Douglas Partners
Geotechnics / Environment / Groundwater

Integrated Practical Solutions

Sampling, Analysis and Quality Plan
Supplementary Contamination Assessment

Proposed School
Lot 100 DP1261496, Maitland Street, Muswellbrook
NSW

Prepared for
Pacific Brook Christian School Ltd

Project 91601.03
July 2024

Douglas Partners
Geotechnics / Environment / Groundwater

Document History

Document details

Project No.	91601.03	Document No.	R.001.Rev7
Document title	Report on Sampling, Analysis and Quality Plan Supplementary Contamination Assessment, Proposed School		
Site address	Lot 100 DP1261496, Maitland Street, Muswellbrook NSW		
Report prepared for	Pacific Brook Christian School Ltd		
File name	91601.03.R.001.Rev7. SAQP.docx		

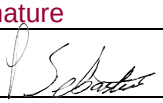
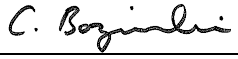
Document status and review

Status	Prepared by	Reviewed by	Date issued
Revision 0	Chris Bozinovski	Matthew Blackert	26 March 2020
Revision 1	Chris Bozinovski	Matthew Blackert	25 August 2020
Revision 2	Paulo Sebastian	Matthew Blackert	13 July 2021
Revision 3	Paulo Sebastian	Chris Bozinovski	23 September 2021
Revision 4	Paulo Sebastian	Chris Bozinovski	24 May 2024
Revision 5	Paulo Sebastian	Chris Bozinovski	11 June 2024
Revision 6	Paulo Sebastian	Chris Bozinovski	25 June 2024
Revision 7	Paulo Sebastian	Chris Bozinovski	23 July 2024

Distribution of copies

Status	Electronic	Paper	Issued to
Revision 0	1	0	Mark Smith, Pacific Brook Christian School Ltd
Revision 1	1	0	Mark Smith, Pacific Brook Christian School Ltd
Revision 2	1	0	Mark Smith, Pacific Brook Christian School Ltd
Revision 3	1	0	Mark Smith, Pacific Brook Christian School Ltd
Revision 4	1	0	Mark Smith, Pacific Brook Christian School Ltd
Revision 5	1	0	Mark Smith, Pacific Brook Christian School Ltd
Revision 6	1	0	Mark Smith, Pacific Brook Christian School Ltd
Revision 7	1	0	Mark Smith, Pacific Brook Christian School Ltd

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

	Signature	Date
Author		23 July 2024
Reviewer		23 July 2024

bsi. ISO 9001 Quality Management
FS 604853

Douglas Partners Pty Ltd
ABN 75 053 980 117
www.douglaspartners.com.au
15 Callistemon Close
Warabrook NSW 2304
PO Box 324
Hunter Region Mail Centre NSW 2310
Phone (02) 4960 9600

Douglas Partners
Geotechnics / Environment / Groundwater

Table of Contents

Sampling, Analysis and Quality Plan
Supplementary Contamination Assessment, Proposed School
Lot 100 DP1261496, Maitland Street, Muswellbrook NSW

1. Introduction

Douglas Partners Pty Ltd (DP) has prepared this Sampling and Analysis Quality Plan (SAQP) for a proposed Supplementary Contamination Assessment to be carried out at Lot 100 DP1261496, Maitland Street, Muswellbrook, New South Wales (hereon in, referred to as the 'site'). The report was commissioned by Mark Smith of Pacific Brook Christian School Ltd, and was undertaken with reference to DP proposal NCL1200113 dated 25 February 2020.

The objective of this SAQP was to identify existing data gaps in relation to site contamination issues and to confirm site remediation requirements for the proposed school development.

The SAQP has been prepared with reference to the NSW EPA 'Guidelines for Consultants Reporting on Contaminated Sites' (EPA, 2011) and National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013 (NEPC, 2013).

2. Site Description

The site is triangular in shape, with a northwest/southeast alignment and has an area of 2.432 ha. The site is bound by Muswellbrook Golf Course along the north eastern boundary, Maitland Street along the south western boundary and residential properties to the south eastern boundary (see below – Aerial image of site boundary). The site address is 72-74 Maitland Street and is legally described as Lot 100 in Deposited Plan (DP) 1261496 (see below – Site Context).

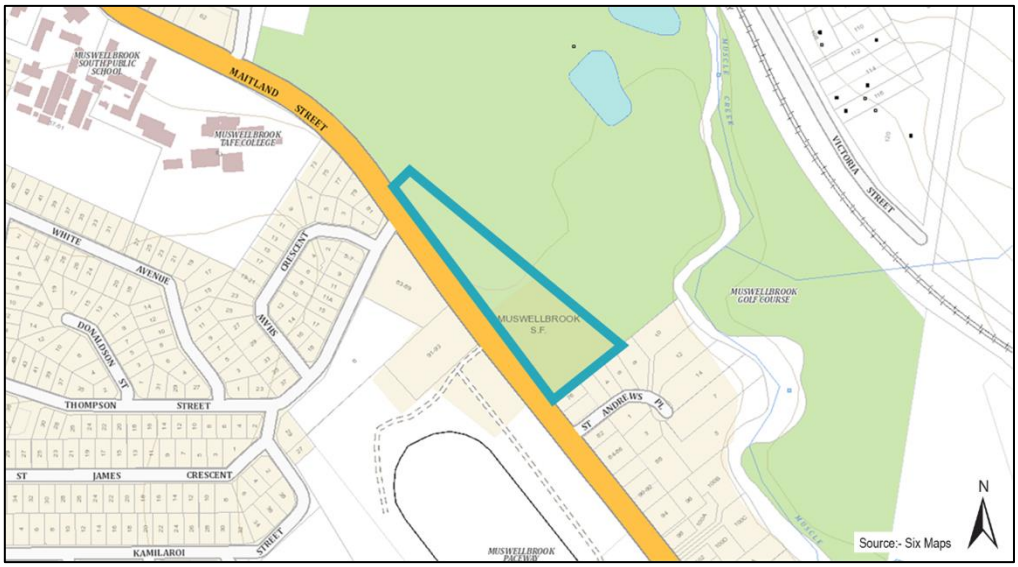
The site is generally level with a slight slope to a watercourse at the north west boundary. This watercourse flows northeast into the adjoining golf course and on to Muscle Creek via a series of dams on the golf course. Muscle Creek flows west into the Hunter River which at its closest is 1.3 km north-west of the site. Stormwater management on site is by overland flow.

72-74 Maitland Street was previously used for forestry plantation purposes and is mapped as Muswellbrook State Forest. The site is no longer used for this purpose and currently sits as an empty and underutilised site.

The main vehicular access to the site is from Maitland Street, as well as pedestrian access. Existing vehicular parking on site includes open air at grade parking spaces facing Maitland Street.

In terms of travel, Muswellbrook is approximately three (3) hours from Sydney, three hours (3) from Dubbo, two (2) hours from Tamworth and 90 minutes from Newcastle.

Aerial Image of Site Boundary



Site Context

At the time of the July 2019 investigation the site was vacant and generally comprised several empty buildings in connection with the previous site use (plant nursery), gravel and asphalt paths, gravel garden beds and grass covering.

The site is bound by Maitland Street to the south west, residential developments immediately to the south east with a service station located further to the south east (approximately 60 m), and a golf course to the west and north.

The site is zoned R1 General Residential and is within Muswellbrook Shire Council.

Refer to Drawing 1, Appendix A, for site features.

3. Proposed Development

The proposed development is for the establishment of a new K-12 school (Pacific Brook Christian School) on the subject site. The proposed development will comprise site preparation and remediation, tree removal, construction of new school buildings, covered outdoor learning area, covered walkways, car parking, landscaping and associated works. The school will accommodate 140 students and 16 staff.

4. Background / Previous Investigations

4.1 Preliminary Contamination Assessment

A preliminary contamination assessment (PCA) was undertaken by JK Environments (JK) in April 2019 (JK, 2019) and comprised a site history review, drilling of 20 boreholes, sampling and laboratory testing. The results of the investigation identified the following:

- Fill materials were identified in all bores from 0.1 m to 0.8 m depth which comprised a mixture of clayey silt, sandy gravel and gravel materials;
- Natural materials were encountered in all bores beneath the filling and typically comprised silty clay materials;
- Groundwater was not encountered during the previous investigation however minor seepage was encountered in the southern portion of the site at a depth of 0.8 m which may have been attributed to site infrastructure (ie site irrigation) as opposed to natural groundwater;
- It was noted that no odours or staining were observed in the filling or natural materials during the investigation;
- Results of laboratory testing indicated minor exceedances of PAHs and hydrocarbons above human health and ecological criteria in regard to the proposed landuse.

JK indicated that the environmental / ecological risks associated with the identified hydrocarbon concentrations were negligible.

JK concluded that “the site can be made suitable for the proposed primary school or secondary school development subject to further investigation, risk assessment, and (if required) remediation / validation”.

The PCA (JK, 2019) also outlined the following data gaps:

- The sampling density was approximately 57% of the minimum sampling density recommended for hotspot identification, as outlined in the NSW EPA Sampling Design Guidelines (EPA, 1995) for a site area of approximately 25 000 m^2. A minimum of 15 additional sampling locations would be required to meet the guidelines for a Stage 2 detailed site investigation (DSI). JK recommended that further investigation is undertaken from test pits to provide a better visual assessment of the soil;

- Groundwater sampling was outside the scope of the preliminary assessment. The potential for on-site activities to have resulted in significant groundwater contamination is considered to be relatively low (based on the site observations and soil analysis results). However, an investigation will be required to assess the potential for contamination impacts associated with the service station to the south-east of the site;
- Chemical storage within the Hazchem sheds has the potential to leach through concrete slabs through historical leaks or spills. Additional sampling would be required around the edges of building slabs and within the building footprint to better characterise these areas; and
- The potential presence of hazardous building materials within the existing buildings.

4.2 Detailed Site Investigation (Contamination)

The DSI conducted by DP in July 2019 (DP 2019a) identified the following:

- Presence of shallow filling within the majority of test pits / bores;
- Presence of ash within the upper fill materials in Pits 103, 107 and 111;
- Presence of asphalt lenses in Pit 106 exceeding landuse criteria;
- Fill materials generally met the criteria for classification as 'General Solid Waste' (GSW) based on total concentrations with reference to NSW EPA (2014). It is noted leachability testing was not conducted on the samples that exceeded GSW to confirm waste classification. Experience with similar materials indicate such contaminants generally have a low propensity to leach. Therefore, classification as GSW is considered likely, however should be confirmed with additional testing (refer to Section 9);
- Elevated PAH associated with asphalt lenses within the upper fill materials of the gravel path (Pit 106). This may be associated with a former asphalt seal layer within the path;
- Testing of localised fibro fragments encountered onsite and their immediately surrounding soils indicated the absence of asbestos containing materials (ACM);
- General absence of impacts from the nearby petrol station to groundwater quality along the south-east site boundary.

In summary, development of the site will require localised remediation of PAH impacted soils associated with the asphalt lenses within the gravel path. The extent of impact has also not been confirmed, however, it is likely to be associated with the gravel path within the site.

The site is considered to be suitable for the proposed development, subject to localised remediation of contamination and regulatory approvals.

4.3 Preliminary Auditor Advice

The following data-gaps were identified by the Auditor in an email dated 23 January 2020 (Ramboll, 2020) following a brief inspection on 9 January 2020:

1. Existing site buildings:
    - Potential for soil contamination by lead, asbestos and organochlorine pesticides (OCPs) around the current buildings due to the weathering of lead paint and asbestos containing material (ACM) used in building construction and spraying of pesticides;
    - Most buildings were in a dilapidated state with peeling paint and fragments of fibre board visible on the ground around the buildings;
        - The hazardous material assessment report (DP, 2019b) identified lead paint and ACM in buildings 1, 5, 6, 8 and 9, hence assessment of the potential contamination of near surface soils around these buildings for lead and asbestos is required (refer to Appendix B plans for building IDs);
        - The surface soils around all buildings should be assessed for OCPs.
2. Various soil stockpiles and earth mounds across the site:
    - These stockpiles should be assessed for potential contamination (including ACM) to confirm suitability to remain on site or waste classification purposes for disposal.
3. Elevated PAH concentrations:
    - Determine the source of the elevated PAH concentrations reported in shallow soils in eastern portion of site (TP106) during previous investigation;
    - Delineate the extent of the contamination;
    - Assess remediation requirements for the intended landuse.
4. Soils beneath building footprints and underground concrete tanks (if removed):
    - Assessment of soil contamination following demolition of structures/concrete tank;
    - This could be completed as a visual assessment with targeted soil sampling if observations indicate any potential sources of contamination.

The Auditor recommended that an environmental consultant review the works to date and develop a sampling and analysis plan for additional investigations to address data gaps and determine the extent of remediation (if any) required.

In summary, the Auditor recommended additional investigations as follows:

- Additional testing for lead, asbestos and organochlorine pesticides (OCPs) around the current buildings;
- Additional testing of various soil stockpiles and earth mounds across the site;
- Additional testing to delineate PAH impacts and remediation requirements (if any);
- Assessment of soils beneath building footprints and underground concrete tanks (following demolition).

5. Site Condition

Site conditions observed during the site walkover on 1 July 2019 (DP, 2019a) are summarised below:

- The site was vacant and contained several site structures as follows:
  - A residential property in the central northern portion of the site (Figure 1);
  - Administration buildings in the south central portion of the site;
  - A glasshouse in the south eastern portion of the site (Figure 2);
  - Two Hazchem sheds in the south eastern portion of the site (Figures 3); and
  - Several awning and shed structures and a large water tank were also located across the site (Figures 3 and 4).

The south eastern portion of the site was fenced and housed the majority of the buildings which were made of weatherboard cladding or metal sheeting along with metal sheet roofing. The south eastern areas also comprised several mature trees along and adjacent to the site boundaries and internal gravel paths and gravel areas covered in weed matting presumably used as display beds when the previous nursery was in operation. The undeveloped areas in the south eastern portion were grassed (Figure 5).

The north western portion of the site was unfenced and appeared to be undeveloped comprising abundant mature trees and vegetative ground cover (Figure 6).

At the time of the inspection the majority of the accessible buildings (sheds, Hazchem and glasshouse) were mostly vacant. The two Hazchem buildings contained remnants of previous chemical storage (ie containers of pesticides etc) (Figure 7).

The concrete flooring and concrete surrounds within the Hazchem buildings did not comprise gross staining or evidence of chemicals leaking from the buildings.

Fibrous cement fragments were also encountered in south eastern portion of the site adjacent to the northern boundary (Figure 8).

Figure 1: Residential building in the central portion of the site, looking south east

Figure 2: Glasshouse in the south eastern portion of the site, looking north

Figure 3: Hazchem buildings in the background and on the right and awning / shed on the left, looking south east

Figure 4: Large water tank on the right and gravel beds lined with weed matting on left, looking south west

Figure 5: Grassed covered areas, internal gravel paths and gravel / weed matting areas, looking north west

Figure 6: Dense grass covered area with abundant mature trees in the undeveloped north western portion of the site, looking south

Figure 7: Stored chemical containers within the Hazchem building

Figure 8: Fibrous cement fragments encountered adjacent to the northern boundary in the south eastern portion of the site, looking north

6. Geology and Hydrogeology

Reference to the 1:250,000 Geology geodatabase indicates that the majority of the site is underlain by Quaternary alluvium deposits which typically comprise gravel, sand, silt and clay and the south western portion is underlain by the Branxton Formation typically comprising conglomerate, sandstone, siltstone.

The regional groundwater flow regime is believed to the north and north west towards Muscle Creek (located approximately 100 m north east of the site) and is considered to be the nearest sensitive receptor. The depth to groundwater within the site was between 5.9 m to 6.5 m in DP (2019a). It should be noted that groundwater levels are affected by climatic conditions and soil permeability and will therefore vary with time.

Reference to the Acid Sulphate Soil Risk Map, prepared by the Department of Land and Water Conservation (DLWC) indicates the site is not mapped within an area known to comprise acid sulfate soils.

7. Potential Contamination

Based on the results of previous investigations and the additional information above, the principal sources of potential contamination within the site are considered to be:

- General fill materials and localised stockpiles/mounds across the site containing various potential contaminants subject to the source of fill (ie TRH, BTEX, metals, PAH, pesticides, PCB);
- Potential impacts from historic and proposed demolition works (hazardous building materials (HBM) including asbestos, lead, PCB);
- Perimeter of existing buildings, weathering/dilapidation of buildings containing hazardous building materials including asbestos and possible use of pesticides (asbestos, lead, pesticides);
- Potential spills and leaks, from storage/use of chemicals in some buildings (ie Hazchem buildings);

- Elevated PAH concentrations reported in shallow soils in eastern portion of site (TP106);
- Potential impacts from adjacent land use (ie petrol station).

It is noted that Per and Poly-Fluoroalkyl Substances (PFAS) are a group or chemicals that are manufactured for their unique properties. There are numerous PFASs that may be present in the environment. Perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA) are two major PFASs, that were originally found as components in products used to provide stain resistance or as firefighting foams. Some PFASs have been recognised as highly persistent, potentially bio-accumulative and toxic, and have been detected in the environment, wildlife, people and food.

The following has been considered to assess the potential for PFAS to be present on-site:

- Is there evidence of fire training occurring at the site – No;
- Is there evidence of fire training occurring, or the presence of a potential source of impact (ie an airport or fire station) up-gradient of, or adjacent to, the site – No;
- Is there evidence or fuel fires having occurred on site – No;
- Is there evidence to suggest PFAS being stored, or used, for manufacturing on site – No.

On this basis, PFAS are not considered to be chemical of concern for the subject site.

8. Conceptual Site Model

A Conceptual Site Model (CSM) has been prepared for the site with reference to NEPC (2013) Schedule B2. The CSM identifies potential contaminant sources and contaminants of concern, contaminant release mechanisms, exposure pathways and potential receptors. The CSM is presented in Table 1 below.

Table 1: Conceptual Site Model

Known and Potential Primary Sources	Primary Release Mechanism	Secondary Release Mechanism	Potential Impacted Media	Contaminants of Concern	Exposure Pathway	Potential Receptors	
						Current	Future
Filling observed within the site & opportunistic dumping	Placement/ storage of filling on-site or opportunistic dumping	Long-term leaching of contaminants via runoff, rain water infiltration / percolation	Soil, groundwater, surface water	TRH, BTEX, PAH, Metals, Pesticides, PCB, Asbestos	Dermal contact, inhalation (dust/vapours), ingestion	Site workers, maintenance workers, consultants, trespassers, surface water bodies, groundwater, neighbouring properties.	Students, site workers, members public, maintenance workers, construction workers, consultants, trespassers, surface water bodies, neighbouring properties, groundwater
Asphalt lens (possibly associated with gravel path)	Placement on-site (possible path)	Long-term leaching of contaminants via runoff, rain water infiltration / percolation	Soil, groundwater, surface water	TRH, Phenol, PAH,	Dermal contact, inhalation (dust/vapours), ingestion		
Hazchem buildings	Spills and leaks, from storage/use of fuels, oils, paints, pesticides etc.	Long-term leaching of contaminants via runoff, rain water infiltration / percolation, through soil or cracks/joints in concrete	Soil, groundwater, surface water	TRH, BTEX, PAH, Metals, Pesticides, PCB,	Dermal contact, inhalation (dust/vapours), ingestion		
Former structures	Demolition of former structures	Long-term leaching of contaminants via runoff, rain water infiltration / percolation or disturbance via traffic/excavation	Soil, groundwater, surface water	Asbestos, PCB, Metals	Dermal contact, inhalation (dust), ingestion		
Perimeter of existing buildings	Weathering/damage to buildings and possible pesticide use	Long-term leaching of contaminants via runoff, rain water infiltration / percolation	Soil, groundwater, surface water	Asbestos, Pesticides, Lead	Dermal contact, inhalation (dust), ingestion		
Adjacent Land Uses including petrol station	Activities on-site	Migration of contamination onto site via runoff or groundwater migration	Soil, groundwater, surface water	TRH, BTEX, PAH, Lead	Dermal contact, inhalation (dust), ingestion		

9. Proposed Sampling Strategy

9.1 Pre-demolition Assessment

The following sampling strategy is proposed for the supplementary investigation prior to demolition:

- **Existing Buildings:**
  - Visual inspection at the perimeter of all existing buildings (Buildings 1 to 10 – refer to Drawing 1 attached);
  - Collection of near surface soil samples using hand tools from the perimeter of each existing building (4 per building – one from each side);
  - Collection of potential ACM fragments where observed from the perimeter of existing buildings;
  - Analysis of all soil samples for OCP;
  - Analysis of soil samples for Lead and asbestos from buildings 1, 5, 6, 8 and 9;
  - Analysis of possible ACM fragments for asbestos identification.
- **Soil Stockpiles and Earth Mounds across the Site:**
  - Visual inspection and identification of soil stockpiles/mounds within the site;
  - Excavation of test pits within mounds to assist with visual inspection and soil sample collection;
  - Collection of representative soil samples from stockpiles;
  - Analysis of representative soil samples for TRH, BTEX, PAH, Phenol, metals, OCP, OPP, PCB, asbestos ID (minimum 1 per mound or 1/25m^3);
  - Analysis of possible ACM fragments for asbestos identification;
  - The number of samples collected and tested will be assessed during field work in order to characterise the materials present (ie will depend on the condition and variability of materials observed);
  - Leachability (TCLP) testing will be conducted on selected samples to confirm waste classification (ie materials exceeding landuse criteria).
- **Elevated PAH Concentrations:**
  - Excavation of test pits in the vicinity of TP106 and along the gravel path (ie potential source of PAH impact) to visibly assess the presence and possible extent of PAH impacts;
  - Collection of representative soil samples for PAH, TRH and Phenol analysis;
  - Review of Chromatographs and lab interpretation to assist with assessing the possible origin of PAH impacts;
  - TCLP testing on selected samples to confirm waste classification (where required);
  - Distilled water leachability (ASLP) testing if on-site management of PAH impacts are considered;

A brief report will be prepared presenting the results of supplementary contamination sampling and testing, with comments on requirements (if any) for remediation.

9.2 Post-Demolition Assessment

The following sampling strategy is proposed for the supplementary investigation following demolition of site buildings:

- **Soils beneath building footprints and underground concrete tanks (if removed):**
  - Visual inspection within the footprint of all existing buildings (Buildings 1 to 10 – refer to Drawing 1 attached);
  - Where there is evidence of potential contamination (ie staining, odours, anthropogenic inclusions) or filling not previous encountered on site, collection of near surface soil samples using hand tools;
  - Collection of potential ACM fragments where observed;
  - Analysis of selected soil samples for TRH, BTEX, PAH, Phenol, metals, OCP, OPP, PCB, asbestos ID;
  - Analysis of possible ACM fragments for asbestos identification.

A brief report will be prepared presenting the results of post-demolition inspections, sampling and testing, with comments on requirements (if any) for remediation.

9.3 Sampling and Analysis

9.3.1 Soil

Soil samples for contamination assessment will be collected at regular depth intervals and/or changes in strata based on field observations, including from the near surface, and upon possible signs of contamination such as odours or staining.

Soil samples from test pits will be collected from freshly exposed walls of the test pits. Near surface soil samples will be collected using stainless steel sampling equipment and/or new disposable gloves.

All soil sampling data will be recorded on DP chain of custody (C-O-C) sheets, with the general sampling procedure comprising:

- Decontamination of sampling equipment using a 3% solution of phosphate free detergent (Decon 90) and tap water prior to collecting each sample;
- The use of disposable gloves for each sampling event;
- Transfer of samples into laboratory-prepared glass jars, and capping immediately;
- Collection of 10% replicate samples for quality assurance (QA) / quality control (QC) purposes;
- Collection of replicate soil samples in zip-lock plastic bags at each depth for PID screening;
- Labelling of sample containers with individual and unique identification, including project number, sample location and sample depth;
- Placement of the sample jars and replicate sample bags into a cooled, insulated and sealed container for transport to the laboratory;

- Use of C-O-C documentation ensuring that sample tracking and custody could be cross-checked at any point in the transfer of samples from the field to the laboratory.

Results of the subsurface investigation will be provided on test pit logs for each test location. Logs supply information on subsurface conditions, stratigraphy, contamination indicators, results of in situ testing (ie PID testing), sample depths, approximate co-ordinates for test locations, the engineer / scientist who logged the subsurface profile, the site details and the details of machinery / equipment used to excavate test pits / drill the boreholes. Observations of potential contamination at the surface will also be included on the logs, if applicable.

At least one soil sample will be selected from each test location for chemical analysis. Additional samples may be selected where required to assist with site characterisation, based on the subsurface conditions encountered.

In the assessment of general soil/fill conditions, samples will be analysed for the following identified potential contaminants of concern (total concentrations) at a NATA accredited laboratory:

- Total Recoverable Hydrocarbons (TRH);
- Volatile Organic Compounds (including chlorinated hydrocarbons);
- Benzene, Toluene, Ethyl Benzene, Xylene (BTEX);
- Polycyclic Aromatic Hydrocarbons (PAH);
- Organochlorine Pesticides (OCP) and Organophosphorus Pesticides (OPP);
- Polychlorinated Biphenyls (PCBs);
- Heavy Metals, Arsenic (As), Cadmium (Cd), Chromium (Cr), Copper (Cu), Lead (Pb), Mercury (Hg), Nickel (Ni), Zinc (Zn), Manganese (Mn).

Analysis of asbestos in soils will also be undertaken for soil / fill samples identified as potentially containing asbestos (ie within former building footprints, and within fill materials containing building rubble or anthropogenic materials) that may be associated with ACM. Initial testing will be for asbestos identification on 40 g soil samples or direct testing on potential ACM.

The possible requirements for a detailed asbestos assessment (if any) will be confirmed following the supplementary assessment. A detailed asbestos assessment would include field sieving / assessment of 10 L bulk samples and laboratory analysis of minimum 500 mL subsamples for asbestos identification.

Following receipt of initial laboratory results (ie total concentrations), selected soil samples will be tested for acid leachability (TCLP) to confirm waste classification for possible off-site disposal to a licensed landfill (if required). The selection of samples for TCLP testing will be based on the results of laboratory testing of total concentrations, where samples with elevated total concentrations are targeted for additional analysis. Waste classification will be undertaken with reference to the NSW EPA Waste Classification Guidelines (EPA, 2014). Similarly, where elevated total contaminant concentrations are detected above landuse site assessment criteria (SAC), water leachability testing (ASLP), may be undertaken to assess leachability characteristics of the materials and suitability for onsite management.

The above suite of testing will be reviewed following field work and may be amended, subject to confirmation by the client.

Test locations and levels will be estimated from site features and the supplied survey plan.

Field sampling and laboratory analysis will be conducted in compliance with standard environmental protocols, including QA/QC testing of 10% replicate samples (intra-laboratory replicate samples), appropriate Chain of Custody procedures and in–house laboratory QA/QC testing.

The proposed test locations are shown on Drawing 1A in Appendix B. The location and number of stockpiles/mounds will be confirmed during the site inspection.

9.4 Data Quality Objectives

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

Step 1 - State the Problem

The proposed development involves the demolition of existing structures and construction of a new school facility. Previous investigations have identified potential sources of soil contamination associated with the sites history. The 'problem' to be addressed is that the extent and nature of potential contamination on site is not fully understood. The objective of the supplementary investigation is therefore to assess the nature and extent of contamination at the site and make recommendations for remediation (where required) to render the site suitable for the proposed redevelopment works. Where required, options for the management or disposal of excess soils from site redevelopment will also be provided.

DP's proposed project team includes a Principal, Project Manager (Senior Associate), field engineers / scientists and excavation subcontractor. The decision makers are the DP Principal and Project Manager (Senior Associate).

Step 2 - Identify the Decision

Based on the site history, it is considered that the contaminants of concern are various organic and inorganic compounds impacting on soil (refer to the CSM in Section 8). As such, the analysis will focus on those contaminants relevant to the identified media.

The analytical data for soil will be compared to relevant SAC including HIL, HSL, EIL and ESL for an educational facility as per Tables 1A and 1B in Schedule B1, NEPC (2013).

The suitability of the site for the proposed development will be based on a comparison of the analytical results for all contaminants of concern to the adopted SAC. If necessary, results will also be compared to the 95% UCL of the mean concentrations (relevant to soil contamination under certain circumstances).

The following specific decisions will be made, as appropriate:

- What is the conceptual site model (ie sources, receptors, migration pathways, exposure)?
- Do the existing fill materials and/or natural soils pose a potential risk to identified receptors?

- Does the existing groundwater beneath the site pose a potential risk to identified receptors?
- Does the existing soil gas/soil vapour beneath the site pose a potential risk (toxic, explosion or asphyxiation) to identified receptors?
- Is the data sufficient to make a decision regarding the abovementioned risks, the compatibility of the site for the proposed development or are additional investigations required?
- Are there any off-site migration issues that need to be considered?
- What are the waste management requirements for excess soils associated with the development?
- 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?

Step 3 - Identify the Inputs to the Decision

Inputs into the decisions are as follows:

- Collection and review of site history information including information regarding previous and current activities undertaken on the site and the surrounding areas;
- Review of previous investigations undertaken;
- Regional geology, topography, ASS risk mapping and hydrogeology;
- Soil samples will be collected at targeted locations and analysed for the relevant contaminants of concern;
- Screening for potential volatile organic compounds (ie soil vapour) will be conducted using a PID);
- The lithology of the site as described in the test pit logs and sample descriptions;
- If site conditions suggest additional contaminants of concern, e.g. if the condition of subsurface material encountered whilst drilling encounter particular odours, further analysis may be undertaken;
- Field and laboratory QA/QC data to assess the suitability of the environmental data for the assessment;
- All analysis undertaken at a NATA accredited laboratory; and
- The results will be compared with the SAC discussed below.

Step 4 - Define the Boundary of the Assessment

The study boundary is as shown on Drawing 1, Appendix B and described in Section 2 above.

Step 5 - Develop a Decision Rule

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

- Laboratory test results for fill/soil will be assessed individually or statistically, if considered appropriate, to determine the 95% UCL of the mean concentration for each analyte or analyte group (of like materials);

- Laboratory test results for targeted locations (and identified 'hot spots') will be assessed individually;
- The adopted SAC will be from NSW EPA endorsed guidelines;
- Where such criteria are not available, other recognised national or international standards will be used;
- The contaminant concentrations in fill / soil should meet the following criteria, or further investigation or remedial action is required if:
    - The concentration of the contaminant is more than 2.5 times the SAC. Any location more than 2.5 times the adopted site criteria is classified as a 'hotspot', requiring further assessment / management; and
    - The calculated 95% UCL for a relevant area and discrete impacted fill/soil stratum (excluding any 'hotspot' concentrations) exceeds the adopted SAC;
    - The standard deviation of the results is greater than 50% of the SAC;
- Further investigation, remediation and/or management will be recommended if the site is found to be contaminated or containing contamination 'hot spots';

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

Table 2: Data Quality Indicators

DQO	Frequency	Data Acceptance Criteria
Completeness		
Field documentation correct	All samples	All samples
Soil bore logs complete and correct	All samples	All samples
Suitably qualified and experience sampler	All samples	All samples
Appropriate lab methods and limits of reporting (LORs)	All samples	All samples
Chain of custodies (COCs) completed appropriately	All samples	All samples
Sample holding times complied with	All samples	All samples
Proposed/critical locations sampled	-	Proposed/critical locations sampled
Comparability		
Consistent standard operating procedures for collection of each sample. Samples should be collected, preserved and handled in a consistent manner	All samples	All samples
Experienced sampler	All samples	All samples
Consistent analytical methods, laboratories and units	All samples	All samples
Representativeness		
Sampling appropriate for media and analytes (appropriate collection, handling and storage)	All samples	All Samples
Samples homogenous	All samples	All Samples
Samples extracted and analysed within recommended holding times	All samples	-
Precision		
Blind duplicates (intra-laboratory duplicates)	1 per 20 samples	30% RPD, then review RPDs >30% would be reviewed in relation to heterogeneity of sample and LOR
Laboratory duplicates	1 per 20 samples	<20% RPD Result > 20 × LOR <50% RPD Result 10-20 × LOR No Limit when RPD Result <10 × LOR
Accuracy		
Surrogate spikes	All organic samples	50-150%
Matrix spikes	1 per 20 samples	70-130% (inorganics) 60-140% (organics)
Laboratory control samples	1 per 20 samples	70-130% (inorganics) 60-140% (organics)
Method blanks	1 per 20 samples	<LOR

Step 6 - Specify Acceptable Limits on Decision Errors

Considering the future site use / development, decision errors for the respective contaminants of concern for fill / soil are:

1. Deciding that the sites fill / soil exceeds the SAC when they truly do not; and
2. Deciding that the sites fill / soils are within the SAC when they are truly not.

Decision errors for the proposed assessment will be minimised and measured by the following:

- Compare new data with available previous investigations to determine the possible range of the parameters of interest;
- The sampling regime will target key strata identified to account for site variability;
- Sample collection and handling techniques will be with reference to DPs Field Procedures Manual;
- Samples will be 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 the previous investigations. The potential for contaminants other than those proposed to be analysed is currently considered to be low;
- The SAC will be adopted from established and EPA endorsed guidelines where available. The SAC have risk probabilities already incorporated;
- Only NATA accredited laboratories using NATA endorsed methods will be used to perform laboratory analysis. Where NATA endorsed methods are not used, the reasons will be stated. The effect of using non-NATA methods (if relevant) on the decision making process will be explained.

Step 7 - Optimise the Design for Obtaining Data

Sampling design and procedures that will be implemented to optimise data collection for achieving the DQOs included the following:

- Only NATA accredited laboratories using NATA endorsed methods are used to perform laboratory analysis whenever possible;
- Targeted soil sampling (within access constraints) will generally be used to provide supplementary information at the site;
- To optimise the selection of soil samples for chemical analysis, samples collected will be screened using a calibrated PID allowing for site assessment and sample selection. In addition, additional soil samples will be collected but kept ‘on hold’ pending details of initial analysis and will be analysed if further delineation is required;
- Adequately experienced environmental scientists / engineers will be chosen to conduct field work and sample analysis interpretation; and
- This SAQP has been prepared.

9.5 Quality Assurance/Quality Control

9.5.1 Field QA/QC

DP's QA/QC procedures will be adopted throughout the field sampling programme.

Regular collection of duplicate/replicate samples will be undertaken during field sampling. Accuracy and precision will be assessed through the analysis of 10% field duplicate / replicate samples.

Appropriate procedures will be undertaken to minimise the potential for cross contamination. Field QA/QC procedures will include the following:

- Standard operating procedures are followed;
- Site safety and environmental plans are developed prior to commencement of works;
- Duplicate or replicate field samples are collected and analysed;
- Samples are stored under secure, temperature controlled conditions;
- Chain of custody documentation is employed for the handling, transport and delivery of samples to the selected laboratory.

9.5.2 Laboratory QA/QC

The NATA accredited chemical laboratory will undertake in-house QA/QC procedures, generally involving the routine testing of:

- Reagent blanks;
- Spike recovery analysis;
- Laboratory duplicate analysis;
- Analysis of control standards;
- Calibration standards and blanks;
- Statistical analysis of QC data.

10. Assessment of Contamination – SAC

It is understood that the proposed development at Lot 100 Maitland Street, Muswellbrook will comprise a primary and/or secondary school facility.

The Site Assessment Criteria (SAC) adopted in the supplementary assessment will be commensurate with that in the DP (2019a) DSI for a generic low density residential landuse which also applies to primary schools.

11. Reporting

The results of the investigation will be assessed with reference to NSW EPA endorsed guidelines. This will include assessment of field and laboratory results to determine the presence of unacceptable risks from contamination being present, or potentially being present at the site. Laboratory results will be assessed individually, and/or statistically where appropriate.

The results will be reported with reference to the NSW EPA (2011) Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites and Guidelines for the NSW Site Auditor Scheme (EPA 2017), and will incorporate the following:

- Details of the investigations undertaken;
- Comments on the presence of potential contamination at the site based on site history, previous site investigations and site conditions;
- Results of subsurface investigations and laboratory testing;
- Comments on the suitability of the site for the proposed future landuse;
- Comments on requirements for further investigation and remediation.

It is noted that the pre-demolition (ie supplementary) assessment was conducted by Douglas in May 2020 (Report 91601.03.R.002.Rev0).

12. References

DP (2019a), *Detailed Site Investigation (Contamination), Lot 100 Maitland Street, Muswellbrook, NSW*, Douglas Partners Pty Ltd, Report 91601.00.R.001.Rev6.

DP (2019b), Hazardous Building Materials (HBM) Survey, Lot 100 Maitland Street, Muswellbrook, NSW, Douglas Partners Pty Ltd, Report 91601.01.R.001.Rev0.

JK (2019), *Preliminary Contamination Assessment, Lot 62, Maitland Street, Muswellbrook, NSW*, J K Environments.

NEPC (2013), *National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013*, National Environment Protection Council.

NSW EPA (2011), *Guidelines for Consultants Reporting on Contaminated Sites*, NSW Environment Protection Authority.

NSW EPA (2014), *Waste Classification Guidelines, Part 1: Classifying Waste*, NSW Environment Protection Authority.

13. Limitations

Douglas Partners Pty Ltd (DP) has prepared this report for this project at Lot 100 Maitland Street, Muswellbrook with reference to DP's proposal NCL200113 dated 25 February 2020 and acceptance received from Pacific Brook Christian School Ltd dated 12 March 2020. The work was carried out under an agreed Professional Services Contract Agreement. This report is provided for the exclusive use of Pacific Brook Christian School 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 the previous investigations are 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 parts of the site being inaccessible and not available for inspection/sampling (ie due to concrete pavements). 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.

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

Douglas Partners Pty Ltd

Appendix A

About This Report

About this Report

Douglas Partners

Introduction

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

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

Copyright

Borehole and Test Pit Logs

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

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

Groundwater

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

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

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

Reports

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

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

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

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

About this Report

Site Anomalies

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

Information for Contractual Purposes

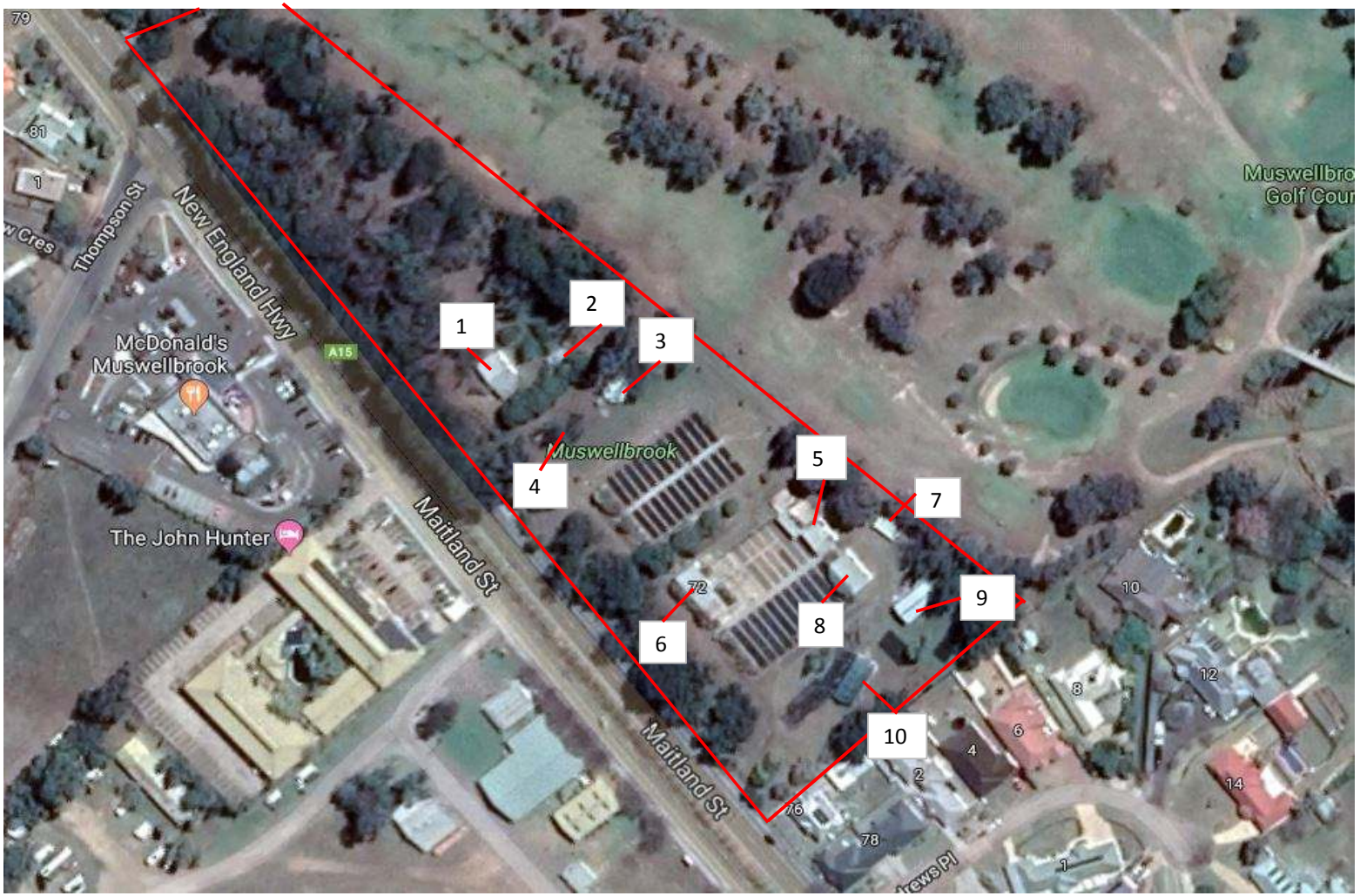
Where information obtained from this report is provided for tendering purposes, it is recommended that all information, including the written report and discussion, be made available. In circumstances where the discussion or comments section is not relevant to the contractual situation, it may be appropriate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

Site Inspection

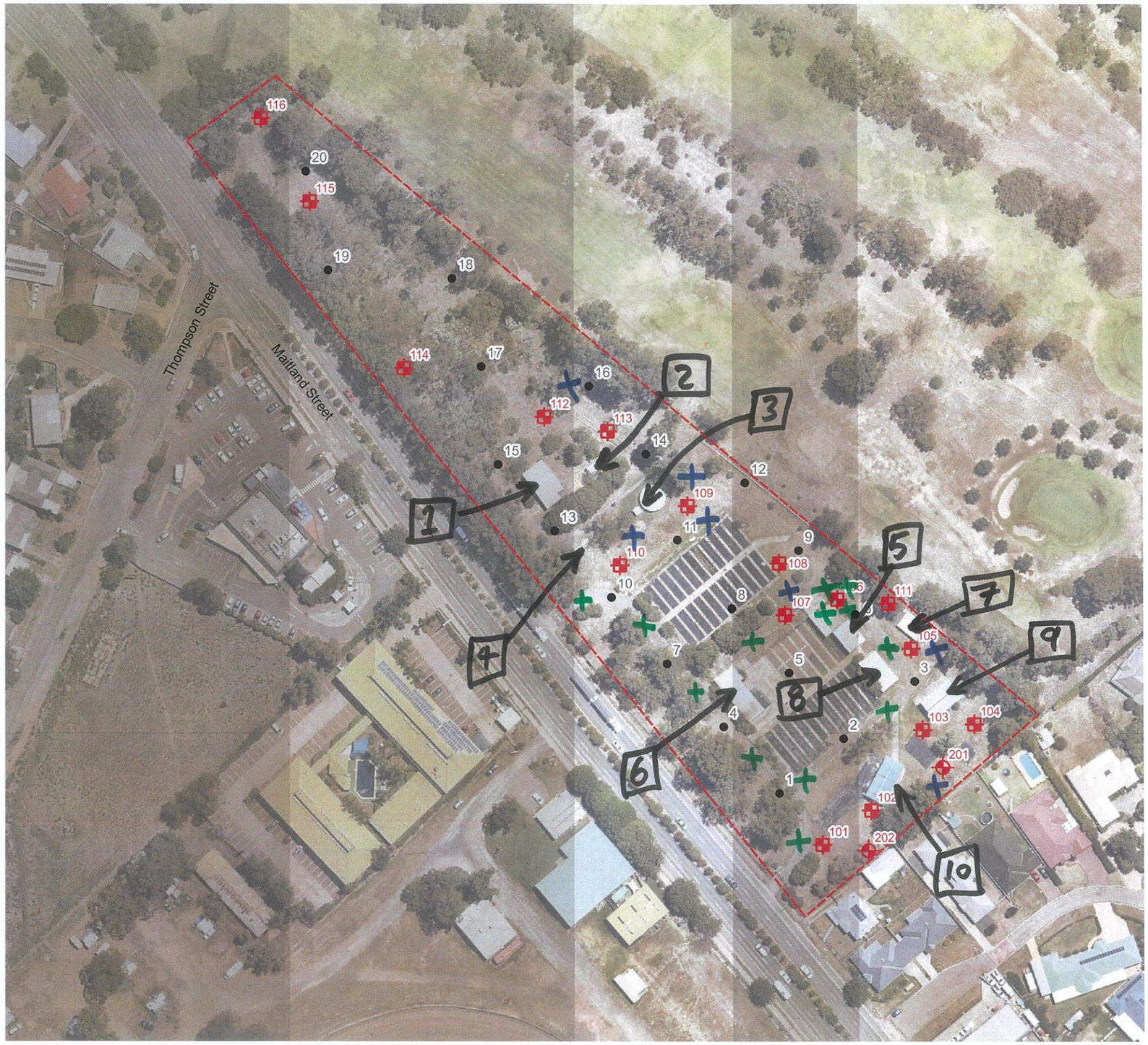
The company will always be pleased to provide engineering inspection services for geotechnical and environmental aspects of work to which this report is related. This could range from a site visit to confirm that conditions exposed are as expected, to full time engineering presence on site.

Appendix B

Drawing 1 – 91601.01 (Building Numbers)
Drawing 1A – Proposed Test Location Plan
Test Pit Log 106 (from Report 91601.00)
LTS – Plan of Details and Levels over Lot 62 – Survey Plan



Douglas Partners Geotechnics / Environment / Groundwater	CLIENT: Pacific Brook Christian SchoolLtd	**Site Locations**	PROJECT No: 91601.01
	OFFICE: Sydney	**Lot 100 DP1261496, Maitland Street**	DWG No: 1
	DATE: 28 Jun 2019	**Muswellbrook NSW**	REVISION: 0



Site Location

SUPPLEMENTARY ASSESSMENT

- FILL MOUNDS (TBC)
- ~~TEST PITS~~ (PATH IMPACTS) (GRAVEL PATH)

1 EXISTING BUILDINGS (4 NEAR SURFACE SOIL SAMPLES FROM PERIMETER OF BUILDING)

Legend (DST – DP 2019a)

- Groundwater Location
- Test Pit Location
- Approximate Site Boundary
- Previous Borehole Locations (JKEnvironments)

Drawing adapted from Nearmap Image dated 13.1.2019.
Test locations are approximate only and were located using hand-held GPS.

0 10 20 30 40 m

Douglas Partners
Geotechnics | Environment | Groundwater

CLIENT:	Pacific Brook Christian School Ltd		
OFFICE:	Newcastle	DRAWN BY:	CB
SCALE:	1:1500 @ A3	DATE:	26-3-2020

TITLE: **Test Location Plan** – SUPPLEMENTARY ASSESSMENT

Lot 100 DP1261496, Maitland Street, Muswellbrook NSW

PROJECT No:	91601.00
DRAWING No:	1A
REVISION:	0

TEST PIT LOG

CLIENT: Pacific Brook Christian School Ltd
PROJECT: Detailed Site Investigation
LOCATION: Lot 100 DP 1261496, Maitland Street, Muswellbrook NSW

SURFACE LEVEL: --
EASTING: 301930
NORTHING: 6426981

PIT No: 106
PROJECT No: 91601.00
DATE: 1/7/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
		FILLING - Generally comprising brown gravelly silty sand filling with clay, dry		D	0.1	E	PID<1		
		From 0.25m to 0.28m asphalt lens		D	0.26	E	PID<1		
		From 0.35m to 0.37m asphalt lens							
	0.4	CLAYEY SILT - Medium to low plasticity pale grey and brown w<PL		D	0.5	E	PID<1		
	0.6	SILTY CLAY - Medium plasticity, dark brown, w>PL							
	1								1
	1.2	Pit discontinued at 1.2m, limit of investigtion		D	1.2	E	PID<1		
	2								2

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

RIG: 6.5 tonne excavator with 450mm bucket teeth

LOGGED: Sebastian

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

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

SAMPLING & IN SITU TESTING LEGEND

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

Douglas Partners
Geotechnics / Environment / Groundwater

MGA

TN

VERNON 18°

SHEET 2

SHEET 3

SHEET 4

SHEET 5

SHEET 6

264
DP 1030447

62
DP 1208238

308°17'50"
345.7

222°50'50"
88.95

163.57
143°29'40"

60.355
141°42'50"

111.24
140°01'50"

50°02'20"
110.685

DP 884020

DP 25827

SP 92214

ST. ANDREWS PLACE

MAITLAND STREET

THOMPSON STREET

1 5 6 8 9

LEGEND

BENCH MARK	▲
TELSTRA PILLAR	⊠ TP
COMMS PIT	COM
TELSTRA PIT	TEL
ELECTRIC LIGHT POLE	LP
ELECTRICITY BOX	EL
POWER POLE	PP
SERVICE PIT	PIT
PIT WITH CONCRETE LID	CLID
PIT WITH METAL LID	MLID
STREET SIGN	SIGN
INSPECTION PIT	IP
GRATED INLET PIT	GIP
KERB INLET PIT	KIP
SEWER MANHOLE	SMH
STOP VALVE	SV
HYDRANT	HYD
WATER METER	WM
WATER TAP	TAP
PUMP	PUMP
VEHICLE CROSSING	(VC)
PRAM CROSSING	(PC)
WINDOW	W
DOOR	D
HEAD/SILL	H/S
GAS (DBYD)	G
COMMUNICATION (DBYD)	C
WATER (DBYD)	W
STORMWATER (DBYD)	SW
SEWER (DBYD)	S
SEWER RISING MAIN (DBYD)	RM
ELECTRICITY (U'GROUND) (DBYD)	E

NOTES

1. THE BOUNDARIES HAVE NOT BEEN MARKED
2. ALL AREAS AND DIMENSIONS HAVE BEEN COMPILED FROM PLANS MADE AVAILABLE BY NSW LAND REGISTRY SERVICES AND ARE SUBJECT TO FINAL SURVEY
3. ORIGIN OF LEVELS ON A.H.D. IS TAKEN FROM **PM47291** R.L. **147.015** (A.H.D.) IN MAITLAND STREET
4. CONTOUR INTERVAL **0.5 m**
5. CONTOURS ARE INDICATIVE ONLY. ONLY SPOT LEVELS SHOULD BE USED FOR CALCULATIONS OF QUANTITIES WITH CAUTION
6. KERB LEVELS ARE TO THE TOP OF KERB UNLESS SHOWN OTHERWISE
7. FLOOR LEVELS SHOWN ARE THRESHOLD LEVELS. NO INVESTIGATION OF INTERNAL FLOOR LEVELS HAS BEEN UNDERTAKEN
8. NO INVESTIGATION OF UNDERGROUND SERVICES HAS BEEN MADE. SERVICES HAVE BEEN PLOTTED FROM RELEVANT AUTHORITIES INFORMATION AND HAVE NOT BEEN SURVEYED. ALL RELEVANT AUTHORITIES SHOULD BE NOTIFIED PRIOR TO ANY EXCAVATION ON OR NEAR THE SITE
9. 8/4/7 DENOTES TREE SPREAD OF 8m, TRUNK DIAMETER OF 0.4m & APPROX HEIGHT OF 7m
10. SHOWS APPROXIMATE POSITION OF ROAD LINEMARKING AND IS INDICATIVE ONLY
11. BEARINGS SHOWN ARE MGA (MAP GRID OF AUSTRALIA) ADD APPROX. 1°00' FOR TRUE NORTH

Bldgs 1, 5, 6, 8 & 9 – lead & AcM
All buildings – OCP & visual inspection

(X) EASEMENT FOR SEWAGE RISING MAIN 5 WIDE (VIDE DP1112032)
(Y) EASEMENT FOR PIPELINE 5 WIDE (VIDE AP319808)

DIAL BEFORE YOU DIG www.1100.com.au

REFER TO NOTES AND LEGEND

0 15 30 45 60 75
SCALE 1:750 @ A1

Revision	Date	Description	Reference
D	00/00/00	-	00
C	00/00/00	-	00
B	00/00/00	-	00
A	00/00/00	-	00

LTS CONFIDENCE TOGETHER
www.ltsi.com.au P 1300 587 000

THIS IS THE PLAN REFERRED TO IN IN MY LETTER DATED:

Registered Surveyor NSW

Client THE PACIFIC GROUP OF SCHOOLS
Drawing title
PLAN OF DETAIL AND LEVELS OVER LOT 62 IN DP 1208238, MAITLAND STREET, MUSWELLBROOK

datum AHD
site Area 2.432 ha
LGA MUSWELLBROOK

reference number 50894 001DT
scale 1:750 @A1
date of survey 11/12/2019
SHEET 1 OF 6