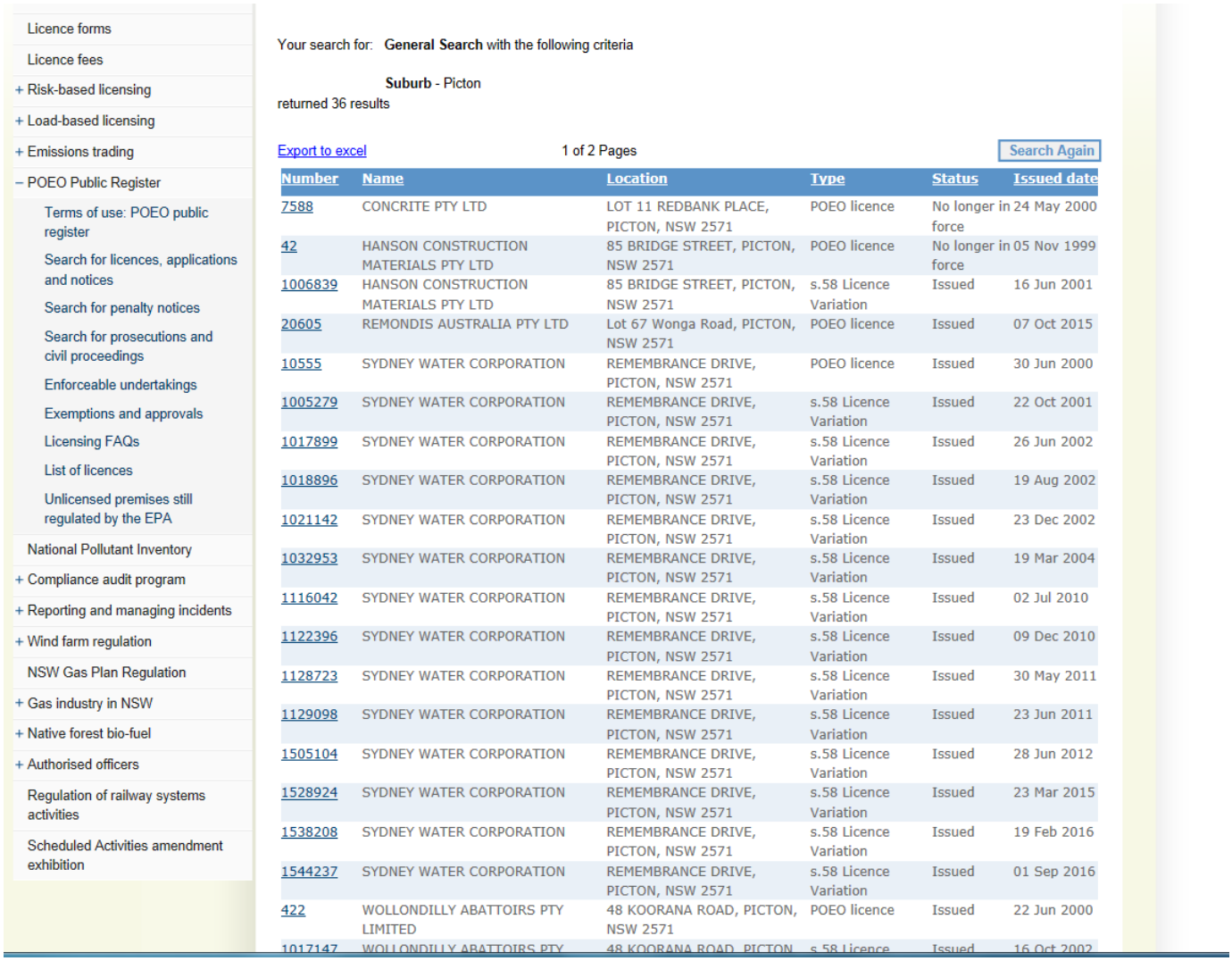
a	QA/QC replicate of sample listed directly below the primary sample.
b	All Chromium are assumed to exist in the stable Cr(III) oxidation state, as Cr(VI) will be too reactive and unstable under the normal environment
HIL A / HSL A & B	HIL / HSL for soil contaminants - NEPC 2013, Schedule B1, (Residential)
EIL / ESL	EIL / ESL soil for soil contaminant - NEPC 2013, Schedule B1.
NAD	No asbestos detected
*	For purposes of assigning NEPM criteria
-	Not Analysed

Appendix D

Site History Information

Appendix D – Site History

	30 Henry ROAD		
PENRITH	Caltex Service Station Castlereagh Rd Cnr Lugard STREET	Service Station	Under assessment
PENRITH	Crane Enfield Metals Castlereagh ROAD	Metal Industry	Contamination currently regulated under CLM Act
PENRITH	BP Express Service Station Corner Coreen Avenue and Castlereagh ROAD	Service Station	Under assessment
PENSHURST	7-Eleven Service Station 612 Forest ROAD	Service Station	Under assessment
PENSHURST	Caltex Service Station 641 King Georges ROAD	Service Station	Under assessment
PERISHER VALLEY	Perisher Centre Loading Dock Kosciuszko ROAD	Other Petroleum	Regulation under CLM Act not required
PERISHER VALLEY	Perisher Ski Resort Kosciuszko ROAD	Other Petroleum	Regulation under CLM Act not required
PETERSHAM	Fanny Durack Aquatic Centre Station STREET	Unclassified	Regulation under CLM Act not required
PHEASANTS NEST	7-Eleven (former Mobil) Service Station (Northbound) Hume HIGHWAY	Service Station	Under assessment
PHEASANTS NEST	7-Eleven Service Station (Southbound) Hume HIGHWAY	Service Station	Under assessment
PICTON	McDonalds 69 -71 Argyle STREET	Service Station	Regulation under CLM Act not required
PICTON	Coles Express Picton 93-99 Argyle STREET	Service Station	Under assessment
PLUMPTON	Woolworths Service Station Jersey ROAD	Service Station	Under assessment
PORT BOTANY	Caltex Banksmeadow 1 -3 Penrhyn ROAD	Chemical Industry	Contamination currently regulated under POEO Act
PORT BOTANY	Port Botany Bus Depot 1 Bumborah Point ROAD	Other Petroleum	Under assessment
PORT BOTANY	Vopak 6 20 Friendship ROAD	Chemical Industry	Under assessment
PORT BOTANY	Smith Bros 4 Bumborah Point ROAD	Other Petroleum	Regulation under CLM Act not required
PORT BOTANY	Terminals 45 Friendship ROAD	Chemical Industry	Under assessment



- Licence forms
- Licence fees
- + Risk-based licensing
- + Load-based licensing
- + Emissions trading
- – POEO Public Register
  - Terms of use: POEO public register
  - Search for licences, applications and notices
  - Search for penalty notices
  - Search for prosecutions and civil proceedings
  - Enforceable undertakings
  - Exemptions and approvals
  - Licensing FAQs
  - List of licences
  - Unlicensed premises still regulated by the EPA
- National Pollutant Inventory
- + Compliance audit program
- + Reporting and managing incidents
- + Wind farm regulation
- NSW Gas Plan Regulation
- + Gas industry in NSW
- + Native forest bio-fuel
- + Authorised officers
- Regulation of railway systems activities
- Scheduled Activities amendment exhibition

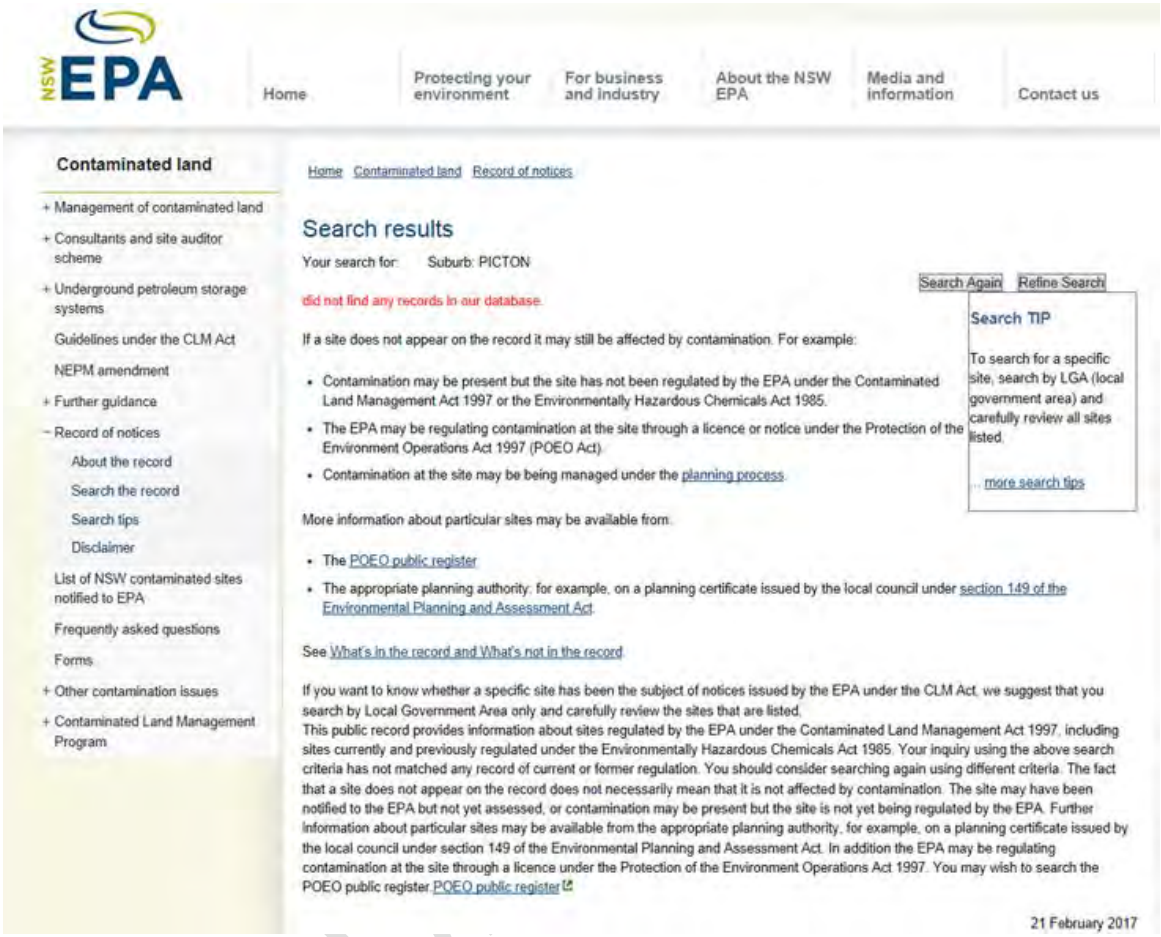
Your search for: **General Search** with the following criteria

Suburb - Picton

returned 36 results

Export to excel 1 of 2 Pages Search Again

Number	Name	Location	Type	Status	Issued date
7588	CONCRITE PTY LTD	LOT 11 REDBANK PLACE, PICTON, NSW 2571	POEO licence	No longer in force	24 May 2000
42	HANSON CONSTRUCTION MATERIALS PTY LTD	85 BRIDGE STREET, PICTON, NSW 2571	POEO licence	No longer in force	05 Nov 1999
1006839	HANSON CONSTRUCTION MATERIALS PTY LTD	85 BRIDGE STREET, PICTON, NSW 2571	s.58 Licence Variation	Issued	16 Jun 2001
20605	REMONDIS AUSTRALIA PTY LTD	Lot 67 Wonga Road, PICTON, NSW 2571	POEO licence	Issued	07 Oct 2015
10555	SYDNEY WATER CORPORATION	REMEMBRANCE DRIVE, PICTON, NSW 2571	POEO licence	Issued	30 Jun 2000
1005279	SYDNEY WATER CORPORATION	REMEMBRANCE DRIVE, PICTON, NSW 2571	s.58 Licence Variation	Issued	22 Oct 2001
1017899	SYDNEY WATER CORPORATION	REMEMBRANCE DRIVE, PICTON, NSW 2571	s.58 Licence Variation	Issued	26 Jun 2002
1018896	SYDNEY WATER CORPORATION	REMEMBRANCE DRIVE, PICTON, NSW 2571	s.58 Licence Variation	Issued	19 Aug 2002
1021142	SYDNEY WATER CORPORATION	REMEMBRANCE DRIVE, PICTON, NSW 2571	s.58 Licence Variation	Issued	23 Dec 2002
1032953	SYDNEY WATER CORPORATION	REMEMBRANCE DRIVE, PICTON, NSW 2571	s.58 Licence Variation	Issued	19 Mar 2004
1116042	SYDNEY WATER CORPORATION	REMEMBRANCE DRIVE, PICTON, NSW 2571	s.58 Licence Variation	Issued	02 Jul 2010
1122396	SYDNEY WATER CORPORATION	REMEMBRANCE DRIVE, PICTON, NSW 2571	s.58 Licence Variation	Issued	09 Dec 2010
1128723	SYDNEY WATER CORPORATION	REMEMBRANCE DRIVE, PICTON, NSW 2571	s.58 Licence Variation	Issued	30 May 2011
1129098	SYDNEY WATER CORPORATION	REMEMBRANCE DRIVE, PICTON, NSW 2571	s.58 Licence Variation	Issued	23 Jun 2011
1505104	SYDNEY WATER CORPORATION	REMEMBRANCE DRIVE, PICTON, NSW 2571	s.58 Licence Variation	Issued	28 Jun 2012
1528924	SYDNEY WATER CORPORATION	REMEMBRANCE DRIVE, PICTON, NSW 2571	s.58 Licence Variation	Issued	23 Mar 2015
1538208	SYDNEY WATER CORPORATION	REMEMBRANCE DRIVE, PICTON, NSW 2571	s.58 Licence Variation	Issued	19 Feb 2016
1544237	SYDNEY WATER CORPORATION	REMEMBRANCE DRIVE, PICTON, NSW 2571	s.58 Licence Variation	Issued	01 Sep 2016
422	WOLLONDILLY ABATTOIRS PTY LIMITED	48 KOORANA ROAD, PICTON, NSW 2571	POEO licence	Issued	22 Jun 2000
1017147	WOLLONDILLY ABATTOIRS PTY	48 KOORANA ROAD, PICTON	s.58 Licence	Issued	16 Oct 2002



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Search results

Your search for: Suburb: PICTON

Search Again Refine Search

did not find any records in our database.

Search TIP

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

... more search tips

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

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

More information about particular sites may be available from:

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

See What's in the record and What's not in the record

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

21 February 2017

Appendix E

Data Quality Objectives and Site Assessment Criteria

Appendix E1: Data Quality Objectives

The PSI has been devised broadly in accordance with 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 below:

E1.1 State the Problem

The site is proposed to be redeveloped as part of the Picton High School Redevelopment Project, which includes removal of demountable buildings and construction of new teaching blocks and associated facilities within the site. Review of previous assessments, site history and a site walkover identified the following:

- DP (2010) undertook a Phase 1 Contamination Assessment for the proposed Metals Fabrication Trade School at Picton High School which incorporates part of the current site;
- DP (2010) considered the site as generally having a low potential for contamination;
- During the site walkover in the current PSI, a fragment of PACM was observed on the ground surface. The fragment was submitted for laboratory analysis and tested positive for asbestos; and
- The historical aerial photograph review indicated that the site was previously used for agricultural activities in the 1950s. The school was most likely constructed in the 1960s, and has undergone development since then.

The “problem” to be addressed is the extent and nature of potential contamination at the site which is unknown, and as such, it is unclear whether the site is suitable for the proposed redevelopment.

The objectives of the investigation are as follows:

- Undertake intrusive investigations of the site to assess and describe the nature and extent of contamination;
- Determine the suitability of the site for the proposed redevelopment; and
- Recommend further investigation where the investigation finds the site to be unsuitable for the proposed redevelopment.

E1.2 Identify the Decision/Goal of the Study

The suitability of the site for the proposed redevelopment was assessed based on a comparison of the analytical results for all contaminants of potential concern (COPC) with the adopted site assessment criteria (SAC) as detailed in Appendix E2 and discussed below.

The main COPC are expected to be total recoverable hydrocarbons (TRH), benzene, toluene, ethyl benzene and xylenes (BTEX), polycyclic aromatic hydrocarbons (PAH), heavy metals and asbestos. Other commonly found contaminants which may be present include phenols, organochlorine pesticides (OCP), organophosphate pesticides (OPP) and polychlorinated biphenyls (PCB).

The following specific decisions were considered as part of the PSI:

- Did field observation and analytical results identify potential contamination sources which were not included in the preliminary CSM?
- Were COPC present in soil at concentrations that pose a potential risk to identified receptors?
- Were COPC present in background areas of the site at concentrations that are above expected background ranges?
- Does concentration of COPC in soil present a risk to groundwater beneath the site?
- Is the data sufficient to make a decision regarding the abovementioned risks, the suitability of the site for the proposed development, or are additional investigations required?
- Does contamination at the site, if encountered, trigger the Duty to Report requirements under the CLM Act 1997?
- Are there any off-site migration issues that need to be considered?
- Is the data sufficient to enable the preparation of a Remediation Action Plan (RAP) and/or Environmental Management Plan (EMP) should the data suggest these are required?

E1.3 Identify Information Inputs

Inputs into the decisions are as follows:

- Review of the previous investigation undertaken by DP (2010);
- Review of regional geology, topography and hydrogeology information;
- Review of site history information;
- Completion of a site walkover;
- The lithology of the site as described in the test pit logs (Appendix F);
- Soil samples were collected across the site. A total of 10 test pits were excavated targeting a general site coverage area;
- Field and laboratory QA/QC data to assess the suitability of the environmental data for the PSI (Appendix H);
- Analytical results for the COPC; and
- Laboratory reported concentrations of COPC were compared with the NEPC (2013) criteria as discussed in Section E2.

E1.4 Define the Study Boundaries

The site is located at 480 Argyle Street, Picton and is identified as Lot 2 Deposited Plan 520158 within the local government area of Wollondilly Shire Council. The site is roughly rectangular shaped and comprises an area of approximately 5.8 ha. The site location and boundaries are shown on Drawing 1, Appendix A.

The investigation was undertaken to a maximum depth of 2.5 m bgl across the site. All test pits terminated in natural soils.

Field investigations were undertaken on 23 January 2017 by a DP environmental engineer.

E1.5 Develop the Analytical Approach (or decision rule)

The information obtained during the assessment was used to characterise the site in terms of contamination issues and risk to human health and the environment. The decision rules used in characterising the site were as follows:

- The adopted SAC was the NSW Environment Protection Authority (EPA) endorsed criteria; and
- The contaminant concentrations in soil were compared to the adopted SAC to determine whether further investigation or remedial action was required.

Field and laboratory test results were considered useable for the assessment after evaluation against the following data quality indicators (DQIs):

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

The specific limits are outlined in the data QA/QC procedures and results (Appendix H).

E1.6 Specify the Performance or Acceptable Criteria

Decision errors for the respective COPC for fill and natural soils are:

1. Deciding that fill and natural soil at the site exceeds the adopted SAC when they truly do not; and
2. Deciding that fill and natural soil at the site is within the adopted SAC when they truly do not.

Decision errors for the PSI were minimised and measured by the following:

- The sampling regime targeted each stratum identified to account for site variability;

- Sample collection and handling techniques were in accordance with DP's *Field Procedures Manual*;
- Samples were prepared and analysed by a NATA-accredited laboratory with the acceptance limits for laboratory QA/QC parameters based on the laboratory reported acceptance limits and those stated in NEPC (2013);
- The analyte selection is based on the available site history, past site activities, site features and the findings of previous investigations. The potential for contaminants other than those proposed to be analysed is considered to be low;
- The SAC were adopted from established and NSW EPA endorsed guidelines. The SAC have risk probabilities already incorporated; and
- A NATA accredited laboratory using NATA endorsed methods are used to perform laboratory analysis. Where NATA endorsed methods are not used, the reasons are stated. The effect of using non-NATA methods on the decision making process are explained.

E1.7 Optimise the design for obtaining data

Sampling design and procedures that were implemented to optimise data collection for achieving the DQOs included the following;

- The site has an area of approximately 5.8 ha. EPA guidelines require a minimum of 55 sampling points for an area of 5 ha. In this PSI, a total of 10 sample locations were targeted. Considering the preliminary nature of this investigation, and taking into account the site history and the low potential for contamination of the site, the number of sampling locations is considered adequate for a PSI.
- A NATA accredited laboratory using NATA endorsed methods were used to perform laboratory analysis;
- To optimise the selection of soil samples for chemical analysis, all samples collected were screened using a calibrated photo-ionisation detector (PID) allowing for site assessment and sample selection. In addition, additional soil samples were collected but kept 'on hold' pending details of initial analysis so that they could be analysed if further delineation was required; and
- Adequately experienced environmental scientists/engineers were chosen to conduct field work and sample analysis interpretation.

Appendix E2: Site Assessment Criteria (Residential)

The Site Assessment Criteria (SAC) applied in the current investigation are informed by the proposed land use and the CSM which identified human receptors to potential contamination on the site (refer to Section 7). Analytical results are assessed (as a Tier 1 assessment) against the SAC comprising investigation and screening levels as per Schedule B1, *National Environment Protection (Assessment of Site Contamination) Measure* 1999, as amended 2013 (NEPC, 2013).

The investigation and screening levels applied in the current investigation comprise levels adopted for a generic residential land use scenario with accessible soils.

E2.1 Health Investigation and Screening Levels

The generic Health Investigation Levels (HILs) and Health Screening Levels (HSLs) are considered to be appropriate for the assessment of human health risk associated with contamination at the site. The adopted soil HILs and HSLs for the potential contaminants of concern are presented in Table E2, with inputs into their derivation shown in Table E1.

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.

HSLs are applicable to selected petroleum compounds and fractions to assess the risk to human health via inhalation and direct contact pathways. It should be noted that although the CSM identifies a direct contact pathway as well as construction worker receptors, the corresponding HSLs are significantly higher than those for the vapour intrusion pathway and are therefore not drivers for further assessment and/or remediation. As such the direct contact and intrusive maintenance worker HSLs have not been listed.

Table E1: Inputs to the Derivation of HSLs

Variable	Input	Rationale
Potential exposure pathway	Inhalation of vapours	Potential exposure pathways
Soil Type	Silt	Dominant soil type in surface soils is silty clay (see Test Pit and Borehole Logs – Appendix F
Depth to contamination	0 m to <1 m	Potential contamination sources likely to impact surface soils

Table E2: HIL and HSL in mg/kg Unless Otherwise Indicated

Contaminants		HIL- A	HSL- AB
Metals	Arsenic	100	-
	Cadmium	20	-
	Chromium (VI)	100	-
	Copper	6000	-
	Lead	300	-
	Mercury (inorganic)	40	-
	Nickel	400	-
	Zinc	7400	-
PAH	Benzo(a)pyrene TEQ[1]	3	-
	Total PAH	300	
	Naphthalene	-	4

Contaminants		HIL- A	HSL- AB
TRH	C6 – C10 (less BTEX) [F1]	-	40
	>C10-C16 (less Naphthalene) [F2]	-	230
	>C16-C34 [F3]	-	-
	>C34-C40 [F4]	-	-
BTEX	Benzene	-	0.6
	Toluene	-	390
	Ethylbenzene	-	NL[3]
	Xylenes	-	95
Phenol	Pentachlorophenol (used as an initial screen)	100	-
OCP	Aldrin + Dieldrin	6	-
	Chlordane	50	-
	DDT+DDE+DDD	240	-
	Endosulfan	270	-
	Endrin	10	-
	Heptachlor	6	-
	HCB	10	-
	Methoxychlor	300	-
OPP	Chlorpyrifos	160	-
PCB[2]		1	-

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'.

E2.2 Ecological Investigation Levels

Ecological Investigation Levels (EILs) and Added Contaminant Limits (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. The adopted EILs, derived using the *Interactive (Excel) Calculation Spreadsheet* (Standing Council on Environment and Water (SCEW) website (http://www.scew.gov.au/node/941)) are shown in the following Table E4, with inputs into their derivation shown on Table E3 (following page).

Table E3: Inputs to the Derivation of EILs

Variable	Input	Rationale
Age of contaminants	"Aged" (>2 years)	Given the potential sources of soil contamination are from historic use, the contamination is considered as "aged" (>2 years);
pH	5.8	Two selected samples were tested for pH. The mean pH value has been used as an initial screening. The pH value adopted is 5.8 (range 5.7 to 5.9).
CEC	5.4 cmolc/kg	Two selected samples were tested for CEC. The mean CEC value has been used as an initial screening. The CEC value adopted is 5.4 cmolc/kg (range 4.3 to 6.5).
Clay content	10 %	Conservative value for initial screen
Traffic volumes	low	The site is considered to be located within a low traffic area
State/Territory	New South Wales	-

Table E4: EIL in mg/kg

Analyte		EIL
Metals	Arsenic	100
	Copper	120
	Nickel	45
	Chromium III	410
	Lead	1100
	Zinc	310
PAH	Naphthalene	170
OCP	DDT	180

E2.3 Ecological Screening Levels

Ecological Screening Levels (ESLs) are used to assess the risk of selected petroleum hydrocarbon compounds, BTEX and benzo(a)pyrene to terrestrial ecosystems. The adopted ESLs, based on a fine soil type are shown in the following Table E5 (following page).

Table E5: ESL in mg/kg

Analyte		ESL[1]	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]	1300	
	>C34-C40 [F4]	5600	
BTEX	Benzene	65	
	Toluene	105	
	Ethylbenzene	125	
	Xylenes	45	
PAH	Benzo(a)pyrene	0.7	

E2.4 Asbestos in Soil

NEPC (2013) defines the various asbestos types as follows:

Bonded ACM: Asbestos containing material which is in sound condition, bound in a matrix of cement or resin, and cannot pass a 7 mm x 7 mm sieve.

FA: Fibrous asbestos material including severely weathered cement sheet, insulation products and woven asbestos material. This material is typically unbonded or was previously bonded and is now significantly degraded and crumbling.

AF: Asbestos fines including free fibres, small fibre bundles and also small fragments of bonded ACM that pass through a 7 mm x 7 mm sieve.

A detailed asbestos assessment was not undertaken as part of these works. A conservative approach was assumed as an initial screening measure. 50 g samples were collected and analysed at a LOR of 0.1 g/kg as a preliminary screen for the presence of asbestos at sampling locations across the site. At these locations the preliminary screen was conducted to assess the potential extent of asbestos and to determine the requirement for (and / or to guide) further characterisation of asbestos with reference to NEPC (2013).

Appendix F

Test Pit Logs

TEST PIT LOG

CLIENT: Billard Leece Partnership Pty Ltd
PROJECT: Proposed Picton High School Redevelopment
LOCATION: Argyle Street, Picton, NSW

SURFACE LEVEL: 218.5 mAHD
EASTING: 279530
NORTHING: 6213581

PIT No: 1
PROJECT No: 34252.02
DATE: 23/1/2017
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)
									5 10 15 20
		FILLING - brown silty clay with some organics (topsoil)		D/B	0.0		PID<1		
	0.2	FILLING - brown and yellow gravel (ripped sandstone)			0.2				
	0.4	FILLING - brown silty clay with some gravel and rootlets, MC~PL		D	0.5		PID<1		
218				B	0.7				
	1.0	CLAY - red brown silty clay, MC~PL		D	1.0		PID<1		1
				D	1.5		PID<1		
217									
	2			D	2.0		PID<1		2
	2.3	SHALE - low to medium strength, highly weathered, grey and brown shale							
216	2.5	Pit discontinued at 2.5m - refusal on low to medium strength shale		D	2.5		PID<1		
	3								3
215									

RIG: Takeuchi TB145 excavator - 300mm bucket

LOGGED: NJG

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

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

SAMPLING & IN SITU TESTING LEGEND

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

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TEST PIT LOG

CLIENT: Billard Leece Partnership Pty Ltd
PROJECT: Proposed Picton High School Redevelopment
LOCATION: Argyle Street, Picton, NSW

SURFACE LEVEL: 215.3 mAHD
EASTING: 279571
NORTHING: 6213636

PIT No: 2
PROJECT No: 34252.02
DATE: 23/1/2017
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)
					0.0		PID<1		5 10 15 20
		FILLING - brown silty clay with some organics (topsoil)		D					
	0.2				0.2				
215		FILLING - brown silty clay, MC<PL		D	0.5		PID<1		
	0.9								
	1	CLAY - very stiff, brown and grey silty clay, MC~PL		D	1.0		PID<1		1
214				D	1.5		PID<1		
	2			D	2.0		PID<1		2
213	2.3	SANDSTONE - low to medium strength, highly weathered, brown and grey sandstone							
	2.5	Pit discontinued at 2.5m - refusal on low to medium strength sandstone		D	2.5		PID<1		
	3								3
212									

RIG: Takeuchi TB145 excavator - 300mm bucket

LOGGED: NJG

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

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

SAMPLING & IN SITU TESTING LEGEND

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

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TEST PIT LOG

CLIENT: Billard Leece Partnership Pty Ltd
PROJECT: Proposed Picton High School Redevelopment
LOCATION: Argyle Street, Picton, NSW

SURFACE LEVEL: 218.1 mAHD
EASTING: 279509
NORTHING: 6213640

PIT No: 3
PROJECT No: 34252.02
DATE: 23/1/2017
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)
218	0.0	FILLING - brown silty clay with some organics (topsoil)		D	0.0				
	0.2	FILLING - brown silty clay, MC~PL		D	0.2				
				D	0.5				
	0.6	CLAY - hard, brown gravelly clay, MC~PL		B	0.6				
					0.8				
217	1	- becoming red brown and grey, silty below 1.0m		D	1.0				1
				D	1.5				
	1.8	SILTSTONE - low to medium strength, grey and brown siltstone							
216	2 2.0	Pit discontinued at 2.0m - refusal on low to medium strength siltstone		D	2.0				2
215	3								3

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

RIG: Takeuchi TB145 excavator - 300mm bucket

LOGGED: NJG

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

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

SAMPLING & IN SITU TESTING LEGEND

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

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TEST PIT LOG

CLIENT: Billard Leece Partnership Pty Ltd
PROJECT: Proposed Picton High School Redevelopment
LOCATION: Argyle Street, Picton, NSW

SURFACE LEVEL: 216.2 mAHD
EASTING: 279464
NORTHING: 6213733

PIT No: 4
PROJECT No: 34252.02
DATE: 23/1/2017
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)
216	0.0	FILLING - brown silty clay with some organics (topsoil)		D	0.0		PID<1		
	0.2	FILLING - brown silty clay with some gravel, MC<PL		U_{50}	0.2				
	0.5	CLAY - red brown silty clay, MC~PL		D	0.5		PID<1		
	0.9				0.6				
215	1.0	SHALE - low to medium strength, highly weathered, grey and brown shale		D	1.0		PID<1		
	1.2	Pit discontinued at 1.2m - refusal on low to medium strength shale							
214	2.0								
213	3.0								

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

RIG: Takeuchi TB145 excavator - 300mm bucket

LOGGED: NJG

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

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

SAMPLING & IN SITU TESTING LEGEND

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

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Geotechnics / Environment / Groundwater

TEST PIT LOG

CLIENT: Billard Leece Partnership Pty Ltd
PROJECT: Proposed Picton High School Redevelopment
LOCATION: Argyle Street, Picton, NSW

SURFACE LEVEL: 212.9 mAHD
EASTING: 279556
NORTHING: 6213772

PIT No: 5
PROJECT No: 34252.02
DATE: 23/1/2017
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)
212	0.0	FILLING - brown and grey clayey gravel		D*	0.0		PID<1		5 10 15 20
					0.2				
	0.4	CLAY - very stiff, red brown silty clay, MC~PL		D	0.5		PID<1		
				B	0.7				
	0.9	SHALE - low to medium strength, highly weathered,							
	1.0	brown and grey shale		D	1.0		PID<1		
		Pit discontinued at 1.0m - refusal on low to medium strength shale							

RIG: Takeuchi TB145 excavator - 300mm bucket

LOGGED: NJG

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: * Replicate sample BD2/230117 collected

☐ 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: Billard Leece Partnership Pty Ltd
PROJECT: Proposed Picton High School Redevelopment
LOCATION: Argyle Street, Picton, NSW

SURFACE LEVEL: 214.1 mAHD
EASTING: 279653
NORTHING: 6213715

PIT No: 6
PROJECT No: 34252.02
DATE: 23/1/2017
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)
214	0	FILLING - brown and grey gravelly clay, MC<PL		D	0.0		PID<1		5 10 15 20
					0.2				
				D	0.5		PID<1		
				U_{50}					
	0.9				0.9				
213	1	SANDSTONE - very low to low strength, highly weathered, orange brown sandstone		D	1.0		PID<1		1
		- becoming low to medium strength below 1.4m							
	1.5	Pit discontinued at 1.5m		D	1.5		PID<1		
		- refusal on low to medium strength sandstone							
212	2								2
211	3								3

RIG: Takeuchi TB145 excavator - 300mm bucket

LOGGED: NJG

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

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

SAMPLING & IN SITU TESTING LEGEND

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

Douglas Partners
Geotechnics / Environment / Groundwater

TEST PIT LOG

CLIENT: Billard Leece Partnership Pty Ltd
PROJECT: Proposed Picton High School Redevelopment
LOCATION: Argyle Street, Picton, NSW

SURFACE LEVEL: 215.5 mAHD
EASTING: 279685
NORTHING: 6213771

PIT No: 7
PROJECT No: 34252.02
DATE: 23/1/2017
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)
									5 10 15 20
		FILLING - brown silty clay with some organics (topsoil)		D	0.0		PID<1		
	0.2	FILLING - brown silty clay, MC<PL			0.2				
215				D	0.5		PID<1		
				B	0.7				
	0.9	SANDSTONE - very low to low strength, highly weathered, orange brown sandstone		D	1.0		PID<1		
1									1
		- becoming low to medium strength below 1.4m							
214	1.5	Pit discontinued at 1.5m - refusal on low to medium strength sandstone		D	1.5		PID<1		
2									2
213									
3									3
212									

RIG: Takeuchi TB145 excavator - 300mm bucket

LOGGED: NJG

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

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

SAMPLING & IN SITU TESTING LEGEND

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

Douglas Partners
Geotechnics / Environment / Groundwater

TEST PIT LOG

CLIENT: Billard Leece Partnership Pty Ltd
PROJECT: Proposed Picton High School Redevelopment
LOCATION: Argyle Street, Picton, NSW

SURFACE LEVEL: 216.3 mAHD
EASTING: 279739
NORTHING: 6213747

PIT No: 8
PROJECT No: 34252.02
DATE: 23/1/2017
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)
216	0.0	TOPSOIL - brown silty clay with some organics		D*	0.0		PID<1		5 10 15 20
					0.2				
	0.3	CLAY - hard, brown gravelly clay, trace weathered shale, MC~PL		U_{50} D	0.3		PID<1		
					0.5				
					0.7				
	0.9	SHALE - low to medium strength, highly weathered, grey and brown shale		D	1.0		PID<1		
	1.0	Pit discontinued at 1.0m - refusal on low to medium strength shale							
215	1								1
	2								2
214									
	3								3
213									

RIG: Takeuchi TB145 excavator - 300mm bucket

LOGGED: NJG

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: * Replicate sample BD3/230117 collected

☐ 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: Billard Leece Partnership Pty Ltd
PROJECT: Proposed Picton High School Redevelopment
LOCATION: Argyle Street, Picton, NSW

SURFACE LEVEL: 216.9 mAHD
EASTING: 279759
NORTHING: 6213689

PIT No: 9
PROJECT No: 34252.02
DATE: 23/1/2017
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)
		TOPSOIL - brown silty clay with some organics			0.0		PID<1		
	0.1	SHALE - very low to low strength, highly weathered, grey and brown shale		D					
					0.2				
					0.3				
				B					
	0.5	Pit discontinued at 0.5m - limit of investigation		D	0.5		PID<1		
216	1			D	1.0		PID<1		
215	2								
214	3								
213									

RIG: Takeuchi TB145 excavator - 300mm bucket

LOGGED: NJG

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

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

SAMPLING & IN SITU TESTING LEGEND

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

Douglas Partners
Geotechnics / Environment / Groundwater

TEST PIT LOG

CLIENT: Billard Leece Partnership Pty Ltd
PROJECT: Proposed Picton High School Redevelopment
LOCATION: Argyle Street, Picton, NSW

SURFACE LEVEL: 216.0 mAHD
EASTING: 279678
NORTHING: 6213620

PIT No: 10
PROJECT No: 34252.02
DATE: 23/1/2017
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)
216		TOPSOIL - brown silty clay with some organics		D	0.0		PID<1		
	0.2	SHALE - extremely low to very low strength, extremely to highly weathered, grey and brown shale			0.2				
				D	0.5		PID<1		
		- becoming low to medium strength below 0.9m							
215	1 1.0	Pit discontinued at 1.0m - limit of investigation		D	1.0		PID<1		1
214	2								2
213	3								3

RIG: Takeuchi TB145 excavator - 300mm bucket

LOGGED: NJG

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

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

SAMPLING & IN SITU TESTING LEGEND

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

Douglas Partners
Geotechnics / Environment / Groundwater

Appendix G

Chain of Custody and Laboratory Certificate of Analysis

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 Pty Ltd Smeaton Grange
Attention	Y Shrestha

Sample Login Details	
Your Reference	34252.02, Picton HS
Envirolab Reference	**160758**
Date Sample Received	24/01/2017
Date Instructions Received	24/01/2017
Date Results Expected to be Reported	**01/02/2017**

Sample Condition	
Samples received in appropriate condition for analysis	YES
No. of Samples Provided	13 soils
Turnaround Time Requested	Standard
Temperature on receipt (°C)	29.2
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*
BD02/23.1.17	✓	✓	✓	✓	✓	✓	✓	✓	✓
1-0.5	✓	✓	✓	✓	✓	✓	✓	✓	✓
2-0.5	✓	✓	✓	✓	✓	✓	✓	✓	✓
3-0.5	✓	✓	✓	✓	✓	✓	✓	✓	✓
4-0.5	✓	✓	✓	✓	✓	✓	✓	✓	✓
5-0-0.2	✓	✓	✓	✓	✓	✓	✓	✓	✓
6-0-0.2	✓	✓	✓	✓	✓	✓	✓	✓	✓
7-0-0.2	✓	✓	✓	✓	✓	✓	✓	✓	✓
8-0-0.2	✓	✓	✓	✓	✓	✓	✓	✓	✓
9-0.5	✓	✓	✓	✓	✓	✓	✓	✓	✓
10-0.5	✓	✓	✓	✓	✓	✓	✓	✓	✓
Trip Blank	✓								
Trip Spike	✓								

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

Douglas Partners
Geotechnics | Environment | Groundwater

CHAIN OF CUSTODY

Project Name:	Picton H. S.			**To:**	Envirolab Services
Project No:	34252.02	**Sampler:**	NG		12 Ashley Street, Chatswood NSW 2067
Project Mgr:	Yashu	**Mob. Phone:**	447223709	**Attn:**	Tania Notaras
Email:	yashu.shrestha@douglaspartners.com.au			**Phone:**	(02) 9910 6200 **Fax:** (02) 9910 6201
Date Required:	Standard			**Email:**	tnotaras@envirolabservices.com.au

Sample ID 160758	Lab ID	Date Sampled	Sample Type S - soil W - water	Container Type G - glass P - plastic	Analytes 8 Heavy Metals	OCP/OPP PCB	TRH	PAH	BTEX	Phenols	Asbestos	TRH C6-C9		Notes/preservation
BD02/23.1.17	1	23/01/17	S	G	x	x	x	x	x	x	x			Combo 8a
1/0.5	2	23/01/17	S	G	x	x	x	x	x	x	x			Combo 8a
2/0 .5	3	23/01/17	S	G	x	x	x	x	x	x	x			Combo 8a
3/0.5	4	23/01/17	S	G	x	x	x	x	x	x	x			Combo 8a
4/0.5	5	23/01/17	S	G	x	x	x	x	x	x	x			Combo 8a
5/0 - 0.2	6	23/01/17	S	G	x	x	x	x	x	x	x			Combo 8a
6/0 - 0.2	7	23/01/17	S	G	x	x	x	x	x	x	x			Combo 8a
7/0 - 0.2	8	23/01/17	S	G	x	x	x	x	x	x	x			Combo 8a
8/0 - 0.2	9	23/01/17	S	G	x	x	x	x	x	x	x			Combo 8a
9/0.5	10	23/01/17	S	G	x	x	x	x	x	x	x			Combo 8a
10/0.5	11	23/01/17	S	G	x	x	x	x	x	x	x			Combo 8a
Trip Blank	NR	12							x			x		Envirolab Services 12 Ashley St Chatswood NSW 2067 Ph: (02) 9910 6200
Trip Spike	NR	13							x					

Lab Report No: Job No:

Send Results to: Douglas Partners Pty Ltd **Address** 18 Waler Crescent, Smeaton Grange 2567 **Phone:** (02) 4647 0075 **Fax:** (02) 4646 1886

Relinquished by: IKA **Transported to laboratory by:**

Signed: **Date & Time:** 24/01/2017 **Received by:** P.Ray / EAS 24/1/2017

Date Received:
Time Received: 160758
Received by: 24.1.17
Temp: Cool/Ambient 17.20
Cooling: Ice/Icepack
Security: Intact/Broken/None 29.2

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 160758

Client:

Douglas Partners Pty Ltd Smeaton Grange
18 Waler Crescent
Smeaton Grange
NSW 2567

Attention: Y Shrestha

Sample log in details:

Your Reference:	**34252.02, Picton HS**		
No. of samples:	13 soils		
Date samples received / completed instructions received	24/01/17	/	24/01/17

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:	1/02/17	/	31/01/17
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	160758-1	160758-2	160758-3	160758-4	160758-5
Your Reference	---------- -	BD02/23.1.17	1	2	3	4
Depth	----------	-	0.5	0.5	0.5	0.5
Date Sampled		23/01/2017	23/01/2017	23/01/2017	23/01/2017	23/01/2017
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	25/01/2017	25/01/2017	25/01/2017	25/01/2017	25/01/2017
Date analysed	-	27/01/2017	27/01/2017	27/01/2017	27/01/2017	27/01/2017
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	%	99	92	97	99	98

vTRH(C6-C10)/BTEXN in Soil						
Our Reference:	UNITS	160758-6	160758-7	160758-8	160758-9	160758-10
Your Reference	---------- -	5	6	7	8	9
Depth	----------	0-0.2	0-0.2	0-0.2	0-0.2	0.5
Date Sampled		23/01/2017	23/01/2017	23/01/2017	23/01/2017	23/01/2017
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	25/01/2017	25/01/2017	25/01/2017	25/01/2017	25/01/2017
Date analysed	-	27/01/2017	27/01/2017	27/01/2017	27/01/2017	27/01/2017
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	%	103	93	94	103	98

vTRH(C6-C10)/BTEXN in Soil				
Our Reference:	UNITS	160758-11	160758-12	160758-13
Your Reference	---------- -	10	Trip Blank	Trip Spike
Depth	----------	0.5	-	-
Date Sampled		23/01/2017	23/01/2017	23/01/2017
Type of sample		soil	soil	soil
Date extracted	-	25/01/2017	25/01/2017	25/01/2017
Date analysed	-	27/01/2017	27/01/2017	27/01/2017
TRHC$_6$ - C$_9$	mg/kg	<25	<25	[NA]
TRHC$_6$ - C$_{10}$	mg/kg	<25	<25	[NA]
vTPHC$_6$ - C$_{10}$ less BTEX (F1)	mg/kg	<25	<25	[NA]
Benzene	mg/kg	<0.2	<0.2	85%
Toluene	mg/kg	<0.5	<0.5	83%
Ethylbenzene	mg/kg	<1	<1	85%
m+p-xylene	mg/kg	<2	<2	86%
o-Xylene	mg/kg	<1	<1	85%
Total +ve Xylenes	mg/kg	<1	<1	[NA]
naphthalene	mg/kg	<1	<1	[NA]
Surrogate aaa-Trifluorotoluene	%	96	103	97

svTRH (C10-C40) in Soil						
Our Reference:	UNITS	160758-1	160758-2	160758-3	160758-4	160758-5
Your Reference	---------- -	BD02/23.1.17	1	2	3	4
Depth	----------	-	0.5	0.5	0.5	0.5
Date Sampled		23/01/2017	23/01/2017	23/01/2017	23/01/2017	23/01/2017
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	25/01/2017	25/01/2017	25/01/2017	25/01/2017	25/01/2017
Date analysed	-	26/01/2017	26/01/2017	26/01/2017	26/01/2017	26/01/2017
TRHC$_{10}$ - C$_{14}$	mg/kg	<50	<50	<50	<50	<50
TRHC$_{15}$ - C$_{28}$	mg/kg	<100	<100	<100	<100	<100
TRHC$_{29}$ - C$_{36}$	mg/kg	<100	<100	<100	<100	<100
TRH>C$_{10}$-C$_{16}$	mg/kg	<50	<50	<50	<50	<50
TRH>C$_{10}$ - C$_{16}$ less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH>C$_{16}$-C$_{34}$	mg/kg	<100	<100	<100	<100	<100
TRH>C$_{34}$-C$_{40}$	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	77	76	78	77	76

svTRH (C10-C40) in Soil						
Our Reference:	UNITS	160758-6	160758-7	160758-8	160758-9	160758-10
Your Reference	---------- -	5	6	7	8	9
Depth	----------	0-0.2	0-0.2	0-0.2	0-0.2	0.5
Date Sampled		23/01/2017	23/01/2017	23/01/2017	23/01/2017	23/01/2017
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	25/01/2017	25/01/2017	25/01/2017	25/01/2017	25/01/2017
Date analysed	-	26/01/2017	26/01/2017	26/01/2017	26/01/2017	26/01/2017
TRHC$_{10}$ - C$_{14}$	mg/kg	<50	<50	<50	<50	<50
TRHC$_{15}$ - C$_{28}$	mg/kg	<100	<100	<100	<100	<100
TRHC$_{29}$ - C$_{36}$	mg/kg	<100	<100	<100	<100	<100
TRH>C$_{10}$-C$_{16}$	mg/kg	<50	<50	<50	<50	<50
TRH>C$_{10}$ - C$_{16}$ less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH>C$_{16}$-C$_{34}$	mg/kg	<100	<100	<100	<100	<100
TRH>C$_{34}$-C$_{40}$	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	76	77	75	77	75

svTRH (C10-C40) in Soil		
Our Reference:	UNITS	160758-11
Your Reference	----------	10
	-	
Depth	----------	0.5
Date Sampled		23/01/2017
Type of sample		soil
Date extracted	-	25/01/2017
Date analysed	-	26/01/2017
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	%	74

PAHs in Soil Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ---------- - ---------- 	160758-1 BD02/23.1.17 - 23/01/2017 soil	160758-2 1 0.5 23/01/2017 soil	160758-3 2 0.5 23/01/2017 soil	160758-4 3 0.5 23/01/2017 soil	160758-5 4 0.5 23/01/2017 soil
Date extracted	-	25/01/2017	25/01/2017	25/01/2017	25/01/2017	25/01/2017
Date analysed	-	25/01/2017	25/01/2017	25/01/2017	25/01/2017	25/01/2017
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	%	81	80	81	83	81

PAHs in Soil Our Reference: Your Reference	UNITS ---------- -	160758-6 5	160758-7 6	160758-8 7	160758-9 8	160758-10 9
Depth	----------	0-0.2	0-0.2	0-0.2	0-0.2	0.5
Date Sampled		23/01/2017	23/01/2017	23/01/2017	23/01/2017	23/01/2017
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	25/01/2017	25/01/2017	25/01/2017	25/01/2017	25/01/2017
Date analysed	-	25/01/2017	25/01/2017	25/01/2017	25/01/2017	25/01/2017
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	%	77	79	79	78	78

PAHs in Soil		
Our Reference:	UNITS	160758-11
Your Reference	----------	10
	-	
Depth	----------	0.5
Date Sampled		23/01/2017
Type of sample		soil
Date extracted	-	25/01/2017
Date analysed	-	25/01/2017
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	%	73

Organochlorine Pesticides in soil						
Our Reference:	UNITS	160758-1	160758-2	160758-3	160758-4	160758-5
Your Reference	----------	BD02/23.1.17	1	2	3	4
Depth	----------	-	0.5	0.5	0.5	0.5
Date Sampled		23/01/2017	23/01/2017	23/01/2017	23/01/2017	23/01/2017
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	25/01/2017	25/01/2017	25/01/2017	25/01/2017	25/01/2017
Date analysed	-	25/01/2017	25/01/2017	25/01/2017	25/01/2017	25/01/2017
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	%	88	83	85	84	89

Organochlorine Pesticides in soil						
Our Reference:	UNITS	160758-6	160758-7	160758-8	160758-9	160758-10
Your Reference	---------- -	5	6	7	8	9
Depth	----------	0-0.2	0-0.2	0-0.2	0-0.2	0.5
Date Sampled		23/01/2017	23/01/2017	23/01/2017	23/01/2017	23/01/2017
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	25/01/2017	25/01/2017	25/01/2017	25/01/2017	25/01/2017
Date analysed	-	26/01/2017	26/01/2017	26/01/2017	26/01/2017	26/01/2017
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	%	82	87	87	84	84

Organochlorine Pesticides in soil		
Our Reference:	UNITS	160758-11
Your Reference	---------- -	10
Depth	----------	0.5
Date Sampled		23/01/2017
Type of sample		soil
Date extracted	-	25/01/2017
Date analysed	-	26/01/2017
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	%	89

Organophosphorus Pesticides Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ---------- - ---------- 	160758-1 BD02/23.1.17 - 23/01/2017 soil	160758-2 1 0.5 23/01/2017 soil	160758-3 2 0.5 23/01/2017 soil	160758-4 3 0.5 23/01/2017 soil	160758-5 4 0.5 23/01/2017 soil
Date extracted	-	25/01/2017	25/01/2017	25/01/2017	25/01/2017	25/01/2017
Date analysed	-	25/01/2017	25/01/2017	25/01/2017	25/01/2017	25/01/2017
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	%	88	83	85	84	89

Organophosphorus Pesticides Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ---------- - ---------- 	160758-6 5 0-0.2 23/01/2017 soil	160758-7 6 0-0.2 23/01/2017 soil	160758-8 7 0-0.2 23/01/2017 soil	160758-9 8 0-0.2 23/01/2017 soil	160758-10 9 0.5 23/01/2017 soil
Date extracted	-	25/01/2017	25/01/2017	25/01/2017	25/01/2017	25/01/2017
Date analysed	-	26/01/2017	26/01/2017	26/01/2017	26/01/2017	26/01/2017
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	%	82	87	87	84	84

Organophosphorus Pesticides		
Our Reference:	UNITS	160758-11
Your Reference	----------	10
	-	
Depth	----------	0.5
Date Sampled		23/01/2017
Type of sample		soil
Date extracted	-	25/01/2017
Date analysed	-	26/01/2017
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	%	89

PCBs in Soil						
Our Reference:	UNITS	160758-1	160758-2	160758-3	160758-4	160758-5
Your Reference	---------- -	BD02/23.1.17	1	2	3	4
Depth	----------	-	0.5	0.5	0.5	0.5
Date Sampled		23/01/2017	23/01/2017	23/01/2017	23/01/2017	23/01/2017
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	25/01/2017	25/01/2017	25/01/2017	25/01/2017	25/01/2017
Date analysed	-	25/01/2017	25/01/2017	25/01/2017	25/01/2017	25/01/2017
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	%	88	83	85	84	89

PCBs in Soil						
Our Reference:	UNITS	160758-6	160758-7	160758-8	160758-9	160758-10
Your Reference	---------- -	5	6	7	8	9
Depth	----------	0-0.2	0-0.2	0-0.2	0-0.2	0.5
Date Sampled		23/01/2017	23/01/2017	23/01/2017	23/01/2017	23/01/2017
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	25/01/2017	25/01/2017	25/01/2017	25/01/2017	25/01/2017
Date analysed	-	26/01/2017	26/01/2017	26/01/2017	26/01/2017	26/01/2017
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	%	82	87	87	84	84

PCBs in Soil		
Our Reference:	UNITS	160758-11
Your Reference	----------	10
	-	
Depth	----------	0.5
Date Sampled		23/01/2017
Type of sample		soil
Date extracted	-	25/01/2017
Date analysed	-	26/01/2017
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	%	89

Acid Extractable metals in soil						
Our Reference:	UNITS	160758-1	160758-2	160758-3	160758-4	160758-5
Your Reference	----------	BD02/23.1.17	1	2	3	4
Depth	----------	-	0.5	0.5	0.5	0.5
Date Sampled		23/01/2017	23/01/2017	23/01/2017	23/01/2017	23/01/2017
Type of sample		soil	soil	soil	soil	soil
Date prepared	-	25/01/2017	25/01/2017	25/01/2017	25/01/2017	25/01/2017
Date analysed	-	25/01/2017	25/01/2017	25/01/2017	25/01/2017	25/01/2017
Arsenic	mg/kg	11	6	10	7	6
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	27	22	23	30	20
Copper	mg/kg	13	35	17	15	25
Lead	mg/kg	19	68	29	26	21
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	9	14	16	14	9
Zinc	mg/kg	32	86	31	26	36

Acid Extractable metals in soil						
Our Reference:	UNITS	160758-6	160758-7	160758-8	160758-9	160758-10
Your Reference	----------	5	6	7	8	9
Depth	----------	0-0.2	0-0.2	0-0.2	0-0.2	0.5
Date Sampled		23/01/2017	23/01/2017	23/01/2017	23/01/2017	23/01/2017
Type of sample		soil	soil	soil	soil	soil
Date prepared	-	25/01/2017	25/01/2017	25/01/2017	25/01/2017	25/01/2017
Date analysed	-	25/01/2017	25/01/2017	25/01/2017	25/01/2017	25/01/2017
Arsenic	mg/kg	7	7	7	6	7
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	28	21	15	15	10
Copper	mg/kg	12	12	14	15	9
Lead	mg/kg	19	22	16	16	20
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	7	6	10	7	2
Zinc	mg/kg	26	24	36	29	14

Acid Extractable metals in soil		
Our Reference:	UNITS	160758-11
Your Reference	----------	10
	-	
Depth	----------	0.5
Date Sampled		23/01/2017
Type of sample		soil
Date prepared	-	25/01/2017
Date analysed	-	25/01/2017
Arsenic	mg/kg	7
Cadmium	mg/kg	<0.4
Chromium	mg/kg	12
Copper	mg/kg	16
Lead	mg/kg	20
Mercury	mg/kg	<0.1
Nickel	mg/kg	3
Zinc	mg/kg	24

Misc Soil - Inorg						
Our Reference:	UNITS	160758-1	160758-2	160758-3	160758-4	160758-5
Your Reference	---------- -	BD02/23.1.17	1	2	3	4
Depth	----------	-	0.5	0.5	0.5	0.5
Date Sampled		23/01/2017	23/01/2017	23/01/2017	23/01/2017	23/01/2017
Type of sample		soil	soil	soil	soil	soil
Date prepared	-	25/01/2017	25/01/2017	25/01/2017	25/01/2017	25/01/2017
Date analysed	-	25/01/2017	25/01/2017	25/01/2017	25/01/2017	25/01/2017
Total Phenolics (as Phenol)	mg/kg	<5	<5	<5	<5	<5

Misc Soil - Inorg						
Our Reference:	UNITS	160758-6	160758-7	160758-8	160758-9	160758-10
Your Reference	---------- -	5	6	7	8	9
Depth	----------	0-0.2	0-0.2	0-0.2	0-0.2	0.5
Date Sampled		23/01/2017	23/01/2017	23/01/2017	23/01/2017	23/01/2017
Type of sample		soil	soil	soil	soil	soil
Date prepared	-	25/01/2017	25/01/2017	25/01/2017	25/01/2017	25/01/2017
Date analysed	-	25/01/2017	25/01/2017	25/01/2017	25/01/2017	25/01/2017
Total Phenolics (as Phenol)	mg/kg	<5	<5	<5	<5	<5

Misc Soil - Inorg		
Our Reference:	UNITS	160758-11
Your Reference	---------- -	10
Depth	----------	0.5
Date Sampled		23/01/2017
Type of sample		soil
Date prepared	-	25/01/2017
Date analysed	-	25/01/2017
Total Phenolics (as Phenol)	mg/kg	<5

Moisture						
Our Reference:	UNITS	160758-1	160758-2	160758-3	160758-4	160758-5
Your Reference	---------- -	BD02/23.1.17	1	2	3	4
Depth	----------	-	0.5	0.5	0.5	0.5
Date Sampled		23/01/2017	23/01/2017	23/01/2017	23/01/2017	23/01/2017
Type of sample		soil	soil	soil	soil	soil
Date prepared	-	25/01/2017	25/01/2017	25/01/2017	25/01/2017	25/01/2017
Date analysed	-	27/01/2017	27/01/2017	27/01/2017	27/01/2017	27/01/2017
Moisture	%	8.5	14	11	12	15

Moisture						
Our Reference:	UNITS	160758-6	160758-7	160758-8	160758-9	160758-10
Your Reference	---------- -	5	6	7	8	9
Depth	----------	0-0.2	0-0.2	0-0.2	0-0.2	0.5
Date Sampled		23/01/2017	23/01/2017	23/01/2017	23/01/2017	23/01/2017
Type of sample		soil	soil	soil	soil	soil
Date prepared	-	25/01/2017	25/01/2017	25/01/2017	25/01/2017	25/01/2017
Date analysed	-	27/01/2017	27/01/2017	27/01/2017	27/01/2017	27/01/2017
Moisture	%	9.4	6.1	12	5.4	6.6

Moisture		
Our Reference:	UNITS	160758-11
Your Reference	---------- -	10
Depth	----------	0.5
Date Sampled		23/01/2017
Type of sample		soil
Date prepared	-	25/01/2017
Date analysed	-	27/01/2017
Moisture	%	12

Asbestos ID - soils						
Our Reference:	UNITS	160758-1	160758-2	160758-3	160758-4	160758-5
Your Reference	---------- -	BD02/23.1.17	1	2	3	4
Depth	----------	-	0.5	0.5	0.5	0.5
Date Sampled		23/01/2017	23/01/2017	23/01/2017	23/01/2017	23/01/2017
Type of sample		soil	soil	soil	soil	soil
Date analysed	-	31/01/2017	31/01/2017	31/01/2017	31/01/2017	31/01/2017
Sample mass tested	g	Approx. 50g	Approx. 40g	Approx. 55g	Approx. 55g	Approx. 45g
Sample Description	-	Brown clayey soil	Brown clayey soil	Brown clayey soil	Brown clayey soil	Brown clayey soil
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	160758-6	160758-7	160758-8	160758-9	160758-10
Your Reference	---------- -	5	6	7	8	9
Depth	----------	0-0.2	0-0.2	0-0.2	0-0.2	0.5
Date Sampled		23/01/2017	23/01/2017	23/01/2017	23/01/2017	23/01/2017
Type of sample		soil	soil	soil	soil	soil
Date analysed	-	31/01/2017	31/01/2017	31/01/2017	31/01/2017	31/01/2017
Sample mass tested	g	Approx. 60g	Approx. 60g	Approx. 55g	Approx. 55g	Approx. 60g
Sample Description	-	Brown clayey soil	Brown clayey soil	Brown clayey soil	Brown clayey soil	Brown clayey soil
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	160758-11
Your Reference	---------- -	10
Depth	----------	0.5
Date Sampled		23/01/2017
Type of sample		soil
Date analysed	-	31/01/2017
Sample mass tested	g	Approx. 55g
Sample Description	-	Brown clayey soil
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected

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.

QUALITY CONTROL vTRH(C6-C10)/BTEXN in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			25/01/2017	160758-1	25/01/2017 || 25/01/2017	LCS-8	25/01/2017
Date analysed	-			27/01/2017	160758-1	27/01/2017 || 27/01/2017	LCS-8	27/01/2017
TRHC$_6$ - C$_9$	mg/kg	25	Org-016	<25	160758-1	<25 || <25	LCS-8	108%
TRHC$_6$ - C$_{10}$	mg/kg	25	Org-016	<25	160758-1	<25 || <25	LCS-8	108%
Benzene	mg/kg	0.2	Org-016	<0.2	160758-1	<0.2 || <0.2	LCS-8	108%
Toluene	mg/kg	0.5	Org-016	<0.5	160758-1	<0.5 || <0.5	LCS-8	109%
Ethylbenzene	mg/kg	1	Org-016	<1	160758-1	<1 || <1	LCS-8	106%
m+p-xylene	mg/kg	2	Org-016	<2	160758-1	<2 || <2	LCS-8	108%
o-Xylene	mg/kg	1	Org-016	<1	160758-1	<1 || <1	LCS-8	108%
naphthalene	mg/kg	1	Org-014	<1	160758-1	<1 || <1	[NR]	[NR]
Surrogate aaa-Trifluorotoluene	%		Org-016	96	160758-1	99 || 100 || RPD: 1	LCS-8	108%

QUALITY CONTROL svTRH (C10-C40) in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			25/01/2017	160758-1	25/01/2017 || 25/01/2017	LCS-8	25/01/2017
Date analysed	-			26/01/2017	160758-1	26/01/2017 || 26/01/2017	LCS-8	26/01/2017
TRHC$_{10}$ - C$_{14}$	mg/kg	50	Org-003	<50	160758-1	<50 || <50	LCS-8	70%
TRHC$_{15}$ - C$_{28}$	mg/kg	100	Org-003	<100	160758-1	<100 || <100	LCS-8	72%
TRHC$_{29}$ - C$_{36}$	mg/kg	100	Org-003	<100	160758-1	<100 || <100	LCS-8	106%
TRH>C$_{10}$-C$_{16}$	mg/kg	50	Org-003	<50	160758-1	<50 || <50	LCS-8	70%
TRH>C$_{16}$-C$_{34}$	mg/kg	100	Org-003	<100	160758-1	<100 || <100	LCS-8	72%
TRH>C$_{34}$-C$_{40}$	mg/kg	100	Org-003	<100	160758-1	<100 || <100	LCS-8	106%
Surrogate o-Terphenyl	%		Org-003	75	160758-1	77 || 77 || RPD: 0	LCS-8	106%

QUALITY CONTROL PAHs in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			25/01/2017	160758-1	25/01/2017 || 25/01/2017	LCS-8	25/01/2017
Date analysed	-			25/01/2017	160758-1	25/01/2017 || 25/01/2017	LCS-8	25/01/2017
Naphthalene	mg/kg	0.1	Org-012	<0.1	160758-1	<0.1 || <0.1	LCS-8	100%
Acenaphthylene	mg/kg	0.1	Org-012	<0.1	160758-1	<0.1 || <0.1	[NR]	[NR]
Acenaphthene	mg/kg	0.1	Org-012	<0.1	160758-1	<0.1 || <0.1	[NR]	[NR]
Fluorene	mg/kg	0.1	Org-012	<0.1	160758-1	<0.1 || <0.1	LCS-8	113%
Phenanthrene	mg/kg	0.1	Org-012	<0.1	160758-1	<0.1 || <0.1	LCS-8	119%
Anthracene	mg/kg	0.1	Org-012	<0.1	160758-1	<0.1 || <0.1	[NR]	[NR]
Fluoranthene	mg/kg	0.1	Org-012	<0.1	160758-1	<0.1 || <0.1	LCS-8	107%
Pyrene	mg/kg	0.1	Org-012	<0.1	160758-1	<0.1 || <0.1	LCS-8	108%
Benzo(a)anthracene	mg/kg	0.1	Org-012	<0.1	160758-1	<0.1 || <0.1	[NR]	[NR]
Chrysene	mg/kg	0.1	Org-012	<0.1	160758-1	<0.1 || <0.1	LCS-8	99%
Benzo(b,j +k)fluoranthene	mg/kg	0.2	Org-012	<0.2	160758-1	<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	160758-1	<0.05 || <0.05	LCS-8	100%
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012	<0.1	160758-1	<0.1 || <0.1	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012	<0.1	160758-1	<0.1 || <0.1	[NR]	[NR]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012	<0.1	160758-1	<0.1 || <0.1	[NR]	[NR]
Surrogate p-Terphenyl-d14	%		Org-012	79	160758-1	81 || 77 || RPD: 5	LCS-8	116%
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	-			25/01/2017	160758-1	25/01/2017 || 25/01/2017	LCS-8	25/01/2017
Date analysed	-			25/01/2017	160758-1	25/01/2017 || 25/01/2017	LCS-8	25/01/2017
HCB	mg/kg	0.1	Org-005	<0.1	160758-1	<0.1 || <0.1	[NR]	[NR]
alpha-BHC	mg/kg	0.1	Org-005	<0.1	160758-1	<0.1 || <0.1	LCS-8	93%
gamma-BHC	mg/kg	0.1	Org-005	<0.1	160758-1	<0.1 || <0.1	[NR]	[NR]
beta-BHC	mg/kg	0.1	Org-005	<0.1	160758-1	<0.1 || <0.1	LCS-8	100%
Heptachlor	mg/kg	0.1	Org-005	<0.1	160758-1	<0.1 || <0.1	LCS-8	95%
delta-BHC	mg/kg	0.1	Org-005	<0.1	160758-1	<0.1 || <0.1	[NR]	[NR]
Aldrin	mg/kg	0.1	Org-005	<0.1	160758-1	<0.1 || <0.1	LCS-8	96%
Heptachlor Epoxide	mg/kg	0.1	Org-005	<0.1	160758-1	<0.1 || <0.1	LCS-8	100%
gamma-Chlordane	mg/kg	0.1	Org-005	<0.1	160758-1	<0.1 || <0.1	[NR]	[NR]
alpha-chlordane	mg/kg	0.1	Org-005	<0.1	160758-1	<0.1 || <0.1	[NR]	[NR]
Endosulfan I	mg/kg	0.1	Org-005	<0.1	160758-1	<0.1 || <0.1	[NR]	[NR]
pp-DDE	mg/kg	0.1	Org-005	<0.1	160758-1	<0.1 || <0.1	LCS-8	103%
Dieldrin	mg/kg	0.1	Org-005	<0.1	160758-1	<0.1 || <0.1	LCS-8	108%
Endrin	mg/kg	0.1	Org-005	<0.1	160758-1	<0.1 || <0.1	LCS-8	110%
pp-DDD	mg/kg	0.1	Org-005	<0.1	160758-1	<0.1 || <0.1	LCS-8	93%
Endosulfan II	mg/kg	0.1	Org-005	<0.1	160758-1	<0.1 || <0.1	[NR]	[NR]
pp-DDT	mg/kg	0.1	Org-005	<0.1	160758-1	<0.1 || <0.1	[NR]	[NR]
Endrin Aldehyde	mg/kg	0.1	Org-005	<0.1	160758-1	<0.1 || <0.1	[NR]	[NR]
Endosulfan Sulphate	mg/kg	0.1	Org-005	<0.1	160758-1	<0.1 || <0.1	LCS-8	91%
Methoxychlor	mg/kg	0.1	Org-005	<0.1	160758-1	<0.1 || <0.1	[NR]	[NR]
Surrogate TCMX	%		Org-005	84	160758-1	88 || 85 || RPD: 3	LCS-8	123%

QUALITY CONTROL Organophosphorus Pesticides	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			25/01/2017	160758-1	25/01/2017 || 25/01/2017	LCS-8	25/01/2017
Date analysed	-			25/01/2017	160758-1	25/01/2017 || 25/01/2017	LCS-8	25/01/2017
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-008	<0.1	160758-1	<0.1 || <0.1	[NR]	[NR]
Bromophos-ethyl	mg/kg	0.1	Org-008	<0.1	160758-1	<0.1 || <0.1	[NR]	[NR]
Chlorpyriphos	mg/kg	0.1	Org-008	<0.1	160758-1	<0.1 || <0.1	LCS-8	109%
Chlorpyriphos-methyl	mg/kg	0.1	Org-008	<0.1	160758-1	<0.1 || <0.1	[NR]	[NR]
Diazinon	mg/kg	0.1	Org-008	<0.1	160758-1	<0.1 || <0.1	[NR]	[NR]
Dichlorvos	mg/kg	0.1	Org-008	<0.1	160758-1	<0.1 || <0.1	LCS-8	97%
Dimethoate	mg/kg	0.1	Org-008	<0.1	160758-1	<0.1 || <0.1	[NR]	[NR]
Ethion	mg/kg	0.1	Org-008	<0.1	160758-1	<0.1 || <0.1	LCS-8	96%
Fenitrothion	mg/kg	0.1	Org-008	<0.1	160758-1	<0.1 || <0.1	LCS-8	113%
Malathion	mg/kg	0.1	Org-008	<0.1	160758-1	<0.1 || <0.1	LCS-8	94%
Parathion	mg/kg	0.1	Org-008	<0.1	160758-1	<0.1 || <0.1	LCS-8	103%
Ronnel	mg/kg	0.1	Org-008	<0.1	160758-1	<0.1 || <0.1	LCS-8	130%
Surrogate TCMX	%		Org-008	84	160758-1	88 || 85 || RPD: 3	LCS-8	88%

QUALITY CONTROL PCBs in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			25/01/2017	160758-1	25/01/2017 || 25/01/2017	LCS-8	25/01/2017
Date analysed	-			25/01/2017	160758-1	25/01/2017 || 25/01/2017	LCS-8	25/01/2017
Aroclor 1016	mg/kg	0.1	Org-006	<0.1	160758-1	<0.1 || <0.1	[NR]	[NR]
Aroclor 1221	mg/kg	0.1	Org-006	<0.1	160758-1	<0.1 || <0.1	[NR]	[NR]
Aroclor 1232	mg/kg	0.1	Org-006	<0.1	160758-1	<0.1 || <0.1	[NR]	[NR]
Aroclor 1242	mg/kg	0.1	Org-006	<0.1	160758-1	<0.1 || <0.1	[NR]	[NR]
Aroclor 1248	mg/kg	0.1	Org-006	<0.1	160758-1	<0.1 || <0.1	[NR]	[NR]
Aroclor 1254	mg/kg	0.1	Org-006	<0.1	160758-1	<0.1 || <0.1	LCS-8	107%
Aroclor 1260	mg/kg	0.1	Org-006	<0.1	160758-1	<0.1 || <0.1	[NR]	[NR]
Surrogate TCLMX	%		Org-006	84	160758-1	88 || 85 || RPD: 3	LCS-8	88%

QUALITY CONTROL Acid Extractable metals in soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date prepared	-			25/01/2017	160758-1	25/01/2017 || 25/01/2017	LCS-8	25/01/2017
Date analysed	-			25/01/2017	160758-1	25/01/2017 || 25/01/2017	LCS-8	25/01/2017
Arsenic	mg/kg	4	Metals-020	<4	160758-1	11 || 8 || RPD: 32	LCS-8	121%
Cadmium	mg/kg	0.4	Metals-020	<0.4	160758-1	<0.4 || <0.4	LCS-8	111%
Chromium	mg/kg	1	Metals-020	<1	160758-1	27 || 26 || RPD: 4	LCS-8	115%
Copper	mg/kg	1	Metals-020	<1	160758-1	13 || 12 || RPD: 8	LCS-8	115%
Lead	mg/kg	1	Metals-020	<1	160758-1	19 || 21 || RPD: 10	LCS-8	112%
Mercury	mg/kg	0.1	Metals-021	<0.1	160758-1	<0.1 || <0.1	LCS-8	110%
Nickel	mg/kg	1	Metals-020	<1	160758-1	9 || 8 || RPD: 12	LCS-8	105%
Zinc	mg/kg	1	Metals-020	<1	160758-1	32 || 26 || RPD: 21	LCS-8	107%

QUALITY CONTROL Misc Soil - Inorg	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date prepared	-			25/01/2017	160758-1	25/01/2017 || 25/01/2017	LCS-1	25/01/2017
Date analysed	-			25/01/2017	160758-1	25/01/2017 || 25/01/2017	LCS-1	25/01/2017
Total Phenolics (as Phenol)	mg/kg	5	Inorg-031	<5	160758-1	<5 || <5	LCS-1	99%

QUALITY CONTROL vTRH(C6-C10)/BTEXN in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	160758-11	25/01/2017 || 25/01/2017	160758-2	25/01/2017
Date analysed	-	160758-11	27/01/2017 || 27/01/2017	160758-2	27/01/2017
TRHC$_6$ - C$_9$	mg/kg	160758-11	<25 || <25	160758-2	99%
TRHC$_6$ - C$_{10}$	mg/kg	160758-11	<25 || <25	160758-2	99%
Benzene	mg/kg	160758-11	<0.2 || <0.2	160758-2	97%
Toluene	mg/kg	160758-11	<0.5 || <0.5	160758-2	97%
Ethylbenzene	mg/kg	160758-11	<1 || <1	160758-2	99%
m+p-xylene	mg/kg	160758-11	<2 || <2	160758-2	100%
o-Xylene	mg/kg	160758-11	<1 || <1	160758-2	98%
naphthalene	mg/kg	160758-11	<1 || <1	[NR]	[NR]
Surrogate aaa-Trifluorotoluene	%	160758-11	96 || 99 || RPD: 3	160758-2	95%

QUALITY CONTROL svTRH (C10-C40) in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	160758-11	25/01/2017 || 25/01/2017	160758-2	25/01/2017
Date analysed	-	160758-11	26/01/2017 || 26/01/2017	160758-2	26/01/2017
TRHC$_{10}$ - C$_{14}$	mg/kg	160758-11	<50 || <50	160758-2	121%
TRHC$_{15}$ - C$_{28}$	mg/kg	160758-11	<100 || <100	160758-2	122%
TRHC$_{29}$ - C$_{36}$	mg/kg	160758-11	<100 || <100	160758-2	100%
TRH>C$_{10}$-C$_{16}$	mg/kg	160758-11	<50 || <50	160758-2	121%
TRH>C$_{16}$-C$_{34}$	mg/kg	160758-11	<100 || <100	160758-2	122%
TRH>C$_{34}$-C$_{40}$	mg/kg	160758-11	<100 || <100	160758-2	100%
Surrogate o-Terphenyl	%	160758-11	74 || 76 || RPD: 3	160758-2	76%
QUALITY CONTROL PAHs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	160758-11	25/01/2017 || 25/01/2017	160758-2	25/01/2017
Date analysed	-	160758-11	25/01/2017 || 25/01/2017	160758-2	25/01/2017
Naphthalene	mg/kg	160758-11	<0.1 || <0.1	160758-2	93%
Acenaphthylene	mg/kg	160758-11	<0.1 || <0.1	[NR]	[NR]
Acenaphthene	mg/kg	160758-11	<0.1 || <0.1	[NR]	[NR]
Fluorene	mg/kg	160758-11	<0.1 || <0.1	160758-2	101%
Phenanthrene	mg/kg	160758-11	<0.1 || <0.1	160758-2	97%
Anthracene	mg/kg	160758-11	<0.1 || <0.1	[NR]	[NR]
Fluoranthene	mg/kg	160758-11	<0.1 || <0.1	160758-2	91%
Pyrene	mg/kg	160758-11	<0.1 || <0.1	160758-2	97%
Benzo(a)anthracene	mg/kg	160758-11	<0.1 || <0.1	[NR]	[NR]
Chrysene	mg/kg	160758-11	<0.1 || <0.1	160758-2	86%
Benzo(b,j+k)fluoranthene	mg/kg	160758-11	<0.2 || <0.2	[NR]	[NR]
Benzo(a)pyrene	mg/kg	160758-11	<0.05 || <0.05	160758-2	94%
Indeno(1,2,3-c,d)pyrene	mg/kg	160758-11	<0.1 || <0.1	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	160758-11	<0.1 || <0.1	[NR]	[NR]
Benzo(g,h,i)perylene	mg/kg	160758-11	<0.1 || <0.1	[NR]	[NR]
Surrogate p-Terphenyl-d14	%	160758-11	73 || 78 || RPD: 7	160758-2	108%

QUALITY CONTROL Organochlorine Pesticides in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	160758-11	25/01/2017 || 25/01/2017	160758-2	25/01/2017
Date analysed	-	160758-11	26/01/2017 || 26/01/2017	160758-2	25/01/2017
HCB	mg/kg	160758-11	<0.1 || <0.1	[NR]	[NR]
alpha-BHC	mg/kg	160758-11	<0.1 || <0.1	160758-2	82%
gamma-BHC	mg/kg	160758-11	<0.1 || <0.1	[NR]	[NR]
beta-BHC	mg/kg	160758-11	<0.1 || <0.1	160758-2	90%
Heptachlor	mg/kg	160758-11	<0.1 || <0.1	160758-2	87%
delta-BHC	mg/kg	160758-11	<0.1 || <0.1	[NR]	[NR]
Aldrin	mg/kg	160758-11	<0.1 || <0.1	160758-2	87%
Heptachlor Epoxide	mg/kg	160758-11	<0.1 || <0.1	160758-2	90%
gamma-Chlordane	mg/kg	160758-11	<0.1 || <0.1	[NR]	[NR]
alpha-chlordane	mg/kg	160758-11	<0.1 || <0.1	[NR]	[NR]
Endosulfan I	mg/kg	160758-11	<0.1 || <0.1	[NR]	[NR]
pp-DDE	mg/kg	160758-11	<0.1 || <0.1	160758-2	92%
Dieldrin	mg/kg	160758-11	<0.1 || <0.1	160758-2	97%
Endrin	mg/kg	160758-11	<0.1 || <0.1	160758-2	100%
pp-DDD	mg/kg	160758-11	<0.1 || <0.1	160758-2	88%
Endosulfan II	mg/kg	160758-11	<0.1 || <0.1	[NR]	[NR]
pp-DDT	mg/kg	160758-11	<0.1 || <0.1	[NR]	[NR]
Endrin Aldehyde	mg/kg	160758-11	<0.1 || <0.1	[NR]	[NR]
Endosulfan Sulphate	mg/kg	160758-11	<0.1 || <0.1	160758-2	87%
Methoxychlor	mg/kg	160758-11	<0.1 || <0.1	[NR]	[NR]
Surrogate TCMX	%	160758-11	89 || 86 || RPD: 3	160758-2	112%

QUALITY CONTROL Organophosphorus Pesticides	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	160758-11	25/01/2017 || 25/01/2017	160758-2	25/01/2017
Date analysed	-	160758-11	26/01/2017 || 26/01/2017	160758-2	25/01/2017
Azinphos-methyl (Guthion)	mg/kg	160758-11	<0.1 || <0.1	[NR]	[NR]
Bromophos-ethyl	mg/kg	160758-11	<0.1 || <0.1	[NR]	[NR]
Chlorpyriphos	mg/kg	160758-11	<0.1 || <0.1	160758-2	102%
Chlorpyriphos-methyl	mg/kg	160758-11	<0.1 || <0.1	[NR]	[NR]
Diazinon	mg/kg	160758-11	<0.1 || <0.1	[NR]	[NR]
Dichlorvos	mg/kg	160758-11	<0.1 || <0.1	160758-2	88%
Dimethoate	mg/kg	160758-11	<0.1 || <0.1	[NR]	[NR]
Ethion	mg/kg	160758-11	<0.1 || <0.1	160758-2	97%
Fenitrothion	mg/kg	160758-11	<0.1 || <0.1	160758-2	102%
Malathion	mg/kg	160758-11	<0.1 || <0.1	160758-2	86%
Parathion	mg/kg	160758-11	<0.1 || <0.1	160758-2	88%
Ronnel	mg/kg	160758-11	<0.1 || <0.1	160758-2	122%
Surrogate TCMX	%	160758-11	89 || 86 || RPD: 3	160758-2	87%

QUALITY CONTROL PCBs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	160758-11	25/01/2017 || 25/01/2017	160758-2	25/01/2017
Date analysed	-	160758-11	26/01/2017 || 26/01/2017	160758-2	25/01/2017
Aroclor 1016	mg/kg	160758-11	<0.1 || <0.1	[NR]	[NR]
Aroclor 1221	mg/kg	160758-11	<0.1 || <0.1	[NR]	[NR]
Aroclor 1232	mg/kg	160758-11	<0.1 || <0.1	[NR]	[NR]
Aroclor 1242	mg/kg	160758-11	<0.1 || <0.1	[NR]	[NR]
Aroclor 1248	mg/kg	160758-11	<0.1 || <0.1	[NR]	[NR]
Aroclor 1254	mg/kg	160758-11	<0.1 || <0.1	160758-2	96%
Aroclor 1260	mg/kg	160758-11	<0.1 || <0.1	[NR]	[NR]
Surrogate TCLMX	%	160758-11	89 || 86 || RPD: 3	160758-2	87%

QUALITY CONTROL Acid Extractable metals in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date prepared	-	160758-11	25/01/2017 || 25/01/2017	160758-2	25/01/2017
Date analysed	-	160758-11	25/01/2017 || 25/01/2017	160758-2	25/01/2017
Arsenic	mg/kg	160758-11	7 || 10 || RPD: 35	160758-2	96%
Cadmium	mg/kg	160758-11	<0.4 || <0.4	160758-2	93%
Chromium	mg/kg	160758-11	12 || 15 || RPD: 22	160758-2	101%
Copper	mg/kg	160758-11	16 || 20 || RPD: 22	160758-2	113%
Lead	mg/kg	160758-11	20 || 21 || RPD: 5	160758-2	89%
Mercury	mg/kg	160758-11	<0.1 || <0.1	160758-2	106%
Nickel	mg/kg	160758-11	3 || 4 || RPD: 29	160758-2	91%
Zinc	mg/kg	160758-11	24 || 27 || RPD: 12	160758-2	91%

QUALITY CONTROL Misc Soil - Inorg	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date prepared	-	160758-11	25/01/2017 || 25/01/2017	160758-2	25/01/2017
Date analysed	-	160758-11	25/01/2017 || 25/01/2017	160758-2	25/01/2017
Total Phenolics (as Phenol)	mg/kg	160758-11	<5 || <5	160758-2	102%

Report Comments:

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

Asbestos ID was analysed by Approved Identifier: Lucy Zhu
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.

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 Pty Ltd Smeaton Grange
Attention	Y Shresstha

Sample Login Details	
Your Reference	34252.02, Picton HS
Envirolab Reference	**160757**
Date Sample Received	24/01/2017
Date Instructions Received	24/01/2017
Date Results Expected to be Reported	**01/02/2017**

Sample Condition	
Samples received in appropriate condition for analysis	YES
No. of Samples Provided	1 material
Turnaround Time Requested	Standard
Temperature on receipt (°C)	NA
Cooling Method	Not applicable
Sampling Date Provided	

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	*Asbestos ID - materials*
ACM1	✓

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

Douglas Partners
Geotechnics / Environment / Groundwater

CHAIN OF CUSTODY

Project Name:	Picton H. S.			**To:**	Envirolab Services
Project No:	34252.02	**Sampler:**	YS		12 Ashley Street, Chatswood NSW 2067
Project Mgr:	Yashu	**Mob. Phone:**	447223709	**Attn:**	Tania Notaras
Email:	yashu.shrestha@douglaspartners.com.au			**Phone:**	(02) 9910 6200 **Fax:** (02) 9910 6201
Date Required:	Standard			**Email:**	tnotaras@envirolabservices.com.au

Sample ID	Lab ID	Date Sampled	Sample Type (S - soil, W - water)	Container Type (G - glass, P - plastic)	Analytes: Asbestos ID									Notes/preservation
ACM1	1	23/01/17	S	P	x									

ENVIROLAB
Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200
Job No: 160757
Date Received: 24/1/2017
Time Received: 17:20
Received by: R
Temp: Cool/Ambient 21.0
Cooling: Ice/Icepack
Security: Intact/Broken/None

Lab Report No:			
Send Results to:	Douglas Partners Pty Ltd	**Address** 18 Waler Crescent, Smeaton Grange 2567	**Phone:** (02) 4647 0075 **Fax:** (02) 4646 1886
Relinquished by:	YS	**Transported to laboratory by:**	
Signed:	**Date & Time:** 23/01/2017	**Received by:** ELS Ray 24/1/2017	

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 160757

Client:

Douglas Partners Pty Ltd Smeaton Grange
18 Waler Crescent
Smeaton Grange
NSW 2567

Attention: Y Shresstha

Sample log in details:

Your Reference:	**34252.02, Picton HS**
No. of samples:	1 material
Date samples received:	24/01/17
Date completed instructions received:	24/01/17

Analysis Details:

Please refer to the following pages for results and methodology summary.
Samples were analysed as received from the client. Results relate specifically to the samples as received.
Note, even after disintegration it can be difficult to detect the presence of asbestos in some asbestos containing bulk materials using PLM and dispersion staining. This is due to the low grade or small length or diameter of the asbestos fibres present in the material, or to the fact that very fine fibres have been distributed intimately throughout the materials. Vinyl/asbestos floor tiles, some asbestos containing epoxy resins and some ore samples are examples of these types of material, which are difficult to analyse.

Report Details:

Date results requested by:	1/02/17
Date of Preliminary Report:	Not Issued
Issue Date:	30/01/17

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Results Approved By:

Asbestos was analysed by Approved Identifier:	Lucy Zhu
Asbestos was authorised by Approved Signatory:	Paul Ching

Paul Ching
Approved Signatory

ACCREDITED FOR TECHNICAL COMPETENCE

Envirolab Ref: –	Sample ID: –	Date analysed -	Mass / Dimension of Sample -	Sample Description -	Asbestos ID in materials -
160757-1	ACM1	25/01/2017	80x50x5mm	Grey compressed fibre cement material	Chrysotile asbestos detected Amosite asbestos detected

Method ID	Methodology Summary
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.

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enquiries@envirolabservices.com.au
www.envirolabservices.com.au

SAMPLE RECEIPT ADVICE

Client Details	
Client	Douglas Partners Pty Ltd Smeaton Grange
Attention	Y Shrestha

Sample Login Details	
Your Reference	34252.02, Picton HS
Envirolab Reference	**160758-A**
Date Sample Received	24/01/2017
Date Instructions Received	13/03/2017
Date Results Expected to be Reported	**15/03/2017**

Sample Condition	
Samples received in appropriate condition for analysis	YES
No. of Samples Provided	Additional testings
Turnaround Time Requested	48hr
Temperature on receipt (°C)	29.2
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	*pH 1:5 soil:water*	*CEC*	*On Hold*
BD02/23.1.17			✓
1-0.5			✓
2-0.5			✓
3-0.5			✓
4-0.5	✓	✓	
5-0-0.2			✓
6-0-0.2			✓
7-0-0.2	✓	✓	
8-0-0.2			✓
9-0.5			✓
10-0.5			✓
Trip Blank			✓
Trip Spike			✓

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

Simon Song

From: Chamali Nagodavithane <Chamali.Nagodavithane@douglaspartners.com.au>
Sent: Monday, 13 March 2017 2:35 PM
To: Simon Song
Subject: Additional analysis - Picton

160758 - A

Hi Simon,

Can we please get the following additional analysis done:

Lab reference: 160758
Our reference: 34252.02 – Picton H.S
Analysis required: pH and CEC
Sample #: 5 and 8
TAT: 2 day

Chamali Nagodavithane | Environmental Scientist
Douglas Partners Pty Ltd | ABN 75 053 980 117 | www.douglaspartners.com.au
18 Waler Crescent Smeaton Grange NSW 2567
P: 02 4647 0075 | F: 02 4646 1886 | E: Chamali.Nagodavithane@douglaspartners.com.au

12 Ashley Street, Chatswood, NSW 2067
tel: +61 2 9910 6200

email: sydney@envirolab.com.au
envirolab.com.au

Envirolab Services Pty Ltd - Sydney | ABN 37 112 535 645

CERTIFICATE OF ANALYSIS 160758-A

Client:

Douglas Partners Pty Ltd Smeaton Grange
18 Waler Crescent
Smeaton Grange
NSW 2567

Attention: Y Shrestha

Sample log in details:

Your Reference:	**34252.02, Picton HS**
No. of samples:	Additional testings
Date samples received / completed instructions received	24/01/17 / 13/03/17

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:	15/03/17 / 15/03/17
Date of Preliminary Report:	Not Issued

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Results Approved By:

David Springer
General Manager

Misc Inorg - Soil			
Our Reference:	UNITS	160758-A-5	160758-A-8
Your Reference	---------- -	4	7
Depth	----------	0.5	0-0.2
Date Sampled		23/01/2017	23/01/2017
Type of sample		soil	soil
Date prepared	-	15/03/2017	15/03/2017
Date analysed	-	15/03/2017	15/03/2017
pH 1:5 soil:water	pH Units	5.9	5.7

CEC Our Reference: Your Reference	UNITS ---------- -	160758-A-5 4	160758-A-8 7
Depth	----------	0.5	0-0.2
Date Sampled		23/01/2017	23/01/2017
Type of sample		soil	soil
Date prepared	-	15/03/2017	15/03/2017
Date analysed	-	15/03/2017	15/03/2017
Exchangeable Ca	meq/100g	1.2	3.7
Exchangeable K	meq/100g	<0.1	0.2
Exchangeable Mg	meq/100g	2.9	2.5
Exchangeable Na	meq/100g	0.19	<0.1
Cation Exchange Capacity	meq/100g	4.3	6.5

Method ID	Methodology Summary
Inorg-001	pH - Measured using pH meter and electrode in accordance with APHA latest edition, 4500-H+. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times.
Metals-009	Determination of exchangeable cations and cation exchange capacity in soils using 1M Ammonium Chloride exchange and ICP-AES analytical finish.

QUALITY CONTROL Misc Inorg - Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date prepared	-			15/03/2017	160758-A-5	15/03/2017 || 15/03/2017	LCS-1	15/03/2017
Date analysed	-			15/03/2017	160758-A-5	15/03/2017 || 15/03/2017	LCS-1	15/03/2017
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	160758-A-5	5.9 || 5.8 || RPD: 2	LCS-1	102%
QUALITY CONTROL CEC	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date prepared	-			15/03/2017	[NT]	[NT]	LCS-1	15/03/2017
Date analysed	-			15/03/2017	[NT]	[NT]	LCS-1	15/03/2017
Exchangeable Ca	meq/100g	0.1	Metals-009	<0.1	[NT]	[NT]	LCS-1	102%
Exchangeable K	meq/100g	0.1	Metals-009	<0.1	[NT]	[NT]	LCS-1	103%
Exchangeable Mg	meq/100g	0.1	Metals-009	<0.1	[NT]	[NT]	LCS-1	100%
Exchangeable Na	meq/100g	0.1	Metals-009	<0.1	[NT]	[NT]	LCS-1	100%

Report Comments:

Asbestos ID was analysed by Approved Identifier:	Not applicable for this job
Asbestos ID was authorised by Approved Signatory:	Not applicable for this job

INS: Insufficient sample for this test	PQL: Practical Quantitation Limit	NT: Not tested
NR: Test not required	RPD: Relative Percent Difference	NA: Test not required
<: Less than	>: Greater than	LCS: Laboratory Control Sample

Quality Control Definitions

Blank: This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.

Duplicate: This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.

Matrix Spike : A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

LCS (Laboratory Control Sample) : This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

Surrogate Spike: Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.
Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.
Spikes for Physical and Aggregate Tests are not applicable.
For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.
Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

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

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

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

Measurement Uncertainty estimates are available for most tests upon request.

Appendix H

QA/QC

Appendix H - DATA QUALITY ASSESSMENT

Q1. Data Quality Indicators

The reliability of field procedures and analytical results were 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.

DQI	Considerations with reference to NEPC (2013) Schedule B2	Comment
Completeness		
Field Considerations	Critical locations sampled	Due to access constraints, sample locations were selected by BLP. Test pits were positioned to provide general site coverage.
	Samples collected (from grid and at depth)	A limited sampling plan was followed as discussed in Appendix E – Data Quality Objectives; potentially impacted media (topsoil, fill) was sampled. At location TP9 and TP10, where fill was not present, samples from natural material were analysed to provide an indication of contamination at depth.
	Standard operating procedures (SOPs) appropriate and complied with	Field staff followed SOPs, and discussed further in Report Section 8.
	Experienced sampler	Experienced DP environmental engineers led the field team and were given guidance from the project manager.
	Documentation correct	The DP environmental engineer completed a safe work method statement (SWMS), chain of custody, and test pit logs. The project manager reviewed the documentation.

DQI	Considerations with reference to NEPC (2013) Schedule B2	Comment
Laboratory Considerations	Critical samples analysed according to the proposal	The DP Proposal MAC160384 dated 21 November 2016 (the proposal) was followed in the selection of samples for analysis. Samples of media initially considered to be potentially impacted by COPC were analysed. Any variation to the proposal was recorded in the report.
	Analytes analysed according to the proposal	The analytes were selected on the basis of the COPC as outlined in the proposal. Any variation has been recorded in the report.
	Appropriate methods and PQLs/LOR	NATA approved methods were adopted by the selected analytical laboratory. Limits of reporting (LORs) and practical quantitation limits (PQLs) in accordance with the method have been used by the contract laboratory.
	Sample documentation complete	Chain-of-custody (CoC) maintained and appended to the Certificates of Analysis(s). Certificates of Analysis complete and appended to the report.
	Sample holding times complied with	All samples were analysed within the holding times, as discussed in Section Q3.3.
Comparability		
Field Considerations	Same SOPs used on each occasion	Field staff followed the same SOPs for each sampling location as defined in the proposal.
	Same types of samples collected	At all test pit locations, soil samples were collected from the test pit wall. Samples were placed in laboratory supplied jars.
Laboratory Considerations	Sample analytical methods used	The laboratory used is accredited by NATA for the analyses undertaken. Laboratory analytical methods were the same for each sample, for the same analyte, in the same laboratory, and are as stated on the Certificates of Analysis.
	Sample PQLs / LORs	PQL or LOR set by the laboratory are generally below the adopted SAC.
	Same laboratories	Envirolab Services Pty Ltd (Envirolab) was used for sample analysis. The reliability of the data provided by the laboratory is discussed in Section Q3.
	Same units	Laboratory results are expressed in consistent units for each media / analyte.

DQI	Considerations with reference to NEPC (2013) Schedule B2	Comment
Representativeness		
Field Considerations	Appropriate media sampled according to the proposal	Appropriate media were sampled with reference to the proposal. This included media considered to be potentially impacted by the COPC such as topsoil and fill.
	Media identified in the proposal sampled	Media identified as requiring investigation in the proposal were sampled.
Laboratory Considerations	Samples analysed according to the proposal	Samples were analysed according to the proposal, and as stipulated in the COC.
Precision		
Field Considerations	SOPs appropriate and complied with	Field staff followed SOPs as defined in the proposal. SOPs specific for contamination investigation purposes.
Laboratory Considerations	Analysis of laboratory duplicates	Refer to Section Q3.5. The duplicate results were within the laboratory acceptance standards. The relevance of those outside the standards are discussed in the same section.
	Field duplicates	The analysis included 10% intra- replicates prepared in the field. The RPDs were within acceptable limits, as discussed in Section Q2.5.
	Laboratory prepared volatile trip spikes	Trip spike samples were provided by Envirolab, taken into the field during sampling, and analysed for BTEX as part of the analytical suite for the corresponding sample batch. The results are discussed in Section Q2.7. All trip spike samples had acceptable recoveries.
Accuracy (bias)		
Field Considerations	SOPs appropriate and complied with	Field staff followed SOPs as defined in the proposal. SOPs specific for contamination investigation purposes.
Laboratory Considerations	Analysis of field blanks	Trip (field) blank samples were provided by Envirolab, taken into the field during sampling, and analysed for BTEX as part of the analytical suite for the corresponding sample batch. The results are discussed in Section Q2.6. Trip blank samples had concentrations less than limits of reporting.
	Analysis of reagent blanks	Refer to Section Q3.6. The reagent blank samples were generally within laboratory acceptance standards. The implications of those outside the standards are discussed in Section Q3.10
	Analysis of matrix spikes	Refer to Section Q3.7. The matrix spike samples were generally within laboratory acceptance standards. The implications of those outside the standards are discussed in Section Q3.10.
	Analysis of surrogate spikes	Refer to Section Q3.8. The surrogate spike samples were generally within laboratory acceptance standards. The implications of those outside the standards are discussed in Section Q3.10.
	Analysis of laboratory control samples	Refer to Section Q3.9. The LCS were generally within laboratory acceptance standards. The implications of those outside the standards are discussed in Section Q3.10.

Q2. FIELD QUALITY ASSURANCE AND QUALITY CONTROL

The field QC procedures for sampling as prescribed in the DP *Field Procedures Manual* were followed at all times during the investigation.

Q2.1 Sampling Team and Weather Conditions

Field sampling was undertaken by a DP Environmental Engineer. Fieldwork was undertaken on 23 January 2017. The DP environmental engineer was instructed by the Project Manager regarding the sampling methods to be adopted.

Climatic or weather conditions are not considered to have impeded or significantly impacted the investigation.

Q2.2 Sample Collection

Soil

At test pit locations, samples were collected from the test pit walls, at regular intervals or where a change in soil stratification was observed. Further details of the excavation and sampling methodology are presented in Report Section 8. The QA/QC samples collected during the course of soil sampling comprised the following:

- 10% intra-laboratory replicates (10% of soil samples analysed); and
- One trip spike and one trip blank per day of sampling.

Q2.3 Logs and Field Sheets

Logs for each soil sampling location were recorded in the field. The individual samples were recorded on the field logs along with the sample identity, depth, replicate sample locations, and observations. Logs are presented in Appendix F.

Q2.4 Chain-of-Custody

Chain of custody information was recorded on the Chain-of-Custody (COC) sheets which accompanied samples to the analytical laboratory. Signed copies of COCs are presented in Appendix G.

The COC documented, *inter alia*, the analytical laboratory, dispatch courier, DP dispatcher, date, sample identifications, sample type and analysis to be performed on each sample.

Q2.5 Field Replicates

Replicate samples were collected in the field as a measure of accuracy, precision and repeatability of the results.

Field replicate samples for soil were collected from the same location and an identical depth to the primary sample. Equal portions of the subject material were placed into the primary and replicate sampling jars and sealed. The sample was not homogenised so as to minimise the possible loss of volatiles. Replicate samples were labelled with a DP identification number, recorded on DP's field logs, so as to conceal their relationship to their primary sample from the analytical laboratory.

A measure of the consistency of results is derived by the calculation of relative percentage differences (RPDs) for replicate samples. A RPD of +/- 30% is generally considered acceptable for inorganic analytes by the industry, although in general a wider RPD range (50%) may be acceptable for organic analytes. RPDs above the generally acceptable limits (if applicable) are shown in **bold** on the relevant tables below.

Q2.5.1 Intra-Laboratory Analysis

Intra-laboratory replicates were analysed as an internal check of the reproducibility within the primary laboratory 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 H1.

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

The calculated RPD values were within the acceptable range, therefore the intra-laboratory replicate comparisons indicate that the sampling techniques were generally consistent and repeatable.

Table H1: Relative Percentage Difference Results – Intra-laboratory Replicates

Test Pit/ Sample ID[a]	Sampling Date	Units	Metals								Total Recoverable Hydrocarbons						BTEX			
			Arsenic	Cadmium	Chromium (VI)[b]	Copper	Lead	Mercury	Nickel	Zinc	TRH C_6-C_{10}	TRH >C_{10}-C_{16}	F1	F2	F3	F4	Benzene	Toluene	Ethylbenzene	Total xylenes
			4	0.4	1	1	1	0.1	1	1	25	50	25	50	100	100	0.2	0.5	1	3
BD02/23.1.17	23/01/2017	mg/kg	8	<0.4	26	12	21	<0.1	8	26	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<3
TP5	23/01/2017	mg/kg	7	<0.4	28	12	19	<0.1	7	26	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<3
Difference			1	0	2	0	2	0	1	0	0	0	0	0	0	0	0	0	0	0
RPD			13%	0	7%	0%	10%	0	13%	0%	0	0	0	0	0	0	0	0	0	0

Q2.6 Trip (Field) Blank

The purpose of a trip blank is to assess the potential for transfer of contaminants into samples to have occurred between the time of collection and analysis of the sample by the laboratory. Laboratory prepared soil field blanks were taken out to the field unopened, subjected to the same preservation methods as the field samples, then analysed for the purposes of determining whether transfer of contaminants into the blank sample had occurred prior to reaching the laboratory. The results of the laboratory analysis for the field blanks are shown in Table H2.

Table H2: Trip Blank Results - Soils (mg/kg)

Sample ID	BTEX					TRH
	Benzene	Toluene	Ethylbenzene	m+p-xylene	o-Xylene	TRH C6-C9
Trip Blank	<0.2	<0.5	<1	<2	<1	<25

The concentrations of the analytes were all below laboratory detection limits indicating that significant cross contamination had not occurred during the course of the round trip from the site to the laboratory.

Q2.7 Trip Spike

The purpose of a trip spike is to assess the potential for loss of volatile analytes to have occurred between the time of collection and analysis of the sample by the laboratory.

For soils, laboratory preparation of the trip spike involved putting 1mL of BTEX (using a 1500ppm BTEX trip spike standard) into two jars which were cross referenced and labelled ‘trip spike’ and ‘control’. Both jars were sealed. The trip spike was taken onto site and subject to the same jar storage and transfer as the field samples. The control was stored by the laboratory in the refrigerator. Following receipt of the trip spike, the laboratory analysed both the trip spike and corresponding control with results of the trip spike being expressed as the % difference from the control sample.

The general acceptance limit for trip spikes is 60-140% in difference compared to the control or standard.

The results of the laboratory analysis for the trip spikes are shown in Table H3

Table H3: Trip Spike Results – Soils (% Recovery)

Ssample ID	BTEX				
	Benzene	Toluene	Ethylbenzene	m+p-xylene	o-Xylene
Trip Spke	85%	83%	85%	86%	85%

Results indicate that the percentage loss for BTEX during the trip was minimal and therefore appropriate preservation techniques were employed.

Q3. LABORATORY QUALITY ASSURANCE AND QUALITY CONTROL

Q3.1 Chain-of-Custody

Chain-of-custody procedures are discussed in Section Q2.4.

Q3.2 Analytical Laboratories

Samples were submitted to the following laboratory for analysis:

- Envirolab Services Pty Ltd (Envirolab)

The laboratory is NATA accredited for the analysis undertaken. Envirolab's accreditation number is 2901 and it is accredited for compliance with ISO/IEC 17025.

Q3.3 Holding Times

A review of the laboratory certificates of analysis and chain-of-custody documentation indicated that holding times were met.

Q3.4 Analytical Methods

The laboratory analytical methods are provided on the laboratory certificates of analysis in Appendix G, along with the PQL/LOR.

Q3.5 Laboratory Replicate Results

Laboratory replicates are additional portions of a sample which are analysed in the same manner as the other samples. Laboratory replicate samples were generally analysed at a rate of 1 for every 10 samples in a batch. The laboratory acceptance criteria for replicate samples is as follows:

Table H4: Laboratory Replicate Acceptance Criteria

Laboratory	PQL / LOR Range	Acceptance Criteria
Envirolab	<5 x PQL	Any RPD
	>5 x PQL	0 – 50%

The laboratory QC for laboratory replicate results, were generally within the acceptance criteria. Any non-conformities with the acceptance criteria are discussed in Section Q3.10

Q3.6 Laboratory Blank (Reagent Blank) Results

The laboratory blank, sometimes referred to as the method blank or reagent blank is the sample prepared and analysed at the beginning of every analytical run, following calibration of the analytical apparatus. This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, it can be determined by processing solvents and reagents in the same manner as for samples. Laboratory blanks are generally analysed at a frequency of 1 in 20, with a minimum of one per batch.

All results should be less than the method PQL or LOR. The report results for the method blanks were generally within the acceptance criteria. Any non-conformities with the acceptance criteria are discussed in Section Q3.10.

Q3.7 Matrix Spike

The matrix spike is a sample replicate prepared by adding a known amount of analyte prior to analysis, and then treated exactly the same as all other samples. The recovery result indicates the proportion of the known concentration of the analyte that is detected during analysis. The laboratory acceptance criteria for matrix spike recoveries is as follows:

Table H5: Laboratory Matrix Spike Acceptance Criteria

Laboratory	Analyte(s)	Accepted Recoveries
ENVIROLAB	Inorganics / metals	70 – 130%
	organics	60 – 140%
	SVOC and speciated phenols	10 – 140%

The laboratory QC for matrix spikes were generally within the acceptance criteria. Any non-conformities with the acceptance criteria are discussed in Section Q3.10.

Q3.8 Surrogate Spike

The surrogate spike sample is prepared by adding a known amount of surrogate, which behaves similarly to the analyte, prior to analysis of each sample. The recovery result indicates the proportion of the known concentration of the surrogate that is detected during analysis. The laboratory acceptance criteria for surrogate spike recoveries is as follows:

Table H6: Laboratory Surrogate Spike Acceptance Criteria

Laboratory	Analyte(s)	Accepted Recoveries
ELS	Inorganics / metals	70 – 130%
	organics	60 – 140%
	SVOC and speciated phenols	10 – 140%

The laboratory QC for surrogate spikes were generally within the acceptance. Any non-conformities with the acceptance criteria are discussed in Section Q3.10.

Q3.9 Reference / Laboratory Control Sample (LCS)

This sample comprises spiking either a standard reference material or a control matrix (such as a blank of sand or water) with a known concentration of specific analytes. The LCS is then analysed and results compared against each other to determine how the laboratory has performed with regard to sample preparation and analytical procedure. LCSs are generally analysed at a frequency of 1 in 20, with a minimum of one analysed per batch.

The laboratory acceptance criteria for LCS recoveries is as follows:

Table H7: Laboratory LCS Acceptance Criteria

Laboratory	Analyte(s)	Accepted Recoveries
ENVIROLAB	Inorganics / metals	70 – 130%
	organics	60 – 140%
	SVOC and speciated phenols	10 – 140%

The laboratory QC for LCSs were generally within the acceptance criteria. Any non-conformities with the acceptance criteria are discussed in Section Q3.10.

Q3.10 Laboratory Comments

The laboratory QC for laboratory replicate results, reagent blanks, matrix spikes, surrogate spikes and LCS results are reported in the laboratory certificate of analysis.

The laboratory quality control samples were within the laboratory acceptance criteria. It is considered that an acceptable level of laboratory precision and accuracy was achieved and that surrogate spikes, LCS, laboratory duplicate results, laboratory blanks and matrix spike results were of an acceptable level overall. On the basis of this assessment, the laboratory data set is considered to have complied with the DQIs.

Q4. QA/QC DATA EVALUATION

An evaluation of field and laboratory QA/QC information against the stated DQOs has been undertaken. Overall, the SOPs were generally complied with in the field, and the laboratory quality control samples were generally within the laboratory acceptance criteria. The QC non-conformances, where they occurred, are not considered to have significantly impacted the quality of the results overall as they were generally minor in number compared to the overall QC data. On this basis, it is considered that an acceptable level of laboratory precision and consistency was achieved and that the laboratory data sets are reliable and useable for this assessment.