



Douglas Partners
Geotechnics | Environment | Groundwater

Report on
Preliminary Site Investigation for Contamination

Proposed Commercial/Industrial Subdivision
106 - 142 Aldington Road, Kemps Creek NSW

Prepared for
Stockland Commercial Property Pty Ltd

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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.

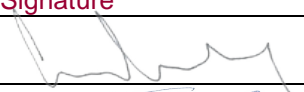

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Report on Preliminary Site Investigation for Contamination Proposed Commercial/Industrial Subdivision 106 - 142 Aldington Road, Kemps Creek NSW

1. Introduction

Douglas Partners Pty Ltd (DP) was commissioned by Stockland Commercial Property Pty Ltd (Stockland) to complete a Preliminary Site Investigation for contamination (PSI) with limited sampling of 106 – 142 Aldington Road, Kemps Creek, NSW (the “site” as shown on Drawing 1, Appendix A). It is understood that Stockland is currently considering purchasing the site for a proposed commercial/industrial subdivision and requires a PSI for due diligence purposes.

The objectives of the PSI are to identify any past or present potentially contaminating activities and to provide a preliminary assessment of site contamination. DP is not aware of any previous contamination investigation undertaken at the site.

This investigation was undertaken concurrently with geotechnical and salinity investigations which are to be reported separately.

2. Scope of Works

The PSI included completion of the following scope of works:

- Review of local topographic, soil, geological, salinity and acid sulfate soils mapping;
- Search of the NSW EPA Land Information records to confirm that there are no statutory notices or licences current on any parts of the site or nearby surrounds under the Contaminated Land Management Act 1997 and the Protection of the Environment Operations Act 1997;
- Search for groundwater bores on or adjacent to the site registered with the NSW Office of Water;
- Review of historical aerial photographs and NearMap Aerial Imagery to identify past/present land uses and areas of environmental concern (AEC);
- Review of available Council Records;
- Undertake a site walkover;
- Preparation of a conceptual site model (CSM);
- Excavation of targeted test pits (TP1 to TP4, TP6, TP7 and TP9 to TP12) and bore holes (BH5 and BH8), with soil sampling at each location;
- Laboratory analysis of selected soil samples for contaminants of potential concern (COPC) at a NATA accredited laboratory;
- Interpretation of laboratory results with reference to National Environment Protection Council, National Environment Protection (Assessment of Site Contamination) Measure 1999 as amended 2013 (ASC NEPM); and

- Preparation of this PSI report outlining the methodology and results of the investigation, and an assessment of potential contamination at the site.

3. Site Description

3.1 Site Identification

The site is located in the suburb of Kemps Creek, in the local government area of Penrith City Council, and comprises two land parcels as described in Table 1 below.

Table 1: Study Area Identification

Lot / Deposited Plan	Address	Current Land Use	Approx. Area (ha)
32 / 258949	106 – 124 Aldington Road	Rural Residential/Agricultural	11.4
31 / 258949	126 – 142 Aldington Road	Rural Residential/Agricultural	9.9
Total Approximate Area			21.3

3.2 Site Description

The site comprises rural residential and agricultural land uses (pastoral and market gardens). The site is mostly grass-covered with remnant trees predominantly along the riparian corridor in the east, and slopes west to east.

The following site description is based on field works completed at the site on 4 April 2019, a site inspection completed on 10 April 2019, and review of NearMap Imagery. Prominent site features are presented on Drawing 2 (Appendix A). Photographic plates are presented in Appendix B.

3.3 Surrounding Land Use

Site inspection and a review of Nearmap imagery identified the following land uses surrounding the site:

North:	Rural residential properties and market gardens.
East	Rural residential properties.
South	Rural residential properties.
West	Aldington Road with rural residential properties beyond.

3.4 Regional Topography

The NSW Department of Lands, *Topographic Map of NSW with 2 m elevation contours* dated April 2009 indicates that the highest point of the site is located at an elevation of approximately 86 m relative to Australian Height Datum (AHD) in the northeast. The site slopes east to the lowest point of elevation located 64 m AHD, as shown on Drawing 1 (Appendix B).

3.5 Regional Geology

Reference to the *Penrith 1:100 000 Geological Series Sheet* indicated that the site is underlain by Bringelly Shale (geological code "Rwb") of the Wianamatta Group of Middle Triassic age and Fluvial Sediments (geological code "Qal") of Quaternary Period. Most of the site is underlain by Bringelly Shale formation typically comprising shale, carbonaceous claystone, laminite, fine to medium grained lithic sandstone and some coal bands and tuff, whereas the remaining eastern portion is underlain by fluvial (stream deposited) soils comprising fine grained sand, silts and clays as shown in Figure 1 below.

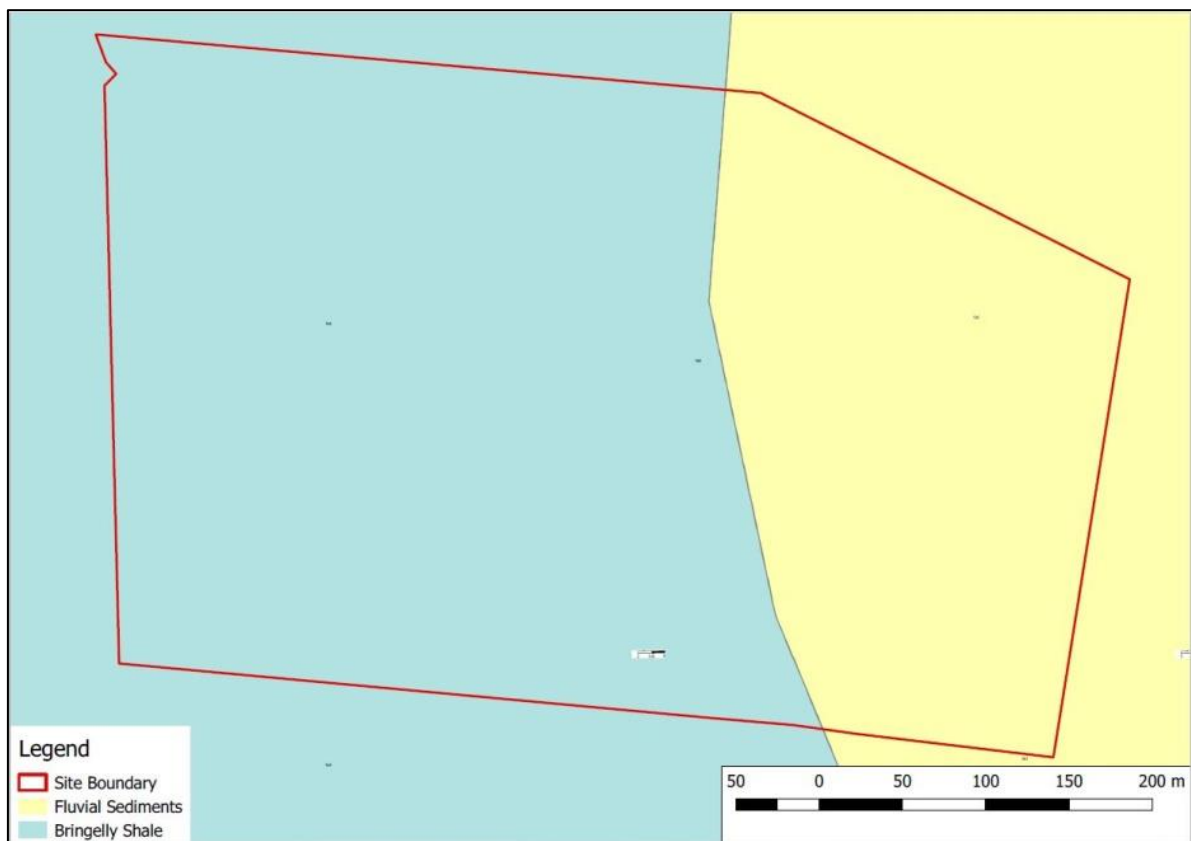


Figure 1. Regional Geology

3.6 Regional Soils

Reference to *The Penrith 1:100,000 Soil Landscape Series Sheet* indicates that the site is located between the residual soils of the Blacktown Landscape, the erosional soils of the Luddenham Landscape, and alluvial soils of the South Creek Landscape groups as shown on Figure 2 below.

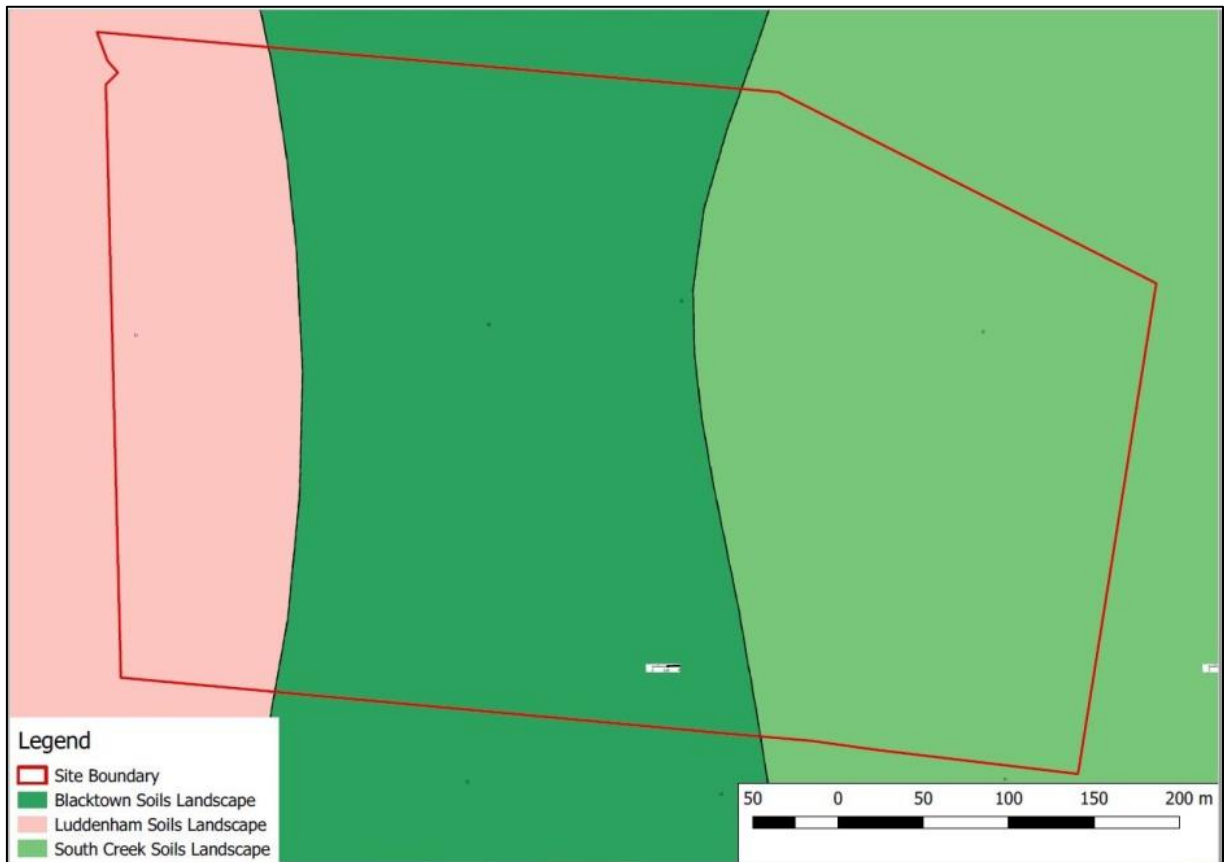


Figure 2. Regional Soils

3.7 Hydrology and Hydrogeology

The nearest surface water receptor, a tributary of Ropes Creek and a large dam are located in the eastern portion of the site. Given the site topography, surface water is expected to flow towards the east.

Groundwater is expected to flow towards the east, consistent with the general topography of the site. General features of the hydrogeology of western Sydney which are relevant to this site are described in the following and summarised further below:

- Old (1942) *The Wianamatta Shale Waters of the Sydney District*, NSW Agricultural Gazette, pp 215 - 221;
- Wooley (1991) *Groundwater in Jones DC and Clark NR* (editors) *Geology of the Penrith 1:100,000 sheet*, pp 119 - 121. NSW Geological Survey, Sydney, 202p;

- McNally (2004) Shale, Salinity and Groundwater in Western Sydney, Australian Geomechanics 39(3), pp 109 - 123;
- McNally (2009) Soil and Groundwater Salinity in the Shales of Western Sydney, Groundwater in the Sydney Basin Symposium, International Association of Hydrogeologists, pp 228 - 235; and
- Russell G, McKibbin D, Williams J and G A Gates (2009) Groundwater Resource Assessment of the Triassic rocks of the Sydney Basin, Groundwater in the Sydney Basin Symposium, International Association of Hydrogeologists, pp 312 - 328.

The shale terrain of much of western Sydney is known for saline groundwater, resulting either from the release of connate salt in shales of marine origin or from the accumulation of windblown sea salt. Seasonal groundwater level changes of 1.0 m to 2.0 m can occur in a shallow regolith aquifer or a deeper shale aquifer due to natural influences.

A search of the NSW Department of Primary Industries (DPI) groundwater bore database confirms that no registered groundwater bores are located within 1 km of the site boundary. The nearest groundwater bore (GW 100290) is located approximately 1.6 km northeast of the site, and is registered for monitoring purposes.

3.8 Acid Sulfate Soils

Review of NSW Government Office of Environment and Heritage Acid Sulfate Soils Risk mapping indicates that the site is classified as having '*no known occurrence of acid sulfate soil*'.

3.9 Sensitive Receptors

The nearest sensitive receptors have been identified as follows:

- On-site users (residents and farm workers);
- Adjacent site users (residents and workers);
- Watercourses - Ropes Creek tributary and a dam located in the east of the site, beyond which is Ropes Creek;
- Groundwater beneath the site;
- On-site ecology; and
- Future site users.

4. Review of Site History Information

A desktop review of site history information has been undertaken to identify AEC and related COPC which may arise from previous and current land uses. The desktop investigation was limited to the following:

- A review of current and historical aerial photographs;
- NSW EPA data base searches; and

- Review of available Council Records.

Given that historical aerial photographs identified that the site and surrounds have been used for rural and residential purposes since the 1950's, a title search, SafeWork NSW Dangerous goods search and Section 10.7 certificate were not considered to be warranted.

The following sections detail the methodology and findings of the desktop investigation.

4.1 Review of Aerial Imageries

A review of historical aerial imageries from 1961, 1970, 1982, 1992 and 2002 (supplied by Spatial Services), and NearMap images from 2010, 2015 and 2018 have been completed to identify AEC at the site. Aerial photographs are provided in Drawings B1 to B7 respectively (Appendix B). A summary of the review of historical/current aerial photography is detailed below.

1961 (Drawing B1)

- The site and surrounds comprise vacant pastoral land, cleared of most trees; and
- No buildings or dams are present. An access track runs north/south in the east.

1970 (Drawing B2)

- A small dam has been constructed along a drainage line in the southwest, and a transmission tower has been constructed in the northwest; and
- The surrounding area appears similar to the previous photograph with the exception of the construction of transmission towers south of the site.

1982 (Drawing B3)

- Two houses have been constructed adjacent in the west, in the locations of the current houses;
- The transmission tower in the northwest has been removed;
- Access tracks and fences divide portions of the site, predominantly in the east;
- The dam in the southeast has increased in size covering an area approximately 0.16 ha. A large dam has been created along a tributary of Ropes Creek in the southeast;
- The dam covers approximately 0.9 ha of the site and continues southeast into adjoining properties;
- The dam in the southeast has been constructed by building a wall across the Ropes Creek tributary;
- A minimum of four sheds have been constructed in the east and along a track leading towards the dam in the southeast; and
- An area approximately 0.6 ha has been cleared adjacent to the dam in the southeast.

Surrounding land use changes include the construction of Aldington Road (unsealed), and a number of houses and dams.

1991 (Drawing B4)

- The site has been cleared of most trees with the exception of remnant riparian vegetation along the Ropes Creek tributary, and along the Lot boundary in the centre of the site;
- Additional sheds have been constructed along the south western boundary and two small sheds (one in the north and one in the southeast) have been demolished; and
- Market gardens have been established across most of the site.

Surrounding land use changes include the creation of market gardens and additional clearing of trees.

2002 (Drawing B5)

- The market gardens no longer appear to be in operation, with the areas now appearing to be used as pasture; and
- A house has been constructed in the south, in the location of a current house.

Aldington Road has been sealed. No other noticeable changes are observed in the site surrounds.

August 2010 (Drawing B6)

- A new house and two in-ground septic tanks have been constructed adjacent to the north western boundary;
- Multiple stockpiles have been placed adjacent to the dam in the southeast;
- Three power poles are identified adjacent to the houses in the west. It is uncertain when the power poles were erected given the low resolution of previous photographs;
- A swimming pool has been constructed adjacent to one of the dwellings in the southern portion of the site; and
- Stockpiles of soil have been placed behind a shed adjacent to the southern boundary. Bitumen/gravel driveways have been constructed leading to houses in the south.

No significant changes were observed in the site surrounds.

October 2015 (Drawing B7)

- Additional soil stockpiles have been added north of the house in the northwest. A 2.8 ha section of land in the northeast is being utilised for market gardens; and
- Additional stockpiles have been placed adjacent to the dam in the southeast and shed along the south western boundary.

December 2018 – No significant changes were observed to the site and surrounds from the 2015 photograph.

4.2 Regulatory (NSW EPA) Notices Search

A search of NSW EPA's contaminated site register, maintained under Section 58 of Contaminated Land Management (CLM) Act 1997, and a database of licenses, applications, notices and enforceable undertakings, maintained under Section 308 of the Protection of Environment Operation (POEO) Act 1997, was undertaken on 4 April 2019. A review of search results indicated the following:

- The site (or immediately adjacent properties) is not recorded on the list of NSW contaminated sites reported to the EPA. No notices or orders to investigate or remediate the site (or immediately adjacent properties) have been issued under the CLM Act, 1997; and
- No environmental protection licences or notices/orders have been issued for the site (or immediately adjacent sites) under the POEO Act, 1997.

It is to be noted that a number of commercial/industrial premises within Kemps Creek are listed in the EPA's contaminated site register and the POEO database. The listed premises are located more than 3 km south-southwest of the site (and therefore are not considered relevant for the site contamination assessment).

4.3 Council Records Search

A search of development applications (DA) and building applications (BA) records through the Penrith City Council (the "Council") Online Enquiry portal did not identify any DA for the site. Therefore, a request was made with Council for all available information of relevance to the site under the Government Information (Public Access) Act 2009 (GIPA Act). Information provided by Council of relevance to the site is summarised below:

- Notices/orders issued by Council was provided and included the following:

Lot 31, D.P. 258949

- o "Certificates of outstanding notices and orders" dated 9 August 2017 and 21 February 2018 in relation to Order No. 22 dated 6 June 2011 (see below);
- o A "Notice of intention to serve an order" dated 16 October 2008 and 14 March 2011 in relation to effluent waste not being dealt with in a satisfactory manner; and
- o An Order No. 22 dated 6 June 2011 in relation to failed two on-site sewage management systems (effluent pooling on ground surface from land application).

Lot 32, D.P. 258949

- o "Certificates of outstanding notices and orders" dated 6 September 2017 and 12 February 2018 indicating no outstanding orders/notices; and
- o A "Notice of intention to serve an order" dated 7 November 2014 in relation to outstanding service maintenance reports for aerated wastewater treatment systems.

- Extracts of permit approvals and DA consents were provided and included the following:

Lot 31, D.P. 258949

- o Consent DA04/1692 dated 18 August 2004 for a construction of swimming pool;
- o Consent DA390/90 dated 21 December 1990 for a construction of rural workers dwelling;
- o A building permit (E/1135/81) dated 24 September 1981 to erect a dwelling; and

- o A building permit (28707) dated 11 June 1981 to erect a brick veneer dwelling.

Lot 32, D.P. 258949

- o An approval dated 29 March 2016 to operate an on-site sewage management system;
- o A building permit (E/178/82) dated 4 March 1982 to erect awnings and screen enclosures; and
- o A building permit (E/1483/81) dated 7 December 1981 to construct a farm shed.

Council was unable to provide any other information regarding asbestos, site contamination or chemicals stored on the properties. Council search results are provided in Appendix D.

5. Preliminary Conceptual Site Model

5.1 Potential Sources of Contamination

Hazardous Building Materials (AEC1 – Source 1)

A review of historical aerial photographs identified that a number of houses and sheds (current and previous) had been constructed at the site.

Given that a number of sheds and two houses were constructed during the late 1970s and early 1980s, there is potential for hazardous building materials to have been used in the construction. There is potential for contamination of surface soils in the vicinity of the former structures to be impacted by hazardous building material. Principal related COPC include:

- ACM;
- PCBs;
- Synthetic mineral fibre (SMF); and
- Heavy metals.

Chemical and Fuel Storage (AEC2 – Source 2)

The former and current sheds identified in the review of historical aerial photographs, may have also been used for chemical and fuel storage. There is potential for contamination of surface soils in the vicinity of sheds as the result of spillages and storage malpractice. COPC associated with chemical and fuel storage includes:

- Total Recoverable Hydrocarbons (TRH);
- Benzene, toluene, ethylbenzene and xylenes (BTEX);
- Polycyclic aromatic hydrocarbons (PAHs);
- Polychlorinated biphenyls (PCBs);
- Heavy metals (As, Cd, Cr, Cu, Pb, Hg, Ni and Zn);
- Organochlorine pesticides (OCPs); and
- Organophosphate pesticides (OPPs).

Areas of Fill (AEC3 – Source 3)

Review of aerial photographs has identified areas where stockpiles and application of filling has occurred including:

- Multiple stockpiles located adjacent to the dam in the southeast (identified in the 2010 and 2015 photographs);
- At least one stockpile located at the rear of sheds in the southwest (identified in the 2015 photograph);
- Filling of the small dam in the southwest - identified in the 1991 photograph; and
- The construction of a dam wall across the Ropes Creek tributary (identified in the 1982 photograph).

There is potential for soil impact at the site from filling and demolition waste related COPC including:

- TRH;
- BTEX;
- PAHs;
- PCBs;
- Heavy metals (As, Cd, Cr, Cu, Pb, Hg, Ni and Zn);
- OCPs;
- OPPs; and
- Asbestos.

Power Poles (AEC4 – Source 4)

Nearmap aerial photographs identified three power poles located on the site. There is potential for contamination of surface soils in the immediate vicinity of power poles to be impacted by power pole-related COPC including:

- TRH;
- BTEX;
- PAHs; and
- Metals.

Former Market Gardens (AEC5 – Source 5)

Historical and Nearmap photographs identified former and current market gardens at the site. There is the potential for contamination of surface soils in the locations of market gardens to be impacted with pesticide related COPC including:

- OCPs;
- OPPs; and
- Metals.

5.2 Potential Receptors

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

- R1 – Current site users (residents and farm labourers)
- R2 - Construction and maintenance workers (during site redevelopment);
- R3 – Future site users following development of the site; and
- R4 – Land users in adjacent areas (residential and commercial).

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

- R5 – Local groundwater, and receiving water bodies;
- R6 – Surface water bodies (on-site and off-site dams and creeks); and
- R7 – Local terrestrial ecosystems. DP notes that potential terrestrial ecosystem receptors are usually associated with the upper 2 m (root zone and habitation zone for many species) of the soil profile.

5.3 Potential Pathways

Potential pathways for contamination include the following:

- P1 – Ingestion and dermal contact;
- P2 – Inhalation of fibres and/or dust and/or vapours;
- P3 – Leaching of contaminants and vertical migration into groundwater;
- P4 – Surface water run-off;
- P5 – Lateral migration of groundwater providing base flow to watercourses; and
- P6 – Direct contact with terrestrial ecosystem receptors.

5.4 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 pathways between the above sources (S1 to S5) and receptors (R1 to R7) are provided in Table 2 below. Assessment of the preliminary CSM was used to determine data gaps and the requirement for sampling and analysis to assess the suitability of the site for the proposed commercial/industrial use.

Table 2: Preliminary Conceptual Site Model

Potential Source	Exposure Pathway	Receptor	Requirement for Additional Data and/or Management
S1: Hazardous building materials	P1 – Ingestion and dermal contact;	R1 – Current site users (residents and farm workers)	Given the identified potential contaminant sources, the initial fate (lay down mechanism) of most of the potential contaminants is likely to be expressed firstly in surface soils. An intrusive investigation is therefore required to quantify and assess potential contamination impact to surface soils. (A further assessment of deeper soils and groundwater may be deemed necessary should significant contamination be identified in surface soils).
S2: Potential chemical storage	P2 – Inhalation of fibres and/or dust and/or vapours	R2 – Future construction and maintenance workers.	
S3: Filling	P3 – Leaching of contaminants and vertical migration into groundwater.	R3 – Future site users following development of the site.	
S4: Power poles	P4 – Surface water run-off.	R4 – Land users in adjacent areas.	
S5: Market Gardens	P5 – Lateral migration of groundwater providing baseflow to watercourses.	R5 – Surface water bodies.	
	P6 – Direct contact of contaminated ground with ecological receptors.	R6 – Local groundwater and receiving water bodies.	
		R7 – Local ecology.	

6. Site Assessment Criteria

The site assessment criteria (SAC) applied in this PSI have been informed by the proposed land use (ie: commercial/industrial) and the CSM - which identified human and ecological receptors to potential contamination on the site (refer to Section 5).

Locations of potential sources of contamination (ie: Sources 1 to 5) were assessed (as a Tier 1 assessment) against the investigation and screening levels as per Schedule B1, National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended 2013 (ASC NEPM).

As the site is proposed to be redeveloped for commercial/industrial use, the investigation and screening levels adopted are consistent with a generic commercial/industrial land use scenario. The derivation of the SAC is included in Appendix E and the adopted SAC are listed in the analytical results tables (Tables G1 and G2 in Appendix G).

7. Field Work

7.1 Site Walkover

The site walkover was undertaken to inspect the AEC identified in the historical investigation and identify additional AEC. Site features are shown on Drawing 2 - Appendix A. Photographs taken during the walkover are provided in Appendix F.

Results of the walkover reported the following:

- All houses were constructed of brick, with no hazardous building materials (such as asbestos-containing materials [ACM]) were observed (Photographs 1 to 3);
- Sheds and /or shipping containers were present at the rear of all houses with the exception of the northernmost house in Lot 32. Sheds were constructed of metal sheeting. No obvious ACM were observed in the construction materials (Photographs 4 and 5);
- The sheds were being utilised for vehicle and machinery storage /general storage (Photographs 6 to 8). A large shed in the south (Lot 31) was locked and could not be accessed;
- Chemical and fuel containers were observed adjacent to the sheds in the south of Lots 31 and 32, with an old fridge (use for storage), empty drums, a generator, fuel and chemical containers observed in the centre of the site adjacent to the market gardens (Photographs 9 to 11);
- Surficial waste (metal, wood, general refuse) was observed surrounding the sheds in the south of Lots 31 and 32 (Photographs 12 to 13). Barbed wire, wooden crates, metal sheeting, an old vehicle and general refuse was observed adjacent to the dam in the southeast (Photographs 14 and 15);
- Multiple (ie: >20) partially vegetated stockpiles of soil were present in the riparian vegetation of the unnamed tributary of Ropes Creek in the northeast covering an area of approximately 600 m². The stockpiles appeared to comprise light brown silty clay and were approximately 1.2 m high. Soil and rock stockpiles (approximately 1 m high) were also observed adjacent to the northern house in Lot 32 and adjacent to the shed in the south of Lot 32. No foreign materials were observed (Photographs 16 and 17);
- Multiple (ie: >15) partially vegetated and exposed stockpiles of brown silty clay with mixed gravel soil containing foreign inclusions (brick, concrete, tile, wood) were present along the south of the dam in the south east. The stockpiles covered an approximate area of 1450 m² and were each approximately 0.8 m to 1 m high. One fragment of suspected ACM was observed on the surface of one stockpile (Photographs 18 to 20);
- The dam wall constructed along the Ropes Creek Tributary was approximately 1.7 m high and appeared to be constructed of soil. No foreign inclusions were observed, however the batter of the wall was obscured due to grass coverage (Photograph 21). The area to the immediate north of the dam wall does not appear to be filled. Although vegetation prevented inspection of the ground surface in this location, no foreign materials were observed in exposed soils (Photograph 22);
- Three pumps and two generators were placed adjacent to the dam and all were petrol powered (with fuel stored adjacent) (Photographs 23 and 24);
- Most of the eastern portion of the site was covered with long grass, preventing thorough inspection of the ground surface (Photograph 25)

- A partially vegetated stockpile of soil (approximately 1.5 m high covering an area approximately 50 m²) containing large volumes of foreign inclusions (brick, concrete, tile and multiple fragments of ACM) was observed behind the largest shed in Lot 31 (Photographs 26 and 27). Multiple waste stockpiles (wood and refuse) were located in the vicinity of the soil stockpile (Photograph 28);
- A fill area (potential soil footbridge) was observed in a small drainage gully in the north. Bricks and concrete were also observed on the surface in this location (Photographs 29 and 30);
- The large shed in the southwest of Lot 31 was constructed on a fill platform (Photograph 31)
- Two septic tanks and stockpiles of soil were observed adjacent to the northern house in Lot 32 (Photographs 32 and 33);
- Two timber power poles were present in the southwest (Photographs 34 and 35). The remaining power pole identified in the historical aerial photographs was constructed of metal; and
- The corridors and immediate surrounds of the market garden appeared to have been sprayed with herbicide (Photograph 36). A drum of glyphosate (herbicide) was located in the vicinity of the market garden.

No staining of soils or olfactory signs of contamination were observed during the walkover.

7.2 Methodology

Limited soil sampling was completed at the site on 4 April 2019. Targeted soil samples were collected in background areas and potential AEC as identified from the PSI desktop investigation (described in Section 4.1). It is noted that intrusive investigations were expedited by the client and so were undertaken prior to full completion of the desktop investigation (ie: prior to receiving all historical aerial photographs) and the site inspection. Given the preliminary nature of the study, DP has adopted a total of 12 sampling points (ie: one test pit per 1.8 ha). Sampling locations are shown on Drawing 2, Appendix A with the rationale provided in Table 3 below. In addition, two fragments of suspected ACM were collected during the site inspection on 10 April 2019 at the following locations:

- Sample MAT1 was collected on the surface of a stockpile located adjacent to the southern boundary of the dam in the southeast; and
- Sample MAT-2 was collected on the surface soils of a stockpile located behind the large shed in the south east of Lot 31.

The field investigation was designed in accordance with the seven step data quality objectives (DQO) process provided in Appendix D, Schedule B2 of the National Environment Protection (Assessment of Site Contamination) Measure 1999 as amended 2013 (NEPC, 2013). The DQO adopted for this PSI are provided in Appendix E.

Table 3: Location and Sampling Rationale

Test pit/ Surface Sample ID	Location and Sample Rationale
TP1	Location selected based on the presence of two septic tanks and stockpiles.
TP2	Location selected based on the proximity to the market gardens.
TP3	Location selected based on the proximity of what appeared to be potential stockpiles in the north and for background information of the surrounding soils. The results of the inspection reported that the suspected stockpiles were instead areas of Blackberry weed.
TP4	Location selected based on collecting chemical data from background areas at the eastern extent of the site.
BH5	Location selected based on identification of current shed and proximity to house potential for shallow soil impact from hazardous building materials and spillages from fuel/chemicals.
TP6	Location selected based on the proximity to the market gardens.
TP7	Location selected based on an access track running through the centre of the site and to collect chemical data from background areas of the site
BH8	Location selected based on collecting chemical data from background areas at the western extent of the site.
TP9	Location selected based on the proximity to surficial waste and stockpiles
TP10	Location selected based on collecting chemical data from background areas at the southern extent of the site.
TP11	Location selected based on proximity to stockpiles located adjacent to the dam in the southeast.
TP12	Located in the proximity to surficial waste in the southeast.

All sampling data was recorded on DP test pit logs (Appendix C) with samples also recorded on chain-of-custody sheets. The general sampling procedure adopted for the collection of environmental samples is summarised below:

- Collection of soil samples was completed using disposable sampling equipment (new nitrile glove for each sample) from the bucket of the backhoe or the shovel. Samples were collected taking care to not include soil that was directly in contact with either the surface of bucket or shovel;
- Samples were transferred into laboratory-prepared glass jars, completely filled to ensure the headspace within the sample jar is minimised, and capped immediately to minimise loss of volatiles;
- Collection of suspected ACM fragments and transfer into a new zip-locked bag. Each sample was double-bagged for safety reasons;
- Label sample containers with individual and unique identification, including project number, sample location and sample depth;
- Place the glass jars, with Teflon lined lid, and the suspected ACM samples into a cooled, insulated and sealed container for transport to the laboratory; and

- Collection of additional replicate samples at a rate of 10% for QA/QC requirements.

Samples designated for analysis were dispatched to NATA accredited laboratory Envirolab Services at Chatswood NSW for analysis of primary samples and intra-laboratory replicates.

7.3 Field Work Observations and Results

The test pit and borehole logs are included in Appendix B and should be read in conjunction with the accompanying standard notes that define classification methods and descriptive terms. Selective representative photos are provided in Appendix F.

Relatively uniform conditions were encountered underlying the site with the general succession of strata broadly summarised as follows:

- TOPSOIL FILLING – silty clay topsoil filling to depths of 0.1 – 0.2 m in TP1 and TP9 and BH5;
- FILLING – silty clay with some anthropogenics to depths of 0.2 – 0.5 m in TP1 and TP9 and BH5;
- TOPSOIL – silty clay and clayey silt to depths of 0.1 – 0.3 m in TP2 to TP4, TP6, TP7 & TP10 to TP12 and BH8
- RESIDUAL SOIL – variably stiff to hard silty clay to depths of 1.4 – 2.8 m in TP1, TP6 and TP10 and BH5 and BH8, and to the termination depths of 3 m in TP2 to TP4, TP7, TP9, TP11 and TP12; and
- BEDROCK – comprising extremely low very low strength shale at first contact at depths of 1.4 – 2.8 m and continuing to the termination depths of 3 m in TP1, TP6 and TP10. The recovered core from BH5 comprised very low strength shale to the termination depth of 5.9 m. In BH8, medium strength shale was intersected at 5.3 m and then medium strength sandstone from 6.1 m and continuing to the termination depth of 7.4 m.

Groundwater was intersected at depths of 2.5 m (RL59.1 AHD) in TP4 and 3 m (RL61 AHD) in TP11 and TP12 during excavation. No free groundwater was observed in the pits for the short time that they were left open. No groundwater was intersected in BH5 and BH8 whilst auger drilling. The use of water as a drilling fluid precluded groundwater observations whilst core drilling. It is also noted that the pits and boreholes were immediately backfilled following excavation which precluded longer term monitoring of groundwater levels. Groundwater levels are affected by factors such as soil permeability and weather conditions, and can therefore vary with time.

No asbestos, staining or olfactory signs of contamination were observed in the test pits and boreholes.

8. Laboratory Analytical Results

The analytical results for the soil samples collected during this PSI are summarised in Tables G1 and G2 in Appendix G, together with the adopted SAC. The laboratory certificates of analysis for this PSI are provided in Appendix H.

TRH and TRH

BTEX and TRH were not detected at concentrations exceeding laboratory limit of reporting (LOR) in any samples analysed with the exception of TP9/0-0.2 which reported a concentration of TRH (c15-c29) of 103 mg/kg. All samples were below the SAC.

PAHs

PAHs were not detected at concentrations exceeding LOR in any sample analysed with the exception of the following:

- BH5/0-0.2 which reported a concentration of Fluroanthene of 0.1 mg/kg; and
- TP9/0-0.2 which reported concentrations of Total Positive PAH of 1.36 mg/kg.

All samples reported concentrations below the SAC.

OCPs, OPPs, PCBs and Phenols

OCPs, OPPs, PCBs and Phenols were not detected at concentrations exceeding LOR in any samples analysed.

Heavy Metals

Heavy metals were not detected at concentrations exceeding SAC in all soil samples analysed.

Asbestos

The presence of crocidolite, amosite and chrysotile asbestos was confirmed in the material samples (MAT-1 and MAT-2) collected from stockpiles at the site.

Asbestos was not detected at the reporting limit of 0.1 g/kg in any soil sample analysed.

8.1 QAQC

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

9. Discussion

AEC identified during the desktop investigation and the site walkover, and the results of field work are discussed in the following sections. The AEC discussed below are shown on Drawing 3 (Appendix A).

9.1 Potential Impact to Site Soils from Hazardous Building Materials (AEC 1)

Four houses and six sheds (four current and two former) were identified during the historical investigation. Results of the site inspection reported that the current sheds appeared to be constructed of metal and timber, and each house was constructed of brick, although inspections were limited due to inaccessibility. No hazardous building materials, such as asbestos, were observed around the perimeter, and no Council reports or photography evidence indicates that any former houses have been demolished. However, given that two of the houses and most sheds were constructed during the late 1970s/ early 1980s when the use of asbestos building products was common, it is likely that asbestos is present in these structures. Given that the field work was undertaken prior to reception of the historical aerial photographs, investigations were not undertaken in the vicinities of the former sheds.

Considering the potential for hazardous building materials in the soil from the demolished sheds, further investigation in these areas is recommended. Further investigation is also recommended in the buildings and sheds constructed during the 1970s/1980s for the presence of hazardous building materials prior to demolition or alteration.

9.2 Potential Impact to Site Soils from Chemical/Fuel Storage (AEC 2)

Several locations of chemical and fuel storage were observed across the site during the historical investigation and site walkover. Although the storage of chemicals and/or fuel appeared limited in the accessible sheds, given the preliminary nature of the investigation, only one soil sample was collected in the vicinity of a shed (BH5). COPC were within the SAC at this location. In addition, the large shed in the southeast of Lot 31 was not inspected due to inaccessibility. Most chemical and fuel storage was observed adjacent to the market garden in the centre of the site. No samples were collected in the vicinity of the chemical stores on site due to the preliminary nature of the investigation and considering intrusive investigations were undertaken prior to the site inspection.

Although no stains or olfactory signs of contamination were reported during the site walkover in the vicinities of sheds and chemical/fuel storage areas, considering investigations were limited, further investigation is recommended to provide greater certainty regarding the presence or absence of chemical/fuel related COPC in the vicinity of sites sheds and chemical/fuel storage locations on the site.

9.3 Potential Impact to Site Soils from Filling (AEC 3)

COPC's were not detected at concentrations greater than the laboratory limit of reporting or SAC in soil samples collected within test pits completed across the site, however, given the preliminary nature of the investigation, the soil sampling was limited and there were several areas of fill that were not investigated. Areas of filling, (stockpiled and in place) requiring further investigation are discussed below and are shown on Drawing 3.

Soil Stockpiles in Unnamed Tributary of Ropes Creek

More than 20 stockpiles of soil were identified in the riparian corridor of the unnamed tributary of Ropes Creek. No signs of contamination (such as anthropogenic material, staining or odours) were observed. Although it is possible that the stockpiles originated from the excavation of the adjacent dam, investigation is required to confirm the contamination status of these stockpiles.

Soil Stockpiles with Demolition Rubble and ACM

Multiple stockpiles containing demolition rubble (bricks, concrete, tile, terracotta and steel) were observed adjacent to the dam in the southeast, and to the rear of the large shed in the southwest. Multiple fragments of ACM were also recovered from stockpiles in these locations. Although vegetation prevented full inspection of the surface of stockpiles in the southeast, the presence of asbestos is likely considering the stockpiles appeared similar in composition and the presence of demolition rubble in the vicinity.

Due to the presence of ACM in two stockpiles, and the potential for asbestos in the adjacent stockpiles, further investigation is required.

Filled Drainage Gully

An area within a drainage gully in the north appeared to be filled, potentially to create a footbridge for cattle. Demolition waste such as bricks and concrete was observed on the surface and partially buried in the vicinity of the filling area. Due to the presence of demolition waste, and the prevalence of historic waste being deposited in gullies, there is a potential for COPC (primarily asbestos) being present in fill material at this location. Investigation along the gully is recommended.

Remaining Stockpiles

Approximately four small stockpiles of soil and rock were identified adjacent to the shed and the house in the north of Lot 32. Although no signs of contamination were observed, no intrusive investigations or sampling was undertaken within the stockpiles. Further investigation is recommended to confirm the contamination status of these stockpiles.

Filling Platform

The large shed in the southwest of Lot 31 was constructed on top of a filling platform. No investigations were undertaken in this area due to the limited nature of this investigation. Investigation is recommended to confirm the contamination status of the platform.

Dam Wall

The historical investigation reported that the construction of the dam wall occurred prior to 1982. No foreign materials were observed in the surface of the dam wall, however, as much of it was vegetated, full inspection was not possible. Although it is likely that the wall was constructed of site-won material excavated during construction of the dam, further investigation would be required to confirm the contamination status of the dam wall.

Test Pits

Filling was reported in TP1, BH5 and TP9 to depths ranging between 0.2 m and 0.8 m bgl. Although the filling in TP1 and BH5 did not report the presence of foreign inclusions, TP9 reported the presence of tile fragments. Considering that TP9 is also located adjacent to a stockpile impacted with demolition rubble and ACM, it is possible that the fill (and stockpile) resulted from the demolition of a former structure in the vicinity of TP9 (ie. the former shed). Therefore, further investigation of the fill in the vicinity of TP9 is recommended.

Former Dam

A dam was observed in the historical aerial photographs to have been constructed in the southwest of the site prior to 1970, which had been filled between 1982 and 1991. The material used to fill the dam is unknown and no investigations were undertaken in this location considering field work was completed prior to conclusion of the historical investigation. Therefore investigation in the location of the former dam is recommended to confirm the contamination status of the fill material.

9.4 Potential Impact to Sites Soils from Timber Power Poles (AEC 4)

Given the preliminary nature of the investigation, the soil sampling was limited across the site and soils in the vicinity of power poles were not collected and tested. Timber power poles are known as a source of localised contamination to shallow soils due to the numerous treatment chemicals used specifically in the base of the power poles to prevent damage by termites, insects and moisture. Further assessment in the form of shallow soil sampling in the vicinity of power poles is required to confirm the presence or absence of related COPC.

9.5 Potential Impact to Sites Soils from Market Gardens

Current market gardens have been in operation since 2015, with former market gardens also observed in the 1991 aerial photograph. Surface soils from test pits TP2, TP3, TP6, TP7, and TP9 to TP12 were collected in the locations of the current and former market gardens and tested for COPC. All samples were below the LOR and SAC for pesticides (OPP and OCP) and within the SAC for all remaining COPC. Based on these results, the potential impact to soils related to market garden COPC is considered to be low, and therefore, the market gardens are no longer considered an AEC. DP does not consider that further investigation into the market gardens is necessary.

9.6 Additional Considerations

The desktop study and site inspection reported the presence of two septic tanks in the northwest of the site. Removal, following the decommissioning of the tanks, is recommended prior to development.

10. Conclusions and Recommendations

The results of the desktop investigation identified that the site and surrounds have a history of rural residential and agricultural land-use. Based on the results of the investigations, the following AEC were identified to have the potential for contamination of site soils:

- AEC 1 – Potential hazardous materials used to construct houses and sheds in the 1970s/1980s;
- AEC 2 – Potential spills in chemical/fuel storage areas;
- AEC 3 – Filling areas including stockpiles containing ACM and in place filling containing demolition rubble; and
- AEC 4 – Potentially impacted soils surrounding the timber power poles on site.

Limited targeted sampling was undertaken at 12 locations across the site. Considering sampling was undertaken prior to the completion of historical investigations, a number of areas requiring investigation were not targeted. The identified AEC requiring further investigation are summarised below and shown on Drawing 3 (Appendix A):

- Filling material at the following locations:
 - o Stockpiles within the riparian corridor of the unnamed tributary of Ropes Creek;
 - o Stockpiles containing demolition rubble and ACM adjacent to the dam and shed in the southwest of Lot 31;

- o Filling of the gully along the drainage line in the north;
- o The current dam wall in the east and former dam in the west; and
- o Soil and rock stockpiles in the vicinities of houses and sheds in Lot 32.
- Soils in the footprints of former sheds and vicinities of current sheds for COPC. Given the preliminary nature of the PSI and the storage of chemicals/fuels observed within a number of sheds, the presence of impact to soils at the site cannot be ruled out.

To determine the presence of hazardous building materials it is recommended that a hazardous building materials survey is undertaken on the houses and sheds constructed during the 1970s and 1980s prior to demolition. Additional soil sampling for COPC following demolition is recommended; and

- Soils in the immediate vicinity of the timber power poles.

With respect to site contamination, the recommended further assessment should build on the information provided in this report with reference to National Environment Protection Council (NEPC, 1999) National Environment Protection Council (Assessment of Site Contamination) Measure 1999 (amended 2013) (NEPC, 2013). Further assessment should include intrusive investigations, sampling, analysis and assessment to determine land use suitability.

11. Limitations

Douglas Partners Pty Ltd (DP) has prepared this report for this project at 106 – 142 Aldington Road, Kemps Creek, NSW in accordance with DP's proposal MAC190088. The work was carried out under DP's Conditions of Engagement and Stockland Development Pty Ltd Short Form Consultancy Agreement for Due Diligence Contamination, Geotechnical and Salinity Investigation. This report is provided for the exclusive use of Stockland Development 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 subsurface 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. Subsurface 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 time constraints imposed by others or by site accessibility.

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

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

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

Douglas Partners Pty Ltd

Appendix A

Drawings 1 to 3



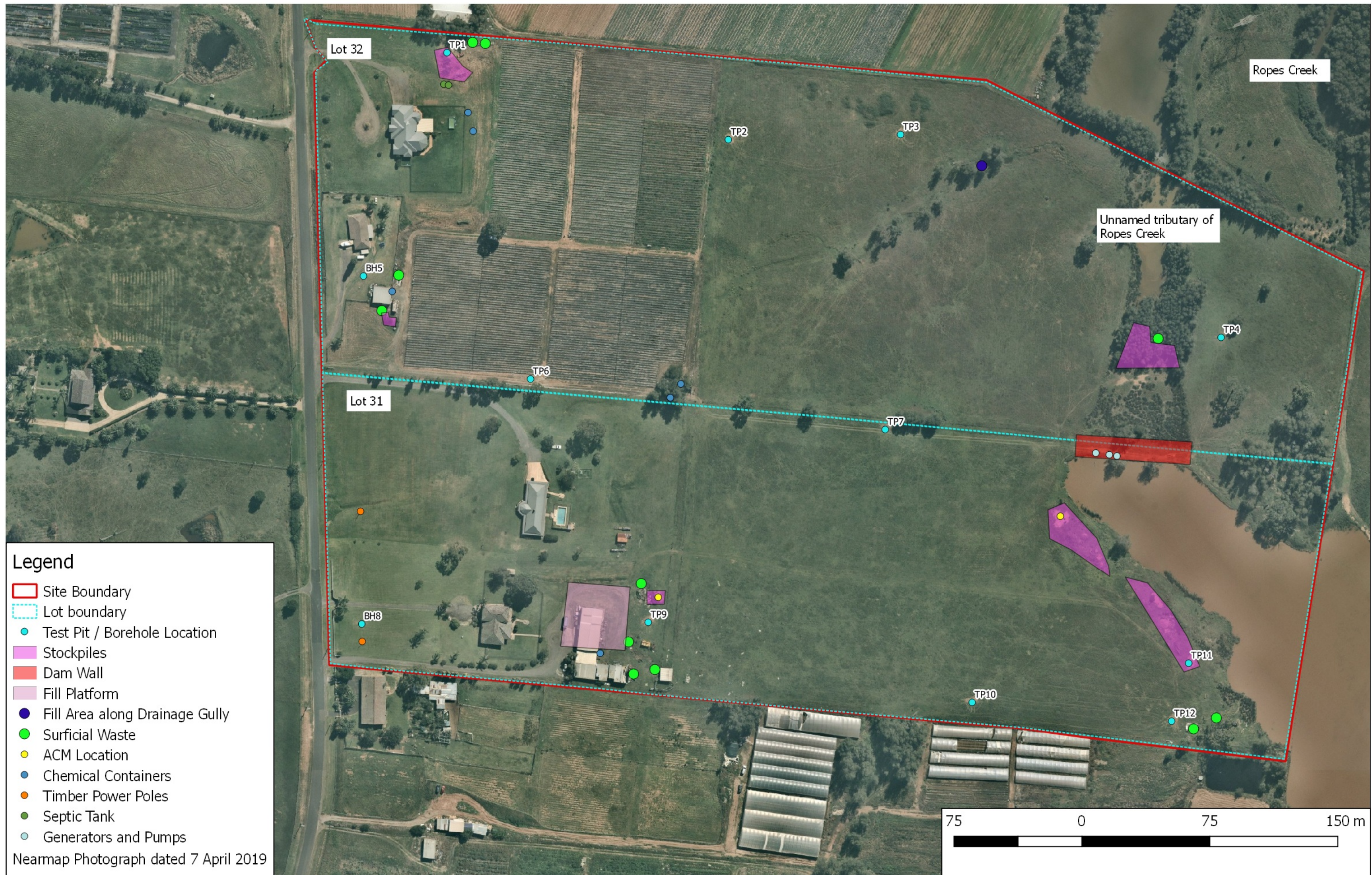
Legend

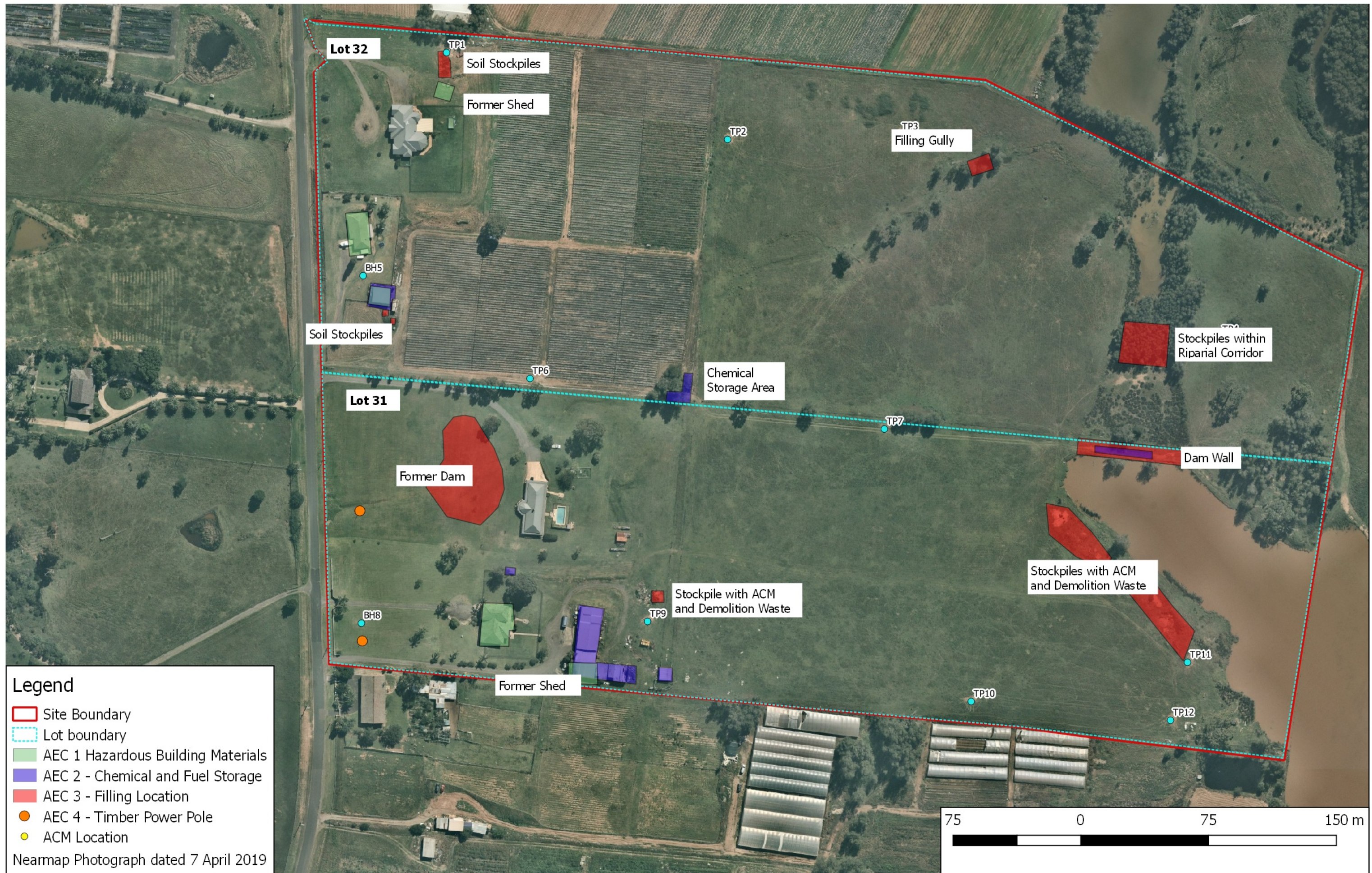
Site Boundary

Lot boundary

2 m contours

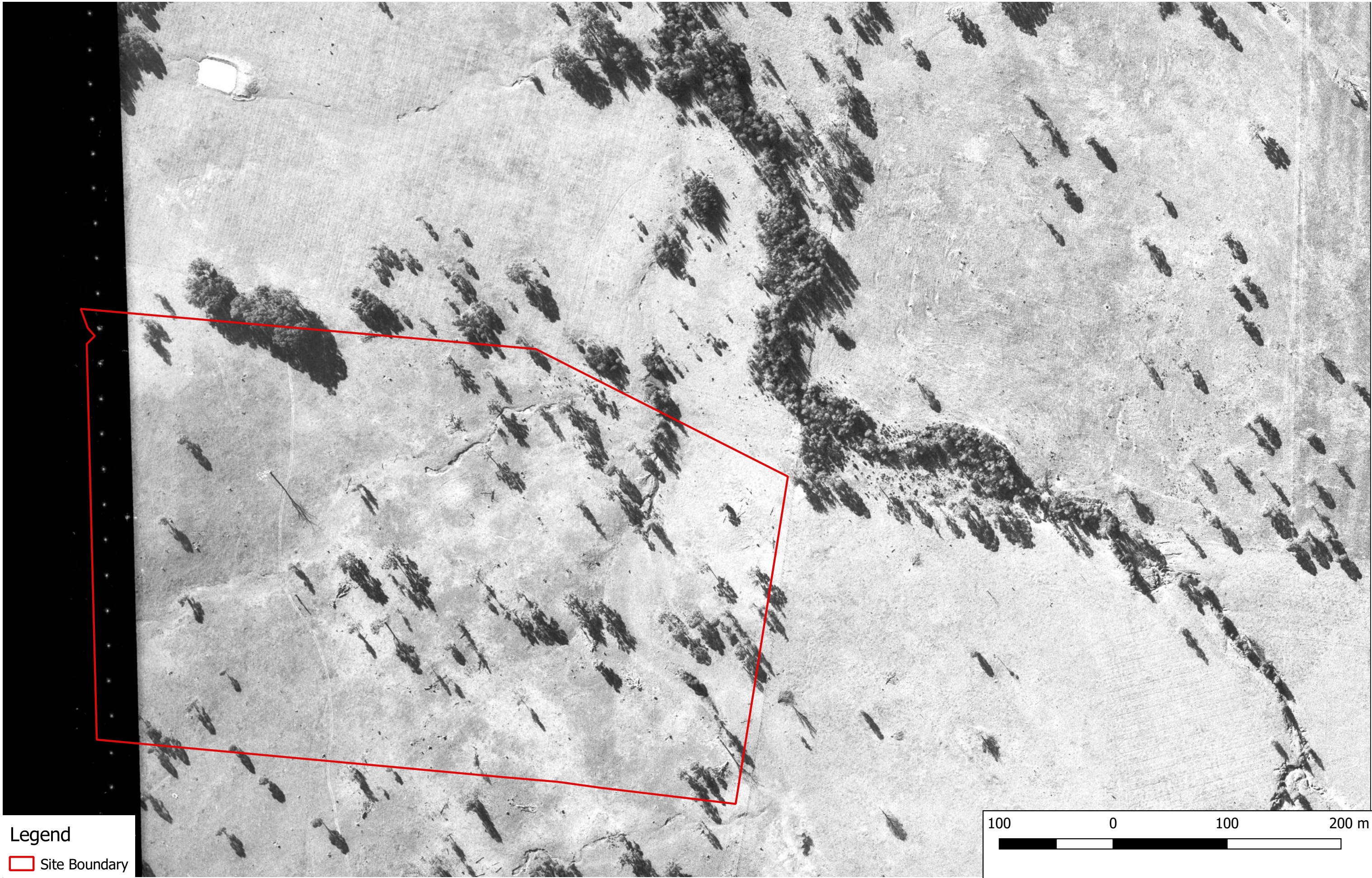
Nearmap Photograph dated 29 December 2018





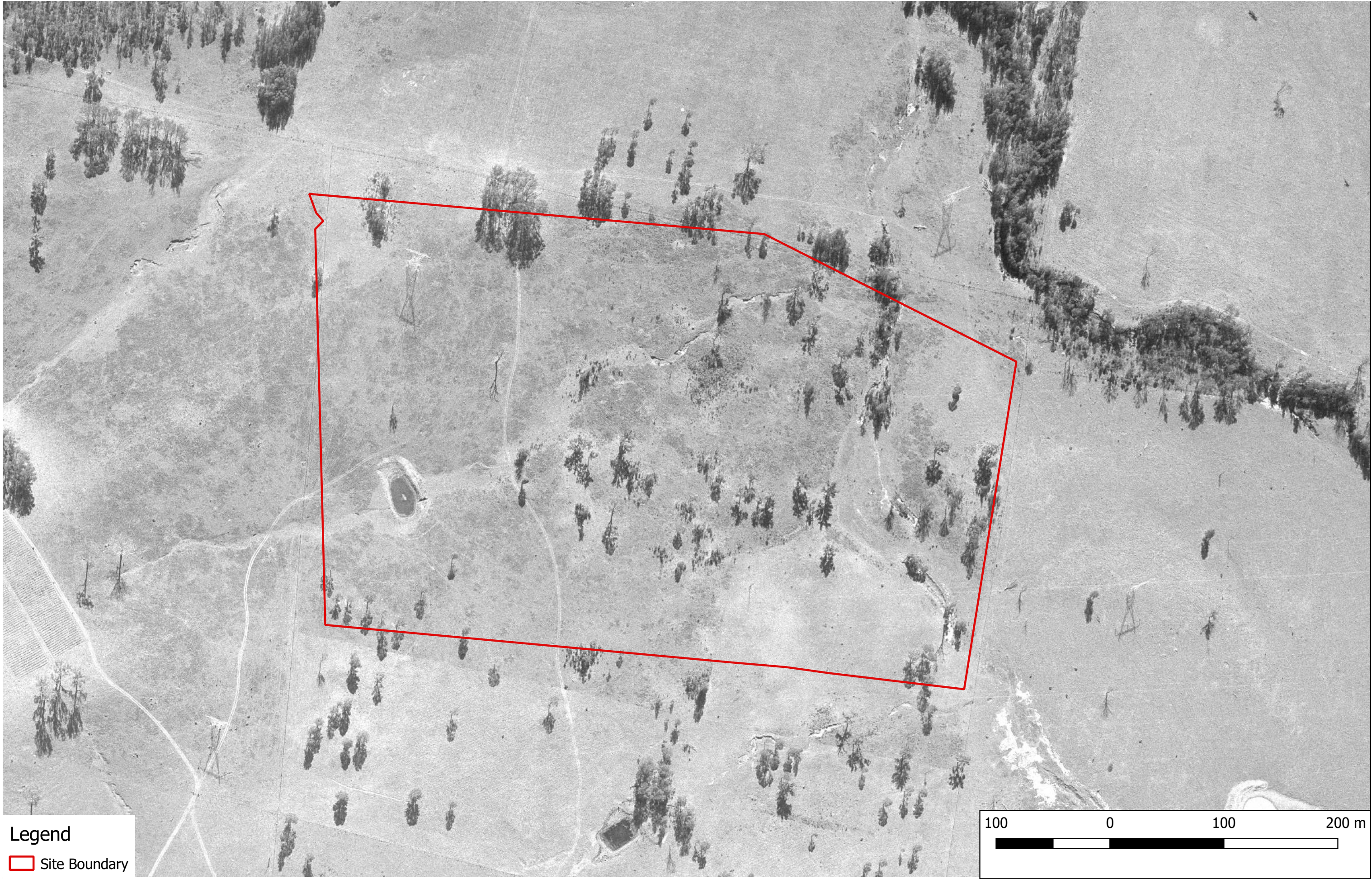
Appendix B

Historical Aerial Photographs



Legend



 Site Boundary



Legend

Site Boundary





 Douglas Partners <i>Geotechnics Environment Groundwater</i>	CLIENT: Stockland Commercial Property Pty Ltd		TITLE: Historical Aerial Photograph - 1970 Preliminary Site Investigation for Contamination Proposed Commercial/Industrial Subdivision 106-142 Aldington Road, Kemps Creek, NSW	 MGA	PROJ. #: 92345.00.R.001	
	OFFICE: Macarthur	DRAWN BY: CKM			DRAWING No:	B2
	SCALE: As shown	DATE: 12.4.19			REVISION:	0

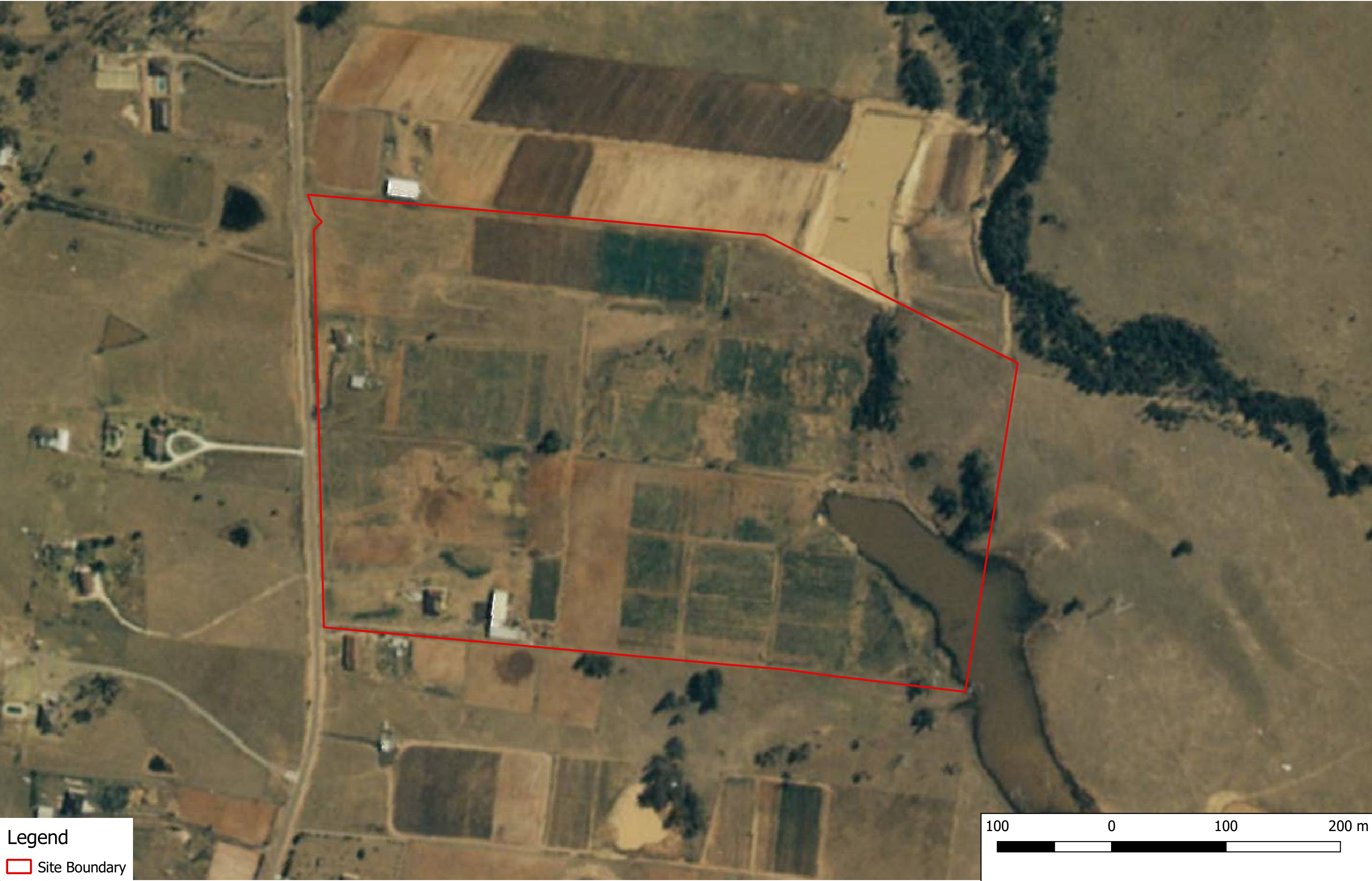


Legend

Site Boundary





 Douglas Partners <i>Geotechnics Environment Groundwater</i>	CLIENT: Stockland Commercial Property Pty Ltd		TITLE: Historical Aerial Photograph - 1982 Preliminary Site Investigation for Contamination Proposed Commercial/Industrial Subdivision 106-142 Aldington Road, Kemps Creek, NSW		PROJ. #: 92345.00.R.001	
	OFFICE: Macarthur	DRAWN BY: CKM			DRAWING No:	B3
	SCALE: As shown	DATE: 12.4.19			REVISION:	0



Legend

Site Boundary



 Douglas Partners <i>Geotechnics Environment Groundwater</i>	CLIENT: Stockland Commercial Property Pty Ltd		TITLE: Historical Aerial Photograph - 1991 Preliminary Site Investigation for Contamination Proposed Commercial/Industrial Subdivision 106-142 Aldington Road, Kemp's Creek, NSW	 MGA	PROJ. #: 92345.00.R.001
	OFFICE: Macarthur	DRAWN BY: CKM			DRAWING No: B4
	SCALE: As shown	DATE: 12.4.19			REVISION: 0



Legend

Site Boundary



 Douglas Partners <i>Geotechnics Environment Groundwater</i>	CLIENT: Stockland Commercial Property Pty Ltd		TITLE: Historical Aerial Photograph - 2002 Preliminary Site Investigation for Contamination Proposed Commercial/Industrial Subdivision 106-142 Aldington Road, Kemps Creek, NSW		PROJ. #: 92345.00.R.001
	OFFICE: Macarthur	DRAWN BY: CKM			DRAWING No: B5
	SCALE: As shown	DATE: 12.4.19			REVISION: 0



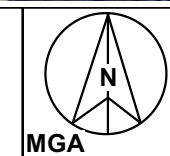
Legend

Site Boundary



CLIENT: Stockland Commercial Property Pty Ltd	
OFFICE: Macarthur	DRAWN BY: CKM
SCALE: As shown	DATE: 12.4.19

TITLE: **Nearmap Aerial Photograph - August 2010**
Preliminary Site Investigation for Contamination
Proposed Commercial/Industrial Subdivision
106-142 Aldington Road, Kemps Creek, NSW



PROJ. #: 92345.00.R.001
DRAWING No: B6
REVISION: 0



Legend

Site Boundary



CLIENT: Stockland Commercial Property Pty Ltd	
OFFICE: Macarthur	DRAWN BY: CKM
SCALE: As shown	DATE: 12.4.19

TITLE: **Nearmap Aerial Photograph - October 2015**
Preliminary Site Investigation for Contamination
Proposed Commercial/Industrial Subdivision
106-142 Aldington Road, Kemps Creek, NSW



PROJ. #: 92345.00.R.001
DRAWING No: B7
REVISION: 0

Appendix C

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126 - 142 Aldington Road KEMPS CREEK NSW 2178

Address: 126 - 142 Aldington Road KEMPS CREEK NSW 2178
Property Number: 105004
Status: C
Ward:

Title(s): [Lot 31 DP 258949](#)
Land Area: 10.12 HECTARES

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Applications

Application(s): No applications recorded.

Zoning

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Property Search

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106 - 124 Aldington Road KEMPS CREEK NSW 2178

Address: 106 - 124 Aldington Road KEMPS CREEK NSW 2178
Property Number: 105013
Status: C
Ward:

Title(s): [Lot 32 DP 258949](#)
Land Area: 11.16 HECTARES

Location

Applications

Planning Details

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Map:



Applications

Application(s): No applications recorded.

Zoning

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Yashu Shrestha

From: Karin Fuller <Karin.Fuller@penrith.city>
Sent: Friday, 5 April 2019 11:35 AM
To: Yashu Shrestha
Subject: Part One of Acknowledged Information relating to 2x properties at 126 -142 & 106-124 Aldington Road Kemps Creek
Attachments: ECM_6249238_v1_NISO re outstanding AWTS servicing at 106 Aldington Road.pdf;
ECM_7093325_v1_Approval to Operate Onsite (LAND Bulk) Sewage Managementpdf;
ECM_7787412_v1_Certificate for Outstanding Notices and Orders 17_0354 01....pdf;
ECM_7787417_v1_Certificate for Outstanding Notices and Orders 17_0354 01....pdf;
ECM_7825836_v1_Certificate for Outstanding Notices and Orders 17_0345 01....pdf;
ECM_7825896_v1_Certificate for Outstanding Notices and Orders 17_0345 01....pdf;
ECM_8045069_v1_Certificate for Outstanding Notices and Orders 18_0041 01....pdf;
ECM_8045070_v1_Certificate for Outstanding Notices and Orders 18_0041 01....pdf;
ECM_8063309_v1_Certificate for Outstanding Notices and Orders 18_0040 01....pdf;
ECM_8063310_v1_Certificate for Outstanding Notices and Orders 18_0040 01....pdf

Morning

Please find attached certificate/order documents requested relating to the said above properties.

NOTE: Part One of Two to be sent - Please contact Council Planners in relation to Site Zoning & will send through Consents once received from Council Archives.

Re: Informal Access under Government Information Public Access Act (GIPA)

I refer to your informal access application under the Government Information (Public Access) Act 2009 (GIPA), requesting access to information relating to 106-124 & 126-142 Aldington Road KEMPS CREEK .

On 5 April 2019, I determined to provide access to the requested information under Schedule 1 Section 4 (A & E) of the GIPA Act (Open Access). Copies of information, which I have determined to release, are attached.

I can be contacted on 47 328220 or email karin.fuller@penrith.city should you require further information on this matter.

Yours faithfully

Karin Fuller
Administration Officer

E Karin.Fuller@penrith.city
T [+612 4732 8220](tel:+61247328220) | F +612 4732 7958 | M
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www.penrithcity.nsw.gov.au

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#ECMBODY

Yashu Shrestha

From: Karin Fuller <Karin.Fuller@penrith.city>
Sent: Friday, 5 April 2019 11:41 AM
To: Yashu Shrestha
Subject: Continued Part One for 106-124 & 126-142 Aldington Road Kemps Creek
Attachments: NISO - 126 Aldington rd issued 14-3-11.pdf; Order issued to 126 Aldington Rd 6-6-11.pdf; NISO 22 issued to Antonio Criniti for failing OSSMs at 126 Aldington Rd,....pdf

Morning

Please find attached certificate/order documents requested relating to the said above properties.

NOTE: Part One continued of Order/Notice

Re: Informal Access under Government Information Public Access Act (GIPA)

I refer to your informal access application under the Government Information (Public Access) Act 2009 (GIPA), requesting access to information relating to 106-124 & 126-142 Aldington Road KEMPS CREEK .

On 5 April 2019, I determined to provide access to the requested information under Schedule 1 Section 4 (A & E) of the GIPA Act (Open Access). Copies of information, which I have determined to release, are attached.

I can be contacted on 47 328220 or email karin.fuller@penrith.city should you require further information on this matter.

Yours faithfully

Karin Fuller
Administration Officer

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#ECMBODY

Yashu Shrestha

From: Karin Fuller <Karin.Fuller@penrith.city>
Sent: Friday, 5 April 2019 12:39 PM
To: Yashu Shrestha
Subject: Part Two of Acknowledged Consents for 106-124 & 126-142 Aldington Road Kemps Creek
Attachments: Lot 31 Aldington 1.pdf; Lot 31 Aldington 2.pdf; Lot 31 Aldington 3.pdf; Lot 32 Aldington 1.pdf; Lot 32 Aldington 2.pdf; Lot 32 Aldington 3.pdf; Lot 32 Aldington 4.pdf; Determination of DA04 1692 for INGROUND SWIMMING POOL at 126-142 Aldingt....pdf; Aldington Road Kemps Creek.pdf

Afternoon

Please find attached certificate/order documents requested relating to the said above properties.

NOTE: Part Two: Consents

Re: Informal Access under Government Information Public Access Act (GIPA)

I refer to your informal access application under the Government Information (Public Access) Act 2009 (GIPA), requesting access to information relating to 106-124 & 126-142 Aldington Road KEMPS CREEK .

On 5 April 2019, I determined to provide access to the requested information under Schedule 1 Section 4 (A & E) of the GIPA Act (Open Access). Copies of information, which I have determined to release, are attached.

I can be contacted on 47 328220 or email karin.fuller@penrith.city should you require further information on this matter.

Yours faithfully

Karin Fuller
Administration Officer

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850-00411-6

D.850/00411
Vince Hardy (VH:DM)

ENVIRONMENTAL PLANNING AND ASSESSMENT ACT, 1979

NOTICE TO APPLICANT OF DETERMINATION

OF A DEVELOPMENT APPLICATION

Pursuant to Section 92 of the Act, notice is hereby given of the determination by the consent authority of the Development Application.

D.A. No. 390/90 Date of Consent: 21st December, 1990

Issued to: Antonio Criniti

Address: Lot 31 Aldington Road, Kemps Creek

Premises Referred to in Lot 31, DP 358949, Aldington Road
Development Application: Kemps Creek

Date of Receipt: 7th November, 1990

Brief Description of Construction of a Rural Workers Dwelling
Proposed Development: in accordance with plans submitted to
Council on 7th November, 1990.

The Development Application has been determined by:

Granting of consent subject to the conditions specified in this Notice.

(This Application was determined under Delegated Authority by Council at its meeting held on 17th July, 1990. Minute No. 546.)

This is Page No. 1 of Development Notice No. 390/90
issued on 21st December, 1990

The conditions of the consent are set out as follows:-

1. Before usage of the development commences, all of the conditions of this consent are to be complied with to Council's satisfaction and it is the responsibility of the applicant to advise Council's Town Planning Department when the development is ready for inspection. (This inspection is a separate requirement to the final inspection of the building which is carried out by Council's Health and Building Department).

2. All alterations to services and municipal facilities as necessitated by the development shall be the responsibility of the applicant.

3. This consent shall lapse if the development to which it refers is not commenced within two (2) years after the date of the consent; provided that Council may, if good cause be shown in a written application requesting an extension of time, grant an extension of the consent for a further twelve months pursuant to Section 99(3) of the Environmental Planning and Assessment Act, 1979.

4. Prior to occupation of the building arrangements satisfactory to the Health and Building Services Manager are to be made for the disposal of all liquid and solid waste material and the storage of any waste material prior to its disposal.

5. The submission of building plans and specifications under cover of a formal Building Application to the satisfaction of the Health and Building Services Manager.

It is to be noted that the consideration of this application has been limited generally to matters relating to site treatment and that detailed consideration has not been given to the internal layout of the building or matters controlled under the provisions of the relevant building requirements.

Applicants are advised that it is in their interests to consult with Council's Health and Building Department with respect to these matters prior to the preparation of working drawings.

6. Where a building is to take place on any land which is to be filled, such filling is to be compacted to the satisfaction of the Health and Building Services Manager, prior to any work being carried out.

7. Room sizes and general room layout and design are to comply with the minimum requirements of Ordinance 70.

8. All land required for vehicular access within the site is to be stabilised in a manner satisfactory to Council.

9. The dwelling shall at all times be occupied by persons employed on site to carry out rural activities.

The reasons for these conditions are as follows

1. To ensure compliance with the terms of the relevant Planning Instrument.

2. To ensure that no injury is caused to the existing and likely future amenity of the neighbourhood.


3. Due to the circumstances of the case and the public interest.

6. To ensure that requirements relating to Health and Building matters will be met.

7. To ensure that access, parking and loading arrangements will be made to satisfy the demands created by the development.

Notice is hereby given of the right of appeal against the decision of Council pursuant to the Environmental Planning and Assessment Act, 1979.

The granting of the above application does not relieve the Applicant of the obligation to obtain any other approval required under the Local Government Act, 1919, or any other Act and Ordinances under such Acts.


Gary Dean
for the Environmental Planning Manager

Dated this Twenty First day of December, 1990



**PENRITH
CITY COUNCIL**
Serving Our Community

DETERMINATION OF DEVELOPMENT APPLICATION

P E N R I T H C I T Y C O U N C I L

DESCRIPTION OF DEVELOPMENT

DA No.	DA04/1692
Description of development	INGROUND SWIMMING POOL
Classification of development	The classification of the building(s) forming part of this consent is <ul style="list-style-type: none">▪ 10b

DETAILS OF THE APPLICANT

Name	AUSTRALIAN POOL COMPANY P/L
Address	23/10 VICTORIA AVENUE CASTLE HILL NSW 2154

NOTES

1. Your attention is drawn to the attached conditions of consent in attachment 2 and the timing requirements for these conditions in attachment 1.
2. You should also check if this type of development requires a construction certificate in addition to this development consent.
3. It is recommended that you read the Advisory Note enclosed with this consent.

DETAILS OF THE LAND TO BE DEVELOPED

Street No.	126
Street name	Aldington Road
Suburb	Kemps Creek
Lot No.	L31
DP/ SP	DP/258949

DECISION OF CONSENT AUTHORITY

In accordance with Section 81(1)(a) of the Environmental Planning and Assessment Act 1979, consent is granted subject to the conditions listed in attachment 2 & the time frame for condition implementation in attachment 1.

Date from which consent operates	18 August 2004
Date the consent expires	18 August 2006
Determination Date	18 August 2004

Please note that this consent will lapse on the expiry date unless the development has commenced in that time.

REVIEW OF DETERMINATION & RIGHTS OF APPEAL

1. The applicant may request Council to review its determination pursuant to Section 82A of the Environmental Planning and Assessment Act 1979 within 12 months of receiving this Notice of Determination.
You cannot make this request if the development is Designated Development, Integrated Development, or State Significant development.
2. The applicant can appeal against this decision in the Land and Environment Court within 12 months of receiving this Notice of Determination.
You cannot appeal if a Commission of Inquiry was held for the subject development application, or if the development is a State Significant Development.
3. Right of Appeal if the application was for Designated Development
If a written objection was made in respect to the Application for Designated Development, the objector can appeal against Council's decision to the Land and Environment Court within 28 days after the date of this Notice. The objector cannot appeal if a Commission of Inquiry was held.
If the applicant appeals against Council's decision, objector(s) will be given a notice of the appeal and the objector(s) can apply to the Land and Environment Court within 28 days after the date of this appeal notice to attend the appeal and make submissions at that appeal.

REASONS

The conditions in the attached schedule have been imposed for the following reasons:

- To ensure compliance with the terms of the relevant Planning Instrument.
- To ensure that no injury is caused to the existing and likely future amenity of the neighbourhood.
- Due to the circumstances of the case and the public interest.
- To ensure the structural integrity of the development.
- To ensure the protection of the health and safety of the occupants of the development.

POINT OF CONTACT

If you have any questions regarding this consent you should contact:

Assessing officer	JULIE CONDON
Contact telephone number	(02) 4732 7513

SIGNATURE

Name	JULIE CONDON
Signature	

For the Building Approvals and Environment Protection Manager

ATTACHMENT 1: TIME FRAME FOR CONDITIONS

TIME FRAME	CONDITION NO.
To be completed prior to the issue of Construction certificate	
To be completed prior to commencement of construction	14
Matters to be submitted during construction	2, 5, 6, 7
To be completed prior to the issue of an Occupation Certificate	10, 11, 12, 15
Note: some conditions may not be listed in the table as they are operational or do not have a time constraint.	

ATTACHMENT 2: CONDITIONS OF CONSENT

GENERAL

- 1 The work must be carried out in accordance with the requirements of the Building Code of Australia. If the works relates to a residential building and is valued in excess of \$12,000, then a contract of insurance for the residential development shall be in force in accordance with Part 6 of the Home Building Act 1989.

(Note: Residential building includes alterations and additions to a dwelling, and structures associated with a dwelling house/dwelling such as carport, garage, shed, rural shed, swimming pool and the like)

- 2 All construction works shall be in accordance with Penrith Development Control Plan- Residential Construction Works.
- 3 The swimming pool shall not be occupied until an Occupation Certificate has been issued.
- 4 The development must be implemented substantially in accordance with the stamped-approved plans issued by Penrith City Council, the application form and any supporting information received with the application, except as may be amended in red on the attached plans and by the following conditions.

{Note: Prescribed conditions under the Environmental Planning and Assessment Regulation 2000 as amended will apply to building and subdivision work commencing/approved on 1 July 2003.}

CONSTRUCTION

- 5 Stamped plans, specifications, a copy of the development consent, the Construction Certificate and any other Certificates to be relied upon shall be available on site at all times during construction.

Signage but not more than 2 signs are to contain the following details:

- * the name of the Principal Certifying Authority, their address and telephone number,
- * the name of the person in charge of the work site and telephone number at which that person may be contacted during work hours,
- * that unauthorised entry to the work site is prohibited,
- * the designated waste storage area must be covered when the site is unattended, and
- * all sediment and erosion control measures shall be fully maintained until completion of the construction phase.

The signage but no more than 2 signs stating the above details is to be erected:

- * at the commencement of, and for the full length of the, construction works onsite, and
- * in a prominent position on the work site and in a manner that can be easily read by pedestrian traffic.

All construction signage is to be removed on completion of earthworks or construction works and when a Compliance Certificate has been issued by the Principal Certifying Authority certifying that the development has complied fully with the development consent and, where required, been constructed in accordance with the Construction Certificate.

- 6 Subdivision or construction works that are carried out in the open that involve the use of heavy vehicles, heavy machinery and other equipment likely to cause offence to adjoining properties shall be restricted to the following hours in accordance with the NSW Environment Protection Authority Noise Control Guidelines:

- * Mondays to Fridays, 7am to 6pm

- * Saturdays, 7am to 1pm (if inaudible on neighbouring residential premises), otherwise 8am to 1pm

- * No work is permitted on Sundays and Public Holidays.

Other construction works carried out inside a building/tenancy and do not involve the use of equipment that emits noise are not restricted to the construction hours stated above.

The provisions of the Protection of the Environment Operations Act, 1997 in regulating offensive noise also apply to all construction works.

SWIMMING POOLS ACT

- 7 All excavated material associated with the construction of the pool shall be disposed of at an approved landfill tip or a Penrith City Council approved location. Failure to dispose of excavated material in an authorised location can result in legal action being taken.
- 8 When the swimming pool construction has reached a stage where the pool is capable of holding water, the pool area shall be restricted from access in accordance with AS1926 "Swimming Pool Safety". Restriction of access to the pool area shall also comply with the Swimming Pools Act, 1992.
- 9 At all times, the swimming pool is to be surrounded by a child-resistant barrier that:
 - * separates the swimming pool from any residential building situated on the premises and from any place (whether public or private) adjoining the premises, and
 - * is designed, constructed, installed and maintained in accordance with the standards prescribed by AS 1926 "Swimming Pool Safety".
- 10 To promote pool safety awareness in the City and ensure that pool owners are actively ensuring the safety of all users of their pool, the "Backyard Pool Safety" package was developed in conjunction with Penrith City Council and State government agencies.

It is the pool owners' responsibility to purchase and read the information package prior to using the swimming pool (The package is available for purchase from Council's Civic Centre, 601 High Street, Penrith).

- 11 A sign must be erected in a prominent position in the immediate vicinity of the swimming pool and must:

- * be erected in accordance with the provisions relating to instructional posters of the document entitled "Policy Statement No. 9.4.1: Guidelines for the Preparation of Posters on Resuscitation" published by the Resuscitation Council. (A copy may be purchased from Penrith City Council's Civic Centre, 601 High Street, Penrith), and

- * bear a notice that contains the words "YOUNG CHILDREN SHOULD BE SUPERVISED WHEN USING THIS SWIMMING POOL", together with details of resuscitation techniques (for adults, children and infants) set out in the relevant provisions of the document entitled "Cardio Pulmonary Resuscitation" published by the Australian Resuscitation Council. (A copy may be purchased from Penrith City Council's Civic Centre, 601 High Street, Penrith).

ENGINEERING

- 12 All backwash water from the pool filter system is to be disposed of into rubble drains to the satisfaction of Council.

LANDSCAPING

- 13 Existing landscaping is to be retained and maintained at all times.

CERTIFICATION

- 14 Prior to the commencement of any earthworks or construction works on site, the proponent is to:

- (a) employ a Principal Certifying Authority to oversee that the said works carried out on the site are in accordance with the development consent and related Construction Certificate issued for the approved development, and with the relevant provisions of the Environmental Planning and Assessment Act and accompanying Regulation, and

- (b) submit a Notice of Commencement to Penrith City Council.

The Principal Certifying Authority shall submit to Council an "Appointment of Principal Certifying Authority" in accordance with Section 81A of the Environmental Planning and Assessment Act 1979.

{Note: As from 1 July 2003, if Penrith City Council is to be appointed as the Principal Certifying Authority (PCA) for the development, then the proponent is to formally appoint Council as the PCA. You should contact Council's Building Approvals and Environment Protection Department on (02) 47327991 to commence the procedures for appointing Council as the PCA.}

Information to accompany the Notice of Commencement

Two (2) days before any earthworks or construction/demolition works are to commence on site (including the clearing site vegetation), the proponent shall submit a "Notice of Commencement" to Council in accordance with Section 81A of the Environmental Planning and Assessment Act 1979.

- 15 An Occupation Certificate or Compliance Certificate is to be obtained from the Principal Certifying Authority on completion of all works and prior to the occupation/use of the swimming pool.

The Certificate shall not be issued if any conditions of this consent, but not the conditions relating to the operation of the development, are outstanding.

A copy of the Occupation Certificate and all necessary documentation supporting the issue of the Certificate is to be submitted to Penrith City Council, if Council is not the Principal Certifying Authority. In the event that a Compliance Certificate was issued by the Principal Certifying Authority certifying compliance that all conditions of the development consent required to be met has in fact been met as well as any documentation stated above, shall be submitted to Penrith City Council if Council is not the Principal Certifying Authority.

{Note: As from 1 July 2003, an Occupation Certificate will be required for Class 1 and 10 buildings before the building can be occupied. This is the date when the "Building Legislation Amendment (Quality of Construction) Act 2002" comes into effect.}

Name

JULIE CONDON

Signature

For the Building Approvals and Environment Protection Manager

AWTS1817
Contact: L Moore
(02) 4732 8055

7 November 2014

S Criniti, P Criniti, F Criniti
P O Box 469
FLEMINGTON MARKETS NSW 2129

Dear Salvatore, Peter & Frank Criniti,

Section 132 Local Government Act 1993
NOTICE OF INTENTION TO SERVE AN ORDER
Lot 32 DP 258949: 106 – 124 Aldington Road KEMPS CREEK NSW 2178

A review of Council records indicates that service maintenance reports for the Aerated Wastewater Treatment System's (AWTS) at the abovementioned property are outstanding.

Previous correspondence has requested that an AWTS service report be presented to Penrith Council. A final reminder letter was sent to you on 22 October 2013. It outlined that all AWTS are required to have quarterly maintenance services conducted by a qualified contractor. An information brochure about your responsibilities as the owner of an AWTS, and how these systems should be maintained, is included with this letter.

It is recommended that you consider all the information provided in this letter and the attached Notice of Intention to Serve an Order.

Within a period of **fourteen (14) days** from the date of this notice you may make representations to Council as to why the Order should not be given or as to the terms of or period for compliance with the Order. Representations must be in writing by you, or on your behalf, and submitted:

1. Directly at Council's Civic Centre, 601 High Street, Penrith; or,
2. In writing to: The General Manager, PO Box 60, PENRITH 2751
3. By email to <mailto:council@penrithcity.nsw.gov.au>

Any representations that you make will be considered prior to the issuing of the Order. This may result in modification of the terms of the Order, or in the matter not progressing to the service of the Order. It is also advised that the Order may be issued without modification.

Yours faithfully,

Mr L Moore
Environmental Health Officer

PROPOSED TERMS OF ORDER 22
Section 124 Local Government Act 1993

To store, treat, process, collect, remove, dispose of or destroy waste which is on land or premises in a manner specified in the order, provided that it is not inconsistent with regulations made under the Protection of the Environment Operations Act 1997

Proposed terms of Order

Lot 32 DP 258949, 106 – 124 Aldington Road MOUNT VERNON NSW 2178

Works Required.		To be completed by.
1	<p>(i) The Owner is required to enter into an annual contract with a suitability qualified and experienced aerated wastewater treatment system (AWTS) service agent to service the AWTS at the above property. The contract shall be for servicing and associated reporting every three months.</p> <p>(ii) A copy of the annual contract with the service contractor shall be provided to Penrith Council.</p> <p>Also</p> <p>(iii) All service reports are to be kept onsite in hard copy.</p> <p>(iv) Copies of the quarterly service reports are to be forwarded to Penrith City Council within 14 days of servicing the AWTS.</p>	Within 14 days from the date of the Order.

Reason for Proposed Order

A review of Council records indicates that service maintenance reports for the Aerated Wastewater Treatment System (AWTS) at the abovementioned property are outstanding. It is apparent that the Aerated Wastewater Treatment System is not being serviced on a quarterly basis in accordance with the relevant conditions of its NSW Health Accreditation.

Council is concerned that effluent is not being treated for disposal in accordance with Council's On-Site Sewage Management and Greywater Reuse Policy, applicable NSW Health requirements, and the relevant Australian Standards. This poses a high environmental health risk.

As such the above work is required to ensure that effluent is being treated and disposed of in a satisfactory manner.

Proposed Period for Compliance

As stated in table above.

Please note:

An inspection of the above works may be required should approval be granted. No charge is applicable for this initial compliance inspection. Should the works not be completed, and further compliance inspections be required, a 'compliance inspection and assessment fee' of \$149 (per hour or part thereof, minimum \$149) will be charged in accordance with Council's Fee and Charges document.

Non-compliance with an Order (if served) also may result in fines being issued and Council may do all things as are necessary or convenient to give effect to the terms of the Order, including the carrying out of any work required by the Order.

OSSM1621/05
(02) 4732 8055

29 March 2016

S Criniti, P Criniti, F Criniti
PO Box 469
FLEMINGTON MARKETS NSW 2129

Dear Salvatore Criniti
Peter Criniti
Frank Criniti

**Re: Approval to Operate an On-Site Sewage Management System
Lot 32 DP 258949 , 106-124 Aldington Road KEMPS CREEK NSW
2178**

The Local Government Act 1993 and Penrith City Council's On-site Sewage Management and Greywater Reuse (OSMGR) Policy requires all on-site sewage management systems to have an operational approval. The Policy provides provisions for the administration and monitoring of on-site sewage management systems within the City.

Your previous operational approval has or is about to expire. Please find attached a copy of your current operational approval. Based on the provisions of the OSMGR Policy, your operational approval is valid until 30 March 2019. A charge of \$61 applies for this approval and will be added to your next rates notice.

It is important that you read your approval as you are required to operate your system in accordance with the attached conditions at all times.

Council does not need to inspect your system at present. However should an inspection be required in the future, Council will contact you to make suitable arrangements.

Please note that failure to comply with your approval can result in further action such as on-the-spot fines of \$330.

Should you have any questions relating to this matter, please contact the Environmental Health Department on (02) 4732 8055 during normal business hours.

Yours faithfully



Mitchell Nobbs
Environmental Health Department

APPROVAL TO OPERATE A SYSTEM OF SEWAGE MANAGEMENT
LOCAL GOVERNMENT (GENERAL) REGULATION 2005

Approval has been granted to:	Salvatore Criniti Peter Criniti Frank Criniti
For the operation of the Sewage Management System installed at:	Lot 32 DP 258949 106-124 Aldington Road KEMPS CREEK NSW 2178
System type:	Septic Tank
Approval Issue Date:	29 March 2016

THIS APPROVAL IS SUBJECT TO THE FOLLOWING CONDITIONS:

1. This approval extends to concurrent owners and occupiers of the premises where the system is installed.
2. The owner must provide a copy of this approval to all current tenants and/or occupiers of the property that the approval relates.
3. Access must be provided to an authorised Council Officer to carry out inspections in accordance with sections 191 to 194 of the Local Government Act 1993, of any premises, facilities or records related to the operation of the on-site sewage management system.
4. No alterations or additions to the on-site sewage management system are permitted without the written approval of Council.
5. The system must be managed and operated to achieve the performance standards as set out in clause 44 of the Local Government (General) Regulation 2005. These are:
 - i. the prevention of the spread of disease by micro-organisms,
 - ii. the prevention of the spread of foul odours,
 - iii. the prevention of the contamination of waters,
 - iv. the prevention of the degradation of soil and vegetation,
 - v. the discouragement of insects and vermin,
 - vi. ensuring that persons do not come into contact with untreated sewage or effluent (whether treated or not) in their ordinary activities on the premises concerned,
 - vii. the minimisation of any adverse impacts on the amenity of the premises and surrounding lands.
 - viii. if appropriate, provision for the re-use of resources (including nutrients, organic matter and water).

6. The system must be operated so as to allow the removal of any treated or untreated sewage or by-product of sewage in a safe and sanitary manner.
7. All wastewater generated on the property including greywater and blackwater is to be directed to the on-site sewage management system unless otherwise approved in writing by Penrith City Council.
8. The system must be operated and maintained in accordance with the relevant operating specifications and procedures for the component facilities, so as to allow disposal of treated sewage in a safe and sanitary manner.
9. The conditions of any certificate of accreditation issued by the Director-General of the Department of Health under the Local Government (General) Regulation 2005 in respect of the plans or designs for any components of the on-site sewage management system must be complied with.
10. All house drainage and sanitary plumbing shall be carried out in accordance with the requirements of the Plumbing and Drainage Act 2011 and the Plumbing Code of Australia.
11. All plumbing and drainage work shall be carried out by a licensed plumber and drainer.
12. Tank lids shall not be permanently covered. The join between the lid and the tank shall be exposed and remain sealed to ensure surface water cannot enter the tank.
13. The ground surrounding the tanks is to be graded and drained to prevent water ponding around the tanks.
14. The inspection holes/caps on the tanks are to be clear and easily accessible.
15. The on-site sewage management system must be operated in a manner which must not discharge effluent into any watercourse or onto land other than its related effluent disposal area.
16. The system shall be operated in such a way as to prevent any run-off of effluent from the effluent disposal area.
17. All stormwater and seepage from higher levels shall be diverted away from the effluent disposal area/s by a suitable drain or earth mound. Such drains/mounds shall be maintained in a satisfactory condition at all times.
18. Any wastes (inclusive of petroleum based products, biocides and acids) that have an adverse effect on the performance of the system shall not be discharged into the on-site sewage management system.
19. Liquid trade wastes are not to be discharged directly into the on-site sewage management system unless otherwise approved in writing by Penrith City Council.
20. Effluent from the on-site sewage management system is not to be used on fruit or vegetables grown for human consumption.
21. The effluent disposal area is not to be used for recreational purposes or vehicular access or storage.

22. No paths, concreting, garages or any other structure shall be constructed over any portion of the effluent disposal area.
23. The effluent disposal area is to be mown on a regular basis to ensure the system operates in a satisfactory manner.
24. Livestock are to be prevented from damaging the on-site sewage management system, including the associated effluent disposal area.
25. Should more than one effluent disposal area be used, the system must be installed to ensure that an effluent disposal area is available at all times.
26. No deep rooted trees or shrubs should be grown over the effluent disposal area.

Yours Faithfully

A handwritten signature in black ink, consisting of a stylized, cursive 'A' followed by a small flourish.

Environmental Health Department

Ref: EC:MG Property No: 105004
Contact: Development Services
Telephone: (02) 4732 7991
Certificate No: 17/0354.01

Your Ref: 6020025632-2

09 August 2017

Infotrack
Dx578
SYDNEY NSW 2000

Dear Sir/Madam

CERTIFICATE OF OUTSTANDING NOTICES AND ORDERS

Section 735A Local Government Act 1993, and Section 121ZP Environmental Planning and Assessment Act 1979

I refer to your application for advice on outstanding Notices and Orders under the above Sections of the Local Government Act, 1993 and the Environmental Planning and Assessment Act 1979.

Description of Land:

Land No: 24522

Legal Description: Lot 31 DP 258949

Address: 126-142 Aldington Road KEMPS CREEK NSW 2178

An examination of Council's records has revealed that the following outstanding Notices, Orders or Written Directions relate to the property described above as at the date of this certificate.

There is an outstanding order relating to this property:

Order No. 22 LOCAL GOVERNMENT ACT 1993, SECTION 124 served under the Local Government Act 1993, regarding two On Site Sewage Management systems failing dated 6 June 2011.

If you wish to discuss this matter further, please contact Environmental Health Department on 4732 8055.

This certificate only relates to notices or orders under the Local Government Act and Environmental Planning and Assessment Act. Please note the Certificate does not include reference to any Notices or Orders issued in the time period prior to seven (7) years from the date this certificate is issued.

Should you wish to discuss this matter please do not hesitate to call me during normal business hours.

Yours faithfully

Maya Goldsmith
on behalf of the Development Services Manager

Our Ref: OSSM: 1623/05 & OSSM0065/08
Contact: K Blain
Telephone: (02) 4732 7724

6th June 2011

Dear Sir/Madam,

ORDER NO. 22
LOCAL GOVERNMENT ACT 1993, SECTION 124

You are hereby ordered by Penrith City Council pursuant to the powers conferred by Section 124, Order No. 22 of the *Local Government Act 1993* to carry out the undermentioned work within the specified time period.

Situation of premises to which this Order refers:

Lot 31 DP258949 –126-142 Aldington Rd Kemps Creek NSW 2178

Specified work to be performed:

1. Within thirty (30) days, provide Council with a Plan of Action for both systems, detailing the proposed action to be taken to ensure the On Site Sewage Management System is working in a satisfactory manner and compliant with the relevant Australian Standards.

This may include connecting the septic tank to a disposal area or constructing a new disposal area. **If a new disposal area is to be constructed, the Plan of Action is to be approved by Council before the works commence.** The Plan of Action is to detail the size, location and construction of the new disposal area and must comply with the relevant Australian Standards. Please also include in the plan the details of the person conducting the works as it is a requirement of Council that the works are carried out by a suitably qualified and licensed plumber experienced in wastewater management.

Note: If your plan is to install a New On Site Sewage Management system. This will require an application under Section 68 of the Local Government Act 1993 to be submitted for approval by Council prior to any works being carried out.

Reason for the issue of this Order:

- An inspection was carried out on 23rd February 2011 revealed that the two On Site Sewage Management systems - Land applications were failing with effluent pooling on the ground surface from both systems.

There was a temporary fence in place which extended to go around both systems.

Throughout both land application systems there were a number of large holes which may have been left by livestock. Within these holes there was pooling effluent. When the ground was disturbed (walked on), the area was extremely wet and the pressure of me walking around the area left marks in the ground and in some places I started to sink. When disturbed there was an effluent odour present.

Samples were taken at two points within both land application systems. The results showed high bacteria levels. Effluent from the property is therefore not being disposed of appropriately.

- NISO was issued on the 14/03/2011 requesting a plan of action. A copy of the NISO was sent to home address as well.
- No information has been received by Council, a follow up phone conversation with the owners son in law stated that whilst a plumber had been out no further works/action has been taken.
- An inspection was booked for the 16-5-11 but was cancelled due to son in laws work commitments.
- No reinspection has been granted or any further information regarding the requested plan of action has been received by Council to date.

As such the effluent waste on the above property is not being disposed of in a satisfactory manner. The above work is required to ensure the effluent is dealt with satisfactorily.

Failure to Comply with Order

Section 628 of the *Local Government Act 1993* states:

1. A person who fails to comply with an Order given to the person under Part 2 of Chapter 7 that is an Order in the terms of Orders Nos. 1-17 of the Table to Section 124 is guilty of an offence. Maximum penalty is 50 penalty points (**\$5,000**) in the case of an individual, or 100 penalty points (**\$10,000**) in the case of a corporation. 1 penalty point = \$100.
2. A person who fails to comply with an Order given to the person under Part 2 of Chapter 7 that is an Order in the terms of Orders Nos. 18-29 of the Table to Section 124 is guilty of an offence. Maximum penalty is 20 penalty points (**\$2,000**). 1 penalty point = \$100.

Failure to comply with this Order may result in the work being carried out at your cost without further notice. Your attention is drawn to the following provisions of the Act:

- 678 (1) If a person fails to comply with the terms of an Order given to the person under Part 2 of Chapter 7, the Council may do all such things as are necessary or convenient to give effect to the terms of the Order, including the carrying out of any work required by the Order.

Any expenses incurred by the Council under this Section, together with all its associated costs, may be recovered by the Council in any court of competent jurisdiction as a debt due to the Council by the person concerned.

Right of Appeal

Section 180 of the *Local Government Act 1993* provides that a person upon whom an Order is served may appeal against the Order to the Land and Environment Court within twenty-eight (28) days after the service of the Order on the person. On the hearing of the appeal, the court may revoke or modify the order or substitute for the Order any other Order that the Council could have made or find that the Order is sufficiently complied with or make such Order with respect to compliance with the Order as the court thinks fit or make any other Order with respect to the Order as the court thinks fit.

Please note it is your responsibility to contact Council for a reinspection once the required works are completed. If the works are not carried out at the expiration of the allotted time period, an automatic fine will be issued.

By Order

Kristin Blain
Environmental Health Department

Ref: EC:MG Property No: 105004
Contact: Development Services
Telephone: (02) 4732 7991
Certificate No: 17/0354.01

Your Ref: 6020025632-2

09 August 2017

Infotrack
Dx578
SYDNEY NSW 2000

Dear Sir/Madam

CERTIFICATE OF OUTSTANDING NOTICES AND ORDERS

Section 735A Local Government Act 1993, and Section 121ZP Environmental Planning and Assessment Act 1979

I refer to your application for advice on outstanding Notices and Orders under the above Sections of the Local Government Act, 1993 and the Environmental Planning and Assessment Act 1979.

Description of Land:

Land No: 24522

Legal Description: Lot 31 DP 258949

Address: 126-142 Aldington Road KEMPS CREEK NSW 2178

An examination of Council's records has revealed that the following outstanding Notices, Orders or Written Directions relate to the property described above as at the date of this certificate.

There is an outstanding order relating to this property:

Order No. 22 LOCAL GOVERNMENT ACT 1993, SECTION 124 served under the Local Government Act 1993, regarding two On Site Sewage Management systems failing dated 6 June 2011.

If you wish to discuss this matter further, please contact Environmental Health Department on 4732 8055.

This certificate only relates to notices or orders under the Local Government Act and Environmental Planning and Assessment Act. Please note the Certificate does not include reference to any Notices or Orders issued in the time period prior to seven (7) years from the date this certificate is issued.

Should you wish to discuss this matter please do not hesitate to call me during normal business hours.

Yours faithfully

Maya Goldsmith
on behalf of the Development Services Manager

Our Ref: OSSM: 1623/05 & OSSM0065/08
Contact: K Blain
Telephone: (02) 4732 7724

6th June 2011

Dear Sir/Madam,

ORDER NO. 22
LOCAL GOVERNMENT ACT 1993, SECTION 124

You are hereby ordered by Penrith City Council pursuant to the powers conferred by Section 124, Order No. 22 of the *Local Government Act 1993* to carry out the undermentioned work within the specified time period.

Situation of premises to which this Order refers:

Lot 31 DP258949 –126-142 Aldington Rd Kemps Creek NSW 2178

Specified work to be performed:

1. Within thirty (30) days, provide Council with a Plan of Action for both systems, detailing the proposed action to be taken to ensure the On Site Sewage Management System is working in a satisfactory manner and compliant with the relevant Australian Standards.

This may include connecting the septic tank to a disposal area or constructing a new disposal area. **If a new disposal area is to be constructed, the Plan of Action is to be approved by Council before the works commence.** The Plan of Action is to detail the size, location and construction of the new disposal area and must comply with the relevant Australian Standards. Please also include in the plan the details of the person conducting the works as it is a requirement of Council that the works are carried out by a suitably qualified and licensed plumber experienced in wastewater management.

Note: If your plan is to install a New On Site Sewage Management system. This will require an application under Section 68 of the Local Government Act 1993 to be submitted for approval by Council prior to any works being carried out.

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Failure to Comply with Order

Section 628 of the *Local Government Act 1993* states:

1. A person who fails to comply with an Order given to the person under Part 2 of Chapter 7 that is an Order in the terms of Orders Nos. 1-17 of the Table to Section 124 is guilty of an offence. Maximum penalty is 50 penalty points (**\$5,000**) in the case of an individual, or 100 penalty points (**\$10,000**) in the case of a corporation. 1 penalty point = \$100.
2. A person who fails to comply with an Order given to the person under Part 2 of Chapter 7 that is an Order in the terms of Orders Nos. 18-29 of the Table to Section 124 is guilty of an offence. Maximum penalty is 20 penalty points (**\$2,000**). 1 penalty point = \$100.

Failure to comply with this Order may result in the work being carried out at your cost without further notice. Your attention is drawn to the following provisions of the Act:

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Any expenses incurred by the Council under this Section, together with all its associated costs, may be recovered by the Council in any court of competent jurisdiction as a debt due to the Council by the person concerned.

Right of Appeal

Section 180 of the *Local Government Act 1993* provides that a person upon whom an Order is served may appeal against the Order to the Land and Environment Court within twenty-eight (28) days after the service of the Order on the person. On the hearing of the appeal, the court may revoke or modify the order or substitute for the Order any other Order that the Council could have made or find that the Order is sufficiently complied with or make such Order with respect to compliance with the Order as the court thinks fit or make any other Order with respect to the Order as the court thinks fit.

Please note it is your responsibility to contact Council for a reinspection once the required works are completed. If the works are not carried out at the expiration of the allotted time period, an automatic fine will be issued.

By Order

Kristin Blain
Environmental Health Department

Ref: RG Property No: 105013
Contact: Development Services
Telephone: (02) 4732 7991
Certificate No: 17/0345.01

Your Ref: 6020025632-1-#37749594#

06 September 2017

Infotrack
D X 578
SYDNEY

Dear Sir/Madam

CERTIFICATE OF OUTSTANDING NOTICES AND ORDERS

**Section 735A Local Government Act 1993, and
Section 121ZP Environmental Planning and Assessment Act 1979**

I refer to your application for advice on outstanding Notices and Orders under the above Sections of the Local Government Act, 1993 and the Environmental Planning and Assessment Act 1979.

Description of Land:

Land No: 24523

Legal Description: Lot 32 DP 258949

Address: 106-124 Aldington Road KEMPS CREEK NSW 2178

An examination of Council's records has revealed that the following outstanding Notices, Orders or Written Directions relate to the property described above as at the date of this certificate.

There are no outstanding notices

This certificate only relates to notices or orders under the Local Government Act and Environmental Planning and Assessment Act. Please note the Certificate does not include reference to any Notices or Orders issued in the time period prior to seven (7) years from the date this certificate is issued.

Should you wish to discuss this matter please do not hesitate to call me during normal business hours.

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on behalf of the Development Services Manager**

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Yours faithfully

Maya Goldsmith
on behalf of the Development Services Manager

Ref: LS Property No: 105013
Contact: Development Services
Telephone: (02) 4732 7991
Certificate No: 18/0041.01

Your Ref: 80401-#43705921#

12 February 2018

Infotrack
D X 578
SYDNEY

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Ref: RG Property No: 105004
Contact: Development Services
Telephone: (02) 4732 7991
Certificate No: 18/0040.01

Your Ref: 80400-#43685213#

21 February 2018

Infotrack
D X 578
SYDNEY

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By Order

Kristin Blain
Environmental Health Department



Penrith City Council

Council Chambers, Station Street, Penrith, N.S.W.

All communications to be addressed to:
The Town Clerk, P.O. Box 329, Penrith, N.S.W. 2750

Telephone: (047) 32 2422 (C.D.E. 8017, Penrith)

In reply please quote:

PERMIT NO. E/1135/81

BUILDING PERMIT

REF. KT

ISSUED IN RESPECT OF LOT NO. 31 D.P. 258949 House No.

STREET Aldington Rd LOCALITY Kemps Creek

Applicant's Name & Address	Owner's Name & Address	Builder's Name & Address
A. Criniti, Lot 29 Jardine Dr., Preston.	Applicant	Applicant

Approved subject to compliance with the Local Government Act, relevant Ordinances issued thereunder and conditions No'd. 2, 6, 10, 12, 13, 17, 25 as set out below for the erection of DWELLING for the value of \$ 80,000

This approval lapses on the expiration of 12 months after the date hereof.

Attention is drawn to the provisions of Section/s 317L (and 288C in regard to fencing of swimming pools) of the Local Government Act, 1919, as amended, giving a right of appeal against the decision of the Council. Appeal forms are available at Council's office.

Date 24 - 9 - 81

D.C. Hawkins
Principal Building Inspector

Floor Area

Material

CONDITIONS:

1. IMPORTANT. A CLEAR 900 mm MUST BE PROVIDED BETWEEN EXTERNAL WALLS OF DWELLING AND SIDE BOUNDARIES. A CLEAR 675 mm MUST BE PROVIDED BETWEEN THE OVERHANGING OF THE EAVES AND GUTTERING AND THE SIDE BOUNDARIES.
2. That 48 hours notice in writing be given to Council for inspection of trenches before foundations are laid, foundations before trenches are filled, the building has been erected to floor level and dampcourses are laid, steel for reinforced structural concrete work is in position prior to pouring of concrete, the building has been erected to roof framing, drains before they are covered in and when the building is completed and ready for occupation. Building shall not be used or occupied until approval is granted by Council.
3. Stamped plan, specification and permit is to be kept on site at all times.
4. Approved in compliance with the conditions of the Metropolitan Water Sewerage and Drainage Board as stamped on plans.
5. A special inspection by Penrith City Council must be obtained on all sanitary plumbing and drainage in respect to work outside the sewered areas of the Metropolitan Water Sewerage and Drainage Board.
6. Council's Building Inspector shall be consulted prior to any drainage work being undertaken.
7. A sewered toilet shall be provided for workmen during building operations.
8. A special inspection by the Water Board shall be obtained on all internal/external drainage.
9. Roofwater drains shall be discharged into street gutter or common line.
10. Sanitary accommodation shall be provided for workmen in accordance with Ordinance 44.
11. courses minimum brickwork beneath bearers.
12. Garage shall not be used for Living, Commercial or Industrial purposes.
13. Separate application shall be submitted for septic tank installation.
14. CAUTION drainage easement at
15. This land is subject to a Tree Preservation Order which prohibits the ringbarking, cutting down, topping, lopping, removing or wilful destruction of any tree, except with the consent of Council.
16. No fencing is to be erected in front of the adopted building alignment.

FOR ADDITIONAL CONDITIONS SEE REVERSE

17. The finished floor level of concrete slabs for habitable rooms shall be a min. of 150mm above surrounding finished ground level including paving.
18. All surface and seepage water shall be diverted clear of the dwelling and disposed to Council's satisfaction. Note: Council will require permanent surface drains to all excavated areas and depressions and the invert of the drain shall be a min. of 150mm below finished habitable floor level and shall be graded 1:100 to the stormwater system or to a point satisfactory to Council's Health and Building Surveyor.
19. The subfloor ground area shall be treated for termites in accordance with AS 2057 and the certificate provided for Council's records.
20. The dwelling shall not be occupied until all services are completed and operating.
21. All footings shall be taken to an adequate natural foundation material or alternatively designed by a practising Structural Engineer.
22. Any exhaust fan in a canopy over a stove shall be ducted in a metal or non-combustible duct through the roof to the outside air to Council's satisfaction.
23. Floor surface of internal WC/Laundry/Bathrooms/Ensuites and the like shall be graded and drained in accordance with the requirements of Clause 47.8(1) of Ord. 70.
24. Easement for Transmission line 60.96m wide at front of property.
25. Roofwater shall be drained to Council's satisfaction.



PENRITH CITY COUNCIL

Council Chambers, Station Street, Penrith, N.S.W. 2750

Telephone: (047) 32 7777

(DX 8017, Penrith)

OUR REF:

OUR REF: 028707

CONTACT: MR MITCHELL 327511

BUILDING PERMIT

PERMIT NO: 28707
REF:

ISSUED TO: A CRINITI
LOT 31 ALDINGTON ROAD
KEMPS CREEK 2171

OF
IN RESPECT OF

LOT NO: 31 D.P: 258949 HOUSE NO: 0000 STREET: ALDINGTON RD
LOCALITY: KEMPS CREEK

-----OWNER'S NAME AND ADDRESS-----
A CRINITI
LOT 31 ALDINGTON ROAD
KEMPS CREEK 2171

-----BUILDER'S NAME AND ADDRESS-----
SAMCRINITI
LOT 31 ALDINGTON ROAD
KEMPS CREEK 2171

APPROVED SUBJECT TO COMPLIANCE WITH THE LOCAL GOVERNMENT ACT, RELEVANT
ORDINANCES ISSUED THEREUNDER AND CONDITIONS NUMBERED; 12, 14, 16, 18, 20, 22,
26, 28, 30, 32, 39, 40, 42, 54, 58, 62, 64, 66, 74, 76, 78, 551, 552, 901, 903, 904,

HEREUNDER FOR THE ERECTION OF
A DWELLING/CUSTOM BRICK VENEER/OUTBUILDING FOR THE VALUE OF \$166803.

THIS APPROVAL LAPSES ON THE EXPIRATION OF 12 MONTHS AFTER THE DATE HEREOF.

ATTENTION IS DRAWN TO THE PROVISIONS OF SECTION/S 317L (AND 288C IN REGARD
TO FENCING OF SWIMMING POOLS) OF THE LOCAL GOVERNMENT ACT, 1919, AS AMENDED,
GIVING A RIGHT OF APPEAL AGAINST THE DECISION OF COUNCIL. APPEAL FORMS ARE
AVAILABLE AT COUNCIL'S OFFICE.

DATE: 11/6/91

SIGNED: G.L. RUMBLE, per:

(HEALTH AND BUILDING SERVICES MANAGER)

DATE: / /

SIGNED:

(PERSON COLLECTING PLANS)

CONDITIONS:

12. IMPORTANT. A CLEAR 900MM MUST BE PROVIDED BETWEEN EXTERNAL WALLS OF
DWELLING AND SIDE BOUNDARIES. A CLEAR 675MM MUST BE PROVIDED BETWEEN THE
OVERHANGING OF THE EAVES GUTTERING AND THE SIDE BOUNDARIES.

14. THAT 48 HOURS' NOTICE IN WRITING BE GIVEN TO COUNCIL FOR INSPECTION:-
(A) OF TRENCHES BEFORE FOOTINGS ARE LAID;
(B) OF FOOTINGS BEFORE TRENCHES ARE FILLED;

CONTINUED...



PENRITH CITY COUNCIL

Council Chambers, Station Street, Penrith, N.S.W. 2750

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APPLICATION NO: 028707

PERMIT NO: 028707

FOLIO NO: 2

- (C) WHEN THE BUILDING HAS BEEN ERECTED TO FLOOR LEVEL AND DAMPCOURSES ARE LAID;
- (D) OF FLASHING AND DAMP-PROOFING OF WET AREAS (VIZ. BATHROOMS, LAUNDRIES, ENSUITES AND W.C.) PRIOR TO CLADDING.
- (E) WHEN STEEL FOR REINFORCED STRUCTURAL CONCRETE WORK IS IN POSITION PRIOR TO POURING OF CONCRETE;
- (F) WHEN THE BUILDING HAS BEEN ERECTED TO ROOF FRAMING;
- (G) OF DRAINS BEFORE THEY ARE COVERED IN; AND
- (H) WHEN THE BUILDING IS COMPLETED AND READY FOR OCCUPATION.

16. BUILDING SHALL NOT BE USED OR OCCUPIED UNTIL APPROVAL IS GRANTED BY COUNCIL.

18. STAMPED PLANS, SPECIFICATION AND PERMIT SHALL BE KEPT ON SITE AT ALL TIMES.

20. APPROVED IN COMPLIANCE WITH THE CONDITIONS OF THE WATER BOARD

22. A SPECIAL INSPECTION BY PENRITH CITY COUNCIL MUST BE OBTAINED ON ALL SANITARY PLUMBING AND DRAINAGE IN RESPECT OF WORK OUTSIDE THE SEWERED AREAS OF THE METROPOLITAN WATER, SEWERAGE AND DRAINAGE BOARD.

26. ROOFWATER DRAINS SHALL BE DISCHARGED INTO STREET GUTTER OR COMMON LINE.

28. SANITARY ACCOMMODATION SHALL BE PROVIDED FOR WORKMEN IN ACCORDANCE WITH THE REQUIREMENTS OF ORDINANCE 44.

30. SEPARATE APPLICATION SHALL BE SUBMITTED FOR SEPTIC TANK INSTALLATION.

32. THIS LAND IS SUBJECT TO A TREE PRESERVATION ORDER WHICH PROHIBITS THE RINGBARKING, CUTTING DOWN, TOPPING, LOPPING, REMOVING OR WILFUL DESTRUCTION OF ANY TREE, EXCEPT WITH THE CONSENT OF COUNCIL.

39. (A) THE SUB-FLOOR GROUND AREA OF THE BUILDING SHALL BE PROTECTED AGAINST TERMITE INFESTATION BY ONE OF THE FOLLOWING METHODS:-

(1) AN APPLICATION OF APPROVED CHEMICALS IN ACCORDANCE WITH THE PROVISION OF AUSTRALIAN STANDARD 2057 "PROTECTION OF BUILDINGS FROM SUBTERRANEAN TERMITES - CHEMICAL TREATMENT FOR BUILDINGS UNDER CONSTRUCTION". A TREATMENT CERTIFICATE MUST BE SUBMITTED TO COUNCIL AND MUST INDICATE THAT THE TREATMENT HAS BEEN PERFORMED IN ACCORDANCE WITH AS 2057.

(2) ANY OTHER METHOD APPROVED BY COUNCIL FOLLOWING A SUBMISSION OF RELEVANT SUPPORTING DOCUMENTATION BY THE BUILDING APPLICANT OR OWNER.

(B) THE PERIMETER OF THE BUILDING SHOULD BE TREATED FOR TERMITES IN ACCORDANCE WITH AUSTRALIAN STANDARD 2057 "PROTECTION OF BUILDINGS FROM SUBTERRANEAN TERMITES - CHEMICAL TREATMENT FOR BUILDINGS UNDER CONSTRUCTION".

THE APPROPRIATE TIME TO PERFORM THIS TREATMENT IS WHEN ALL AREAS

CONTINUED



PENRITH CITY COUNCIL

Council Chambers, Station Street, Penrith, N.S.W. 2750

Telephone: (047) 32 7777

(DX 8017, Penrith)

APPLICATION NO: 028707

PERMIT NO: 028707

FOLIO NO: 3

ADJOINING THE BUILDING ARE LANDSCAPED, PATHS ARE LAID AND ANY OTHER IMPROVEMENTS ARE COMPLETED SO THAT BRIDGING OF ANY PERIMETER TREATMENT DOES NOT RENDER THIS TREATMENT INEFFECTIVE.

(C) THESE TREATMENTS ARE RECOMMENDED ONLY. COUNCIL ACCEPTS NO RESPONSIBILITY FOR FAILURE OF THEM.

(D) LANDSCAPING AROUND A BUILDING CAN LEAD TO TERMITE INFESTATION. YOU SHOULD CONSULT YOUR PEST CONSULTANT REGARDING SUITABLE LANDSCAPING TO REDUCE THE LIKELIHOOD OF ANY INFESTATION.

40. THE FLOOR LEVEL OF CONCRETE SLABS FOR HABITABLE ROOMS SHALL BE A MINIMUM OF 225MM ABOVE SURROUNDING FINISHED GROUND LEVEL.

42. ALL SURFACE AND SEEPAGE WATER SHALL BE DIVERTED CLEAR OF THE DWELLING AND DISPOSED OF TO COUNCIL'S SATISFACTION. (NOTE: COUNCIL WILL REQUIRE PERMANENT SURFACE DRAINS TO ALL EXCAVATED AREAS AND DEPRESSIONS AND THE INVERT OF THE DRAIN SHALL BE A MINIMUM OF 225MM BELOW FINISHED HABITABLE FLOOR LEVEL AND SHALL BE GRADED 1:100 TO THE STORMWATER SYSTEM OR TO A POINT SATISFACTORY TO COUNCIL'S HEALTH AND BUILDING SURVEYOR.

54. SEPARATE DETAILS OF THE FIREPLACE AND CHIMNEY CONSTRUCTION SHALL BE SUBMITTED TO COUNCIL FOR CONSIDERATION AND APPROVAL PRIOR TO THE COMMENCEMENT OF WORK. (NOTE: SUCH DETAILS SHALL BE IN ACCORDANCE WITH ORD. 70, PART 25.

58. ANY EXHAUST FAN IN A CANOPY OVER A STOVE SHALL BE DUCTED IN A METAL OR NON-COMBUSTIBLE DUCT TO THE OUTSIDE AIR TO COUNCIL'S SATISFACTION.

62. MANUFACTURER'S DETAILS OF ROOF TRUSSES ARE TO BE SUBMITTED FOR COUNCIL'S CONSIDERATION AND APPROVAL PRIOR TO THE INSTALLATION OF THE TRUSSES.

64. FLOOR SURFACE OF INTERNAL W.C./LAUNDRY/BATHROOM/ENSUITE AND THE LIKE SHALL BE GRADED AND DRAINED IN ACCORDANCE WITH THE REQUIREMENTS OF CLAUSE 47.2(1) OF ORDINANCE 70.

66. ALL STRUCTURAL STEEL BEAMS/COLUMNS SHALL BE CERTIFIED BY A PRACTISING STRUCTURAL ENGINEER AND THE CERTIFICATION SUBMITTED FOR COUNCIL'S APPROVAL PRIOR TO THEIR INSTALLATION.

74. ALL EXCAVATED AND FILLED BANKS SHALL BE RETAINED TO COUNCIL'S SATISFACTION.

76. ALL FOOTINGS SHALL BE TAKEN TO AN ADEQUATE NATURAL FOUNDATION MATERIAL OR, ALTERNATIVELY, DESIGNED BY A PRACTISING STRUCTURAL ENGINEER.

78. A PROTECTIVE BALUSTRADE OR GUARD SHALL BE PROVIDED ALONG THE SIDE OF ANY STAIRWAY, RAMP, CORRIDOR, HALLWAY, LANDING, BALCONY/VERANDAH, WHICH IS NOT BOUNDED BY A WALL AND WHICH IS IN EXCESS OF 1M OR 5 STAIRWAY RISERS ABOVE FINISHED LEVEL OF ADJOINING FLOOR OR GROUND.

THIS APPROVAL IS SUBJECT TO COMPLIANCE WITH DEVELOPMENT CONSENT NOTICE

1000



PENRITH CITY COUNCIL

Council Chambers, Station Street, Penrith, N.S.W. 2750

Telephone: (047) 32 7777

(DX 8017, Penrith)

APPLICATION NO: 028707 PERMIT NO: 028707 FOLIO NO: 4

NUMBER 390/90.

52. ALL LAND REQUIRED FOR VEHICULAR ACCESS WITHIN THE SITE IS TO BE STABILIZED IN A MANNER SATISFACTORY TO THE COUNCIL.

REQUIREMENTS OF OTHER AUTHORITIES

VEHICULAR DRIVEWAYS ARE NOT TO BE PLACED WITHIN 1 METRE OF A BOUNDARY ON WHICH IS LOCATED AN ELECTRICITY PILLAR. FURTHER DETAILS ARE AVAILABLE FROM PROSPECT ELECTRICITY.

01. WARNING: THESE BUILDING PLANS MUST BE SUBMITTED TO ANY BUSINESS OFFICE OF THE METROPOLITAN WATER, SEWERAGE AND DRAINAGE BOARD, AT LEAST 14 DAYS BEFORE COMMENCEMENT OF WORK.
- THE PLANS AND A BUILDING APPLICATION FORM, AVAILABLE AT BUSINESS OFFICES, NEED TO BE SUBMITTED TO ENSURE THAT THE PROPOSED STRUCTURE MEETS THE REQUIREMENTS OF THE BOARD'S BY-LAWS CONCERNING:-
- 1) LOCATION OF SANITARY FIXTURES,
 - 2) RELATIONSHIP OF THE BUILDING TO WATER MAINS, SEWERS AND STORMWATER CHANNELS,
- AND FOR VALUING PURPOSES IN CONNECTION WITH SECTION 97 (4) AND (7) OF THE BOARD'S ACT, AND FOR THE CALCULATION OF A BUILDING FEE IN ACCORDANCE WITH BY-LAW 7 (1) (A) OF THE BOARD'S ACT.
- FAILURE TO SUBMIT THESE PLANS BEFORE COMMENCEMENT OF WORK WILL RENDER THE OWNER LIABLE TO A PENALTY AND MAY RESULT IN THE DEMOLITION OF THE WORK AT THE BUILDER'S EXPENSE.

BUSINESS OFFICES ARE LOCATED AT:-

BLACKTOWN	22 MAIN ST.	ROCKDALE	564 PRINCESS HWAY.
CAMPBELLTOWN	106 QUEEN ST.	LIVERPOOL	CNR BIGGE & MOORE STS.
CHATSWOOD	66-70 ARCHER ST.	MIRANDA	69-73 KIORA RD.
DEE WHY	687 PITTWATER RD.	PARRAMATTA	136 CHURCH ST.
FAIRFIELD	51 SMART ST.	PENRITH	140-142 HENRY ST.
HORNSBY	CNR EDGEWORTH DAVID AVE. & HUNTER ST.	SYDNEY	115-123 BATHURST ST.
KATOOMBA	103 KATOOMBA ST.	WOLLONGONG	406 COOMBE ST.
		CONISTON	OLD SPRINGHILL RD.

03. APPROVAL FOR THE SITE AND SIZE OF PROPOSED HOUSEHOLDER MAIL BOXES MUST BE OBTAINED FROM AUSTRALIA POST.

04. PROSPECT ELECTRICITY REQUIREMENTS ARE TO BE SOUGHT PRIOR TO COMMENCEMENT OF WORK IN RESPECT TO:- I) UNIMPEDED ACCESS AT ALL TIMES TO METER AND METERING EQUIPMENT; II) ANY CONSTRUCTION ADJACENT TO ANY ELECTRICAL EASEMENT; III) INSTALLATION OF ANY METALLIC OR CONDUCTIVE FENCING OR STRUCTURE WITHIN A FOUR METRE RADIUS (MEASURED FROM EXTREMITIES OF A PADMOUNTED SUBSTATION); IV) INSTALLATION OF CONDUITS ACROSS FOOTPATH APRON; V) ANY CUT OR FILL IN THE VICINITY OF A CABLE EASEMENT.



Penrith City Council

Council Chambers, Station Street, Penrith, N.S.W.

All communications to be addressed to:
The Town Clerk, P.O. Box 329, Penrith, N.S.W. 2750

Telephone: (047) 32 2422 (C.D.E. 8017, Penrith)

In reply please quote:

PERMIT NO. E/178/82

BUILDING PERMIT

REF. KT

ISSUED IN RESPECT OF LOT NO. 32 D.P. 258949 House No. _____
STREET Aldington Rd. LOCALITY Kemps Creek

Applicant's Name & Address	Owner's Name & Address	Builder's Name & Address
<u>M. Oakley</u> <u>Lot 32 Aldington Rd.,</u> <u>KEMPS CREEK</u>	<u>Applicant</u>	<u>Weather Protection Indust.</u> <u>164 Bungaree Rd.,</u> <u>PENDLE HILL</u>

Approved subject to compliance with the Local Government Act, relevant Ordinances issued thereunder and conditions No'd. 2-4, 12, 14, 17 as set out below for the erection of Awnings Scrn. Encl. for the value of \$ 2829

This approval lapses on the expiration of 12 months after the date hereof.

Attention is drawn to the provisions of Section/s 317L (and 288C in regard to fencing of swimming pools) of the Local Government Act, 1919, as amended, giving a right of appeal against the decision of the Council. Appeal forms are available at Council's office.

Date 4 - 3 - 82

D. C. Hawkins for P
Principal Building Inspector

Floor Area _____

Material _____

CONDITIONS:

1. IMPORTANT. A CLEAR 900 mm MUST BE PROVIDED BETWEEN EXTERNAL WALLS OF DWELLING AND SIDE BOUNDARIES. A CLEAR 675 mm MUST BE PROVIDED BETWEEN THE OVERHANGING OF THE EAVES AND GUTTERING AND THE SIDE BOUNDARIES.
2. That 48 hours notice in writing be given to Council for inspection of trenches before foundations are laid, foundations before trenches are filled, the building has been erected to floor level and dampcourses are laid, steel for reinforced structural concrete work is in position prior to pouring of concrete, the building has been erected to roof framing, drains before they are covered in and when the building is completed and ready for occupation. Building shall not be used or occupied until approval is granted by Council.
3. Stamped plan, specification and permit is to be kept on site at all times.
4. Approved in compliance with the conditions of the Metropolitan Water Sewerage and Drainage Board as stamped on plans.
5. A special inspection by Penrith City Council must be obtained on all sanitary plumbing and drainage in respect to work outside the sewered areas of the Metropolitan Water Sewerage and Drainage Board.
6. Council's Building Inspector shall be consulted prior to any drainage work being undertaken.
7. A sewered toilet shall be provided for workmen during building operations.
8. A special inspection by the Water Board shall be obtained on all internal/external drainage.
9. Roofwater drains shall be discharged into street gutter or common line.
10. Sanitary accommodation shall be provided for workmen in accordance with Ordinance 44.
11. _____ courses minimum brickwork beneath bearers.
12. Scrn. Encl. shall not be used for Living, Commercial or Industrial purposes.
13. Separate application shall be submitted for septic tank installation.
14. CAUTION _____ drainage easement at _____
15. This land is subject to a Tree Preservation Order which prohibits the ringbarking, cutting down, topping, lopping, removing or wilful destruction of any tree, except with the consent of Council.
16. No fencing is to be erected in front of the adopted building alignment.

FOR ADDITIONAL CONDITIONS SEE REVERSE

17. Roofwater shall be drained to Council's satisfaction.
18. Transmission easement 60.9m wide through lot.



Penrith City Council

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All communications to be addressed to:
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Telephone: (047) 32 2422 (C.D.E. 8017, Penrith)

In reply please quote:

PERMIT NO. E/1483/81

BUILDING PERMIT

REF. KT

ISSUED IN RESPECT OF LOT NO. 32 D.P. _____ House No. _____

STREET Aldington Rd. LOCALITY Kemps Creek

Applicant's Name & Address	Owner's Name & Address	Builder's Name & Address
M. Oakley 48 Grace Cres., MERRYLANDS	Applicant	Applicant

Approved subject to compliance with the Local Government Act, relevant Ordinances issued thereunder and conditions No'd. 2, 4, 12, 14, 17, 18 as set out below for the erection of Farm Shed for the value of \$ 4000

This approval lapses on the expiration of 12 months after the date hereof.

Attention is drawn to the provisions of Section/s 317L (and 288C in regard to fencing of swimming pools) of the Local Government Act, 1919, as amended, giving a right of appeal against the decision of the Council. Appeal forms are available at Council's office.

Date 7-12-81

D.C. Hawkins
Principal Building Inspector

Floor Area _____

Material _____

CONDITIONS:

1. IMPORTANT. A CLEAR 900 mm MUST BE PROVIDED BETWEEN EXTERNAL WALLS OF DWELLING AND SIDE BOUNDARIES. A CLEAR 675 mm MUST BE PROVIDED BETWEEN THE OVERHANGING OF THE EAVES AND GUTTERING AND THE SIDE BOUNDARIES.
2. That 48 hours notice in writing be given to Council for inspection of trenches before foundations are laid, foundations before trenches are filled, the building has been erected to floor level and dampcourses are laid, steel for reinforced structural concrete work is in position prior to pouring of concrete, the building has been erected to roof framing, drains before they are covered in and when the building is completed and ready for occupation. Building shall not be used or occupied until approval is granted by Council.
3. Stamped plan, specification and permit is to be kept on site at all times.
4. Approved in compliance with the conditions of the Metropolitan Water Sewerage and Drainage Board as stamped on plans.
5. A special inspection by Penrith City Council must be obtained on all sanitary plumbing and drainage in respect to work outside the sewered areas of the Metropolitan Water Sewerage and Drainage Board.
6. Council's Building Inspector shall be consulted prior to any drainage work being undertaken.
7. A sewerer toilet shall be provided for workmen during building operations.
8. A special inspection by the Water Board shall be obtained on all internal/external drainage.
9. Roofwater drains shall be discharged into street gutter or common line.
10. Sanitary accommodation shall be provided for workmen in accordance with Ordinance 44.
11. _____ courses minimum brickwork beneath bearers.
12. Shed shall not be used for Living, Commercial or Industrial purposes.
13. Separate application shall be submitted for septic tank installation.
14. CAUTION 60.96m transmission line 60.96m easement at front northern corner
15. This land is subject to a Tree Preservation Order which prohibits the ringbarking, cutting down, topping, lopping, removing or wilful destruction of any tree, except with the consent of Council.
16. No fencing is to be erected in front of the adopted building alignment.

17. Roofwater shall be drained to Council's satisfaction.
18. The farm shed shall not encroach on the transmission easement.

Our Ref: OSSM: 1623/05 & OSSM0065/08
Contact: K Blain
Telephone: (02) 4732 7724

14th March 2011

Antonio Criniti
C/O Robert
PO Box 469
FLEMINGTON MARKETS NSW 2129

Dear Sir/Madam

Section 132 Local Government Act 1993
NOTICE OF INTENTION TO SERVE ORDER
Lot 31 DP258949 –126-142 Aldington Rd Kemps Creek NSW 2178

A recent inspection by a Council Officer of your premises revealed that effluent waste is not being dealt with in a satisfactory manner. Attached you will find the terms of an Order proposed to be served upon you requiring certain actions to be undertaken so as to ensure that waste is being dealt with satisfactorily. Also enclosed please find additional information to assist in the preparation of a Plan of Action as required.

It is recommended that you consider the information provided and, within **thirty (30) days** from the date of this notice, make representations to Council as to why the Order should not be given or as to the terms of or period for compliance with the Order.

Representations may be made orally or in writing, both by you or on your behalf either:

1. Directly at Council's Civic Centre, 601 High Street, Penrith; or,
2. In writing to: The General Manager, PO Box 60, PENRITH 2751

Any representations that you make will be considered prior to the issuing of the Order. This may result in modification of the terms of the Order, or in the matter not progressing to the service of the Order.

Yours faithfully,

Kristin Blain
Environmental Health Officer

PROPOSED TERMS OF ORDER 22
Section 124 Local Government Act 1993

To store, treat, process, collect, remove, dispose of or destroy waste which is on land or premises in a manner specified in the order, provided that it is not inconsistent with regulations made under the Protection of the Environment Operations Act 1997

Proposed terms of Order

1. Within thirty (30) days, provide Council with a Plan of Action for both systems, detailing the proposed action to be taken to ensure the On Site Sewage Management System is working in a satisfactory manner and compliant with the relevant Australian Standards.

This may include connecting the septic tank to a disposal area or constructing a new disposal area. **If a new disposal area is to be constructed, the Plan of Action is to be approved by Council before the works commence.** The Plan of Action is to detail the size, location and construction of the new disposal area and must comply with the relevant Australian Standards. Please also include in the plan the details of the person conducting the works as it is a requirement of Council that the works are carried out by a suitably qualified and licensed plumber experienced in wastewater management.

Note: If your plan is to install a New On Site Sewage Management system. This will require an application under Section 68 of the Local Government Act 1993 to be submitted for approval by Council prior to any works being carried out.

Reason for Proposed Order

- An inspection was carried out on 23rd February 2011 revealed that the two On Site Sewage Management systems - Land applications were failing with effluent pooling on the ground surface.

There was a temporary fence in place which extended to go around both systems. Throughout both land application systems there were a number of large holes which may have been left by livestock. Within these holes there was pooling effluent. When the ground was disturbed (walked on), the area was extremely wet and the pressure of me walking around the area left marks in the ground and in some places I started to sink. When disturbed there was a effluent odour present.

Samples were taken at two points within both land application systems. The results showed high bacteria levels. Effluent from the property is therefore not being disposed of appropriately.

As such the above work is required due to ensure that effluent waste is being dealt with in a satisfactory manner.

Proposed Period for Compliance

Thirty days (30) days from date of service.

Our Ref: IMS 1761727
Contact: Vanessa Luck
Telephone: (02) 4732 8082

16th October 2008

Antonio Criniti
PO Box 469
FLEMINGTON MARKETS NSW 2129

Dear Sir/Madam

Section 124 Local Government Act 1993
NOTICE OF INTENTION TO SERVE ORDER
Lot 31 DP 258948, 126-142 Aldington Road, Kemps Creek

A recent inspection by a Council Officer of your premises revealed that effluent waste is not being dealt with in a satisfactory manner. Attached you will find the terms of an Order proposed to be served upon you requiring certain actions to be undertaken so as to ensure that waste is being dealt with satisfactorily.

It is recommended that you consider the information provided and, within twenty-one (21) days from the date of this notice, make representations to Council as to why the Order should not be given or as to the terms of or period for compliance with the Order.

Representations may be made orally or in writing, both by you or on your behalf either:

1. Directly at Council's Civic Centre, 601 High Street, Penrith; or,
2. In writing to: The General Manager, PO Box 60, PENRITH 2751

Any representations that you make will be considered prior to the issuing of the Order. This may result in modification of the terms of the Order, or in the matter not progressing to the service of the Order.

Yours faithfully,

Vanessa Luck
Environmental Health Officer

PROPOSED TERMS OF ORDER 22
Section 124 Local Government Act 1993

To store, treat, process, collect, remove, dispose of or destroy waste which is on land or premises in a manner specified in the order, provided that it is not inconsistent with regulations made under the Protection of the Environment Operations Act 1997

Proposed terms of Order

1) Repair or replace the existing absorption trenches for both the Northern dwelling and the Southern dwelling Lot 31 DP 258948, 126 Aldington Rd, Kemps Creek to ensure that all effluent is contained underground within the confines of the trench.

Any work must comply with Australian Standard 1547:2000 On Site domestic-wastewater management and the following conditions

- The disposal area is to be constructed no closer than:
 - 100 metres from permanent surface waters
 - 40 metres from dams and drainage channels
 - 6 metres from property boundaries
 - 6 metres from dwellings and driveways
- The wastewater is to be disposed of entirely within the boundaries of the property.
- The disposal area is to be sized appropriately for the water load from the dwelling
- All work is to be completed by a qualified, licenced plumber

A re-inspection will be required **before** any works are backfilled.

OR

2) Submit a Development Application for a new Aerated Wastewater Treatment system.

Reason for Proposed Order

An inspection carried out on 16th September 2008 revealed:

- At the Northern dwelling, the absorption trench coming from the septic tank was showing signs of failure. There was effluent surfacing over the trench area and pooling at the ground surface. There was a strong septic odour to the water.
- At the Southern dwelling, the absorption trench coming from the septic tank was showing signs of failure. There was effluent surfacing over the trench area and pooling at the ground surface. It appeared that there had been some stock animals in the area, there were strong septic odours to the water.

It was noted that both systems were in close proximity to the houses and people could easily come into contact with the raw effluent. It is considered unsatisfactory that raw effluent is left to pool on the ground surface causing issues with odour and attracting vermin such as mosquitoes.

As such the above work is required due to ensure that effluent waste is being dealt with in a satisfactory manner.

Proposed Period for Compliance

Twenty eight (28) days from date of service.

Our Ref: OSSM: 1623/05 & OSSM0065/08
Contact: K Blain
Telephone: (02) 4732 7724

6th June 2011

Antonio Criniti
C/O Robert
PO Box 469
FLEMINGTON MARKETS NSW 2129

Dear Sir/Madam,

ORDER NO. 22
LOCAL GOVERNMENT ACT 1993, SECTION 124

You are hereby ordered by Penrith City Council pursuant to the powers conferred by Section 124, Order No. 22 of the *Local Government Act 1993* to carry out the undermentioned work within the specified time period.

Situation of premises to which this Order refers:

Lot 31 DP258949 –126-142 Aldington Rd Kemps Creek NSW 2178

Specified work to be performed:

1. Within thirty (30) days, provide Council with a Plan of Action for both systems, detailing the proposed action to be taken to ensure the On Site Sewage Management System is working in a satisfactory manner and compliant with the relevant Australian Standards.

This may include connecting the septic tank to a disposal area or constructing a new disposal area. **If a new disposal area is to be constructed, the Plan of Action is to be approved by Council before the works commence.** The Plan of Action is to detail the size, location and construction of the new disposal area and must comply with the relevant Australian Standards. Please also include in the plan the details of the person conducting the works as it is a requirement of Council that the works are carried out by a suitably qualified and licensed plumber experienced in wastewater management.

Note: If your plan is to install a New On Site Sewage Management system. This will require an application under Section 68 of the Local Government Act 1993 to be submitted for approval by Council prior to any works being carried out.

Reason for the issue of this Order:

- An inspection was carried out on 23rd February 2011 revealed that the two On Site Sewage Management systems - Land applications were failing with effluent pooling on the ground surface for both systems.

There was a temporary fence in place which extended to go around both systems.

Throughout both land application systems there were a number of large holes which may have been left by livestock. Within these holes there was pooling effluent. When the

ground was disturbed (walked on), the area was extremely wet and the pressure of me walking around the area left marks in the ground and in some places I started to sink. When disturbed there was an effluent odour present.

Samples were taken at two points within both land application systems. The results showed high bacteria levels. Effluent from the property is therefore not being disposed of appropriately.

- NISO was issued on the 14/03/2011 requesting a plan of action. A copy of the NISO was sent to home address as well.
- No information has been received by Council, a follow up phone conversation with the owners son in law stated that whilst a plumber had been out no further works/action has been taken.
- An inspection was booked for the 16-5-11 but was cancelled due to son in laws work commitments.
- No reinspection has been granted or any further information regarding the requested plan of action has been received by Council to date.

As such the effluent waste on the above property is not being disposed of in a satisfactory manner. The above work is required to ensure the effluent is dealt with satisfactorily.

Failure to Comply with Order

Section 628 of the *Local Government Act 1993* states:

1. A person who fails to comply with an Order given to the person under Part 2 of Chapter 7 that is an Order in the terms of Orders Nos. 1-17 of the Table to Section 124 is guilty of an offence. Maximum penalty is 50 penalty points (**\$5,000**) in the case of an individual, or 100 penalty points (**\$10,000**) in the case of a corporation. 1 penalty point = \$100.
2. A person who fails to comply with an Order given to the person under Part 2 of Chapter 7 that is an Order in the terms of Orders Nos. 18-29 of the Table to Section 124 is guilty of an offence. Maximum penalty is 20 penalty points (**\$2,000**). 1 penalty point = \$100.

Failure to comply with this Order may result in the work being carried out at your cost without further notice. Your attention is drawn to the following provisions of the Act:

- 678 (1) If a person fails to comply with the terms of an Order given to the person under Part 2 of Chapter 7, the Council may do all such things as are necessary or convenient to give effect to the terms of the Order, including the carrying out of any work required by the Order.

Any expenses incurred by the Council under this Section, together with all its associated costs, may be recovered by the Council in any court of competent jurisdiction as a debt due to the Council by the person concerned.

Right of Appeal

Section 180 of the *Local Government Act 1993* provides that a person upon whom an Order is served may appeal against the Order to the Land and Environment Court within twenty-eight (28) days after the service of the Order on the person. On the hearing of the appeal, the court may revoke or modify the order or substitute for the Order any other Order that the Council could have made or find that the Order is sufficiently complied with or make such Order with respect to compliance with the Order as the court thinks fit or make any other Order with respect to the Order as the court thinks fit.

Please note it is your responsibility to contact Council for a reinspection once the required works are completed. If the works are not carried out at the expiration of the allotted time period, an automatic fine will be issued.

By Order

Kristin Blain
Environmental Health Department

Appendix D

Test Pit and Bore Hole Logs

TEST PIT LOG

CLIENT: Stockland Commercial Property
PROJECT: Proposed Commercial/Industrial Subdivision
LOCATION: 106 - 142 Aldington Road, Kemps Creek

SURFACE LEVEL: 77.8 mAH
EASTING: 296453
NORTHING: 6253476

PIT No: 1
PROJECT No: 92345.00
DATE: 4/4/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per 150mm)
				Type	Depth	Sample	Results & Comments		
77.8	0.2	FILL - dark brown silty clay with a trace of rootlets, moist (topsoil)		E	0.0				
77.5	0.5	FILL - typically stiff, red and brown silty clay, MC~PL		D/E	0.2				
77.0	1.0	SILTY CLAY - stiff, red brown silty clay, MC<PL		U ₅₀	0.5				
76.5	1.5	- becoming hard below 0.9m		D/E	0.75				
76.0	1.9			D/E	1.0		pp = 400-500		
75.5	2.0	SHALE - very low strength, highly weathered, red brown shale with low strength, highly weathered bands		D	1.05				
75.0	2.5			D	1.5				
74.5	3.0	Pit discontinued at 3.0m - limit of investigation		D	2.0				
74.0	4.0				2.5				
73.5	5.0				3.0				
73.0	6.0								
72.5	7.0								
72.0	8.0								
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RIG: John Deere 315SE backhoe - 400mm bucket

LOGGED: ABB

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: MC = moisture content; PL = plastic limit

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


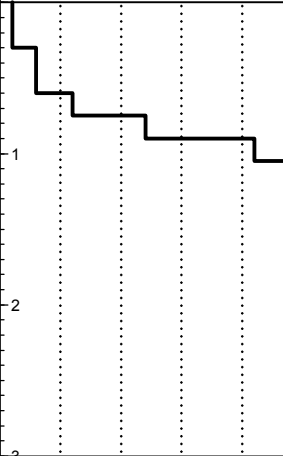









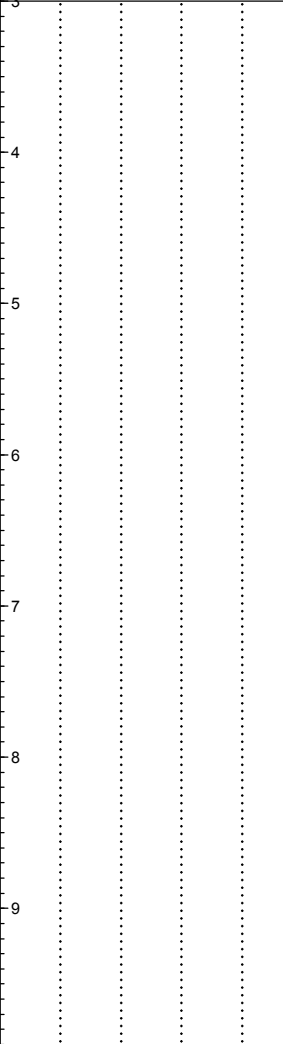
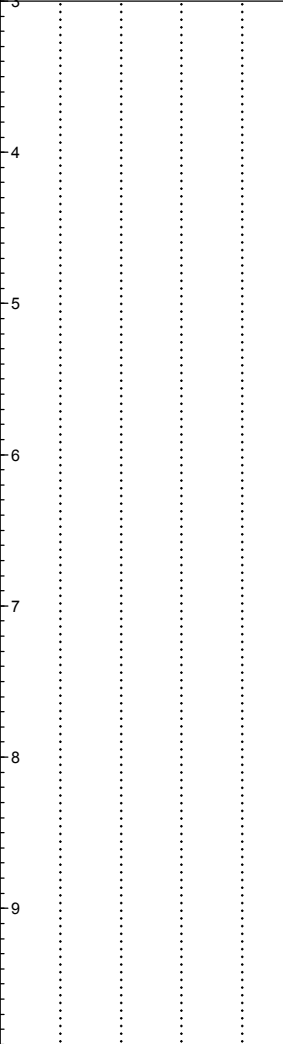
SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U ₅₀	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	W	Water seep
E	Environmental sample	W	Water level
		PID	Photo ionisation detector (ppm)
		PL(A)	Point load axial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

TEST PIT LOG

CLIENT: Stockland Commercial Property
PROJECT: Proposed Commercial/Industrial Subdivision
LOCATION: 106 - 142 Aldington Road, Kemps Creek

SURFACE LEVEL: 69.2 mAHD
EASTING: 296613
NORTHING: 6253437

PIT No: 2
PROJECT No: 92345.00
DATE: 4/4/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing			Water	Dynamic Penetrometer Test (blows per 150mm)
				Type	Depth	Sample		
69	0.3	TOPSOIL - dark brown silty clay with a trace of rootlets, moist		E	0.0			
		SILTY CLAY - stiff, red silty clay with a trace of ironstone gravel, MC~PL		D/E	0.2			
					0.5			
1				D/B/E	1.0			
68					1.5	pp = 400		
				D/E	2.0	pp >600		
67	2	- becoming hard, red and grey with iron indurated bands, MC<PL below 1.2m			2.5	pp = 600		
		- becoming grey mottled red below 1.9m		D				
				D				
3	3.0	Pit discontinued at 3.0m - limit of investigation		D	3.0	pp = 500-600		
66	4							
65								
5								
64								
6								
63								
7	8							
62								
8								
61								
9								
60								

RIG: John Deere 315SE backhoe - 400mm bucket

LOGGED: ABB

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: MC = moisture content; PL = plastic limit

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

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











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TEST PIT LOG

CLIENT: Stockland Commercial Property
PROJECT: Proposed Commercial/Industrial Subdivision
LOCATION: 106 - 142 Aldington Road, Kemps Creek

SURFACE LEVEL: 65.9 mAHD
EASTING: 296719
NORTHING: 6253439

PIT No: 3
PROJECT No: 92345.00
DATE: 4/4/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per 150mm)
				Type	Depth	Sample	Results & Comments		
	0.3	TOPSOIL - dark brown silty clay with rootlets, moist		E	0.0				
		SILTY CLAY - stiff, brown and red silty clay, MC~PL		D/E	0.2				
				D/E	0.5				
	1	- becoming hard, with a trace of gravel below 0.9m		D/E	1.0				
				D/E	1.5		pp = 400		
	2	- becoming red and grey with iron indurated bands below 1.9m		D/E	2.0		pp = 400		
				D/E	2.5		pp = 400		
	3	Pit discontinued at 3.0m - limit of investigation		D/E	3.0		pp = 400		
	4								
	5								
	6								
	7								
	8								
	9								

RIG: John Deere 315SE backhoe - 400mm bucket

LOGGED: ABB

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: MC = moisture content; PL = plastic limit

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













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

TEST PIT LOG

CLIENT: Stockland Commercial Property
PROJECT: Proposed Commercial/Industrial Subdivision
LOCATION: 106 - 142 Aldington Road, Kemps Creek

SURFACE LEVEL: 61.6 mAHD
EASTING: 296924
NORTHING: 6253344

PIT No: 4
PROJECT No: 92345.00
DATE: 4/4/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing			Water	Dynamic Penetrometer Test (blows per 150mm)	
				Type	Depth	Sample			Results & Comments
61 1 60 2 59 3 58 4 57 5 66 6 55 7 64 8 53 9 62	0.2	TOPSOIL - dark brown silty clay with rootlets, moist		E	0.0				
		SILTY CLAY - stiff, brown silty clay with a trace of gravel, MC~PL		D/E	0.2				
				U ₅₀	0.5				
					0.7				
		- becoming very stiff, grey and orange below 0.9m							
									
				D/E	1.5		pp = 300		
									
				D/E	2.0		pp = 100-200		
			- with iron indurated bands below 1.8m; MC>PL below 1.9m		D/E	2.5		pp <100	
									
	3.0	Pit discontinued at 3.0m - limit of investigation		D/E	3.0		pp <100		

RIG: John Deere 315SE backhoe - 400mm bucket

LOGGED: ABB

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: Free groundwater observed at 2.5m

REMARKS: MC = moisture content; PL = plastic limit

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

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



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BOREHOLE LOG

CLIENT: Stockland Commercial Property
PROJECT: Proposed Commercial/Industrial Subdivision
LOCATION: 106 - 142 Aldington Road, Kemps Creek

SURFACE LEVEL: 84.2 mAHD
EASTING: 296403
NORTHING: 6253345
DIP/AZIMUTH: 90°/-

BORE No: 5
PROJECT No: 92345.00
DATE: 5/4/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Degree of Weathering					Graphic Log	Rock Strength					Water	Fracture Spacing (m)				Discontinuities		Sampling & In Situ Testing				
			EW	HW	MW	SW	FS		FR	Ex Low	Very Low	Low	Medium		High	Very High	Ex High	0.01	0.05	0.10	0.50	1.00	B - Bedding S - Shear	J - Joint F - Fault	Type
84	0.2	FILL - dark brown clayey silt, moist (topsoil)																				E			6,13,14 N = 27
		FILL - typically dark brown silty clay with a trace of gravel, MC~PL																				D/E			
	0.8	SILTY CLAY - hard, pale brown silty clay with sand and carbonaceous staining, MC<PL - becoming grey and brown with extremely low strength, extremely weathered shale bands below 1.5m																				E			
83	1																					S			
																						D/E			
	2																					D/E			
82	2.8	SHALE - very low strength, highly weathered, grey shale with extremely low strength, extremely weathered bands																				D/E			
	3																					S			
81	4																					D			
	4.26		SHALE - low strength, highly weathered, fractured, brown and grey shale with extremely low strength, extremely weathered bands																				S		
80	5																								
79	5.9	Bore discontinued at 5.9m - limit of investigation																							
	6																								
78	7																								
77	8																								
	9																								
76																									
75																									

RIG: Hanjin DB8 **DRILLER:** Rockwell **LOGGED:** JHB/ABB **CASING:** QC to 4.0m
TYPE OF BORING: 150mm diameter SFA to 4.26m then NMLC coring to 5.9m
WATER OBSERVATIONS: No free groundwater observed whilst augering
REMARKS: Location coordinates are in MGA94 Zone 56. MC = moisture content; PL = plastic limit

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 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)	

TEST PIT LOG

CLIENT: Stockland Commercial Property
PROJECT: Proposed Commercial/Industrial Subdivision
LOCATION: 106 - 142 Aldington Road, Kemps Creek

SURFACE LEVEL: 74.3 mAHD
EASTING: 296501
NORTHING: 6253285

PIT No: 6
PROJECT No: 92345.00
DATE: 4/4/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per 150mm)
				Type	Depth	Sample	Results & Comments		
74	0.2	FILL - pale brown silty clay, dry (topsoil)		E	0.0				5 10 15 20
		SILTY CLAY - very stiff, pale brown silty clay, MC<PL		D/E	0.2				
73				D/E	0.5				5 10 15 20
		- becoming hard below 1.0m		D/E	1.0				
72	1.4	SHALE - extremely low strength, extremely weathered, brown and grey shale with very low strength, extremely weathered bands		D/E	1.5				5 10 15 20
				D/E	2.0				
71				D/E	2.5				5 10 15 20
				D/E	3.0				
71	3.0	Pit discontinued at 3.0m - limit of investigation		D/E	3.0				
70	4								
69	5								
68	6								
67	7								
66	8								
65	9								

RIG: John Deere 315SE backhoe - 400mm bucket

LOGGED: ABB

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Pit excavated in track; MC = moisture content; PL = plastic limit

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

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

TEST PIT LOG

CLIENT: Stockland Commercial Property
PROJECT: Proposed Commercial/Industrial Subdivision
LOCATION: 106 - 142 Aldington Road, Kemps Creek

SURFACE LEVEL: 67.3 mAH
EASTING: 296708
NORTHING: 6253271

PIT No: 7
PROJECT No: 92345.00
DATE: 4/4/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per 150mm)
				Type	Depth	Sample	Results & Comments		
67 1 66 2 65 3 64 4 63 5 62 6 61 7 60 8 59 9 58	0.1	TOPSOIL - dark brown silty clay with rootlets, moist		E	0.0				
		SILTY CLAY - stiff, red and grey silty clay with a trace of gravel, MC~PL			0.2				
				D/E	0.5				
		- becoming hard, MC<PL below 0.8m		U ₅₀	0.85				
				D/E	1.0				
		- with iron indurated bands below 1.3m			1.5		pp >600		
				D/E	1.5				
				D	2.0		pp >600		
				D	2.5		pp >600		
		3.0	Pit discontinued at 3.0m - limit of investigation		D	3.0		pp >600	

BOREHOLE LOG

CLIENT: Stockland Commercial Property
PROJECT: Proposed Commercial/Industrial Subdivision
LOCATION: 106 - 142 Aldington Road, Kemps Creek

SURFACE LEVEL: 81.4 mAHD
EASTING: 296402
NORTHING: 6253141
DIP/AZIMUTH: 90°/-

BORE No: 8
PROJECT No: 92345.00
DATE: 5/4/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Degree of Weathering					Graphic Log	Rock Strength					Water	Fracture Spacing (m)				Discontinuities		Sampling & In Situ Testing				
			EW	HW	MW	SW	FS		FR	Ex Low	Very Low	Low	Medium		High	Very High	Ex High	0.01	0.05	0.10	0.50	1.00	B - Bedding S - Shear	J - Joint F - Fault	Type
81	0.2	TOPSOIL - dark brown clayey silt, moist																				E			6,11,20 N = 31
		SILTY CLAY - very stiff, brown silty clay, MC~PL																				D/E			
		- becoming hard, red, grey and brown, MC<PL below 0.7m																				D/E			
1																						S			
	1.5	- with very low strength, highly weathered and extremely low strength, extremely weathered shale bands below 1.3m																				D/E			
	2	SHALE - very low strength, highly weathered, red, grey and brown shale with extremely low strength, extremely weathered bands																				D/E			
79	2.55	SHALE - very low strength, highly weathered, highly fractured, brown and grey shale																				D/E			30/90mm,-,- refusal
		- becoming low strength, moderately weathered below 3.03m																				S			
		- becoming fractured below 3.22m																							PL(A) = 0.5
78		- becoming medium strength below 3.5m																							
	4																					C	100	61	PL(A) = 0.3
77																									
	5	- becoming low strength below 4.9m																							PL(A) = 0.26 PL(A) = 0.25
76																									
	6	- becoming medium strength below 5.77m																							PL(A) = 0.33
		- 100mm band of breccia at 6.0m																							
75	6.12	SANDSTONE - medium strength, slightly weathered, slightly fractured, grey fine grained sandstone																				C	100	90	PL(A) = 0.53 PL(A) = 0.64 PL(A) = 0.47
	7																								
74	7.43	Bore discontinued at 7.43m - limit of investigation																							
	8																								
	9																								
72																									

RIG: Hanjin DB8 **DRILLER:** Rockwell **LOGGED:** JHB/ABB **CASING:** QC to 4.0m

TYPE OF BORING: 150mm diameter SFA to 2.55m then NMLC coring to 7.43m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: Location coordinates are in MGA94 Zone 56. MC = moisture content; PL = plastic limit

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	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	W	Water seep	S	Standard penetration test
E	Environmental sample	W	Water level	V	Shear vane (kPa)



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TEST PIT LOG

CLIENT: Stockland Commercial Property
PROJECT: Proposed Commercial/Industrial Subdivision
LOCATION: 106 - 142 Aldington Road, Kemps Creek

SURFACE LEVEL: 73.8 mAHD
EASTING: 296570
NORTHING: 6253138

PIT No: 9
PROJECT No: 92345.00
DATE: 4/4/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per 150mm)
				Type	Depth	Sample	Results & Comments		
	0.1	FILL - dark brown silty clay with rootlets, moist (topsoil)		E	0.0				
	0.5	FILL - typically stiff, dark brown silty clay with household rubble (tiles), moist		D/B/E	0.5				
	1	SILTY CLAY - stiff, red mottled grey silty clay with ironstone gravel, MC<PL		D/E	1.0				
		- becoming hard, MC<PL below 1.0m		D/E	1.5		pp = 400-500		
	2	- with iron indurated bands below 1.4m		D/E	2.0		pp = 400-500		
				D/E	2.5		pp = 500		
	3	Pit discontinued at 3.0m - limit of investigation		D/E	3.0		pp = 400-500		
	4								
	5								
	6								
	7								
	8								
	9								

RIG: John Deere 315SE backhoe - 400mm bucket

LOGGED: ABB

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: MC = moisture content; PL = plastic limit

☐ 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	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	W	Water seep	S	Standard penetration test
E	Environmental sample	W	Water level	V	Shear vane (kPa)

TEST PIT LOG

CLIENT: Stockland Commercial Property
PROJECT: Proposed Commercial/Industrial Subdivision
LOCATION: 106 - 142 Aldington Road, Kemps Creek

SURFACE LEVEL: 68.0 mAHD
EASTING: 296760
NORTHING: 6253102

PIT No: 10
PROJECT No: 92345.00
DATE: 4/4/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per 150mm)				
				Type	Depth	Sample	Results & Comments		5	10	15	20	
68		TOPSOIL - dark brown silty clay with rootlets, moist		E	0.0								
	0.3	SILTY CLAY - stiff, orange and red silty clay with a trace of gravel, MC~PL		D/E	0.2								
		- becoming hard below 0.7m		D/E	0.5								
67	1	- becoming red mottled grey below 0.9m		D/E	1.0		pp >600		1				
		- with very low strength, highly weathered, medium grained sandstone bands below 1.4m		D.E	1.5		pp = 300-400						
66	2	- becoming grey and red below 1.9m		D	2.0		pp >600		2				
	2.4	SHALE - extremely low strength, extremely weathered, red and grey shale with very low strength, highly weathered bands		D	2.5								
65	3	Pit discontinued at 3.0m - limit of investigation		D	3.0				3				
	4								4				
	5								5				
64	6								6				
	7								7				
63	8								8				
62	9								9				
61													
60													
59													

RIG: John Deere 315SE backhoe - 400mm bucket

LOGGED: ABB

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: * Replicate sample BD1/04042019 collected at 0.0 - 0.2m; MC = moisture content; PL = plastic limit

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

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







Douglas Partners
Geotechnics | Environment | Groundwater

TEST PIT LOG

CLIENT: Stockland Commercial Property
PROJECT: Proposed Commercial/Industrial Subdivision
LOCATION: 106 - 142 Aldington Road, Kemps Creek

SURFACE LEVEL: 64.0 mAHD
EASTING: 296863
NORTHING: 6253161

PIT No: 11
PROJECT No: 92345.00
DATE: 4/4/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per 150mm)
				Type	Depth	Sample	Results & Comments		
64	0.2	TOPSOIL - brown silty clay with rootlets, moist		E	0.0				
		SILTY CLAY - stiff, brown silty clay, MC~PL		D/E	0.2				
		- becoming very stiff below 0.4m			0.5				
63	1	- becoming very stiff, brown and red with iron indurated bands below 0.9m		D/B/E	1.0				
				D/E	1.5		pp = 300-400		
62	2	- becoming grey and brown below 1.8m		D	2.0		pp = 300-400		
		- becoming stiff, MC>PL below 2.5m		D	2.5		pp = 200-250		
61	3	Pit discontinued at 3.0m		D	3.0		pp = 100-200		
		- limit of investigation							
60	4								
59	5								
58	6								
57	7								
56	8								
55	9								

RIG: John Deere 315SE backhoe - 400mm bucket

LOGGED: ABB

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: Groundwater seepage observed at ~2.95m

REMARKS: MC = moisture content; PL = plastic limit

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

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

TEST PIT LOG

CLIENT: Stockland Commercial Property
PROJECT: Proposed Commercial/Industrial Subdivision
LOCATION: 106 - 142 Aldington Road, Kemps Creek

SURFACE LEVEL: 64.3 mAHD
EASTING: 296894
NORTHING: 6253085

PIT No: 12
PROJECT No: 92345.00
DATE: 4/4/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per 150mm)
				Type	Depth	Sample	Results & Comments		
	0.1	TOPSOIL - dark brown clayey silt with rootlets, moist		E	0.0				
		SILTY CLAY - stiff, brown and grey silty clay with a trace of gravel, MC<PL		D/E	0.2				
				D/E	0.5				
	1	- becoming very stiff, red and grey with extremely low strength, extremely weathered shale bands below 0.9m		D/E	1.0				
				D/E	1.5		pp = 300		
	2	- becoming MC~PL below 1.8m		D/E	2.0		pp = 300		
				D/E	2.5		pp = 300		
	3	- becoming stiff, MC>PL below 2.8m		D/E	3.0		pp = 100-200		
	3.0	Pit discontinued at 3.0m - limit of investigation							
	4								
	5								
	6								
	7								
	8								
	9								

RIG: John Deere 315SE backhoe - 400mm bucket

LOGGED: ABB

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: Groundwater seepage observed at ~2.95m

REMARKS: MC = moisture content; PL = plastic limit

☐ 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	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	W	Water seep	S	Standard penetration test
E	Environmental sample	W	Water level	V	Shear vane (kPa)



Sampling

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

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

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

Test Pits

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

Large Diameter Augers

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

Continuous Spiral Flight Augers

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

reliability, due to the remoulding, possible mixing or softening of samples by groundwater.

Non-core Rotary Drilling

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

Continuous Core Drilling

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

Standard Penetration Tests

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

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

The test results are reported in the following form.

- In the case where full penetration is obtained with successive blow counts for each 150 mm of, say, 4, 6 and 7 as:
4,6,7
N=13
- In the case where the test is discontinued before the full penetration depth, say after 15 blows for the first 150 mm and 30 blows for the next 40 mm as:
15, 30/40 mm

Sampling Methods

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

Dynamic Cone Penetrometer Tests / Perth Sand Penetrometer Tests

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

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

Symbols & Abbreviations

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Introduction

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

Drilling or Excavation Methods

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

Water

▷	Water seep
▽	Water level

Sampling and Testing

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

Description of Defects in Rock

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

Defect Type

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

Orientation

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

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

Coating or Infilling Term

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

Coating Descriptor

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

Shape

cu	curved
ir	irregular
pl	planar
st	stepped
un	undulating

Roughness

po	polished
ro	rough
sl	slickensided
sm	smooth
vr	very rough

Other

fg	fragmented
bnd	band
qtz	quartz

Symbols & Abbreviations

Graphic Symbols for Soil and Rock

General



Asphalt



Road base



Concrete



Filling

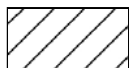
Soils



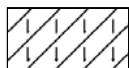
Topsoil



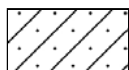
Peat



Clay



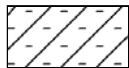
Silty clay



Sandy clay



Gravelly clay



Shaly clay



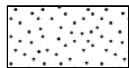
Silt



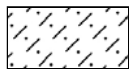
Clayey silt



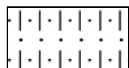
Sandy silt



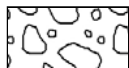
Sand



Clayey sand



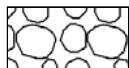
Silty sand



Gravel



Sandy gravel

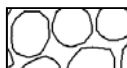


Cobbles, boulders



Talus

Sedimentary Rocks



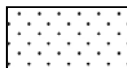
Boulder conglomerate



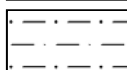
Conglomerate



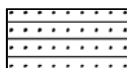
Conglomeratic sandstone



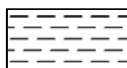
Sandstone



Siltstone



Laminite



Mudstone, claystone, shale

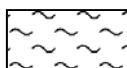


Coal

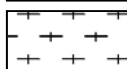


Limestone

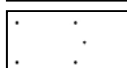
Metamorphic Rocks



Slate, phyllite, schist

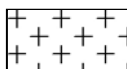


Gneiss

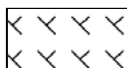


Quartzite

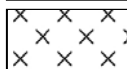
Igneous Rocks



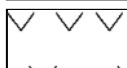
Granite



Dolerite, basalt, andesite



Dacite, epidote



Tuff, breccia



Porphyry



Description and Classification Methods

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

Soil Types

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

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

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

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

The proportions of secondary constituents of soils are described as:

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

Definitions of grading terms used are:

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

Cohesive Soils

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

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

Cohesionless Soils

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

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

Soil Descriptions

Soil Origin

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

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

Transported soils may be further subdivided into:

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



Rock Strength

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

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

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

Degree of Weathering

The degree of weathering of rock is classified as follows:

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

Degree of Fracturing

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

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

Rock Descriptions

Rock Quality Designation

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

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

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

Stratification Spacing

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

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

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 (ASC NEPM). The DQO process is outlined below:

E1.1 State the Problem

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 development.

The objectives of the investigation are as follows:

- Conduct a background assessment of the site to identify past and present potentially contaminating activities on site and from adjacent land uses;
- Undertake intrusive investigations of the site to assess and describe the nature and extent of contamination; and
- Recommend further investigation as considered necessary based on the findings of work completed.

E1.2 Identify the Decision/Goal of the Study

The suitability of the site for the proposed industrial development was assessed based on the site history review, site walkover, intrusive investigations and a comparison of the analytical results for contaminants of potential concern (COPC) against the adopted site assessment criteria (SAC) for soil as detailed in Appendix D2 below. Based on the proposed development, the SAC for this PSI were based on the commercial/industrial land use criteria provided in ASC NEPM.

Based on the results of the site history review, the main COPC are expected to be metals, total recoverable hydrocarbons (TRH), benzene, toluene, ethylbenzene and xylenes (BTEX), polycyclic aromatic hydrocarbons (PAH), and asbestos. Other commonly found contaminants which may be present include phenols, organochlorine pesticides (OCP), organophosphorous pesticides (OPP) and polychlorinated biphenyls (PCB).

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

- Did historical (background) investigations identify potential contamination sources?
- 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?
- 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 regional geology, topography and hydrogeology information;
- Review of site history information;
- Observations made during a site walkover;
- The lithology of the site as described in the test pit logs (Appendix D);
- Soil sampling via excavation of 12 test pits. Collection of additional suspected asbestos-containing material samples;
- Field and laboratory QA/QC data to assess the suitability of the environmental data for the DSI (Appendix G); and
- Laboratory reported concentrations of COPC were compared against the SAC adopted from ASC NEMP.

E1.4 Define the Study Boundaries

The site is located in the suburb of Oran Park within the local government area of Penrith City Council (PCC) and is identified as Lot 31 and 32 Deposited Plan (D.P.) 258949.

The site location and boundary are shown on Drawing 1, Appendix A.

Soil investigation was undertaken on 4 April 2019 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 were 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 G).

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 DSI 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 and site features. 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.

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:

- Intrusive locations comprised a mix of systematic samples for general site coverage, and targeted sample locations to identify potential contamination sources (based on the site history review and observations made during a site walkover);

- A NATA accredited laboratory using NATA endorsed methods were used to perform laboratory analysis; and
- Adequately experienced environmental scientists/engineers were chosen to conduct field work and sample analysis interpretation.

Appendix E2: Adopted Site Assessment Criteria

E.2.1 Soil

The site assessment criteria (SAC) for soil applied in the current investigation are informed by the CSM which identified human and environmental receptors to potential contamination on the site (refer to Section 6). Analytical results are assessed (as a Tier 1 assessment) against the SAC comprising investigation and screening levels for a generic commercial and industrial land use as per Schedule B1 of ASC NEPM. Considerations were also given to protection ecological receptors from contamination present in soil.

Analytical results for the COPC from all samples collected from the site, were assessed (as a Tier 1 assessment) against the SAC comprising the investigation and screening levels provided in Schedule B1, of the National Environment Protection Council, *National Environment Protection (Assessment of Site Contamination) Measure* 1999, as amended 2013 (ASC NEPM). The ASC NEPM guidelines are endorsed by the NSW EPA under the CLM Act 1997.

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

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

E2.1.3 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 (COPC) 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. 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 for direct contact pathway are significantly higher than those for the vapour intrusion pathway and therefore the direct contact is not drivers for further assessment and/or remediation. HSLs for silt have been adopted for this investigation

Table E1: Inputs to the Derivation of HSLs for Soil

Variable	Input	Rationale
Potential exposure pathway	Inhalation of vapours and direct contact with impacted media	Potential exposure pathways include vapour intrusion through concrete from potentially contaminated fill. There is also the risk of soil vapours during any excavation of potentially contaminated fill material.
Soil Type	Fine - Clay	Fine soils have been adopted for this PSI given the dominance of clays at the site (see Test Pit Logs – Appendix C)
Depth to potential contamination	0 m to <1 m bgl	Filling was identified in the dam wall to a minimum thickness of 1.7 m and an unknown depth bgl. In place fill was identified in TP1, TP5 and TP9 to a depth of 0.8 m bgl. Therefore conservative depth to contamination has been adopted.

Table E2: HIL and HSL for Soil in mg/kg

Contaminants		HIL- D	HSL- D
Metals	Arsenic	3000	NC
	Cadmium	900	NC
	Chromium (VI)	3600	NC
	Copper	240000	NC
	Lead	1500	NC
	Mercury (inorganic)	730	NC
	Nickel	6000	NC
	Zinc	400000	NC
PAH	Benzo(a)pyrene TEQ ¹	40	NC
	Naphthalene	NC	NL ³
	Total PAH	4000	NC
TRH	C6 – C10 (less BTEX) [F1]	NC	250
	>C10-C16 (less Naphthalene) [F2]	NC	NL ³
	>C16-C34 [F3]	NC	NC
	>C34-C40 [F4]	NC	NC
BTEX	Benzene	NC	4
	Toluene	NC	NL ³
	Ethylbenzene	NC	NL ³
	Xylenes	NC	230
Phenol	Pentachlorophenol used as a screen	660	NC

Table E2: HIL and HSL for Soil in mg/kg cont.

Contaminants		HIL- D	HSL- D
OCP	Aldrin + Dieldrin	45	NC
	Chlordane	530	NC
	DDT+DDE+DDD	3600	NC
	Endosulfan	2000	NC
	Endrin	100	NC
	Heptachlor	50	NC
	HCB	80	NC
	Methoxychlor	2500	NC
OPP	Chlorpyrifos	2000	NC
PCB ²		7	NC

Notes:

- 1 Sum of carcinogenic PAH
- 2 Non dioxin-like PCBs only.
- 3 The soil saturation concentration (C_{sat}) 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 C_{sat}, a soil vapour source concentration for a petroleum mixture could not exceed a level that would result 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'.
- 4 NC: No criteria

E2.1.3 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 D3.

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	6.1	Samples collected and analysed for the purposes of a concurrent salinity investigation were utilised to determine input parameters for EILs. A total of 59 samples reported a mean pH value of 6.1 for the site. This mean pH value has been adopted for screening.
CEC	10.14 cmol/kg	Samples collected and analysed for the purposes of a concurrent salinity investigation were utilised to determine input parameters for EILs. A total of five samples reported a mean CEC value of 11.9 cmol/kg for the site. This mean CEC value has been adopted for screening.
Clay content	10 %	Conservative value for initial screening
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	160
	Copper	75
	Nickel	290
	Chromium III	670
	Lead	1800
	Zinc	710
PAH	Naphthalene	370
OCP	DDT	640

E2.1.4 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.

Table E5: ESL in mg/kg

Analyte		ESL ¹	Comments
TRH	C6 – C10 (less BTEX) [F1]	215*	All ESLs are low reliability apart from those marked with * which are moderate reliability
	>C10-C16 (less Naphthalene) [F2]	170*	
	>C16-C34 [F3]	2500	
	>C34-C40 [F4]	6600	
BTEX	Benzene	95	
	Toluene	135	
	Ethylbenzene	185	
	Xylenes	180	
PAH	Benzo(a)pyrene	1.4	

E2.1.5 Management Limits

In addition to the application of HSL and ESL, a further screening measure is applicable to petroleum hydrocarbons, which takes into account policy considerations and reflect the nature and properties of petroleum hydrocarbons, including:

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

The adopted management limits, based on a coarse soil type, are shown in the following Table D6.

Table D6: Management Limits in mg/kg

Analyte		Management Limit
TRH	C ₆ – C ₁₀ (F1) [#]	800
	>C ₁₀ -C ₁₆ (F2) [#]	1000
	>C ₁₆ -C ₃₄ (F3)	5000
	>C ₃₄ -C ₄₀ (F4)	10000

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

E2.1.6 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.

NEPC (2013) provides HSL for asbestos in soil which are based on scenario specific likely exposure levels. The HSL for all land use scenarios detailed in NEPC (2013) includes 'no visible asbestos for surface soils', and allowable concentrations of ACM and FA/FA.

A detailed asbestos assessment was not undertaken as part of this DSI given the site history and the intended land use. Therefore the presence or absence of asbestos at a limit of reporting (LOR) of 0.1 g/kg has been adopted for this assessment as an initial screen. The adopted asbestos SAC for the purposes of this investigation is:

- No visible asbestos; and
- Concentrations of all forms of asbestos below the laboratory LOR.

Appendix F

Photographic Plates



Photo 1: View of brick house located in the south of Lot 31 (facing east)



Photo 2: View of brick house located in the south of Lot 32 (facing north east)



Photo 3: View of brick house located in the north of Lot 32 (facing south east)



Photo 4: Shed and shipping container observed adjacent to the southern house in Lot 32 (facing east)


	CLIENT: Stockland Commercial Property Pty Ltd		Site Photographs 1 to 4 Preliminary Site Investigation 106 - 142 Aldington Road, Kemps Creek, NSW	PROJECT No: 92345.00
	OFFICE: Macarthur	Prepared BY: CKM		PLATE No: 1
	SCALE: NTS	DATE: 15 Apr 2019		REVISION: 0



Photo 5: Large shed located behind the southernmost house in Lot 31 (facing west)



Photo 6: Machinery storage in the shed to the rear of the southern house in Lot 32



Photo 7: Vehicle storage in the southernmost shed (Lot 31)



Photo 8: General storage within the southern most shed (Lot 31)


	CLIENT: Stockland Commercial Property Pty Ltd		Site Photographs 5 to 8 Preliminary Site Investigation 106 - 142 Aldington Road, Kemps Creek, NSW	PROJECT No: 92345.00
	OFFICE: Macarthur	Prepared BY: CKM		PLATE No: 2
	SCALE: NTS	DATE: 15 Apr 2019		REVISION: 0



Photo 9: Stored chemicals outside of the shed in the south of Lot 32



Photo 10: A fridge used for storage and chemical containers observed adjacent to the market garden in the centre of the site (facing southeast)



Photo 11: Chemical containers observed adjacent to the marker garden in the centre of the site (facing west)



Photo 12: Surficial waste to the rear of the southern house in Lot 32 (facing north)


 Douglas Partners <i>Geotechnics Environment Groundwater</i>	CLIENT: Stockland Commercial Property Pty Ltd		Site Photographs 9 to 12 Preliminary Site Investigation 106 - 142 Aldington Road, Kemps Creek, NSW	PROJECT No: 92345.00
	OFFICE: Macarthur	Prepared BY: CKM		PLATE No: 3
	SCALE: NTS	DATE: 15 Apr 2019		REVISION: 0



Photo 13: Surfacial waste to the rear of the southern shed in Lot 31 (facing south)



Photo 14: Surfacial waste observed adjacent to the dam in the southeast (facing west)



Photo 15: Old vehicle located adjacent to the dam in the southeast (facing east)



Photo 16: Multiple soil stockpiles located north of the dam in the southeast (facing east)


 Douglas Partners <i>Geotechnics Environment Groundwater</i>	CLIENT: Stockland Commercial Property Pty Ltd		Site Photographs 13 to 16 Preliminary Site Investigation 106 - 142 Aldington Road, Kemps Creek, NSW	PROJECT No: 92345.00
	OFFICE: Macarthur	Prepared BY: CKM		PLATE No: 4
	SCALE: NTS	DATE: 15 Apr 2019		REVISION: 0



Photo 17: Multiple soil stockpiles located north of the dam in the southeast (facing north)



Photo 18: Exposed stockpile in the southeast with a fragment of ACM on the surface (facing south)



Photo 19: Fragment of ACM on the surface of a stockpile in the southeast



Photo 20: View of vegetated stockpiles with exposed foreign inclusions on the surface in the southeast


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	OFFICE: Macarthur	Prepared BY: CKM		PLATE No: 5	
	SCALE: NTS	DATE: 15 Apr 2019		REVISION: 0	



Photo 21: View of the dam wall in the southeast (facing west)



Photo 22: Filled area north of the dam wall. No foreign materials were observed in the exposed areas (facing east)



Photo 23: Petrol powered generator with fuel stored adjacent (facing south)



Photo 24: Second petrol powered generator stored adjacent to the dam in the southeast (facing east)


 Douglas Partners <i>Geotechnics Environment Groundwater</i>	CLIENT: Stockland Commercial Property Pty Ltd		<div>P:\92345.00 -</div> Site Photos 21 to 24 Preliminary Site Investigation 106 - 142 Aldington Road, Kemps Creek, NSW	PROJECT No: 92345.00	
	OFFICE: Macarthur	Prepared BY: CKM		PLATE No: 6	
	SCALE: NTS	DATE: 15 Apr 2019		REVISION: 0	



Photo 25: Long grass prevented thorough inspection of the ground surface accords the eastern half of the site (facing east)



Photo 26: Stockpile of soil containing foreign inclusions (including ACM) was observed in the southwest of Lot 31 (facing south)



Photo 27: ACM fragment on the surface of the soil stockpile in the southwest.



Photo 28: Stockpile of refuse and dead vegetation located in the southwest of Lot 31 (facing west)


	CLIENT: Stockland Commercial Property Pty Ltd		Site Photographs 25 to 28 Preliminary Site Investigation 106 - 142 Aldington Road, Kemps Creek, NSW	PROJECT No: 92345.00
	OFFICE: Macarthur	Prepared BY: CKM		PLATE No: 7
	SCALE: NTS	DATE: 15 Apr 2019		REVISION: 0



Photo 29: : Potential fill area in a drainage gully in the northadjacent to the fill area in the drainage gully (facing west)



Photo 30: Bricks and concrete observed on the surface immediately adjacent to the fill area in the drainage gully



Photo 31: The large shed in the southwest of Lot 31 was constructed on a fill platform (facing east)



Photo 32: Two septic tanks located adjacent to the northern house in Lot 32 (facing east)


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	OFFICE: Macarthur	Prepared BY: CKM		PLATE No: 8	
	SCALE: NTS	DATE: 15 Apr 2019		REVISION: 0	



Photo 33: Vegetated soil stockpiles adjacent to the northern house in Lot 32 (facing northeast)



Photo 34: Timber power pole located in the northwest of Lot 31 (facing southeast)



Photo 35: Timber power pole located in the southwest of Lot 31 (facing east)



Photo 36: The corridors and surrounds of the market garden appeared to have been sprayed with herbicide


 Douglas Partners Geotechnics Environment Groundwater	CLIENT: Stockland Commercial Property Pty Ltd		Site Photographs 33 to 36 Preliminary Site Investigation 106 - 142 Aldington Road, Kemps Creek, NSW	PROJECT No: 92345.00
	OFFICE: Macarthur	Prepared BY: CKM		PLATE No: 9
	SCALE: NTS	DATE: 15 Apr 2019		REVISION: 0



Photo 37: Filling overlying natural clays at TP9




Photo 38: Groundwater observed in the base of TP11



Photo 39: Groundwater observed in the base of TP4



Photo 40: TP6, excavated adjacent to the access road along the market garden

 Douglas Partners <i>Geotechnics Environment Groundwater</i>	CLIENT: Stockland Commercial Property Pty Ltd		Site Photographs 37 to 40 Preliminary Site Investigation 106 - 142 Aldington Road, Kemps Creek, NSW	PROJECT No: 92345.00	
	OFFICE: Macarthur	Prepared BY: CKM		PLATE No: 10	
	SCALE: NTS	DATE: 15 Apr 2019		REVISION: 0	

Appendix G

Summary Tables G1, G2 and G3

Table G1: Summary of Laboratory Results – Metals, TRH, BTEX, PAH

			Metals									TRH						BTEX				PAH			
			Arsenic	Cadmium	Chromium (VI)	Copper	Lead	Mercury (inorganic)	Nickel	Zinc	Manganese	TRH C6 - Cl0	TRH >Cl0-Cl6	F1 ((C6-C10)-BTEX)	F2 (>Cl0-Cl6 less Naphthalene)	F3 (>Cl6-C34)	F4 (>C34-C40)	Benzene	Toluene	Ethylbenzene	Total Xylenes	Naphthalene	Benzo(a)pyrene (BaP)	Benzo(a)pyrene TEQ	Total PAHs
		PQL	4.0	0.4	1.0	1.0	1.0	0.1	1.0	1.0	1.0	25.0	50.0	25.0	50.0	100.0	100.0	0.2	0.5	1.0	1.0	1.0	0.05	0.5	0.05
Sample ID	Depth	Sampled Date	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
TP1/0.0-0.2	0 - 0.2m	04/04/2019	6 3000 160	<0.4 900 NC	15 3600 670	18 240000 75	16 1500 1800	<0.1 730 NC	8 6000 290	33 400000 710	1300 60000 NC	<25 NC NC	<50 NC NC	<25 310 NC	<50 NL NC	<100 NC NC	<100 NC NC	<0.2 4 NC	<0.5 NL NC	<1 NL NC	<1 NL NC	<1 NL NC	<0.05 NC NC	<0.5 40 NC	<0.05 4000 NC
TP2/0.0-0.2	0 - 0.2m	04/04/2019	6 3000 160	<0.4 900 NC	23 3600 670	22 240000 75	17 1500 1800	<0.1 730 NC	5 6000 290	23 400000 710	610 60000 NC	<25 NC NC	<50 NC NC	<25 310 NC	<50 NL NC	<100 NC NC	<100 NC NC	<0.2 4 NC	<0.5 NL NC	<1 NL NC	<1 NL NC	<1 NL NC	<0.05 NC NC	<0.5 40 NC	<0.05 4000 NC
TP3/0.0-0.2	0 - 0.2m	04/04/2019	5 3000 160	<0.4 900 NC	17 3600 670	11 240000 75	13 1500 1800	<0.1 730 NC	4 6000 290	13 400000 710	440 60000 NC	<25 NC NC	<50 NC NC	<25 310 NC	<50 NL NC	<100 NC NC	<100 NC NC	<0.2 4 NC	<0.5 NL NC	<1 NL NC	<1 NL NC	<1 NL NC	<0.05 NC NC	<0.5 40 NC	<0.05 4000 NC
TP4/0.0-0.2	0 - 0.2m	04/04/2019	6 3000 160	<0.4 900 NC	15 3600 670	14 240000 75	23 1500 1800	<0.1 730 NC	9 6000 290	19 400000 710	2400 60000 NC	<25 NC NC	<50 NC NC	<25 310 NC	<50 NL NC	<100 NC NC	<100 NC NC	<0.2 4 NC	<0.5 NL NC	<1 NL NC	<1 NL NC	<1 NL NC	<0.05 NC NC	<0.5 40 NC	<0.05 4000 NC
BH5/0.0-0.2	0 - 0.2m	04/04/2019	6 3000 160	<0.4 900 NC	16 3600 670	23 240000 75	16 1500 1800	<0.1 730 NC	18 6000 290	36 400000 710	420 60000 NC	<25 NC NC	<50 NC NC	<25 310 NC	<50 NL NC	<100 NC NC	<100 NC NC	<0.2 4 NC	<0.5 NL NC	<1 NL NC	<1 NL NC	<1 NL NC	<0.05 NC NC	<0.5 40 NC	0.1 4000 NC
TP6/0.0-0.2	0 - 0.2m	04/04/2019	8 3000 160	<0.4 900 NC	15 3600 670	25 240000 75	20 1500 1800	<0.1 730 NC	12 6000 290	40 400000 710	2000 60000 NC	<25 NC NC	<50 NC NC	<25 310 NC	<50 NL NC	<100 NC NC	<100 NC NC	<0.2 4 NC	<0.5 NL NC	<1 NL NC	<1 NL NC	<1 NL NC	<0.05 NC NC	<0.5 40 NC	<0.05 4000 NC
TP7/0.0-0.2	0 - 0.2m	04/04/2019	7 3000 160	<0.4 900 NC	20 3600 670	17 240000 75	15 1500 1800	<0.1 730 NC	4 6000 290	17 400000 710	420 60000 NC	<25 NC NC	<50 NC NC	<25 310 NC	<50 NL NC	<100 NC NC	<100 NC NC	<0.2 4 NC	<0.5 NL NC	<1 NL NC	<1 NL NC	<1 NL NC	<0.05 NC NC	<0.5 40 NC	<0.05 4000 NC
BH8/0.0-0.2	0 - 0.2m	04/04/2019	4 3000 160	<0.4 900 NC	15 3600 670	24 240000 75	17 1500 1800	<0.1 730 NC	10 6000 290	37 400000 710	1000 60000 NC	<25 NC NC	<50 NC NC	<25 310 NC	<50 NL NC	<100 NC NC	<100 NC NC	<0.2 4 NC	<0.5 NL NC	<1 NL NC	<1 NL NC	<1 NL NC	<0.05 NC NC	<0.5 40 NC	<0.05 4000 NC
TP9/0.0-0.2	0 - 0.2m	04/04/2019	8 3000 160	<0.4 900 NC	17 3600 670	27 240000 75	30 1500 1800	<0.1 730 NC	5 6000 290	47 400000 710	140 60000 NC	<25 NC NC	<50 NC NC	<25 310 NC	<50 NL NC	<100 NC NC	<100 NC NC	<0.2 4 NC	<0.5 NL NC	<1 NL NC	<1 NL NC	<1 NL NC	0.2 NC NC	<0.5 40 NC	1.4 4000 NC
TP10/0.0-0.2	0 - 0.2m	04/04/2019	13 3000 160	<0.4 900 NC	20 3600 670	12 240000 75	17 1500 1800	<0.1 730 NC	8 6000 290	26 400000 710	810 60000 NC	<25 NC NC	<50 NC NC	<25 310 NC	<50 NL NC	<100 NC NC	<100 NC NC	<0.2 4 NC	<0.5 NL NC	<1 NL NC	<1 NL NC	<1 NL NC	<0.05 NC NC	<0.5 40 NC	<0.05 4000 NC
BD1/04042019	0 - 0.2m	04/04/2019	11 3000 160	<0.4 900 NC	20 3600 670	14 240000 75	17 1500 1800	<0.1 730 NC	7 6000 290	21 400000 710	700 60000 NC	<25 NC NC	<50 NC NC	<25 310 NC	<50 NL NC	<100 NC NC	<100 NC NC	<0.2 4 NC	<0.5 NL NC	<1 NL NC	<1 NL NC	<1 NL NC	<0.05 NC NC	<0.5 40 NC	<0.05 4000 NC
TP11/0.0-0.2	0 - 0.2m	04/04/2019	5 3000 160	<0.4 900 NC	15 3600 670	8 240000 75	13 1500 1800	<0.1 730 NC	3 6000 290	9 400000 710	460 60000 NC	<25 NC NC	<50 NC NC	<25 310 NC	<50 NL NC	<100 NC NC	<100 NC NC	<0.2 4 NC	<0.5 NL NC	<1 NL NC	<1 NL NC	<1 NL NC	<0.05 NC NC	<0.5 40 NC	<0.05 4000 NC
TP12/0.0-0.2	0 - 0.2m	04/04/2019	5 3000 160	<0.4 900 NC	16 3600 670	7 240000 75	12 1500 1800	<0.1 730 NC	3 6000 290	8 400000 710	550 60000 NC	<25 NC NC	<50 NC NC	<25 310 NC	<50 NL NC	<100 NC NC	<100 NC NC	<0.2 4 NC	<0.5 NL NC	<1 NL NC	<1 NL NC	<1 NL NC	<0.05 NC NC	<0.5 40 NC	<0.05 4000 NC

■ HIL / HSL exceedance
 ■ EIL / ESL exceedance
 ■ ML exceedance
 ■ HIL/HSL and EIL/ESL exceedance
Bold = Lab detections
 Key: Lab result
HIL/HSL value EIL/ESL value
■ ML and HIL/HSL/EIL/ESL exceedance
■ = DC exceedance
 NT = Not tested
 NL = Non limiting
 NC = No criteria
 NAD = No asbestos detected

■ Indicates that asbestos has been detected by the lab below the PQL, refer to the lab report

Notes:

a QA/QC replicate of sample listed directly below the primary sample

HIL/HSL HIL D / HSL D - NEPC 2013, Schedule B1
EIL/ESL Commercial and Industrial - NEPC 2013, Schedule B1

Table G2: Summary of Laboratory Results – Phenol, OCP, OPP, PCB, Asbestos (50 g)

			Phenol	OCP								OPP	PCB	Asbestos (50 g)
			Phenol	DDT+DDE+DDD	Aldrin & Dieldrin	Total Chlordane	Total Endosulfan	Endrin	Heptachlor	HCB	Methoxychlor	Chlorpyrifos	Total PCB	Calculated Asbestos (AS)
		PQL	5.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
Sample ID	Depth	Sampled Date		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	
TP1/0.0-0.2	0 - 0.2m	04/04/2019	NT 660 NC	<0.1 3600 NC	<0.1 45 NC	<0.1 530 NC	<0.1 2000 NC	<0.1 100 NC	<0.1 50 NC	<0.1 80 NC	<0.1 2500 NC	<0.1 2000 NC	<0.1 7 NC	NAD
TP2/0.0-0.2	0 - 0.2m	04/04/2019	NT 660 NC	<0.1 3600 NC	<0.1 45 NC	<0.1 530 NC	<0.1 2000 NC	<0.1 100 NC	<0.1 50 NC	<0.1 80 NC	<0.1 2500 NC	<0.1 2000 NC	<0.1 7 NC	NT
TP3/0.0-0.2	0 - 0.2m	04/04/2019	NT 660 NC	<0.1 3600 NC	<0.1 45 NC	<0.1 530 NC	<0.1 2000 NC	<0.1 100 NC	<0.1 50 NC	<0.1 80 NC	<0.1 2500 NC	<0.1 2000 NC	<0.1 7 NC	NT
TP4/0.0-0.2	0 - 0.2m	04/04/2019	NT 660 NC	<0.1 3600 NC	<0.1 45 NC	<0.1 530 NC	<0.1 2000 NC	<0.1 100 NC	<0.1 50 NC	<0.1 80 NC	<0.1 2500 NC	<0.1 2000 NC	<0.1 7 NC	NT
BH5/0.0-0.2	0 - 0.2m	04/04/2019	NT 660 NC	<0.1 3600 NC	<0.1 45 NC	<0.1 530 NC	<0.1 2000 NC	<0.1 100 NC	<0.1 50 NC	<0.1 80 NC	<0.1 2500 NC	<0.1 2000 NC	<0.1 7 NC	NT
TP6/0.0-0.2	0 - 0.2m	04/04/2019	NT 660 NC	<0.1 3600 NC	<0.1 45 NC	<0.1 530 NC	<0.1 2000 NC	<0.1 100 NC	<0.1 50 NC	<0.1 80 NC	<0.1 2500 NC	<0.1 2000 NC	<0.1 7 NC	NT
TP7/0.0-0.2	0 - 0.2m	04/04/2019	NT 660 NC	<0.1 3600 NC	<0.1 45 NC	<0.1 530 NC	<0.1 2000 NC	<0.1 100 NC	<0.1 50 NC	<0.1 80 NC	<0.1 2500 NC	<0.1 2000 NC	<0.1 7 NC	NT
BH8/0.0-0.2	0 - 0.2m	04/04/2019	NT 660 NC	<0.1 3600 NC	<0.1 45 NC	<0.1 530 NC	<0.1 2000 NC	<0.1 100 NC	<0.1 50 NC	<0.1 80 NC	<0.1 2500 NC	<0.1 2000 NC	<0.1 7 NC	NT
TP9/0.0-0.2	0 - 0.2m	04/04/2019	<5 660 NC	<0.1 3600 NC	<0.1 45 NC	<0.1 530 NC	<0.1 2000 NC	<0.1 100 NC	<0.1 50 NC	<0.1 80 NC	<0.1 2500 NC	<0.1 2000 NC	<0.1 7 NC	NT
TP11/0.0-0.2	0 - 0.2m	04/04/2019	NT 660 NC	<0.1 3600 NC	<0.1 45 NC	<0.1 530 NC	<0.1 2000 NC	<0.1 100 NC	<0.1 50 NC	<0.1 80 NC	<0.1 2500 NC	<0.1 2000 NC	<0.1 7 NC	NAD
TP12/0.0-0.2	0 - 0.2m	04/04/2019	<5 660 NC	<0.1 3600 NC	<0.1 45 NC	<0.1 530 NC	<0.1 2000 NC	<0.1 100 NC	<0.1 50 NC	<0.1 80 NC	<0.1 2500 NC	<0.1 2000 NC	<0.1 7 NC	NT
TP10/0.0-0.2	0 - 0.2m	04/04/2019	NT 660 NC	<0.1 3600 NC	<0.1 45 NC	<0.1 530 NC	<0.1 2000 NC	<0.1 100 NC	<0.1 50 NC	<0.1 80 NC	<0.1 2500 NC	<0.1 2000 NC	<0.1 7 NC	NT
BD1/04042019	0 - 0.2m	04/04/2019	<5 660 NC	<0.1 3600 NC	<0.1 45 NC	<0.1 530 NC	<0.1 2000 NC	<0.1 100 NC	<0.1 50 NC	<0.1 80 NC	<0.1 2500 NC	<0.1 2000 NC	<0.1 7 NC	NAD

■ HIL / HSL exceedance

■ EIL / ESL exceedance

■ ML exceedance

■ HIL/HSL and EIL/ESL exceedance

Bold = Lab detections

Key:

Lab result	
HIL/HSL value	EIL/ESL value

■ ML and HIL/HSL/EIL/ESL exceedance

red = DC exceedance

NT = Not tested

NL = Non limiting

NC = No criteria

NAD = No asbestos detected

■ Indicates that asbestos has been detected by the lab below the PQL, refer to the lab report

Notes:

a QA/QC replicate of sample listed directly below the primary sample

HIL/HSL HIL D / HSL D - NEPC 2013, Schedule B1
EIL/ESL Commercial and Industrial - NEPC 2013, Schedule B1

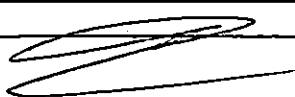
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Appendix H

Lab Certificates of Analysis and Chain-of-Custody documentation

Project Name: KEMPS CREEK, PSI & Geotech, Aldington Rd						To: Envirolab Services					
Project No: 92345.00			Sampler: Adad Barkho			12 Ashley Street, Chatswood NSW 2067					
Project Mgr: Eric Riggie			Mob. Phone: 0437 396 499			Attn: Tania Notaras					
Email: rod.gray@douglaspartners.com.au; grant.russell@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	Container Type	Analytes								Notes/preservation		
			S - soil W - water	G - glass P - plastic	Combo 6a	Combo 8a	PH/EC	ESP	Chloride & Sulfate						
TP1/0.0-0.2	1	04/04/19	S	G/P	X										
TP2/0.0-0.2	2	04/04/19	S	G/P	X										
TP3/0.0-0.2	3	04/04/19	S	G/P	X										
TP4/0.0-0.2	4	04/04/19	S	G/P	X										
BH5/0.0-0.2	5	05/04/19	S	G/P	X										
TP6/0.0-0.2	6	04/04/19	S	G/P	X										
TP7/0.0-0.2	7	04/04/19	S	G/P	X										
BH8/0.0-0.2	8	05/04/19	S	G/P	X										
TP9/0.0-0.2	9	04/04/19	S	G/P		X									
TP10/0.0-0.2	10	04/04/19	S	G/P											
TP11/0.0-0.2	11	04/04/19	S	G/P	X										
TP12/0.0-0.2	12	04/04/19	S	G/P		X									
TP1/0.5	13	04/04/19	S	G/P					X						

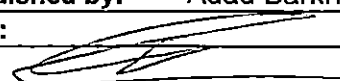
Lab Report No:			
Send Results to: Douglas Partners Pty Ltd		Address: 18 Waler Crescent, Smeaton Grange 2567	
Relinquished by: Adad Barkho		Transported to laboratory by:	
Signed: 		Received by: F. Gore	
Date & Time: 9/04/19 1:00			


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

Job No: 215356
Date Received: 9.4.19
Time Received: 17:10
Received by: K.G.
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

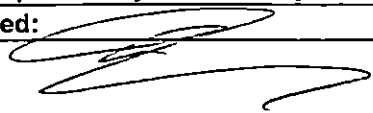
Project Name: KEMPS CREEK, PSI & Geotech, Aldington Rd						To: Envirolab Services					
Project No: 92345.00				Sampler: Adad Barkho		12 Ashley Street, Chatswood NSW 2067					
Project Mgr: Eric Riggie				Mob. Phone: 0437 396 499		Attn: Tania Notaras					
Email: rod.gray@douglaspartners.com.au; grant.russell@douglaspartners.com.au						Phone: (02) 9910 6200			Fax: (02) 9910 6201		
Date Required: Standard						Email: tnotaras@envirolabservices.com.au					

Sample ID	Lab ID	Date Sampled	Sample Type	Container Type	Analytes								Notes/preservation	
			S - soil W - water	G - glass P - plastic	Combo 6a	Combo 8a	PH/EC	ESP	Chloride & Sulfate					Hold
TP1/1.0	14	04/04/19	S	G/P			X							
TP1/1.5	15	04/04/19	S	G/P			X							
TP2/0.5	16	04/04/19	S	G/P			X							
TP2/1.0	17	04/04/19	S	G/P			X							
TP2/1.5	18	04/04/19	S	G/P			X		X					
TP3/0.5	19	04/04/19	S	G/P			X							
TP3/1.0	20	04/04/19	S	G/P			X							
TP3/1.5	21	04/04/19	S	G/P			X							
TP3/2.0	22	04/04/19	S	G/P			X							
TP3/2.5	23	04/04/19	S	G/P			X							
TP3/3.0	24	04/04/19	S	G/P			X							
TP4/0.5	25	04/04/19	S	G/P			X	X	X					
TP4/1.0	26	04/04/19	S	G/P			X							

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: Adad Barkho		Transported to laboratory by:
Signed: 	Date & Time: 9/04/19 1.00	Received by: K. Gore 215 350

Project Name: KEMPS CREEK, PSI & Geotech, Aldington Rd						To: Envirolab Services					
Project No: 92345.00			Sampler: Adad Barkho			12 Ashley Street, Chatswood NSW 2067					
Project Mgr: Eric Riggie			Mob. Phone: 0437 396 499			Attn: Tania Notaras					
Email: rod.gray@douglaspartners.com.au; grant.russell@douglaspartners.com.au						Phone: (02) 9910 6200			Fax: (02) 9910 6201		
Date Required: Standard						Email: tnotaras@envirolabservices.com.au					

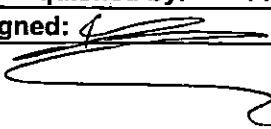
Sample ID	Lab ID	Date Sampled	Sample Type	Container Type	Analytes								Notes/preservation	
			S - soil W - water	G - glass P - plastic	Combo 6a	Combo 8a	PH/EC	ESP	Chloride & Sulfate					Hold
TP4/1.5	27	04/04/19	S	G/P			X							
TP4/2.0	28	04/04/19	S	G/P			X							
TP4/2.5	29	04/04/19	S	G/P			X							
TP4/3.0	30	04/04/19	S	G/P			X							
BH5/0.5	31	05/04/19	S	G/P			X		X					
BH5/1.0	32	05/04/19	S	G/P			X							
BH5/1.5	33	05/04/19	S	G/P			X							
BH5/2.0	34	05/04/19	S	G/P			X	X	X					
BH5/2.5	35	05/04/19	S	G/P										
BH5/3.0	36	05/04/19	S	G/P										
TP6/0.5	37	04/04/19	S	G/P			X							
TP6/1.0	38	04/04/19	S	G/P			X							
TP6/1.5	39	04/04/19	S	G/P			X							

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: Adad Barkho		Transported to laboratory by:	
Signed: 		Date & Time: 9/04/19 1:00	Received by: K. Gore

215350


Project Name: KEMPS CREEK, PSI & Geotech, Aldington Rd						To: Envirolab Services					
Project No: 92345.00			Sampler: Adad Barkho			12 Ashley Street, Chatswood NSW 2067					
Project Mgr: Eric Riggle			Mob. Phone: 0437 396 499			Attn: Tania Notaras					
Email: rod.gray@douglaspartners.com.au; grant.russell@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	Container Type	Analytes										Notes/preservation
			S - soil W - water	G - glass P - plastic	Combo 6a	Combo 8a	PH/EC	ESP	Chloride & Sulfate					Hold	
TP6/2.0	40	04/04/19	S	G/P			X		X						
TP6/2.5	41	04/04/19	S	G/P			X								
TP6/3.0	42	04/04/19	S	G/P			X								
TP7/0.5	43	04/04/19	S	G/P			X								
TP7/1.0	44	04/04/19	S	G/P			X								
TP7/1.5	45	04/04/19	S	G/P			X								
BH8/0.5	46	05/04/19	S	G/P			X								
BH8/1.0	47	05/04/19	S	G/P			X	X	X						
BH8/1.5	48	05/04/19	S	G/P			X								
BH8/2.0	49	05/04/19	S	G/P			X								
BH8/2.5	50	05/04/19	S	G/P			X		X						
TP9/0.5	51	04/04/19	S	G/P			X								
TP9/1.0	52	04/04/19	S	G/P			X								

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: Adad Barkho		Transported to laboratory by:	
Signed: 		Received by: K. Gore	
Date & Time: 9/04/19 1:00		215356	

Project Name: KEMPS CREEK, PSI & Geotech, Aldington Rd						To: Envirolab Services					
Project No: 92345.00			Sampler: Adad Barkho			12 Ashley Street, Chatswood NSW 2067					
Project Mgr: Eric Riggle			Mob. Phone: 0437 396 499			Attn: Tania Notaras					
Email: rod.gray@douglaspartners.com.au; grant.russell@douglaspartners.com.au						Phone: (02) 9910 6200			Fax: (02) 9910 6201		
Date Required: Standard						Email: tnotaras@envirolabservices.com.au					

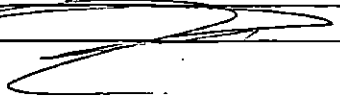
Sample ID	Lab ID	Date Sampled	Sample Type	Container Type	Analytes								Notes/preservation	
			S - soil W - water	G - glass P - plastic	Combo 6a	Combo 8a	PH/EC	ESP	Chloride & Sulfate					Hold
TP9/1.5	53	04/04/19	S	G/P			X							
TP9/2.0	54	04/04/19	S	G/P			X							
TP9/2.5	55	04/04/19	S	G/P			X							
TP9/3.0	56	04/04/19	S	G/P			X		X					
TP10/0.5	57	04/04/19	S	G/P			X							
TP10/1.0	58	04/04/19	S	G/P			X							
TP10/1.5	59	04/04/19	S	G/P			X							
TP11/0.5	60	04/04/19	S	G/P			X							
TP11/1.0	61	04/04/19	S	G/P			X							
TP11/1.5	62	04/04/19	S	G/P			X	X	X					
TP12/0.5	63	04/04/19	S	G/P			X							
TP12/1.0	64	04/04/19	S	G/P			X		X					
TP12/1.5	65	04/04/19	S	G/P			X							

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: Adad Barkho				Transported to laboratory by:					
Signed: 				Date & Time: 9/04/19 1:00		Received by: K. Gore			

215350

Project Name: KEMPS CREEK, PSI & Geotech, Aldington Rd										To: Envirolab Services						
Project No: 92345.00					Sampler: Adad Barkho					12 Ashley Street, Chatswood NSW 2067						
Project Mgr: Eric Riggie					Mob. Phone: 0437 396 499					Attn: Tania Notaras						
Email: rod.gray@douglaspartners.com.au; grant.russell@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	Container Type	Analytes								Notes/preservation	
			S - soil W - water	G - glass P - plastic	Combo 6a	Combo 8a	PH/EC	ESP	Chloride & Sulfate					Hold
TP12/2.0	66	04/04/19	S	G/P			X							
TP12/2.5	67	04/04/19	S	G/P			X	X	X					
TP12/3.0	68	04/04/19	S	G/P			X							
BD1/04042019	69		S			X								
			S											
TP10/2.0	70		S											
TP10/2.5	71		S											
TP10/3.0	72		S											
			S											
			S											
			S											
			S											
Count			S		9	3	53	5	12	0	0	0	0	

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: Adad Barkho		Transported to laboratory by:	
Signed: 		Received by: K. Gore	
Date & Time: 9/04/19 1:00			

215350

SAMPLE RECEIPT ADVICE

Client Details

Client	Douglas Partners Pty Ltd Smeaton Grange
Attention	Eric Riggle

Sample Login Details

Your reference	92345.00, Kemps Creek
Envirolab Reference	215350
Date Sample Received	10/04/2019
Date Instructions Received	10/04/2019
Date Results Expected to be Reported	16/04/2019

Sample Condition

Samples received in appropriate condition for analysis	YES
No. of Samples Provided	72 Soil
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	19.7
Cooling Method	Ice Pack
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

Aileen Hie

Phone: 02 9910 6200
Fax: 02 9910 6201
Email: ahie@envirolab.com.au

Jacinta Hurst

Phone: 02 9910 6200
Fax: 02 9910 6201
Email: jhurst@envirolab.com.au

Analysis Underway, details on the following page:



Envirolab Services Pty Ltd

ABN 37 112 535 645

12 Ashley St Chatswood NSW 2067

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Sample ID	VTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Organochlorine Pesticides in soil	Organophosphorus Pesticides	PCBs in Soil	Acid Extractable metals in soil	Misc Soil - Inorg	Asbestos ID - soils	Misc Inorg - Soil	ESP/CEC	On Hold
TP1/0.0-0.2	✓	✓	✓	✓	✓	✓	✓		✓			
TP2/0.0-0.2	✓	✓	✓	✓	✓	✓	✓		✓			
TP3/0.0-0.2	✓	✓	✓	✓	✓	✓	✓		✓			
TP4/0.0-0.2	✓	✓	✓	✓	✓	✓	✓		✓			
BH5/0.0-0.2	✓	✓	✓	✓	✓	✓	✓		✓			
TP6/0.0-0.2	✓	✓	✓	✓	✓	✓	✓		✓			
TP7/0.0-0.2	✓	✓	✓	✓	✓	✓	✓		✓			
BH8/0.0-0.2	✓	✓	✓	✓	✓	✓	✓		✓			
TP9/0.0-0.2	✓	✓	✓	✓	✓	✓	✓	✓	✓			
TP10/0.0-0.2												✓
TP11/0.0-0.2	✓	✓	✓	✓	✓	✓	✓		✓			
TP12/0.0-0.2	✓	✓	✓	✓	✓	✓	✓	✓	✓			
TP1/0.5										✓		
TP1/1.0										✓		
TP1/1.5										✓		
TP2/0.5										✓		
TP2/1.0										✓		
TP2/1.5										✓		
TP3/0.5										✓		
TP3/1.0										✓		
TP3/1.5										✓		
TP3/2.0										✓		
TP3/2.5										✓		
TP3/3.0										✓		
TP4/0.5										✓	✓	
TP4/1.0										✓		
TP4/1.5										✓		
TP4/2.0										✓		
TP4/2.5										✓		
TP4/3.0										✓		
BH5/0.5										✓		
BH5/1.0										✓		



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Sample ID	VTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Organochlorine Pesticides in soil	Organophosphorus Pesticides	PCBs in Soil	Acid Extractable metals in soil	Misc Soil - Inorg	Asbestos ID - soils	Misc Inorg - Soil	ESP/CEC	On Hold
BH5/1.5										✓		
BH5/2.0										✓	✓	
BH5/2.5												✓
BH5/3.0												✓
TP6/0.5										✓		
TP6/1.0										✓		
TP6/1.5										✓		
TP6/2.0										✓		
TP6/2.5										✓		
TP6/3.0										✓		
TP7/0.5										✓		
TP7/1.0										✓		
TP7/1.5										✓		
BH8/0.5										✓		
BH8/1.0										✓	✓	
BH8/1.5										✓		
BH8/2.0										✓		
BH8/2.5										✓		
TP9/0.5										✓		
TP9/1.0										✓		
TP9/1.5										✓		
TP9/2.0										✓		
TP9/2.5										✓		
TP9/3.0										✓		
TP10/0.5										✓		
TP10/1.0										✓		
TP10/1.5										✓		
TP11/0.5										✓		
TP11/1.0										✓		
TP11/1.5										✓	✓	
TP12/0.5										✓		
TP12/1.0										✓		



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Sample ID	VTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Organochlorine Pesticides in soil	Organophosphorus Pesticides	PCBs in Soil	Acid Extractable metals in soil	Misc Soil - Inorg	Asbestos ID - soils	Misc Inorg - Soil	ESP/CEC	On Hold
TP12/1.5										✓		
TP12/2.0										✓		
TP12/2.5										✓	✓	
TP12/3.0										✓		
BD1/04042019	✓	✓	✓	✓	✓	✓	✓	✓	✓			
TP10/2.0												✓
TP10/2.5												✓
TP10/3.0												✓

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

Additional Info

Sample storage - Waters are routinely disposed of approximately 1 month and soils approximately 2 months from receipt.

Requests for longer term sample storage must be received in writing.

CERTIFICATE OF ANALYSIS 215350

Client Details

Client	Douglas Partners Pty Ltd Smeaton Grange
Attention	Cindy Murphy, Eric Riggle
Address	18 Waler Crescent, Smeaton Grange, NSW, 2567

Sample Details

Your Reference	92345.00, Kemps Creek
Number of Samples	72 Soil
Date samples received	10/04/2019
Date completed instructions received	10/04/2019

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	16/04/2019
Date of Issue	16/04/2019
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Asbestos Approved By

Analysed by Asbestos Approved Identifier: Lucy Zhu
 Authorised by Asbestos Approved Signatory: Matt Tang

Results Approved By

Giovanni Agosti, Group Technical Manager
 Ken Nguyen, Reporting Supervisor
 Matthew Tang, Asbestos Supervisor
 Nick Sarlamis, Inorganics Supervisor
 Steven Luong, Organics Supervisor

Authorised By



Nancy Zhang, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil

Our Reference		215350-1	215350-2	215350-3	215350-4	215350-5
Your Reference	UNITS	TP1/0.0-0.2	TP2/0.0-0.2	TP3/0.0-0.2	TP4/0.0-0.2	BH5/0.0-0.2
Date Sampled		04/04/2019	04/04/2019	04/04/2019	04/04/2019	04/04/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	11/04/2019	11/04/2019	11/04/2019	11/04/2019	11/04/2019
Date analysed	-	13/04/2019	13/04/2019	13/04/2019	13/04/2019	13/04/2019
TRH C ₆ - C ₉	mg/kg	<25	<25	<25	<25	<25
TRH C ₆ - C ₁₀	mg/kg	<25	<25	<25	<25	<25
vTPH C ₆ - C ₁₀ less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	84	88	86	86	87

vTRH(C6-C10)/BTEXN in Soil

Our Reference		215350-6	215350-7	215350-8	215350-9	215350-11
Your Reference	UNITS	TP6/0.0-0.2	TP7/0.0-0.2	BH8/0.0-0.2	TP9/0.0-0.2	TP11/0.0-0.2
Date Sampled		04/04/2019	04/04/2019	04/04/2019	04/04/2019	04/04/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	11/04/2019	11/04/2019	11/04/2019	11/04/2019	11/04/2019
Date analysed	-	13/04/2019	13/04/2019	13/04/2019	13/04/2019	13/04/2019
TRH C ₆ - C ₉	mg/kg	<25	<25	<25	<25	<25
TRH C ₆ - C ₁₀	mg/kg	<25	<25	<25	<25	<25
vTPH C ₆ - C ₁₀ less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	86	89	84	94	83

vTRH(C6-C10)/BTEXN in Soil			
Our Reference		215350-12	215350-69
Your Reference	UNITS	TP12/0.0-0.2	BD1/04042019
Date Sampled		04/04/2019	04/04/2019
Type of sample		Soil	Soil
Date extracted	-	11/04/2019	11/04/2019
Date analysed	-	13/04/2019	13/04/2019
TRH C ₆ - C ₉	mg/kg	<25	<25
TRH C ₆ - C ₁₀	mg/kg	<25	<25
vTPH C ₆ - C ₁₀ less BTEX (F1)	mg/kg	<25	<25
Benzene	mg/kg	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1
m+p-xylene	mg/kg	<2	<2
o-Xylene	mg/kg	<1	<1
naphthalene	mg/kg	<1	<1
Total +ve Xylenes	mg/kg	<1	<1
Surrogate aaa-Trifluorotoluene	%	88	81

svTRH (C10-C40) in Soil

Our Reference		215350-1	215350-2	215350-3	215350-4	215350-5
Your Reference	UNITS	TP1/0.0-0.2	TP2/0.0-0.2	TP3/0.0-0.2	TP4/0.0-0.2	BH5/0.0-0.2
Date Sampled		04/04/2019	04/04/2019	04/04/2019	04/04/2019	04/04/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	11/04/2019	11/04/2019	11/04/2019	11/04/2019	11/04/2019
Date analysed	-	13/04/2019	13/04/2019	13/04/2019	13/04/2019	13/04/2019
TRH C ₁₀ - C ₁₄	mg/kg	<50	<50	<50	<50	<50
TRH C ₁₅ - C ₂₈	mg/kg	<100	<100	<100	<100	<100
TRH C ₂₉ - C ₃₆	mg/kg	<100	<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	%	85	83	83	86	84

svTRH (C10-C40) in Soil

Our Reference		215350-6	215350-7	215350-8	215350-9	215350-11
Your Reference	UNITS	TP6/0.0-0.2	TP7/0.0-0.2	BH8/0.0-0.2	TP9/0.0-0.2	TP11/0.0-0.2
Date Sampled		04/04/2019	04/04/2019	04/04/2019	04/04/2019	04/04/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	11/04/2019	11/04/2019	11/04/2019	11/04/2019	11/04/2019
Date analysed	-	13/04/2019	13/04/2019	13/04/2019	13/04/2019	13/04/2019
TRH C ₁₀ - C ₁₄	mg/kg	<50	<50	<50	<50	<50
TRH C ₁₅ - C ₂₈	mg/kg	<100	<100	<100	<100	<100
TRH C ₂₉ - C ₃₆	mg/kg	<100	<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	%	87	85	87	85	81

svTRH (C10-C40) in Soil			
Our Reference		215350-12	215350-69
Your Reference	UNITS	TP12/0.0-0.2	BD1/04042019
Date Sampled		04/04/2019	04/04/2019
Type of sample		Soil	Soil
Date extracted	-	11/04/2019	11/04/2019
Date analysed	-	13/04/2019	13/04/2019
TRH C ₁₀ - C ₁₄	mg/kg	<50	<50
TRH C ₁₅ - C ₂₈	mg/kg	<100	<100
TRH C ₂₉ - C ₃₆	mg/kg	<100	<100
TRH >C ₁₀ -C ₁₆	mg/kg	<50	<50
TRH >C ₁₀ - C ₁₆ less Naphthalene (F2)	mg/kg	<50	<50
TRH >C ₁₆ -C ₃₄	mg/kg	<100	<100
TRH >C ₃₄ -C ₄₀	mg/kg	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50
Surrogate o-Terphenyl	%	84	84

PAHs in Soil						
Our Reference		215350-1	215350-2	215350-3	215350-4	215350-5
Your Reference	UNITS	TP1/0.0-0.2	TP2/0.0-0.2	TP3/0.0-0.2	TP4/0.0-0.2	BH5/0.0-0.2
Date Sampled		04/04/2019	04/04/2019	04/04/2019	04/04/2019	04/04/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	11/04/2019	11/04/2019	11/04/2019	11/04/2019	11/04/2019
Date analysed	-	12/04/2019	12/04/2019	12/04/2019	12/04/2019	12/04/2019
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
Total +ve PAH's	mg/kg	<0.05	<0.05	<0.05	<0.05	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
Surrogate <i>p</i> -Terphenyl-d14	%	102	98	99	101	101

PAHs in Soil						
Our Reference		215350-6	215350-7	215350-8	215350-9	215350-11
Your Reference	UNITS	TP6/0.0-0.2	TP7/0.0-0.2	BH8/0.0-0.2	TP9/0.0-0.2	TP11/0.0-0.2
Date Sampled		04/04/2019	04/04/2019	04/04/2019	04/04/2019	04/04/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	11/04/2019	11/04/2019	11/04/2019	11/04/2019	11/04/2019
Date analysed	-	12/04/2019	12/04/2019	12/04/2019	12/04/2019	12/04/2019
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	0.2	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	0.2	<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	0.2	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	0.3	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	0.2	<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	0.2	<0.1
Total +ve PAH's	mg/kg	<0.05	<0.05	<0.05	1.4	<0.05
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
Surrogate <i>p</i> -Terphenyl-d14	%	102	101	105	106	102

PAHs in Soil			
Our Reference		215350-12	215350-69
Your Reference	UNITS	TP12/0.0-0.2	BD1/04042019
Date Sampled		04/04/2019	04/04/2019
Type of sample		Soil	Soil
Date extracted	-	11/04/2019	11/04/2019
Date analysed	-	12/04/2019	12/04/2019
Naphthalene	mg/kg	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1
Total +ve PAH's	mg/kg	<0.05	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5
Surrogate <i>p</i> -Terphenyl-d14	%	103	103

Organochlorine Pesticides in soil						
Our Reference		215350-1	215350-2	215350-3	215350-4	215350-5
Your Reference	UNITS	TP1/0.0-0.2	TP2/0.0-0.2	TP3/0.0-0.2	TP4/0.0-0.2	BH5/0.0-0.2
Date Sampled		04/04/2019	04/04/2019	04/04/2019	04/04/2019	04/04/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	11/04/2019	11/04/2019	11/04/2019	11/04/2019	11/04/2019
Date analysed	-	12/04/2019	12/04/2019	12/04/2019	12/04/2019	12/04/2019
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	%	92	93	91	92	96

Organochlorine Pesticides in soil						
Our Reference		215350-6	215350-7	215350-8	215350-9	215350-11
Your Reference	UNITS	TP6/0.0-0.2	TP7/0.0-0.2	BH8/0.0-0.2	TP9/0.0-0.2	TP11/0.0-0.2
Date Sampled		04/04/2019	04/04/2019	04/04/2019	04/04/2019	04/04/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	11/04/2019	11/04/2019	11/04/2019	11/04/2019	11/04/2019
Date analysed	-	12/04/2019	12/04/2019	12/04/2019	12/04/2019	12/04/2019
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	%	97	93	98	94	91

Organochlorine Pesticides in soil			
Our Reference		215350-12	215350-69
Your Reference	UNITS	TP12/0.0-0.2	BD1/04042019
Date Sampled		04/04/2019	04/04/2019
Type of sample		Soil	Soil
Date extracted	-	11/04/2019	11/04/2019
Date analysed	-	12/04/2019	12/04/2019
HCB	mg/kg	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1
Surrogate TCMX	%	92	91

Organophosphorus Pesticides						
Our Reference	UNITS	215350-1	215350-2	215350-3	215350-4	215350-5
Your Reference		TP1/0.0-0.2	TP2/0.0-0.2	TP3/0.0-0.2	TP4/0.0-0.2	BH5/0.0-0.2
Date Sampled		04/04/2019	04/04/2019	04/04/2019	04/04/2019	04/04/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	11/04/2019	11/04/2019	11/04/2019	11/04/2019	11/04/2019
Date analysed	-	12/04/2019	12/04/2019	12/04/2019	12/04/2019	12/04/2019
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
Chlorpyrifos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyrifos-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	%	92	93	91	92	96

Organophosphorus Pesticides						
Our Reference	UNITS	215350-6	215350-7	215350-8	215350-9	215350-11
Your Reference		TP6/0.0-0.2	TP7/0.0-0.2	BH8/0.0-0.2	TP9/0.0-0.2	TP11/0.0-0.2
Date Sampled		04/04/2019	04/04/2019	04/04/2019	04/04/2019	04/04/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	11/04/2019	11/04/2019	11/04/2019	11/04/2019	11/04/2019
Date analysed	-	12/04/2019	12/04/2019	12/04/2019	12/04/2019	12/04/2019
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
Chlorpyrifos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyrifos-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	%	97	93	98	94	91

Organophosphorus Pesticides			
Our Reference		215350-12	215350-69
Your Reference	UNITS	TP12/0.0-0.2	BD1/04042019
Date Sampled		04/04/2019	04/04/2019
Type of sample		Soil	Soil
Date extracted	-	11/04/2019	11/04/2019
Date analysed	-	12/04/2019	12/04/2019
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1
Chlorpyrifos	mg/kg	<0.1	<0.1
Chlorpyrifos-methyl	mg/kg	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1
Dichlorvos	mg/kg	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1
Surrogate TCMX	%	92	91

PCBs in Soil						
Our Reference		215350-1	215350-2	215350-3	215350-4	215350-5
Your Reference	UNITS	TP1/0.0-0.2	TP2/0.0-0.2	TP3/0.0-0.2	TP4/0.0-0.2	BH5/0.0-0.2
Date Sampled		04/04/2019	04/04/2019	04/04/2019	04/04/2019	04/04/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	11/04/2019	11/04/2019	11/04/2019	11/04/2019	11/04/2019
Date analysed	-	12/04/2019	12/04/2019	12/04/2019	12/04/2019	12/04/2019
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	%	92	93	91	92	96

PCBs in Soil						
Our Reference		215350-6	215350-7	215350-8	215350-9	215350-11
Your Reference	UNITS	TP6/0.0-0.2	TP7/0.0-0.2	BH8/0.0-0.2	TP9/0.0-0.2	TP11/0.0-0.2
Date Sampled		04/04/2019	04/04/2019	04/04/2019	04/04/2019	04/04/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	11/04/2019	11/04/2019	11/04/2019	11/04/2019	11/04/2019
Date analysed	-	12/04/2019	12/04/2019	12/04/2019	12/04/2019	12/04/2019
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	%	97	93	98	94	91

PCBs in Soil			
Our Reference		215350-12	215350-69
Your Reference	UNITS	TP12/0.0-0.2	BD1/04042019
Date Sampled		04/04/2019	04/04/2019
Type of sample		Soil	Soil
Date extracted	-	11/04/2019	11/04/2019
Date analysed	-	12/04/2019	12/04/2019
Aroclor 1016	mg/kg	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1
Surrogate TCLMX	%	92	91

Acid Extractable metals in soil

Our Reference		215350-1	215350-2	215350-3	215350-4	215350-5
Your Reference	UNITS	TP1/0.0-0.2	TP2/0.0-0.2	TP3/0.0-0.2	TP4/0.0-0.2	BH5/0.0-0.2
Date Sampled		04/04/2019	04/04/2019	04/04/2019	04/04/2019	04/04/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	11/04/2019	11/04/2019	11/04/2019	11/04/2019	11/04/2019
Date analysed	-	11/04/2019	11/04/2019	11/04/2019	11/04/2019	11/04/2019
Arsenic	mg/kg	6	6	5	6	6
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	15	23	17	15	16
Copper	mg/kg	18	22	11	14	23
Lead	mg/kg	16	17	13	23	16
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	8	5	4	9	18
Zinc	mg/kg	33	23	13	19	36
Manganese	mg/kg	1,300	610	440	2,400	420

Acid Extractable metals in soil

Our Reference		215350-6	215350-7	215350-8	215350-9	215350-11
Your Reference	UNITS	TP6/0.0-0.2	TP7/0.0-0.2	BH8/0.0-0.2	TP9/0.0-0.2	TP11/0.0-0.2
Date Sampled		04/04/2019	04/04/2019	04/04/2019	04/04/2019	04/04/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	11/04/2019	11/04/2019	11/04/2019	11/04/2019	11/04/2019
Date analysed	-	11/04/2019	11/04/2019	11/04/2019	11/04/2019	11/04/2019
Arsenic	mg/kg	8	7	4	8	5
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	15	20	15	17	15
Copper	mg/kg	25	17	24	27	8
Lead	mg/kg	20	15	17	30	13
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	12	4	10	5	3
Zinc	mg/kg	40	17	37	47	9
Manganese	mg/kg	2,000	420	1,000	140	460

Acid Extractable metals in soil			
Our Reference		215350-12	215350-69
Your Reference	UNITS	TP12/0.0-0.2	BD1/04042019
Date Sampled		04/04/2019	04/04/2019
Type of sample		Soil	Soil
Date prepared	-	11/04/2019	11/04/2019
Date analysed	-	11/04/2019	11/04/2019
Arsenic	mg/kg	5	11
Cadmium	mg/kg	<0.4	<0.4
Chromium	mg/kg	16	20
Copper	mg/kg	7	14
Lead	mg/kg	12	17
Mercury	mg/kg	<0.1	<0.1
Nickel	mg/kg	3	7
Zinc	mg/kg	8	21
Manganese	mg/kg	550	700

Misc Soil - Inorg				
Our Reference		215350-9	215350-12	215350-69
Your Reference	UNITS	TP9/0.0-0.2	TP12/0.0-0.2	BD1/04042019
Date Sampled		04/04/2019	04/04/2019	04/04/2019
Type of sample		Soil	Soil	Soil
Date prepared	-	11/04/2019	11/04/2019	11/04/2019
Date analysed	-	11/04/2019	11/04/2019	11/04/2019
Total Phenolics (as Phenol)	mg/kg	<5	<5	<5

Moisture						
Our Reference	UNITS	215350-1	215350-2	215350-3	215350-4	215350-5
Your Reference		TP1/0.0-0.2	TP2/0.0-0.2	TP3/0.0-0.2	TP4/0.0-0.2	BH5/0.0-0.2
Date Sampled		04/04/2019	04/04/2019	04/04/2019	04/04/2019	04/04/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	11/04/2019	11/04/2019	11/04/2019	11/04/2019	11/04/2019
Date analysed	-	12/04/2019	12/04/2019	12/04/2019	12/04/2019	12/04/2019
Moisture	%	18	15	14	19	16

Moisture						
Our Reference	UNITS	215350-6	215350-7	215350-8	215350-9	215350-11
Your Reference		TP6/0.0-0.2	TP7/0.0-0.2	BH8/0.0-0.2	TP9/0.0-0.2	TP11/0.0-0.2
Date Sampled		04/04/2019	04/04/2019	04/04/2019	04/04/2019	04/04/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	11/04/2019	11/04/2019	11/04/2019	11/04/2019	11/04/2019
Date analysed	-	12/04/2019	12/04/2019	12/04/2019	12/04/2019	12/04/2019
Moisture	%	13	15	20	16	15

Moisture			
Our Reference	UNITS	215350-12	215350-69
Your Reference		TP12/0.0-0.2	BD1/04042019
Date Sampled		04/04/2019	04/04/2019
Type of sample		Soil	Soil
Date prepared	-	11/04/2019	11/04/2019
Date analysed	-	12/04/2019	12/04/2019
Moisture	%	16	21

Asbestos ID - soils						
Our Reference	UNITS	215350-1	215350-2	215350-3	215350-4	215350-5
Your Reference		TP1/0.0-0.2	TP2/0.0-0.2	TP3/0.0-0.2	TP4/0.0-0.2	BH5/0.0-0.2
Date Sampled		04/04/2019	04/04/2019	04/04/2019	04/04/2019	04/04/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	11/04/2019	11/04/2019	11/04/2019	11/04/2019	11/04/2019
Sample mass tested	g	Approx. 50g	Approx. 30g	Approx. 40g	Approx. 45g	Approx. 30g
Sample Description	-	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

Asbestos ID - soils

Our Reference		215350-6	215350-7	215350-8	215350-9	215350-11
Your Reference	UNITS	TP6/0.0-0.2	TP7/0.0-0.2	BH8/0.0-0.2	TP9/0.0-0.2	TP11/0.0-0.2
Date Sampled		04/04/2019	04/04/2019	04/04/2019	04/04/2019	04/04/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	11/04/2019	11/04/2019	11/04/2019	11/04/2019	11/04/2019
Sample mass tested	g	Approx. 30g	Approx. 65g	Approx. 30g	Approx. 40g	Approx. 30g
Sample Description	-	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

Asbestos ID - soils

Our Reference		215350-12	215350-69
Your Reference	UNITS	TP12/0.0-0.2	BD1/04042019
Date Sampled		04/04/2019	04/04/2019
Type of sample		Soil	Soil
Date analysed	-	11/04/2019	11/04/2019
Sample mass tested	g	Approx. 25g	Approx. 25g
Sample Description	-	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected

Misc Inorg - Soil

Our Reference		215350-13	215350-14	215350-15	215350-16	215350-17
Your Reference	UNITS	TP1/0.5	TP1/1.0	TP1/1.5	TP2/0.5	TP2/1.0
Date Sampled		04/04/2019	04/04/2019	04/04/2019	04/04/2019	04/04/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	14/04/2019	14/04/2019	14/04/2019	14/04/2019	14/04/2019
Date analysed	-	14/04/2019	14/04/2019	14/04/2019	14/04/2019	14/04/2019
pH 1:5 soil:water	pH Units	[NA]	5.9	4.9	5.8	5.3
Electrical Conductivity 1:5 soil:water	µS/cm	[NA]	500	900	160	310
Chloride, Cl 1:5 soil:water	mg/kg	25	[NA]	[NA]	[NA]	[NA]
Sulphate, SO4 1:5 soil:water	mg/kg	20	[NA]	[NA]	[NA]	[NA]

Misc Inorg - Soil

Our Reference		215350-18	215350-19	215350-20	215350-21	215350-22
Your Reference	UNITS	TP2/1.5	TP3/0.5	TP3/1.0	TP3/1.5	TP3/2.0
Date Sampled		04/04/2019	04/04/2019	04/04/2019	04/04/2019	04/04/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	14/04/2019	14/04/2019	14/04/2019	14/04/2019	14/04/2019
Date analysed	-	14/04/2019	14/04/2019	14/04/2019	14/04/2019	14/04/2019
pH 1:5 soil:water	pH Units	5.0	6.2	5.7	5.7	5.6
Electrical Conductivity 1:5 soil:water	µS/cm	550	58	84	100	180
Chloride, Cl 1:5 soil:water	mg/kg	780	[NA]	[NA]	[NA]	[NA]
Sulphate, SO4 1:5 soil:water	mg/kg	270	[NA]	[NA]	[NA]	[NA]

Misc Inorg - Soil

Our Reference		215350-23	215350-24	215350-25	215350-26	215350-27
Your Reference	UNITS	TP3/2.5	TP3/3.0	TP4/0.5	TP4/1.0	TP4/1.5
Date Sampled		04/04/2019	04/04/2019	04/04/2019	04/04/2019	04/04/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	14/04/2019	14/04/2019	14/04/2019	14/04/2019	14/04/2019
Date analysed	-	14/04/2019	14/04/2019	14/04/2019	14/04/2019	14/04/2019
pH 1:5 soil:water	pH Units	5.6	5.7	6.8	5.2	4.9
Electrical Conductivity 1:5 soil:water	µS/cm	300	280	100	880	1,300
Chloride, Cl 1:5 soil:water	mg/kg	[NA]	[NA]	62	[NA]	[NA]
Sulphate, SO4 1:5 soil:water	mg/kg	[NA]	[NA]	20	[NA]	[NA]

Misc Inorg - Soil						
Our Reference		215350-28	215350-29	215350-30	215350-31	215350-32
Your Reference	UNITS	TP4/2.0	TP4/2.5	TP4/3.0	BH5/0.5	BH5/1.0
Date Sampled		04/04/2019	04/04/2019	04/04/2019	04/04/2019	04/04/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	14/04/2019	14/04/2019	14/04/2019	14/04/2019	14/04/2019
Date analysed	-	14/04/2019	14/04/2019	14/04/2019	14/04/2019	14/04/2019
pH 1:5 soil:water	pH Units	6.5	7.7	7.4	7.0	6.9
Electrical Conductivity 1:5 soil:water	µS/cm	760	780	630	51	46
Chloride, Cl 1:5 soil:water	mg/kg	[NA]	[NA]	[NA]	10	[NA]
Sulphate, SO4 1:5 soil:water	mg/kg	[NA]	[NA]	[NA]	<10	[NA]

Misc Inorg - Soil						
Our Reference		215350-33	215350-34	215350-37	215350-38	215350-39
Your Reference	UNITS	BH5/1.5	BH5/2.0	TP6/0.5	TP6/1.0	TP6/1.5
Date Sampled		04/04/2019	04/04/2019	04/04/2019	04/04/2019	04/04/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	14/04/2019	14/04/2019	14/04/2019	14/04/2019	14/04/2019
Date analysed	-	14/04/2019	14/04/2019	14/04/2019	14/04/2019	14/04/2019
pH 1:5 soil:water	pH Units	7.3	7.9	6.7	7.9	9.1
Electrical Conductivity 1:5 soil:water	µS/cm	30	150	440	510	530
Chloride, Cl 1:5 soil:water	mg/kg	[NA]	<10	[NA]	[NA]	[NA]
Sulphate, SO4 1:5 soil:water	mg/kg	[NA]	31	[NA]	[NA]	[NA]

Misc Inorg - Soil						
Our Reference		215350-40	215350-41	215350-42	215350-43	215350-44
Your Reference	UNITS	TP6/2.0	TP6/2.5	TP6/3.0	TP7/0.5	TP7/1.0
Date Sampled		04/04/2019	04/04/2019	04/04/2019	04/04/2019	04/04/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	14/04/2019	14/04/2019	14/04/2019	14/04/2019	14/04/2019
Date analysed	-	14/04/2019	14/04/2019	14/04/2019	14/04/2019	14/04/2019
pH 1:5 soil:water	pH Units	8.6	9.3	9.5	6.1	5.4
Electrical Conductivity 1:5 soil:water	µS/cm	380	620	600	94	280
Chloride, Cl 1:5 soil:water	mg/kg	430	[NA]	[NA]	[NA]	[NA]
Sulphate, SO4 1:5 soil:water	mg/kg	52	[NA]	[NA]	[NA]	[NA]

Misc Inorg - Soil						
Our Reference		215350-45	215350-46	215350-47	215350-48	215350-49
Your Reference	UNITS	TP7/1.5	BH8/0.5	BH8/1.0	BH8/1.5	BH8/2.0
Date Sampled		04/04/2019	04/04/2019	04/04/2019	04/04/2019	04/04/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	14/04/2019	14/04/2019	14/04/2019	14/04/2019	14/04/2019
Date analysed	-	14/04/2019	14/04/2019	14/04/2019	14/04/2019	14/04/2019
pH 1:5 soil:water	pH Units	5.3	6.4	5.3	5.2	5.0
Electrical Conductivity 1:5 soil:water	µS/cm	280	190	640	530	370
Chloride, Cl 1:5 soil:water	mg/kg	[NA]	[NA]	720	[NA]	[NA]
Sulphate, SO4 1:5 soil:water	mg/kg	[NA]	[NA]	360	[NA]	[NA]

Misc Inorg - Soil						
Our Reference		215350-50	215350-51	215350-52	215350-53	215350-54
Your Reference	UNITS	BH8/2.5	TP9/0.5	TP9/1.0	TP9/1.5	TP9/2.0
Date Sampled		04/04/2019	04/04/2019	04/04/2019	04/04/2019	04/04/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	14/04/2019	14/04/2019	14/04/2019	14/04/2019	14/04/2019
Date analysed	-	14/04/2019	14/04/2019	14/04/2019	14/04/2019	14/04/2019
pH 1:5 soil:water	pH Units	5.1	7.3	5.3	5.0	5.0
Electrical Conductivity 1:5 soil:water	µS/cm	380	92	480	590	810
Chloride, Cl 1:5 soil:water	mg/kg	280	[NA]	[NA]	[NA]	[NA]
Sulphate, SO4 1:5 soil:water	mg/kg	300	[NA]	[NA]	[NA]	[NA]

Misc Inorg - Soil						
Our Reference		215350-55	215350-56	215350-57	215350-58	215350-59
Your Reference	UNITS	TP9/2.5	TP9/3.0	TP10/0.5	TP10/1.0	TP10/1.5
Date Sampled		04/04/2019	04/04/2019	04/04/2019	04/04/2019	04/04/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	14/04/2019	14/04/2019	14/04/2019	14/04/2019	14/04/2019
Date analysed	-	14/04/2019	14/04/2019	14/04/2019	14/04/2019	14/04/2019
pH 1:5 soil:water	pH Units	5.0	5.3	5.9	5.2	5.0
Electrical Conductivity 1:5 soil:water	µS/cm	860	760	77	340	600
Chloride, Cl 1:5 soil:water	mg/kg	[NA]	850	[NA]	[NA]	[NA]
Sulphate, SO4 1:5 soil:water	mg/kg	[NA]	300	[NA]	[NA]	[NA]

Misc Inorg - Soil						
Our Reference		215350-60	215350-61	215350-62	215350-63	215350-64
Your Reference	UNITS	TP11/0.5	TP11/1.0	TP11/1.5	TP12/0.5	TP12/1.0
Date Sampled		04/04/2019	04/04/2019	04/04/2019	04/04/2019	04/04/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	14/04/2019	14/04/2019	14/04/2019	14/04/2019	14/04/2019
Date analysed	-	14/04/2019	14/04/2019	14/04/2019	14/04/2019	14/04/2019
pH 1:5 soil:water	pH Units	5.4	4.8	4.9	5.3	4.8
Electrical Conductivity 1:5 soil:water	µS/cm	170	770	880	350	1,100
Chloride, Cl 1:5 soil:water	mg/kg	[NA]	[NA]	1,100	[NA]	1,400
Sulphate, SO4 1:5 soil:water	mg/kg	[NA]	[NA]	92	[NA]	37

Misc Inorg - Soil					
Our Reference		215350-65	215350-66	215350-67	215350-68
Your Reference	UNITS	TP12/1.5	TP12/2.0	TP12/2.5	TP12/3.0
Date Sampled		04/04/2019	04/04/2019	04/04/2019	04/04/2019
Type of sample		Soil	Soil	Soil	Soil
Date prepared	-	14/04/2019	14/04/2019	14/04/2019	14/04/2019
Date analysed	-	14/04/2019	14/04/2019	14/04/2019	14/04/2019
pH 1:5 soil:water	pH Units	5.3	6.6	6.7	6.7
Electrical Conductivity 1:5 soil:water	µS/cm	800	830	720	880
Chloride, Cl 1:5 soil:water	mg/kg	[NA]	[NA]	840	[NA]
Sulphate, SO4 1:5 soil:water	mg/kg	[NA]	[NA]	140	[NA]

ESP/CEC						
Our Reference		215350-25	215350-34	215350-47	215350-62	215350-67
Your Reference	UNITS	TP4/0.5	BH5/2.0	BH8/1.0	TP11/1.5	TP12/2.5
Date Sampled		04/04/2019	04/04/2019	04/04/2019	04/04/2019	04/04/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	15/04/2019	15/04/2019	15/04/2019	15/04/2019	15/04/2019
Date analysed	-	15/04/2019	15/04/2019	15/04/2019	15/04/2019	15/04/2019
Exchangeable Ca	meq/100g	2.1	18	1.7	0.2	0.1
Exchangeable K	meq/100g	<0.1	<0.1	0.1	<0.1	<0.1
Exchangeable Mg	meq/100g	4.9	2.4	4.1	6.2	4.0
Exchangeable Na	meq/100g	0.76	0.15	1.6	1.5	2.0
Cation Exchange Capacity	meq/100g	7.9	21	7.6	8.0	6.2
ESP	%	10	<1	21	19	32

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.
Inorg-001	pH - Measured using pH meter and electrode in accordance with APHA latest edition, 4500-H+. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times.
Inorg-002	Conductivity and Salinity - measured using a conductivity cell at 25°C in accordance with APHA latest edition 2510 and Rayment & Lyons.
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Inorg-031	Total Phenolics by segmented flow analyser (in line distillation with colourimetric finish). Solids are extracted in a caustic media prior to analysis.
Inorg-081	Anions - a range of Anions are determined by Ion Chromatography, in accordance with APHA latest edition, 4110-B. Alternatively determined by colourimetry/turbidity using Discrete Analyser.
Metals-009	Determination of exchangeable cations and cation exchange capacity in soils using 1M Ammonium Chloride exchange and ICP-AES analytical finish.
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).
Org-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-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.

Method ID	Methodology Summary
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD. Note, the Total +ve PCBs PQL is reflective of the lowest individual PQL and is therefore "Total +ve PCBs" is simply a sum of the positive individual PCBs.
Org-008	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Org-012	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013. For soil results:- 1. 'EQ PQL' values are assuming all contributing PAHs reported as <PQL are actually at the PQL. This is the most conservative approach and can give false positive TEQs given that PAHs that contribute to the TEQ calculation may not be present. 2. 'EQ zero' values are assuming all contributing PAHs reported as <PQL are zero. This is the least conservative approach and is more susceptible to false negative TEQs when PAHs that contribute to the TEQ calculation are present but below PQL. 3. 'EQ half PQL' values are assuming all contributing PAHs reported as <PQL are half the stipulated PQL. Hence a mid-point between the most and least conservative approaches above. Note, the Total +ve PAHs PQL is reflective of the lowest individual PQL and is therefore "Total +ve PAHs" is simply a sum of the positive individual PAHs.
Org-014	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater. Note, the Total +ve Xylene PQL is reflective of the lowest individual PQL and is therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes.

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate		Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-8	215350-12
Date extracted	-			11/04/2019	3	11/04/2019	11/04/2019		11/04/2019	11/04/2019
Date analysed	-			13/04/2019	3	13/04/2019	13/04/2019		13/04/2019	13/04/2019
TRH C ₆ - C ₉	mg/kg	25	Org-016	<25	3	<25	<25	0	96	85
TRH C ₆ - C ₁₀	mg/kg	25	Org-016	<25	3	<25	<25	0	96	85
Benzene	mg/kg	0.2	Org-016	<0.2	3	<0.2	<0.2	0	88	80
Toluene	mg/kg	0.5	Org-016	<0.5	3	<0.5	<0.5	0	98	87
Ethylbenzene	mg/kg	1	Org-016	<1	3	<1	<1	0	99	86
m+p-xylene	mg/kg	2	Org-016	<2	3	<2	<2	0	97	86
o-Xylene	mg/kg	1	Org-016	<1	3	<1	<1	0	96	83
naphthalene	mg/kg	1	Org-014	<1	3	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	91	3	86	86	0	92	85

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate		Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	9	11/04/2019	11/04/2019		[NT]	[NT]
Date analysed	-			[NT]	9	13/04/2019	13/04/2019		[NT]	[NT]
TRH C ₆ - C ₉	mg/kg	25	Org-016	[NT]	9	<25	<25	0	[NT]	[NT]
TRH C ₆ - C ₁₀	mg/kg	25	Org-016	[NT]	9	<25	<25	0	[NT]	[NT]
Benzene	mg/kg	0.2	Org-016	[NT]	9	<0.2	<0.2	0	[NT]	[NT]
Toluene	mg/kg	0.5	Org-016	[NT]	9	<0.5	<0.5	0	[NT]	[NT]
Ethylbenzene	mg/kg	1	Org-016	[NT]	9	<1	<1	0	[NT]	[NT]
m+p-xylene	mg/kg	2	Org-016	[NT]	9	<2	<2	0	[NT]	[NT]
o-Xylene	mg/kg	1	Org-016	[NT]	9	<1	<1	0	[NT]	[NT]
naphthalene	mg/kg	1	Org-014	[NT]	9	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	[NT]	9	94	90	4	[NT]	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-8	215350-12
Date extracted	-			11/04/2019	3	11/04/2019	11/04/2019		11/04/2019	11/04/2019
Date analysed	-			13/04/2019	3	13/04/2019	13/04/2019		13/04/2019	13/04/2019
TRH C ₁₀ - C ₁₄	mg/kg	50	Org-003	<50	3	<50	<50	0	108	103
TRH C ₁₅ - C ₂₈	mg/kg	100	Org-003	<100	3	<100	<100	0	105	102
TRH C ₂₉ - C ₃₆	mg/kg	100	Org-003	<100	3	<100	<100	0	114	121
TRH >C ₁₀ -C ₁₆	mg/kg	50	Org-003	<50	3	<50	<50	0	108	103
TRH >C ₁₆ -C ₃₄	mg/kg	100	Org-003	<100	3	<100	<100	0	105	102
TRH >C ₃₄ -C ₄₀	mg/kg	100	Org-003	<100	3	<100	<100	0	114	121
Surrogate o-Terphenyl	%		Org-003	88	3	83	127	42	92	84

QUALITY CONTROL: svTRH (C10-C40) in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	9	11/04/2019	11/04/2019		[NT]	[NT]
Date analysed	-			[NT]	9	13/04/2019	13/04/2019		[NT]	[NT]
TRH C ₁₀ - C ₁₄	mg/kg	50	Org-003	[NT]	9	<50	<50	0	[NT]	[NT]
TRH C ₁₅ - C ₂₈	mg/kg	100	Org-003	[NT]	9	<100	<100	0	[NT]	[NT]
TRH C ₂₉ - C ₃₆	mg/kg	100	Org-003	[NT]	9	100	110	10	[NT]	[NT]
TRH >C ₁₀ -C ₁₆	mg/kg	50	Org-003	[NT]	9	<50	<50	0	[NT]	[NT]
TRH >C ₁₆ -C ₃₄	mg/kg	100	Org-003	[NT]	9	<100	100	0	[NT]	[NT]
TRH >C ₃₄ -C ₄₀	mg/kg	100	Org-003	[NT]	9	<100	100	0	[NT]	[NT]
Surrogate o-Terphenyl	%		Org-003	[NT]	9	85	86	1	[NT]	[NT]

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-8	215350-12
Date extracted	-			11/04/2019	3	11/04/2019	11/04/2019		11/04/2019	11/04/2019
Date analysed	-			12/04/2019	3	12/04/2019	12/04/2019		12/04/2019	12/04/2019
Naphthalene	mg/kg	0.1	Org-012	<0.1	3	<0.1	<0.1	0	122	110
Acenaphthylene	mg/kg	0.1	Org-012	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-012	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-012	<0.1	3	<0.1	<0.1	0	106	100
Phenanthrene	mg/kg	0.1	Org-012	<0.1	3	<0.1	<0.1	0	98	96
Anthracene	mg/kg	0.1	Org-012	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-012	<0.1	3	<0.1	<0.1	0	102	100
Pyrene	mg/kg	0.1	Org-012	<0.1	3	<0.1	<0.1	0	102	100
Benzo(a)anthracene	mg/kg	0.1	Org-012	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-012	<0.1	3	<0.1	<0.1	0	124	117
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-012	<0.2	3	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-012	<0.05	3	<0.05	<0.05	0	100	97
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012	92	3	99	97	2	95	93

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	9	11/04/2019	11/04/2019		[NT]	[NT]
Date analysed	-			[NT]	9	12/04/2019	12/04/2019		[NT]	[NT]
Naphthalene	mg/kg	0.1	Org-012	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
Acenaphthylene	mg/kg	0.1	Org-012	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-012	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-012	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
Phenanthrene	mg/kg	0.1	Org-012	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
Anthracene	mg/kg	0.1	Org-012	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-012	[NT]	9	0.2	0.2	0	[NT]	[NT]
Pyrene	mg/kg	0.1	Org-012	[NT]	9	0.2	0.2	0	[NT]	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-012	[NT]	9	0.1	0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-012	[NT]	9	0.2	0.2	0	[NT]	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-012	[NT]	9	0.3	0.3	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-012	[NT]	9	0.2	0.2	0	[NT]	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012	[NT]	9	0.1	0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012	[NT]	9	0.2	0.2	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012	[NT]	9	106	106	0	[NT]	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-8	215350-12
Date extracted	-			11/04/2019	3	11/04/2019	11/04/2019		11/04/2019	11/04/2019
Date analysed	-			12/04/2019	3	12/04/2019	12/04/2019		12/04/2019	12/04/2019
HCB	mg/kg	0.1	Org-005	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-005	<0.1	3	<0.1	<0.1	0	125	100
gamma-BHC	mg/kg	0.1	Org-005	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-005	<0.1	3	<0.1	<0.1	0	95	87
Heptachlor	mg/kg	0.1	Org-005	<0.1	3	<0.1	<0.1	0	91	80
delta-BHC	mg/kg	0.1	Org-005	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-005	<0.1	3	<0.1	<0.1	0	96	88
Heptachlor Epoxide	mg/kg	0.1	Org-005	<0.1	3	<0.1	<0.1	0	109	101
gamma-Chlordane	mg/kg	0.1	Org-005	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-005	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-005	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-005	<0.1	3	<0.1	<0.1	0	102	95
Dieldrin	mg/kg	0.1	Org-005	<0.1	3	<0.1	<0.1	0	125	116
Endrin	mg/kg	0.1	Org-005	<0.1	3	<0.1	<0.1	0	102	94
pp-DDD	mg/kg	0.1	Org-005	<0.1	3	<0.1	<0.1	0	91	85
Endosulfan II	mg/kg	0.1	Org-005	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-005	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-005	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-005	<0.1	3	<0.1	<0.1	0	90	80
Methoxychlor	mg/kg	0.1	Org-005	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-005	96	3	91	93	2	84	80

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	9	11/04/2019	11/04/2019		[NT]	[NT]
Date analysed	-			[NT]	9	12/04/2019	12/04/2019		[NT]	[NT]
HCB	mg/kg	0.1	Org-005	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-005	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
gamma-BHC	mg/kg	0.1	Org-005	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-005	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-005	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
delta-BHC	mg/kg	0.1	Org-005	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-005	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-005	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
gamma-Chlordane	mg/kg	0.1	Org-005	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-005	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-005	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-005	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
Dieldrin	mg/kg	0.1	Org-005	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
Endrin	mg/kg	0.1	Org-005	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-005	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
Endosulfan II	mg/kg	0.1	Org-005	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-005	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-005	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-005	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
Methoxychlor	mg/kg	0.1	Org-005	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-005	[NT]	9	94	92	2	[NT]	[NT]

QUALITY CONTROL: Organophosphorus Pesticides					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-8	215350-12
Date extracted	-			11/04/2019	3	11/04/2019	11/04/2019		11/04/2019	11/04/2019
Date analysed	-			12/04/2019	3	12/04/2019	12/04/2019		12/04/2019	12/04/2019
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-008	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-008	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Chlorpyrifos	mg/kg	0.1	Org-008	<0.1	3	<0.1	<0.1	0	93	91
Chlorpyrifos-methyl	mg/kg	0.1	Org-008	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-008	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Dichlorvos	mg/kg	0.1	Org-008	<0.1	3	<0.1	<0.1	0	93	100
Dimethoate	mg/kg	0.1	Org-008	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-008	<0.1	3	<0.1	<0.1	0	90	102
Fenitrothion	mg/kg	0.1	Org-008	<0.1	3	<0.1	<0.1	0	105	96
Malathion	mg/kg	0.1	Org-008	<0.1	3	<0.1	<0.1	0	75	71
Parathion	mg/kg	0.1	Org-008	<0.1	3	<0.1	<0.1	0	114	112
Ronnel	mg/kg	0.1	Org-008	<0.1	3	<0.1	<0.1	0	93	93
Surrogate TCMX	%		Org-008	96	3	91	93	2	91	88

QUALITY CONTROL: Organophosphorus Pesticides					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	9	11/04/2019	11/04/2019		[NT]	[NT]
Date analysed	-			[NT]	9	12/04/2019	12/04/2019		[NT]	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-008	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-008	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
Chlorpyrifos	mg/kg	0.1	Org-008	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
Chlorpyrifos-methyl	mg/kg	0.1	Org-008	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-008	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
Dichlorvos	mg/kg	0.1	Org-008	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
Dimethoate	mg/kg	0.1	Org-008	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-008	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
Fenitrothion	mg/kg	0.1	Org-008	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
Malathion	mg/kg	0.1	Org-008	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
Parathion	mg/kg	0.1	Org-008	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-008	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-008	[NT]	9	94	92	2	[NT]	[NT]

QUALITY CONTROL: PCBs in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-8	215350-12
Date extracted	-			11/04/2019	3	11/04/2019	11/04/2019		11/04/2019	11/04/2019
Date analysed	-			12/04/2019	3	12/04/2019	12/04/2019		12/04/2019	12/04/2019
Aroclor 1016	mg/kg	0.1	Org-006	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-006	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-006	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-006	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-006	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-006	<0.1	3	<0.1	<0.1	0	103	100
Aroclor 1260	mg/kg	0.1	Org-006	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCLMX	%		Org-006	96	3	91	93	2	91	88

QUALITY CONTROL: PCBs in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	9	11/04/2019	11/04/2019		[NT]	[NT]
Date analysed	-			[NT]	9	12/04/2019	12/04/2019		[NT]	[NT]
Aroclor 1016	mg/kg	0.1	Org-006	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-006	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-006	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-006	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-006	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-006	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1260	mg/kg	0.1	Org-006	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCLMX	%		Org-006	[NT]	9	94	92	2	[NT]	[NT]

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-8	215350-12
Date prepared	-			11/04/2019	3	11/04/2019	11/04/2019		11/04/2019	11/04/2019
Date analysed	-			11/04/2019	3	11/04/2019	11/04/2019		11/04/2019	11/04/2019
Arsenic	mg/kg	4	Metals-020	<4	3	5	6	18	98	92
Cadmium	mg/kg	0.4	Metals-020	<0.4	3	<0.4	<0.4	0	104	90
Chromium	mg/kg	1	Metals-020	<1	3	17	23	30	107	89
Copper	mg/kg	1	Metals-020	<1	3	11	9	20	114	107
Lead	mg/kg	1	Metals-020	<1	3	13	14	7	104	92
Mercury	mg/kg	0.1	Metals-021	<0.1	3	<0.1	<0.1	0	93	86
Nickel	mg/kg	1	Metals-020	<1	3	4	3	29	101	89
Zinc	mg/kg	1	Metals-020	<1	3	13	10	26	105	88
Manganese	mg/kg	1	Metals-020	<1	3	440	380	15	116	121

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	9	11/04/2019	11/04/2019		[NT]	[NT]
Date analysed	-			[NT]	9	11/04/2019	11/04/2019		[NT]	[NT]
Arsenic	mg/kg	4	Metals-020	[NT]	9	8	9	12	[NT]	[NT]
Cadmium	mg/kg	0.4	Metals-020	[NT]	9	<0.4	<0.4	0	[NT]	[NT]
Chromium	mg/kg	1	Metals-020	[NT]	9	17	18	6	[NT]	[NT]
Copper	mg/kg	1	Metals-020	[NT]	9	27	24	12	[NT]	[NT]
Lead	mg/kg	1	Metals-020	[NT]	9	30	38	24	[NT]	[NT]
Mercury	mg/kg	0.1	Metals-021	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
Nickel	mg/kg	1	Metals-020	[NT]	9	5	5	0	[NT]	[NT]
Zinc	mg/kg	1	Metals-020	[NT]	9	47	45	4	[NT]	[NT]
Manganese	mg/kg	1	Metals-020	[NT]	9	140	140	0	[NT]	[NT]

Client Reference: 92345.00, Kemps Creek

QUALITY CONTROL: Misc Soil - Inorg						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-8	215350-12
Date prepared	-			11/04/2019	9	11/04/2019	11/04/2019		11/04/2019	11/04/2019
Date analysed	-			11/04/2019	9	11/04/2019	11/04/2019		11/04/2019	11/04/2019
Total Phenolics (as Phenol)	mg/kg	5	Inorg-031	<5	9	<5	<5	0	99	106

QUALITY CONTROL: Misc Inorg - Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	215350-18
Date prepared	-			14/04/2019	16	14/04/2019	14/04/2019		14/04/2019	14/04/2019
Date analysed	-			14/04/2019	16	14/04/2019	14/04/2019		14/04/2019	14/04/2019
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	16	5.8	5.7	2	102	[NT]
Electrical Conductivity 1:5 soil:water	µS/cm	1	Inorg-002	<1	16	160	150	6	102	[NT]
Chloride, Cl 1:5 soil:water	mg/kg	10	Inorg-081	<10	25	62	96	43	83	#
Sulphate, SO4 1:5 soil:water	mg/kg	10	Inorg-081	<10	25	20	20	0	87	72

QUALITY CONTROL: Misc Inorg - Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	[NT]
Date prepared	-			[NT]	25	14/04/2019	14/04/2019		14/04/2019	[NT]
Date analysed	-			[NT]	25	14/04/2019	14/04/2019		14/04/2019	[NT]
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	25	6.8	6.8	0	102	[NT]
Electrical Conductivity 1:5 soil:water	µS/cm	1	Inorg-002	[NT]	25	100	120	18	101	[NT]
Chloride, Cl 1:5 soil:water	mg/kg	10	Inorg-081	[NT]	56	850	980	14	[NT]	[NT]
Sulphate, SO4 1:5 soil:water	mg/kg	10	Inorg-081	[NT]	56	300	320	6	[NT]	[NT]

QUALITY CONTROL: Misc Inorg - Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-8	[NT]
Date prepared	-			[NT]	33	14/04/2019	14/04/2019		14/04/2019	[NT]
Date analysed	-			[NT]	33	14/04/2019	14/04/2019		14/04/2019	[NT]
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	33	7.3	7.3	0	101	[NT]
Electrical Conductivity 1:5 soil:water	µS/cm	1	Inorg-002	[NT]	33	30	31	3	101	[NT]

QUALITY CONTROL: Misc Inorg - Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	46	14/04/2019	14/04/2019		[NT]	[NT]
Date analysed	-			[NT]	46	14/04/2019	14/04/2019		[NT]	[NT]
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	46	6.4	6.4	0	[NT]	[NT]
Electrical Conductivity 1:5 soil:water	µS/cm	1	Inorg-002	[NT]	46	190	180	5	[NT]	[NT]

QUALITY CONTROL: Misc Inorg - Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	56	14/04/2019	14/04/2019		[NT]	[NT]
Date analysed	-			[NT]	56	14/04/2019	14/04/2019		[NT]	[NT]
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	56	5.3	5.3	0	[NT]	[NT]
Electrical Conductivity 1:5 soil:water	µS/cm	1	Inorg-002	[NT]	56	760	810	6	[NT]	[NT]

Client Reference: 92345.00, Kemps Creek

QUALITY CONTROL: Misc Inorg - Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	63	14/04/2019	14/04/2019		[NT]	[NT]
Date analysed	-			[NT]	63	14/04/2019	14/04/2019		[NT]	[NT]
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	63	5.3	5.3	0	[NT]	[NT]
Electrical Conductivity 1:5 soil:water	µS/cm	1	Inorg-002	[NT]	63	350	340	3	[NT]	[NT]

Client Reference: 92345.00, Kemps Creek

QUALITY CONTROL: ESP/CEC					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			15/04/2019	[NT]	[NT]	[NT]	[NT]	15/04/2019	[NT]
Date analysed	-			15/04/2019	[NT]	[NT]	[NT]	[NT]	15/04/2019	[NT]
Exchangeable Ca	meq/100g	0.1	Metals-009	<0.1	[NT]	[NT]	[NT]	[NT]	103	[NT]
Exchangeable K	meq/100g	0.1	Metals-009	<0.1	[NT]	[NT]	[NT]	[NT]	106	[NT]
Exchangeable Mg	meq/100g	0.1	Metals-009	<0.1	[NT]	[NT]	[NT]	[NT]	106	[NT]
Exchangeable Na	meq/100g	0.1	Metals-009	<0.1	[NT]	[NT]	[NT]	[NT]	109	[NT]

Result Definitions

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

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.
Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.	

Laboratory Acceptance Criteria

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

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

Spikes for Physical and Aggregate Tests are not applicable.

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

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

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 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.

Report Comments

Asbestos: Excessive sample volumes were provided for asbestos analysis.

A portion of the supplied samples were sub-sampled according to Envirolab procedures.

We cannot guarantee that these sub-samples are indicative of the entire sample.

Envirolab recommends supplying 40-50g (50mL) of sample in its own container as per AS4964-2004.

Note: Samples 215350-1-12 were sub-sampled from bags provided by the client.

Asbestos: A portion of the supplied sample was sub-sampled for asbestos analysis according to Envirolab procedures.

We cannot guarantee that this sub-sample is indicative of the entire sample.

Envirolab recommends supplying 40-50g of sample in its own container.

Note: Sample 215350-69 was sub-sampled from a jar provided by the client.

MISC_INORG_DRY

Percent recovery is not possible to report due to the high concentration of the element/s in the sample/s. However an acceptable recovery was obtained for the LCS.

Andrew Fitzsimons

From: Ken Nguyen
Sent: Wednesday, 17 April 2019 1:29 PM
To: Andrew Fitzsimons
Subject: FW: Results for Registration 215350 92345.00, Kemps Creek

Follow Up Flag: Follow up
Flag Status: Flagged

Regards,

Ken Nguyen | Customer Service / Chemist | Envirolab Services Pty Ltd
(Monday to Friday 1pm to 9pm)

Ref: 215350-A
TAT: 1 day
Due: 18/4/19

FLZ

Great Science, Great Service.

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

Please note that all samples submitted to the Envirolab Group laboratories will be analysed under the Envirolab Group Terms and Conditions. The Terms and Conditions are accessible by clicking this link

From: Cindy Murphy <Cindy.Murphy@douglaspartners.com.au>
Sent: Wednesday, 17 April 2019 10:08 AM
To: Ken Nguyen <KNguyen@envirolab.com.au>
Subject: RE: Results for Registration 215350 92345.00, Kemps Creek

Hi Ken,

Can we please get a Combo 8a done on Sample 10? 1 day TA please.

Many thanks!

Cindy Murphy | 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 | M: 0407 630 549 | E: Cindy.Murphy@douglaspartners.com.au

FINANCIAL REVIEW

CLIENT CHOICE AWARDS
WINNER



SAMPLE RECEIPT ADVICE

Client Details

Client	Douglas Partners Pty Ltd Smeaton Grange
Attention	Cindy Murphy

Sample Login Details

Your reference	92345.00, Kemps Creek
Envirolab Reference	215350-A
Date Sample Received	10/04/2019
Date Instructions Received	17/04/2019
Date Results Expected to be Reported	18/04/2019

Sample Condition

Samples received in appropriate condition for analysis	YES
No. of Samples Provided	72 Soil
Turnaround Time Requested	1 day
Temperature on Receipt (°C)	19.7
Cooling Method	Ice Pack
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

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

Analysis Underway, details on the following page:



Envirolab Services Pty Ltd

ABN 37 112 535 645

12 Ashley St Chatswood NSW 2067

ph 02 9910 6200 fax 02 9910 6201

customerservice@envirolab.com.au

www.envirolab.com.au

Sample ID	VTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Organochlorine Pesticides in soil	Organophosphorus Pesticides	PCBs in Soil	Acid Extractable metals in soil	Misc Soil - Inorg	Asbestos ID - soils	On Hold
TP1/0.0-0.2										✓
TP2/0.0-0.2										✓
TP3/0.0-0.2										✓
TP4/0.0-0.2										✓
BH5/0.0-0.2										✓
TP6/0.0-0.2										✓
TP7/0.0-0.2										✓
BH8/0.0-0.2										✓
TP9/0.0-0.2										✓
TP10/0.0-0.2	✓	✓	✓	✓	✓	✓	✓	✓	✓	
TP11/0.0-0.2										✓
TP12/0.0-0.2										✓
TP1/0.5										✓
TP1/1.0										✓
TP1/1.5										✓
TP2/0.5										✓
TP2/1.0										✓
TP2/1.5										✓
TP3/0.5										✓
TP3/1.0										✓
TP3/1.5										✓
TP3/2.0										✓
TP3/2.5										✓
TP3/3.0										✓
TP4/0.5										✓
TP4/1.0										✓
TP4/1.5										✓
TP4/2.0										✓
TP4/2.5										✓
TP4/3.0										✓
BH5/0.5										✓
BH5/1.0										✓



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Sample ID	VTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Organochlorine Pesticides in soil	Organophosphorus Pesticides	PCBs in Soil	Acid Extractable metals in soil	Misc Soil - Inorg	Asbestos ID - soils	On Hold
BH5/1.5										✓
BH5/2.0										✓
BH5/2.5										✓
BH5/3.0										✓
TP6/0.5										✓
TP6/1.0										✓
TP6/1.5										✓
TP6/2.0										✓
TP6/2.5										✓
TP6/3.0										✓
TP7/0.5										✓
TP7/1.0										✓
TP7/1.5										✓
BH8/0.5										✓
BH8/1.0										✓
BH8/1.5										✓
BH8/2.0										✓
BH8/2.5										✓
TP9/0.5										✓
TP9/1.0										✓
TP9/1.5										✓
TP9/2.0										✓
TP9/2.5										✓
TP9/3.0										✓
TP10/0.5										✓
TP10/1.0										✓
TP10/1.5										✓
TP11/0.5										✓
TP11/1.0										✓
TP11/1.5										✓
TP12/0.5										✓
TP12/1.0										✓



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Sample ID	VTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Organochlorine Pesticides in soil	Organophosphorus Pesticides	PCBs in Soil	Acid Extractable metals in soil	Misc Soil - Inorg	Asbestos ID - soils	On Hold
TP12/1.5										✓
TP12/2.0										✓
TP12/2.5										✓
TP12/3.0										✓
BD1/04042019										✓
TP10/2.0										✓
TP10/2.5										✓
TP10/3.0										✓

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

Additional Info

Sample storage - Waters are routinely disposed of approximately 1 month and soils approximately 2 months from receipt.

Requests for longer term sample storage must be received in writing.

INTERIM REPORT 215350-A

Client Details

Client	Douglas Partners Pty Ltd Smeaton Grange
Attention	Cindy Murphy
Address	18 Waler Crescent, Smeaton Grange, NSW, 2567

Sample Details

Your Reference	<u>92345.00, Kemps Creek</u>
Number of Samples	72 Soil
Date samples received	10/04/2019
Date completed instructions received	17/04/2019

Analysis Details

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

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

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

Please refer to the last page of this report for any comments relating to the results.

Report Details

Date results requested by	18/04/2019
Interim Report Date	18/04/2019
NATA Accreditation Number 2901. This document shall not be reproduced except in full.	
Accredited for compliance with ISO/IEC 17025 - Testing. Tests not covered by NATA are denoted with *	

vTRH(C6-C10)/BTEXN in Soil		
Our Reference		215350-A-10
Your Reference	UNITS	TP10/0.0-0.2
Date Sampled		04/04/2019
Type of sample		Soil
Date extracted	-	17/04/2019
Date analysed	-	18/04/2019
TRH C ₆ - C ₉	mg/kg	<25
TRH C ₆ - C ₁₀	mg/kg	<25
vTPH C ₆ - C ₁₀ less BTEX (F1)	mg/kg	<25
Benzene	mg/kg	<0.2
Toluene	mg/kg	<0.5
Ethylbenzene	mg/kg	<1
m+p-xylene	mg/kg	<2
o-Xylene	mg/kg	<1
naphthalene	mg/kg	<1
Total +ve Xylenes	mg/kg	<1
Surrogate aaa-Trifluorotoluene	%	108

svTRH (C10-C40) in Soil		
Our Reference		215350-A-10
Your Reference	UNITS	TP10/0.0-0.2
Date Sampled		04/04/2019
Type of sample		Soil
Date extracted	-	17/04/2019
Date analysed	-	18/04/2019
TRH C ₁₀ - C ₁₄	mg/kg	<50
TRH C ₁₅ - C ₂₈	mg/kg	<100
TRH C ₂₉ - C ₃₆	mg/kg	<100
TRH >C ₁₀ -C ₁₆	mg/kg	<50
TRH >C ₁₀ - C ₁₆ less Naphthalene (F2)	mg/kg	<50
TRH >C ₁₆ -C ₃₄	mg/kg	<100
TRH >C ₃₄ -C ₄₀	mg/kg	<100
Total +ve TRH (>C10-C40)	mg/kg	<50
Surrogate o-Terphenyl	%	99

PAHs in Soil		
Our Reference		215350-A-10
Your Reference	UNITS	TP10/0.0-0.2
Date Sampled		04/04/2019
Type of sample		Soil
Date extracted	-	17/04/2019
Date analysed	-	18/04/2019
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
Total +ve PAH's	mg/kg	<0.05
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
Surrogate <i>p</i> -Terphenyl-d14	%	99

Organochlorine Pesticides in soil		
Our Reference		215350-A-10
Your Reference	UNITS	TP10/0.0-0.2
Date Sampled		04/04/2019
Type of sample		Soil
Date extracted	-	17/04/2019
Date analysed	-	17/04/2019
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	%	99

Organophosphorus Pesticides		
Our Reference		215350-A-10
Your Reference	UNITS	TP10/0.0-0.2
Date Sampled		04/04/2019
Type of sample		Soil
Date extracted	-	17/04/2019
Date analysed	-	17/04/2019
Azinphos-methyl (Guthion)	mg/kg	<0.1
Bromophos-ethyl	mg/kg	<0.1
Chlorpyrifos	mg/kg	<0.1
Chlorpyrifos-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	%	99

PCBs in Soil		
Our Reference		215350-A-10
Your Reference	UNITS	TP10/0.0-0.2
Date Sampled		04/04/2019
Type of sample		Soil
Date extracted	-	17/04/2019
Date analysed	-	17/04/2019
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	%	99

Acid Extractable metals in soil		
Our Reference		215350-A-10
Your Reference	UNITS	TP10/0.0-0.2
Date Sampled		04/04/2019
Type of sample		Soil
Date prepared	-	17/04/2019
Date analysed	-	17/04/2019
Arsenic	mg/kg	13
Cadmium	mg/kg	<0.4
Chromium	mg/kg	20
Copper	mg/kg	12
Lead	mg/kg	17
Mercury	mg/kg	<0.1
Nickel	mg/kg	8
Zinc	mg/kg	26
Manganese	mg/kg	810

Misc Soil - Inorg		
Our Reference		215350-A-10
Your Reference	UNITS	TP10/0.0-0.2
Date Sampled		04/04/2019
Type of sample		Soil
Date prepared	-	
Date analysed	-	
Total Phenolics (as Phenol)	mg/kg	

Moisture		
Our Reference		215350-A-10
Your Reference	UNITS	TP10/0.0-0.2
Date Sampled		04/04/2019
Type of sample		Soil
Date prepared	-	17/04/2019
Date analysed	-	18/04/2019
Moisture	%	17

Asbestos ID - soils		
Our Reference		215350-A-10
Your Reference	UNITS	TP10/0.0-0.2
Date Sampled		04/04/2019
Type of sample		Soil
Date analysed	-	18/04/2019
Sample mass tested	g	Approx. 25g
Sample Description	-	Brown coarse-grained soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected

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.
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Inorg-031	Total Phenolics by segmented flow analyser (in line distillation with colourimetric finish). Solids are extracted in a caustic media prior to analysis.
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).
Org-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-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD. Note, the Total +ve PCBs PQL is reflective of the lowest individual PQL and is therefore "Total +ve PCBs" is simply a sum of the positive individual PCBs.
Org-008	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.

Method ID	Methodology Summary
Org-012	<p>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.</p> <p>For soil results:-</p> <ol style="list-style-type: none"> 1. 'EQ PQL' values are assuming all contributing PAHs reported as <PQL are actually at the PQL. This is the most conservative approach and can give false positive TEQs given that PAHs that contribute to the TEQ calculation may not be present. 2. 'EQ zero' values are assuming all contributing PAHs reported as <PQL are zero. This is the least conservative approach and is more susceptible to false negative TEQs when PAHs that contribute to the TEQ calculation are present but below PQL. 3. 'EQ half PQL' values are assuming all contributing PAHs reported as <PQL are half the stipulated PQL. Hence a mid-point between the most and least conservative approaches above. <p>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.</p>
Org-014	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-016	<p>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)-BTX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.</p> <p>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.</p>

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate		Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-9	[NT]
Date extracted	-			17/04/2019	[NT]	[NT]	[NT]	[NT]	17/04/2019	[NT]
Date analysed	-			18/04/2019	[NT]	[NT]	[NT]	[NT]	18/04/2019	[NT]
TRH C ₆ - C ₉	mg/kg	25	Org-016	<25	[NT]	[NT]	[NT]	[NT]	108	[NT]
TRH C ₆ - C ₁₀	mg/kg	25	Org-016	<25	[NT]	[NT]	[NT]	[NT]	108	[NT]
Benzene	mg/kg	0.2	Org-016	<0.2	[NT]	[NT]	[NT]	[NT]	98	[NT]
Toluene	mg/kg	0.5	Org-016	<0.5	[NT]	[NT]	[NT]	[NT]	117	[NT]
Ethylbenzene	mg/kg	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	109	[NT]
m+p-xylene	mg/kg	2	Org-016	<2	[NT]	[NT]	[NT]	[NT]	110	[NT]
o-Xylene	mg/kg	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	108	[NT]
naphthalene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	111	[NT]	[NT]	[NT]	[NT]	116	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-9	[NT]
Date extracted	-			17/04/2019	[NT]	[NT]	[NT]	[NT]	17/04/2019	[NT]
Date analysed	-			18/04/2019	[NT]	[NT]	[NT]	[NT]	18/04/2019	[NT]
TRH C ₁₀ - C ₁₄	mg/kg	50	Org-003	<50	[NT]	[NT]	[NT]	[NT]	111	[NT]
TRH C ₁₅ - C ₂₈	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	108	[NT]
TRH C ₂₉ - C ₃₆	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	114	[NT]
TRH >C ₁₀ -C ₁₆	mg/kg	50	Org-003	<50	[NT]	[NT]	[NT]	[NT]	111	[NT]
TRH >C ₁₆ -C ₃₄	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	108	[NT]
TRH >C ₃₄ -C ₄₀	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	114	[NT]
Surrogate o-Terphenyl	%		Org-003	98	[NT]	[NT]	[NT]	[NT]	110	[NT]

QUALITY CONTROL: PAHs in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-9	[NT]
Date extracted	-			17/04/2019	[NT]	[NT]	[NT]	[NT]	17/04/2019	[NT]
Date analysed	-			18/04/2019	[NT]	[NT]	[NT]	[NT]	18/04/2019	[NT]
Naphthalene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	130	[NT]
Acenaphthylene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	128	[NT]
Phenanthrene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	118	[NT]
Anthracene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	122	[NT]
Pyrene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	122	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	128	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-012	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-012	<0.05	[NT]	[NT]	[NT]	[NT]	126	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012	104	[NT]	[NT]	[NT]	[NT]	98	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-9	[NT]
Date extracted	-			17/04/2019	[NT]	[NT]	[NT]	[NT]	17/04/2019	[NT]
Date analysed	-			17/04/2019	[NT]	[NT]	[NT]	[NT]	17/04/2019	[NT]
HCB	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	109	[NT]
gamma-BHC	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	119	[NT]
Heptachlor	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	111	[NT]
delta-BHC	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	110	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	119	[NT]
gamma-Chlordane	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	120	[NT]
Dieldrin	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	131	[NT]
Endrin	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	129	[NT]
pp-DDD	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	126	[NT]
Endosulfan II	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	105	[NT]
Methoxychlor	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCMX	%		Org-005	113	[NT]	[NT]	[NT]	[NT]	98	[NT]

QUALITY CONTROL: Organophosphorus Pesticides					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-9	[NT]
Date extracted	-			17/04/2019	[NT]	[NT]	[NT]	[NT]	17/04/2019	[NT]
Date analysed	-			17/04/2019	[NT]	[NT]	[NT]	[NT]	17/04/2019	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chlorpyrifos	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NT]	[NT]	120	[NT]
Chlorpyrifos-methyl	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dichlorvos	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NT]	[NT]	94	[NT]
Dimethoate	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ethion	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NT]	[NT]	118	[NT]
Fenitrothion	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NT]	[NT]	110	[NT]
Malathion	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NT]	[NT]	87	[NT]
Parathion	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NT]	[NT]	119	[NT]
Ronnel	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NT]	[NT]	114	[NT]
Surrogate TCMX	%		Org-008	113	[NT]	[NT]	[NT]	[NT]	105	[NT]

Client Reference: 92345.00, Kemps Creek

QUALITY CONTROL: PCBs in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-9	[NT]
Date extracted	-			17/04/2019	[NT]	[NT]	[NT]	[NT]	17/04/2019	[NT]
Date analysed	-			17/04/2019	[NT]	[NT]	[NT]	[NT]	17/04/2019	[NT]
Aroclor 1016	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	104	[NT]
Aroclor 1260	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCLMX	%		Org-006	113	[NT]	[NT]	[NT]	[NT]	105	[NT]

Client Reference: 92345.00, Kemps Creek

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-10	[NT]
Date prepared	-			17/04/2019	[NT]	[NT]	[NT]	[NT]	17/04/2019	[NT]
Date analysed	-			17/04/2019	[NT]	[NT]	[NT]	[NT]	17/04/2019	[NT]
Arsenic	mg/kg	4	Metals-020	<4	[NT]	[NT]	[NT]	[NT]	107	[NT]
Cadmium	mg/kg	0.4	Metals-020	<0.4	[NT]	[NT]	[NT]	[NT]	108	[NT]
Chromium	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	108	[NT]
Copper	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	115	[NT]
Lead	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	106	[NT]
Mercury	mg/kg	0.1	Metals-021	<0.1	[NT]	[NT]	[NT]	[NT]	109	[NT]
Nickel	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	107	[NT]
Zinc	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	105	[NT]
Manganese	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	103	[NT]

QUALITY CONTROL: Misc Soil - Inorg						Duplicate		Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Total Phenolics (as Phenol)	mg/kg	5	Inorg-031	<5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]

Result Definitions

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

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.
Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.	

Laboratory Acceptance Criteria

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

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

Spikes for Physical and Aggregate Tests are not applicable.

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

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

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 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.

Report Comments


Asbestos: A portion of the supplied sample was sub-sampled for asbestos analysis according to Envirolab procedures.

We cannot guarantee that this sub-sample is indicative of the entire sample. Envirolab recommends supplying 40-50g of sample in its own container.

Note: Sample was sub-sampled from a jar provided by the client.

Project Name:	106 -142 Aldington Rd, Kemps Creek PSI		To:	Envirolab Services	
Project No:	92345.00	Sampler:	CKM		
Project Mgr:	Grant Russell	Mob. Phone:	0407 630 549		
Email:	cindy.murphy@douglaspartners.com.au		Attn:	Tania Notaras	
Date Required:	2 day TA		Phone:	(02) 9910 6200	Fax: (02) 9910 6201
			Email:	tnotaras@envirolabservices.com.au	

Sample ID	Lab ID	Date Sampled	Sample Type	Container Type	Analytes									Notes/preservation
			S - soil M - material	G - glass P - plastic	Metals	TRH & BTEX	PAH	OCP/OPP & PCB	Phenols	Asbestos 500 ml (NEPM)	Asbestos absence/present	Hold		
MAT-1	1	10.4.19	M	P							x			
MAT-2	2	10.4.19	M	P							x			



Job No:

Date Received:

Time Received:

Received by:

Temp: Cool:

Cooling: Ice:

Security: Intact:



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

Job No:

Date Received _____


~~Time Received~~

Received by: _____

Temp: Cool (Ambient)

Cooling: Ice/Icepack

Security: Intact/Broken/None

Lab Report No:			
Send Results to:	Douglas Partners Pty Ltd	Address 18 Waler Crescent Smeaton Grange NSW 2567	Phone: (02) 4647 0075 Fax: (02) 4646 1886
Relinquished by:	CKM	Transported to laboratory by: ES	
Signed:		Date & Time: 15.4.19	Received by: PP 20 15/4/2019

SAMPLE RECEIPT ADVICE

Client Details

Client	Douglas Partners Pty Ltd Smeaton Grange
Attention	Grant Russell

Sample Login Details

Your reference	92345.00, Kemps Creek PSI
Envirolab Reference	215749
Date Sample Received	15/04/2019
Date Instructions Received	15/04/2019
Date Results Expected to be Reported	17/04/2019

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	2 Material
Turnaround Time Requested	2 days
Temperature on Receipt (°C)	21.6
Cooling Method	None
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

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

Analysis Underway, details on the following page:



Envirolab Services Pty Ltd

ABN 37 112 535 645

12 Ashley St Chatswood NSW 2067

ph 02 9910 6200 fax 02 9910 6201

customerservice@envirolab.com.au

www.envirolab.com.au

Sample ID	
Asbestos ID - materials	
MAT-1	✓
MAT-2	✓

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

Additional Info

Sample storage - Waters are routinely disposed of approximately 1 month and soils approximately 2 months from receipt.

Requests for longer term sample storage must be received in writing.

CERTIFICATE OF ANALYSIS 215749

Client Details

Client	Douglas Partners Pty Ltd Smeaton Grange
Attention	Grant Russell
Address	18 Waler Crescent, Smeaton Grange, NSW, 2567

Sample Details

Your Reference	<u>92345.00, Kemps Creek PSI</u>
Number of Samples	2 Material
Date samples received	15/04/2019
Date completed instructions received	15/04/2019

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.
Samples were analysed as received from the client. Results relate specifically to the samples as received.
Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Report Details

Date results requested by	16/04/2019
Date of Issue	16/04/2019
NATA Accreditation Number 2901. This document shall not be reproduced except in full.	
Accredited for compliance with ISO/IEC 17025 - Testing. Tests not covered by NATA are denoted with *	

Asbestos Approved By

Analysed by Asbestos Approved Identifier: Matt Tang
Authorised by Asbestos Approved Signatory: Matt Tang

Results Approved By

Matthew Tang, Asbestos Supervisor

Authorised By



Nancy Zhang, Laboratory Manager

Asbestos ID - materials			
Our Reference		215749-1	215749-2
Your Reference	UNITS	MAT-1	MAT-2
Type of sample		Material	Material
Date analysed	-	16/04/2019	16/04/2019
Mass / Dimension of Sample	-	81x55x5mm	51x31x5mm
Sample Description	-	Grey compressed fibre cement material	Grey compressed fibre cement material
Asbestos ID in materials	-	Chrysotile asbestos detected Amosite asbestos detected Crocidolite asbestos detected	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.

Result Definitions

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

Appendix I

QA/QC

Appendix I

Data Quality Assurance and Quality Control Assessment

I1 Data Quality Indicators

Field and laboratory procedures were assessed against the following data quality indicators (DQIs):

Table I1: Data Quality Indicators

DQI	Performance Indicator	Acceptable Range
Precision		
Field considerations	SOPs appropriate and complied with	Field staff follow SOPs in the DP <i>Field Procedures Manual</i>
Laboratory considerations	field duplicates	Precision average relative percent difference (RPD) result <5 times PQL, no limit; results >5 times PQL, 0% - 30%
	laboratory duplicates	Precision average RPD result <5 times PQL, no limit; results >5 times PQL, 0% - 50%
Accuracy (bias)		
Field considerations	SOPs appropriate and complied with	Field staff to follow SOPs in the DP <i>Field Procedures Manual</i>
Laboratory considerations	Analysis of:	
	method blanks (laboratory blanks)	Recovery of 60-140%
	matrix spikes	Recovery of 70-130% (inorganics); 60-140% (organics)
	matrix spike duplicates	Recovery of 70-130% (inorganics); 60-140% (organics); Recovery 70 "low" to 130% "high" indicates interference
	surrogate spikes	Recovery of 70-130% (inorganics); 60-140% (organics)
	laboratory control samples	Recovery of 70-130% (inorganics); 60-140% (organics)
Completeness		
Field considerations	All critical locations sampled	All critical locations sampled in accordance with the DQO's (Appendix E)
	SOPs appropriate and complied with	Field staff to follow SOPs in the DP <i>Field Procedures Manual</i>
	Experienced sampler	Experienced DP Environmental Scientist to conduct field work and sampling
	Documentation correct	Maintain COC documentation at all times
	Sample holding times complied with	Sample holding times complied with
Laboratory considerations	All critical samples analysed according to DQO's	All critical locations analysed in accordance with the DQO's
	Appropriate methods and PQLs	Appropriate methods and PQLs have been used by the contract laboratory
	Sample documentation complete	Maintain COC documentation at all times

DQI	Performance Indicator	Acceptable Range
Comparability		
Field considerations Laboratory considerations	Same SOPs used on each occasion	Field staff to follow SOPs in the DP <i>Field Procedures Manual</i>
	Experienced sampler	Experienced DP Environmental Scientist/Engineer to conduct field work and sampling
	Same types of samples collected	Same types of samples collected
	Sample analytical methods used (including clean-up)	Methods to be NATA accredited
	Sample PQLs (justify/quantify if different)	Consistent PQLs to be used
	Same laboratories (justify/quantify if different)	Same analytical laboratory for primary samples to be used
Representativeness		
Field considerations Laboratory considerations	Appropriate media sampled according to DQO's (Appendix E)	Appropriate media sampled according to DQO's (Appendix E)
	All media identified in DQO's sampled	All media identified in DQO's sampled
	All samples analysed according to DQO's	All samples analysed according to DQO's

Notes to Table 1: SOP – Standard Operating Procedure
 DQO – Data Quality Objectives (Appendix E)

I2 Field Quality Assurance and Quality Control

The field QC procedures for sampling as prescribed in the standard operating procedures (SOPs) in the Douglas Partners *Field Procedures Manual* were followed at all times during the assessment. All sample locations and media were in accordance with the DQO (i.e. as per scope of work in DP's proposal).

I2.1 Sampling Team

Sampling was undertaken by DP Environmental Engineer Adad Barkho.

I2.2 Sample Collection and Weather Conditions

Sample collection procedures and dispatch are reported in body of the report. Sampling was undertaken during sunny and mild conditions with a light north-westerly breeze.

I2.3 Logs

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, location, depth, initials of sampler, duplicate locations, duplicate type and site observations. Logs are presented in Appendix D.

I2.4 Chain-of-Custody

Chain-of-Custody information was recorded on the Chain-of-Custody (COC) sheets and accompanied samples to the analytical laboratory. Signed copies of COCs are presented in Appendix H, prior to the laboratory certificates.

I2.5 Sample Splitting Techniques

One blind duplicate sample was collected in the field as a measure of precision of the results. The duplicate sample for soil was collected from the same location and an identical depth to the primary sample. Equal portions of the primary sample were placed into the sampling jars and sealed. The sample was not homogenised in a bowl to prevent the loss of volatiles from the soil. The duplicate sample was labelled with a DP identification number, recorded on DP logs, so as to conceal the relationship to the primary sample from the analysing laboratory.

I2.6 Duplicate Frequency

Field sampling comprised intra-laboratory duplicate sampling, at a rate of approximately one duplicate sample for the 12 samples collected. The adopted frequency is considered suitable for a PSI.

I2.7 Relative Percentage Difference

A measure of the consistency of results for field samples is derived by the calculation of relative percentage differences (RPDs) for duplicate samples. RPDs have only been considered where a concentration is greater than five times the practical quantitation limit (PQL).

I2.7.1 Intra-Laboratory Replicate Analysis

The duplicate was tested to assess data 'precision' and the reproducibility within the primary laboratory (EnviroLab Pty Ltd) as a measure of consistency of sampling techniques. One replicate sample was analysed. The Relative Percent Difference (RPD) between replicate results is used as a measure of laboratory reproducibility and is given by the following:

$$RPD = \frac{(\text{Replicate result 1} - \text{Replicate result 2})}{(\text{Replicate result 1} + \text{Replicate result 2})/2} \times 100$$

The RPD can have a value between 0% and 200%. An RPD data quality objective of up to 30% for non-organics and 50% for organics is considered to be within the acceptable range.

The comparative results of analysis between primary and duplicate sample is summarised in Table G3 (Appendix G). Where one or both results were below the PQL, an RPD was not calculated.

RPD values were within the acceptable range of ± 30 . Therefore, the intra-laboratory comparisons indicate that the sampling technique was consistent and repeatable and therefore acceptable precision was achieved.

I3 Laboratory Quality Assurance and Quality Control

Envirolab Services was used as the primary laboratory. Appropriate methods and PQLs were used by the laboratory. Sample methods were NATA accredited (noting the exception for fibrous asbestos (FA) and asbestos fines (AF) quantification to 0.001% w/w).

I3.1 Surrogate Spike

This sample is prepared by adding a known amount of surrogate, which behaves similarly to the analyte, prior to analysis to each sample. The recovery result indicates the proportion of the known concentration of the surrogate that is detected during analysis and is used to assess data 'accuracy'. Results within acceptance limits indicate that the extraction technique was effective.

I3.2 Reference and Daily Check Sample Results – 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 and is used to assess data 'accuracy'. LCSs are analysed at a frequency of one in 20, with a minimum of one analysed per batch.

I3.4 Laboratory Duplicate Results

These are additional portions of a sample which are analysed in exactly the same manner as all other samples and is used to assess data 'precision'. The laboratory acceptance criteria for duplicate samples is: in cases where the level is $< 5 \times \text{PQL}$ – any RPD is acceptable; and in cases where the level is $> 5 \times \text{PQL}$ - 0-50% RPD is acceptable.

I3.5 Laboratory 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 and is used to assess data 'accuracy'. 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 exactly the same manner as for samples. Laboratory blanks are analysed at a frequency of 1 in 20, with a minimum of one per batch.

13.6 Matrix Spike

This is a sample duplicate 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 and is used to assess data 'accuracy'. The laboratory acceptance criteria for matrix spike samples are generally 70 - 130% for inorganic/metals; and 60 - 140% for organics; and 10 - 140% for SVOC and speciated phenols.

13.7 Results of Laboratory QC

The laboratory QC for surrogate spikes, LCS, laboratory duplicate results, laboratory blanks and matrix spikes 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.

13.8 Overall Assessment of QA/QC

Specific limits associated with sample handling and laboratory QA/QC was assessed against the DQIs and a summary of compliance is presented in the following table.

Table 15: Data Quality Indicators

DQI	Performance Indicator	Acceptable Range	Compliance
Precision			
Field considerations	SOPs appropriate and complied with	Field staff follow SOPs in the <i>DP Field Procedures Manual</i>	C
	field duplicate	Precision average relative percent difference (RPD) result <5 times PQL, no limit; results >5 times PQL, 0% - 30%	C
Laboratory considerations	laboratory duplicates	Precision average RPD result <5 times PQL, no limit; results >5 times PQL, 0% - 50%	C
Accuracy (bias)			
Field considerations	SOPs appropriate and complied with	Field staff to follow SOPs in the <i>DP Field Procedures Manual</i>	C
Laboratory considerations	Analysis of:		
	method blanks (laboratory blanks)	Recovery of 60-140%	C
	matrix spikes	Recovery of 70-130% (inorganics); 60-140% (organics)	C
	matrix spike duplicates	Recovery of 70-130% (inorganics); 60-140% (organics); Recovery 70 "low" to 130% "high" indicates interference	C
	surrogate spikes	Recovery of 70-130% (inorganics); 60-140% (organics)	C
	laboratory control samples	Recovery of 70-130% (inorganics); 60-140% (organics)	C

DQI	Performance Indicator	Acceptable Range	Compliance
Completeness			
Field considerations	All critical locations sampled	All critical locations sampled in accordance with the SAQP	C
	SOPs appropriate and complied with	Field staff to follow SOPs in the DP <i>Field Procedures Manual</i>	C
	Experienced sampler	Experienced DP Environmental Scientist/Engineer to conduct field work and sampling	C
	Documentation correct	Maintain COC documentation at all times	C
	Sample holding times complied with	Sample holding times complied with	C
Laboratory considerations	All critical samples analysed according to SAQP	All critical locations analysed in accordance with the SAQP	C
	Appropriate methods and PQLs	Appropriate methods and PQLs have been used by the contract laboratory	C
	Sample documentation complete	Maintain COC documentation at all times	C
Comparability			
Field considerations	Same SOPs used on each occasion	Field staff to follow SOPs in the DP <i>Field Procedures Manual</i>	C
	Experienced sampler	Experienced DP Environmental Scientist/Engineer to conduct field work and sampling	C
	Same types of samples collected (filtered)	Field filtering for metals	NA
Laboratory considerations	Sample analytical methods used (including clean-up)	Methods to be NATA accredited	C
	Sample PQLs (justify/quantify if different)	Consistent PQLs to be used	C
	Same laboratories (justify/quantify if different)	Same analytical laboratory for primary samples to be used	C
Representativeness			
Field considerations	Appropriate media sampled according to DQOs	Appropriate media sampled according to DQOs	C
	All media identified in DQOs sampled	All media identified in DQOs sampled	C
Laboratory considerations	All samples analysed according to DQOs	All samples analysed according to DQOs	C

Notes to Table 5:

- C – Compliance
- PC – Partial Compliance
- NC – Non-Compliance
- NA – Not Applicable
- SOP – Standard Operating Procedure
- DQO – Data Quality Objectives

A review of the adopted QA/QC procedures and results indicates that the DQIs have generally been met with compliance and one minor partial-compliance. On this basis, the sampling and laboratory methods used during the investigation were found to meet DQOs for this project.

Appendix J

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

This report is the property of Douglas Partners Pty Ltd. The report may only be used for the purpose for which it was commissioned and in accordance with the Conditions of Engagement for the commission supplied at the time of proposal. Unauthorised use of this report in any form whatsoever is prohibited.

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.