



# **Douglas Partners**

*Geotechnics | Environment | Groundwater*

Report on  
Supplementary Contamination Assessment

Proposed St Marys Intermodal Freight Terminal  
Lot 2 Forrester Road, St Marys NSW

Prepared for  
Urbanco Group Pty Limited

Project 94525.02  
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Integrated Practical Solutions



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Signature	Date
<b>Author</b> 	17 April 2019
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## Executive Summary

Douglas Partners Pty Ltd (DP) was commissioned by Urbanco Group Pty Ltd (Urbanco), on behalf of Pacific National (NSW) Pty Ltd (Pacific National), to undertake a Supplementary Contamination Assessment (SCA) for the proposed St Marys Freight Hub at Lot 2 Forrester Road, St Marys NSW (the site).

The proposed St Marys Freight Hub is a State Significant Development under the provision of Schedule 1, Clause 19(1b) of the State Environmental Planning Policy - State and Regional Development 2011. The site has an approximate total area of 11 ha and the proposed development will comprise upgrade of the existing rail infrastructure sidings, construction of hardstand areas, new internal access roads, wash bay, repair bay, office building, fuel storage area, container shed, transport shed, vehicle parking bays and reach stacker/forklift parking bays, and other ancillary development.

PN required this SCA to further assess the potential areas of environmental concern (PAEC) identified during a recent Preliminary Site Assessment (PSI) and to determine any remediation requirements (if any) for the site. The identified PAEC included:

- PAEC 1: Former building and stockpile footprints - A fragment of ACM was identified in one former stockpile footprint area in the far northern portion of the site;
- PAEC 3: Current Stockpiles - Multiple soil stockpiles were identified within the site. A limited visual assessment of the stockpiles was undertaken as part of the PSI. Given the preliminary nature of the PSI and the significant number / volume of soil stockpiles observed on-site, the presence of fill related COPC impact to stockpiles at the site could not be ruled out and therefore required further investigation;
- PAEC 4: Soil surrounding timber power poles - Five timber power poles were identified within the site. Leached timber treatment chemical from poles have the potential to impacted soil in close vicinity to the poles. Further investigation is required to determine the contamination status and any remediation requirements for PAEC 4 ;
- PAEC 5: Surficial ACM - Surficial ACM was identified in one area of the site associated with a former stockpile footprint (PAEC 1). DP also considered that there was a potential for surficial ACM to also be present within the rail corridor associated with abandoned train brake pads;
- PAEC 6: Fuel and chemical leaks and spills - There is a potential that any fuel and chemical leaks and spills of fuel from vehicles (and stored chemicals within the former structures) have a potential to contaminate soil at the site. A limited visual assessment of PAEC 6 was undertaken as part of the PSI assessment; and
- PAEC 9: The majority of the site was owned by James Hardie and Coy Pty Limited between 1969 and 1984. James Hardie sites are associated with manufacture and disposal of asbestos waste. Review of historic aerial photography during the period of Jamie Hardie ownership does not indicate evidence of the manufacture of asbestos (i.e. development of industrial type buildings) or filling with asbestos waste (i.e. no extensive disturbance areas) at the site.

An approximately 15,000 m<sup>3</sup> – 25,000 m<sup>3</sup> stockpile (SP3) is present within the site which is understood to have been generated through the stripping of the site surface following the site ownership by James Hardie. This investigation included assessment of SP3 to assess potential site surface impacts during the ownership of the site by James Hardy.

SCA field work was completed at the site between 19 and 22 March 2019 and included the following scope of works:

- Review of previous environmental investigations and results relevant to the Site;
- A site walkover to identify any additional PAEC (beyond those identified from the PSI) and to investigate the potential for surficial ACM (PAEC 5);
- Excavation of test pits and collection of soils samples from Former building / stockpile foot prints (PAEC1), current soil stockpiles (PAEC3) and to investigate the potential for fuel and chemical leaks and spills (PAEC 6);
- Collection of surface soil samples with a hand held shovel from the vicinity of the base of five timber power poles (PAEC 4) and nearby to the railway corridor (PAEC 5); and
- Laboratory analysis of selected soil samples for the identified contaminants of concern (COC) associated with each PAEC.

Based on the findings of the SCA, DP considers that the site can be made suitable for the proposed development subject to the successful remediation and validation of asbestos impacted soil at PAEC 1 (former stockpile footprint) located in the far northern portion of the site. DP has been engaged by Pacific National to prepare a remediation action plan (RAP) which details a strategy to render PAEC 1 suitable for the proposed use.

Remaining COPC were not detected in the soil samples collected during this SCA at levels that would prevent the remainder of the site being redeveloped for the proposed landuse.

Notwithstanding the above, the potential remains for isolated pockets of contamination to be present in untested areas of the site.

To appropriately manage unexpected potential contamination issues encountered during development works, DP recommends the implementation of an Unexpected Finds Protocol at this site. Additionally, any materials requiring off-site disposal must be classified, managed and disposed in accordance with the Protection of the Environment Operations Act 1997.



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## **Report on Supplementary Contamination Assessment**

### **Proposed St Marys Intermodal Freight Terminal**

### **Lot 2 Forrester Road, St Marys NSW**

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## **1. Introduction**

Douglas Partners Pty Ltd (DP) was commissioned by Urbanco Group Pty Ltd (Urbanco), on behalf of Pacific National (NSW) Pty Ltd (Pacific National), to undertake a Supplementary Contamination Assessment (SCA) for the proposed St Marys Freight Hub at Lot 2 Forrester Road, St Marys NSW (the site) as shown on Drawing 1 (Appendix B).

The proposed St Marys Freight Hub is a State Significant Development under the provision of Schedule 1, Clause 19(1b) of the State Environmental Planning Policy - State and Regional Development 2011. The site has an approximate total area of 11 ha and the proposed development will comprise upgrade of the existing rail infrastructure sidings, construction of hardstand areas, new internal access roads, wash bay, repair bay, office building, fuel storage area, container shed, transport shed, vehicle parking bays and reach stacker/forklift parking bays, and other ancillary development.

PN required this SCA to further assess the potential areas of environmental concern (PAEC) identified during a recent Preliminary Site Assessment (PSI) and to determine any remediation requirements (if any) for the site. The identified PAEC are discussed in Section 1.1 below.

### **1.1 Background**

In March 2019 DP completed a PSI (ref: 94525.01). The purpose of the PSI was to address Clause 13 of the *Revised Planning Secretary's Environmental Assessment Requirements (SEARs)* dated 23 October 2018: *Assess and quantify any soil and groundwater contamination and demonstrate that the site is suitable for the proposed use in accordance with SEPP55*. The PSI identified the following PAEC that required further investigation and/or remediation for the Site to be considered suitable for the proposed development:

- PAEC 1: Former building and stockpile footprints - A fragment of ACM was identified in one former stockpile footprint area in the far northern portion of the site;
- PAEC 3: Current Stockpiles - Multiple soil stockpiles were identified within the site. A limited visual assessment of the stockpiles was undertaken as part of the PSI. Given the preliminary nature of the PSI and the significant number / volume of soil stockpiles observed on-site, the presence of fill related COPC impact to stockpiles at the site could not be ruled out and therefore required further investigation;
- PAEC 4: Soil surrounding timber power poles - Five timber power poles were identified within the site. Leached timber treatment chemical from poles have the potential to impacted soil in close vicinity to the poles. Further investigation is required to determine the contamination status and any remediation requirements for PAEC 4 ;

- PAEC 5: Surficial ACM - Surficial ACM was identified in one area of the site associated with a former stockpile footprint (PAEC 1). DP also considered that there is a potential for surficial ACM to also be present within the rail corridor associated with abandoned train brake pads; and
- PAEC 6: Fuel and chemical leaks and spills - There is a potential that any fuel and chemical leaks and spills of fuel from vehicles (and stored chemicals within the former structures) have a potential to contaminate soil at the site. A limited visual assessment of PAEC 6 was undertaken as part of the PSI assessment.

## 2. Scope of Works

The following scope of works was undertaken for the SCA:

- Review of previous environmental investigations and results relevant to the Site;
- A site walkover to identify any additional PAEC (beyond those identified from the PSI) and to investigate the potential for surficial ACM (PAEC 5);
- Excavation of test pits and collection of soils samples from former building/stockpile foot prints (PAEC1), current soil stockpiles (PAEC3) and to investigate the potential for fuel and chemical leaks and spills (PAEC 6);
- Collection of surface soil samples with a hand held shovel from the vicinity of the base of five timber power poles (PAEC 4) and nearby to the railway corridor (PAEC 5);
- Laboratory analysis of selected soil samples for the identified contaminants of concern (COC) associated with each PAEC;
- Interpretation of results in accordance with current NSW EPA endorsed guidelines; and
- Preparation of this report detailing the methodology and results of the investigation including recommendations for future remedial/management options for the Site.

## 3. Site Information

The site is located in the suburb of St Marys within the local government area of Penrith City Council ("Council") and is identified as:

- Part Lot 2 Deposited Plan (D.P.) 876781 (Lot 2 – approximately 9.95 ha of the site)
- Part Lot 2 and 3 in D.P. 876781 (Lot 3 – approximately 0.75 ha of the site); and
- Part Lot 196 in D.P. 31912 (Lot 196 – approximately 0.35 ha of the site).

The broader site (ie land owned by Pacific National) is identified as Lots 2 and 3 in D.P. 876781, Lot 196 in D.P. 31912, Lot 2 in D.P. 734445 and Lot 2031 in D.P. 815293.

The location and boundary of the site (and the broader site) are shown on Drawing 1, Appendix B.

### 3.1 Site Description

The site was vacant at the time of this PSI. The site generally consists of cleared land with exposed filled surfaces, with over-grown vegetation present in some parts. Multiple overhead transmission lines (high and low voltage) traverse the site. Multiple stockpiles of soil and construction material are present throughout the site. Prominent site features are shown on Drawing 2, Appendix B. Photographic Plates showing site conditions are presented in Appendix C.

### 3.2 Surrounding Landuse

Land use surrounding the site comprises the following:

- East: Industrial premises;
- West: The rail corridor beyond which is a vacant lot and South Creek. Recreational facilities (Colonial Golf and Foot Golf Course, Troy Adams Archery Field and Parkes Avenue/Sporting Complex) are present further west of South Creek;
- North: A sediment basin beyond which is Little Creek, a tributary of South Creek and vacant land; and
- South: T1 Great Western Railway Line and St Marys train station. Beyond the railway are residential areas and recreational facilities, including Penrith BMX Club, Blair Oval, St Marys Senior High School, St Mary's Tennis Court Clubhouse.

Surrounding land uses are shown on Drawing 1, Appendix B.

## 4. Site Environmental Setting

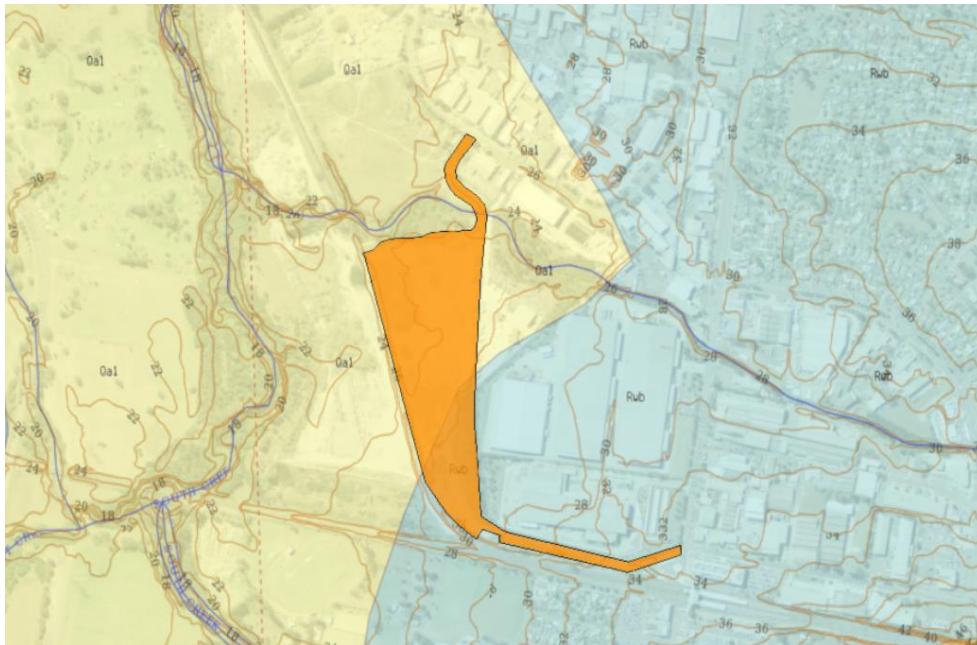
### 4.1 Site Topography

The NSW Department of Lands, Topographic Map of NSW with 2 m elevation contours dated April 2009 indicates that the site is located at an elevation of approximately 24 to 30 m relative to Australian Height Datum (AHD). The site is relatively flat with an overall topographic relief of approximately 6 m descending from the south to north. Refer Figure 1 below.

### 4.2 Site Geology

Reference to the Geological Survey of NSW Department of Mineral Resources (1983) *Penrith 1:100,000 Geology Sheet* indicates that the site is underlain by fluvial sediment (geological code – “Qa1”) of Quaternary geological period and Bringelly Shale (geological code – “Rwb”) of Middle Triassic period of Wianamatta Group.

Bringelly Shale typically comprises interlayered siltstone/claystone with some fine to medium grained sandstone layers, which weather to a residual clay profile of medium to high plasticity. Quaternary Sediments are typically fluvial (stream deposited) soils comprising sands, silts and clays. Refer Figure 1.



**Figure 1: Local geology and contours (yellow – Quaternary alluvium, green - Bringelly Shale)**

### 4.3 Soil Landscape

Reference to The *Penrith 1:100,000 Soil Landscape Series Sheet* indicates that the site is located near the boundary between the Blacktown and South Creek soil landscape groups. The southern portion of the site is underlain by Blacktown residual soil landscape (soil landscape code – “bt”) whereas the north-north western portion of the site is underlain by South Creek alluvial soil landscape (soil landscape code – “sc”).

The Blacktown soil landscape is characterised by gentle undulating rises on Wianamatta Group shales and Hawkesbury shales with slopes usually <5% and local relief to 30 m. Broad rounded crests and ridges with gently inclined slopes are common. The soils of this group are moderately reactive with a low fertility, poor soil drainage and highly plastic subsoil.

The South Creek soil landscape is characterised by floodplains, valley flats and drainage depressions of the channels (usually flat with incised channels) on the Cumberland Plain. The soils of this group are identified as erosion hazard and are prone to frequent flooding.

### 4.4 Hydrology

Little Creek is present immediately north of the site which discharges into South Creek located approximately 250 m west of the site. Surface water is anticipated to follow the topographical slope with some areas of the site expected to drain towards Little Creek.



## 4.5 Hydrogeology

A search of groundwater bore database maintained by Bureau of Meteorology, accessed on 30 January 2019 via Australian Groundwater Explorer, indicates that there is no registered groundwater bore within a 500 m distance from the site. However, 17 registered groundwater bores (GW 075076, GW 101259, GW 101262, GW 101266, GW 109584 to GW 109588 and GW 109829 to GW 109836) were identified within 1 km distance from the site (refer to Figure 2). These bores are located to the northeast, south and southeast of the site, and are registered for monitoring/test purposes. The depth of the bores ranged from 1.5 m to a maximum of 13.5 m.

The standing water level in these bores ranged from 2.4 m to 7 m bgl. DP notes that adequate information on water bearing zone is not available for some of the bores. Refer to the groundwater bore summary sheets provided in Appendix D for details.



**Figure 2: Groundwater well locations**

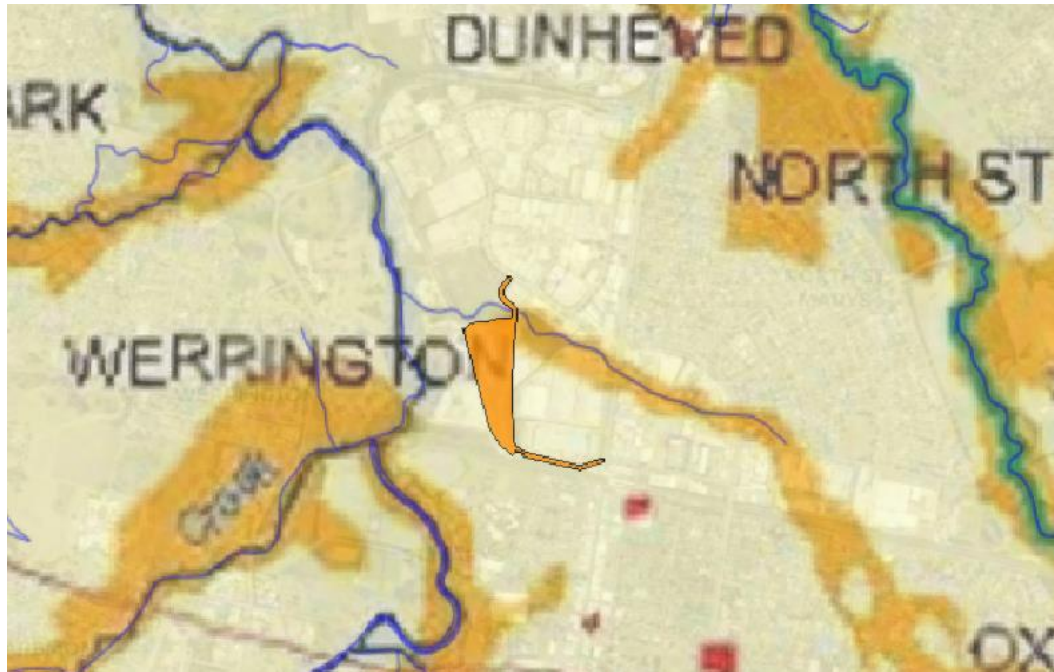
## 4.6 Acid Sulphate Soil

Reference to *the NSW Acid Sulphate Soils Risk Map* indicates that the site is in an area of 'no known occurrence' of acid sulphate soil. *The Atlas of Australian Acid Sulfate Soils* from CSIRO Australian Soil Resource Information System (ASRIS) also indicates that there is an extremely low probability of acid sulfate soil being present at the site.

The NSW Acid Sulfate Soils Manual 1998 published by the Acid Sulfate Soils Advisory Committee (ASSMAC) indicates that ASS (and Potential Acid Sulfate Soils – PASS) normally occur in alluvial or estuarine soils below RL 5 m AHD although can be encountered up to 12 m AHD. Considering the ASS mapping and given that the site soils are at site elevations above 24 m AHD, it is considered unlikely that ASS is present on-site.

#### 4.7 Salinity Potential

Reference to the *Map of Salinity Potential in Western Sydney – 2002*, NSW Department of Infrastructure, Planning and Natural Resources (DIPNR) indicates that the site is in an area of 'moderate to high salinity potential' with a higher potential in the lower elevation areas in close proximity to the South Creek system (Refer Figure 3).



**Figure 3: Local Salinity Potential**

### 5. Previous Environmental Investigations and Reports

DP is aware of the following investigations previously undertaken at the site and its vicinity:

- Parsons Brinckerhoff Australia Pty Limited (PB) report on *Proposed Container Freight Terminal at 6-8 Forrester Road, St Marys, Geotechnical Investigation Report, Document No: 2135587S-GEO-REP-350A Rev A* dated 2 September 2015 (PB, 2015);
- Environmental Resources Management Australia Pty Ltd (ERM) report on *55 - 67 and 69 - 81 Lee Holm Drive, St Marys, NSW, Phase 1 Environmental Site Assessment, Project No: 0030809 Draft* dated 15 April 2005 (ERM, 2005a);
- ERM report on *55 - 67 and 69 - 81 Lee Holm Drive, St Marys, NSW, Phase 2 Soil and Groundwater Investigation, Project No: 0030809RP2V3 Final* dated 30 August 2005 (ERM, 2005b);
- ERM report on *55-67 and 69-81 Lee Holm Drive, St Marys, NSW, Validation Report, Project No: 0021594RP1 Final* dated 22 December 2005 (ERM, 2005c); and
- DP (March, 2019a) *Preliminary Site Contamination Investigation, Proposed St Mary's Freight Hub, 2 Forrester Road, St Mary's NSW*. Project 94525.00.R.001.Rev0.



The key findings of the above-listed investigations that are relevant for this SCA are summarised in the following sub-sections. Extracts of figures from the above-listed reports showing the former investigation locations are included in Appendix E. The boundaries of former investigations are shown on Drawing 3, Appendix B.

## 5.1 PB (2015)

PB (2015) was a preliminary geotechnical investigation undertaken within the Lot 2 portion of the site to assess the geotechnical properties of sub-surface fill. Information presented in PB (2015) indicates that filling was completed around 2000 to raise the surface elevation above the 1:100 flood levels. Material generated at the ex-North Side Sewerage Tunnel project was imported and stockpiled at the site.

Eight test pits (TP 01 to TP 08) were excavated to a maximum depth of 4.2 m bgl within the site and the samples collected from the test pits were analysed for various geotechnical parameters. No contamination testing was undertaken during PB (2015).

Fill was encountered to depths of between 0.5 m – 3 m in all eight test pits during PB (2015). Fill material was generally consistent throughout the area investigated. Given the presence of potentially unsuitable materials (organics, sandstone cobbles and silt), filling was considered as uncontrolled fill. Residual and alluvium soils were encountered beneath fill in TP 01 and TP 08. Extreme to highly weather rock (fine to coarse grained sandstone of extremely low to very low strength) was also encountered from 1.5 m bgl in TP 01. PB (2015) recommended further geotechnical investigation to assess the quality of fill and the underlying natural material at the wider site area.

## 5.2 ERM (2005a)

ERM (2005a) was a due diligence assessment undertaken within Lot 2, D.P 734445 and Lot 3, (i.e. a portion of the site and the broader site) to assess potential liabilities and risk to the future land owner from any soil and groundwater contamination and environmental compliance issues associated with the land. ERM (2005a) comprised a desktop review of site history, permits/authorisations and a site walkover.

Information presented in ERM (2005a) indicates the following:

- Fill was present up to 2.9 m in Lot 3 (based on information presented in *Fill Contamination Assessment Report* prepared by Geotechnique Pty Ltd in October 2003). The extent of filling undertaken at Lot 3 after October 2003 was not known;
- Hallinan's Recycling (Hallinan's) operated at and oversaw the management of Lot 2, D.P 734445 and Lot 3. A number of activities were undertaken in the past within Lot 2 D.P 734445 (not within the site), including tyre processing, shredding and disposal (operated by Ableway Waste Management Pty Ltd), machine recycling assembly, soil decontamination treatment and cardboard recycling. At the time of ERM (2005a) a number of stockpiles including tyres, soil/debris, portable containers, machinery and a small concrete block metal roofed building used for cardboard recycling and soil remediation were present within Lot 2, D.P 734445. The soil decontamination building had one above ground storage silo, air filter unit, wheel wash facility and eight drums containing fertiliser and torque fluid (without secondary containment). The decontamination methodology and the type of material decontaminated was not known;

- A small pipe line and factory second business that repaired concrete pipes and pits operated on the south-eastern corner of Lot 3 (i.e. within the site). Some small buildings and minor amounts of concrete parts associated with this business operation were present at the time of ERM (2005a); and
- Based on the assessment completed, ERM (2005a) identified a risk of soil and groundwater contamination within Lot 2, D.P 734445 and Lot 3, and recommended undertaking a Phase 2 contamination investigation.

### 5.3 ERM (2005b)

ERM (2005b) was undertaken within Lot 2, D.P 734445 and Lot 3 to characterise fill and the underlying natural material at these lots and to assess the potential for soil and groundwater contamination in Lot 2, D.P 734445 from the historic site activities. DP was only provided with the executive summary of ERM (2005b) that provided no information on the number and depths of ERM (2005b) investigation. A review of Figure 2 included in the validation report (ERM, 2005c) indicates that 88 test pits (TP 001 to TP 088) were excavated and three monitoring wells (MW 1 to MW 3) were installed at these two lots during ERM (2005b).

ERM (2005b) reported the following exceedances above the ERM adopted site assessment criteria (SAC) in the soil samples analysed:

- Within Lot 2, D.P 734445: Concentration of TRH C<sub>10</sub>-C<sub>36</sub> in soil samples from TP 001 (0.15 m), TP 019 (0.1 m) and TP 088 (0.2 m), and the concentration of PAH in soil sample from TP 001 (0.15 m); and
- Within Lot 3: Concentration of toluene in soil sample MW 1 (0.1 m). In addition, a fragment of bonded cement sheet was also observed in fill material at TP 039 (0.1 m). Asbestos fibres were also reported in sample TP 035 (0.1 m).

ERM (2005b) concluded that the site was suitable for the ongoing commercial/industrial use provided contamination identified at the above-mentioned locations was remediated and validated. DP notes that the executive summary of ERM (2005b) provides no information on groundwater assessment.

### 5.4 ERM (2005c)

ERM (2005c) comprised excavation of impacted fill material from the six hot spots identified during ERM (2005b) and decommissioning of three monitoring wells (MW 1 to MW 3). Impacted fill was excavated down to the underlying natural soil at former intrusive locations (TP 001, TP 019, TP 035, TP 039, TP 088 and MW 1), none of which are within the current site. All target analytes were reported below the relevant validation criteria in the soil samples analysed from the remediation excavations. Fragments of asbestos or asbestos fibres were not detected in the soil samples analysed from TP 35 and TP 39 locations. The monitoring wells were decommissioned in accordance with *Minimum Construction Requirements for Water Bores in Australia* (September, 2003).

Based on the remediation and validation works completed, ERM (2005c) concluded Lot 2, D.P 734445 and Lot 3 as suitable for the ongoing commercial/industrial use.

## 5.5 DP (March 2019a) Preliminary Site Investigation

DP completed a PSI of the Site in March 2019. The purpose of this PSI was to address Clause 13 of the Revised Planning Secretary's Environmental Assessment Requirements (SEARs) dated 23 October 2018. The PSI included completion of the following scope (sample locations are shown on Drawing 4, Appendix B):

- A site walkover and a desktop review of site history information were undertaken to identify PAEC and contaminants of potential concern (COPC) which may arise from previous land uses. The desktop investigation included a review of previous investigation reports, a review of historical aerial photographs, NSW EPA data base searches, a title search and SafeWork NSW Dangerous Goods search;
- Drilling of four bore holes (BH 101 to BH 104) to a maximum depth of 10.5 m below ground level (bgl) or 2 m below the encountered groundwater level. Installation of a groundwater monitoring well in each bore hole (BH/MW 101 to BH/MW 104);
- Excavation of eight test pits (TP 106 to TP 113) to a minimum depth of 0.5 m into natural soil, or to a maximum depth of 3.3 m;
- Collection of representative soil samples from the bore holes and test pits at surface and every 0.5 m depth intervals to a maximum depth of investigation;
- Collection of representative groundwater samples from monitoring wells (BH/MW 101 to BH/MW 104);
- Laboratory analysis of selected soil samples for one or more of the following analytical suite at a National Association of Testing Authority (NATA) accredited laboratory:
  - o Metals comprising arsenic (As), cadmium (Cd), chromium (Cr), copper (Cu), lead (Pb), mercury (Hg), nickel (Ni) and zinc (Zn);
  - o Total recoverable hydrocarbons (TRH);
  - o Benzene, toluene, ethylbenzene and xylene (BTEX);
  - o Polycyclic aromatic hydrocarbons (PAH);
  - o Total phenols;
  - o Organochlorine (OCP), organophosphorous pesticides (OPP) and polychlorinated biphenyls (PCB); and
  - o Asbestos.
- Laboratory analysis of suspected fragments of bonded asbestos-containing material (ACM) for asbestos identification; and
- Laboratory analysis of groundwater samples for one or more of the following analytical suite at a NATA accredited laboratory:
  - o Eight metals listed above and additional analytes (aluminium, iron, bromine and manganese);
  - o TRH and BTEX;
  - o PAH and total phenols;
  - o Volatile organic compounds (VOC);
  - o OCP, OPP and PCB;

- o Oil and grease;
- o Hardness; and
- o Nutrients (nitrogen, ammonia and phosphorous).

The results of the PSI identified the PAEC as described in Section 1.1 that required further investigation and/or remediation for the Site to be considered suitable for the proposed development:

- PAEC 1: Former building and stockpile footprints
- PAEC 3: Current Stockpiles - Multiple soil stockpiles were identified within the site.
- PAEC 4: Soil surrounding timber power poles - Five timber power poles were identified within the site.
- PAEC 5: Surficial ACM;
- PAEC 6: Fuel and chemical leaks and spills; and
- PAEC 9: Former activity of James Hardie & Coy Pty Limited

## 5.6 Additional Information

Subsequent to the completion of DP (2019a), DP contacted the EPA in regard to its investigations of James Hardie asbestos legacy sites. DP understands that the EPA obtained information from Hardie Industries regarding up to 47 sites which were used to dispose of bulk asbestos waste and the EPA determined that 27 of the site required inspections and assessment for asbestos contamination. Information provided in the EPA web site does not indicate that any of the site are located within the Penrith City Council LGA.

## 6. Soil Sampling

SCA field work was completed at the site between 19 and 22 March 2019 to assess the PAEC identified in the PSI (Discussed in Section 5.5) that required further investigation as well as additional areas of the site not previously investigated.

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

### 6.1 Soil Sampling Methodology and Rationale

Test pit and surface sample locations are shown on Drawings 5 to 9, Appendix B. Soil samples were collected based on identified PAEC and visual observations during field work. The majority of test pits and soil sampling in PAEC 1, 3 and 6 were completed using a backhoe fitted with 450 mm bucket. Shallow soil sampling within PAEC 4 and 5 was completed with a hand held shovel. Test pit/surface sampling locations and COPC analysis rationale is as follows.

### 6.1.1 PAEC 1

A fragment of bonded ACM was previously identified during the PSI on the surface of an area within a former stockpile footprint in the far northern portion of the site. It was not certain whether this fragment was an anomalous/isolated fragment or indicative of widespread impact to surface soils and/or filling in the northern portion of the site. In addition another footprint of a former stockpile area was identified the northwest portion of the site. Previous soil sampling in both of the footprints was limited given the preliminary nature of the PSI.

To further investigate the potential for ACM and other COC within the footprints the following was completed:

- Excavation of an initial six test pits (TP201 to TP206) on an approximate 25 m grid across the far northern footprint and excavation of four test pits (TP212 to TP215) on an approximate 20 m grid across the north-western footprint. The number of samples satisfies NSW EPA sampling requirements for the total area of the footprints (total area of approx. 3,500 m<sup>2</sup>). Sampling locations for the far northern and north-western footprints are shown on Drawings 5 and 6, respectively (Appendix B);
- Each test pit was extended through fill soils at least 0.2 – 0.3 m into the underlying natural (in situ) soils;
- At each test pit fill soil samples were collected for laboratory analysis of fill related COPC including TRH, BTEX, PAHs, heavy metals, OCPs, OPPs and PCBs; and
- At each test pit location one 10 L bulk and one 500 mL soil samples were also collected at depths representative of each metre of fill encountered and inspected in accordance with WA DoH 2009 gravimetric method.

Following the identification of ACM fragments within filling at test pit location TP205 two test additional pits (TP207 and TP208) were completed on 19 March 2019 and an additional seven test pits (TP216 to TP222) were completed on 22 March 2019 to determine the lateral extent of ACM impact to filling. The additional test pits were inspected for signs of anthropogenic material, particularly demolition waste and ACM. A 10 L bulk sample and one 500 mL bag sample was collected from fill material at each additional test pit location and inspected in accordance with WA DoH 2009 gravimetric method.

### 6.1.2 PAEC 3

Several stockpiles were identified at the site in the PSI. A limited visual assessment of the stockpiles was undertaken as part of the PSI. Further stockpile assessment was therefore required. The following scope was completed for the soil stockpiles:

- Excavation of 30 test pits within stockpile SP3 and collection of soil samples at varied depths from all test pits. It is understood that SP3 was created from topsoil stripping works completed at the site and the number of sampling locations in SP3 is based on approximately 30% of the minimum density recommended in the NSW EPA (1995) *Sampling Design Guidelines* for an 8 hectare site (estimate area where topsoil stripping occurred). The number of samples provides a sampling rate of between 1 sample per 500 to 850 m<sup>3</sup> of material. The appropriateness of this density of testing will be assessed against the uniformity of the results obtained;

- Excavation of up to 44 test pits from within other stockpiles. Selected samples were collected from the test pits based on the minimum density recommended in the NSW EPA (1995) *Sampling Design Guidelines* for a 0.7 hectare site (estimate area of stockpiles excluding SP3) with a minimum of two samples collected from each stockpile area; and
- Laboratory analysis of selected stockpile soil samples for fill related and commonly encountered (including market gardening/pesticide related) COPC including TRH, BTEX, PAHs, heavy metals, OCPs, OPPs, PCBs and asbestos.

The number of test pits completed and samples collected was considered suitable to assess the potential for widespread gross contamination of stockpiled material given:

- Stockpiled material within each individual stockpile was observed to generally contain consistent material; and
- No significant volumes of anthropogenic material and/or odours/staining were observed within stockpiles during test pitting.

Stockpile approximate volumes, test pits completed and samples collected are presented in Table 3 below.

**Table 3: Stockpiles, Approximate Volumes, Test Pits Completed and Samples collected**

<b>Stockpile</b>	<b>Approx. Volume (m<sup>3</sup>)</b>	<b>General Description of Stockpiled Soil</b>	<b>Test Pits Completed</b>	<b>Samples Collected for Laboratory Analysis</b>	<b>Depth of Samples within Stockpile (m)</b>
SP1	15 - 25	Road waste material - Gravels and fragments of concrete	NA	No samples collected – due to consistent gravels and concrete encountered within stockpile	NA
SP2	300 - 400	Dark brown clayey sandy gravel with railway ballast (basalt cobbles) some large fragments of concrete and fragments of brick	SP2 / TP1 to TP10	SP2/TP1 SP2/TP4 SP2/TP8 SP2/TP10	0.7 – 0.8 0.4 – 0.5 1.9 – 2.0 0.1 – 0.2
SP3	15000 – 25000	Brown silty clay with sand with trace organic material	SP3 / TP1 to TP30	SP3/TP1 to SP3/TP30	One sample collected per test pit at varied depths with stockpile
SP4	1000 - 1500	Dark grey clayey sand with railway ballast (basalt cobbles) and trace of timber	SP4 / TP1 to TP10	SP4/TP1 SP4/TP5 SP4/TP8 SP4/TP10	0.4 – 0.5 0.4 – 0.5 0.4 – 0.5 0.5 – 0.6



Stockpile	Approx. Volume (m <sup>3</sup> )	General Description of Stockpiled Soil	Test Pits Completed	Samples Collected for Laboratory Analysis	Depth of Samples within Stockpile (m)
SP5	300 - 400	Pale brown sandy clay with gravel and trace of plastic and vegetation	SP5 / TP1 to TP8	SP5/TP1 SP5/TP3 SP5/TP6 SP5/TP8	1.9 – 2.0 0.9 – 1.0 1.4 – 1.5 1.9 – 2.0
SP7	10 - 15	Pale brown and grey sandy gravel	SP7 / TP1 to TP2	SP7/TP1 SP7/TP2	0.2 – 0.3 0.4 – 0.5
SP8	10 - 15	Pale brown gravelly sand	SP8 / TP1 to TP2	SP8/TP1 SP8/TP2	0.5 – 0.6 0.5 – 0.6
SP9	10 - 15	Brown silty clay with gravel and timber, railway sleepers, concrete, bricks, vegetation, tiles, plastic, metal wire	SP9 / TP1 to TP2	SP9/TP1 SP9/TP2	0.5 – 0.6 0.5 – 0.6
SP10	1500 – 2000	Dark grey sandy gravel with trace rootlets and brick fragments	SP10 / TP1 to TP10	SP10/TP1 SP10/TP3 SP10/TP6 SP10/TP10	3.4 – 3.5 1.9 – 2.0 0.6 – 0.7 0.4 – 0.5

Stockpile sample locations from stockpiles SP2, SP3 and SP5 are presented on Drawing 7 (Appendix B). Stockpile sample locations from stockpiles SP4, SP7, SP8, SP9 and SP10 are presented on Drawing 8 (Appendix B).

### 6.1.3 PAEC 4

Five timber power poles (PP1 to PP5) were identified on the site. Given the potential for leaching of COPC related to the power poles the following was undertaken:

- Collection of shallow soil samples (0.1 - 0.2 m bgl) located approximately 0.2 - 0.3 m to the north of the base of each of the onsite power poles (PP1 to PP5); and
- Laboratory analysis of the three samples collected in the power poles for PCOC including TRH, BTEX and PAHs.

### 6.1.4 PAEC 5 and PAEC 6

Surficial ACM was identified in one area of the site associated with a former stockpile footprint (PAEC 1) during the PSI. DP also considered that there is a potential for surficial ACM to also be present within the other stockpile footprint in the north western portion of the site and the rail corridor associated with abandoned train brake pads. There is also potential for contamination to surface soils from fuel and chemical leaks and spills from vehicles (and stored chemicals within the former structures).

To investigate the potential for surficial ACM and from fuel and chemical leaks and spills the following was undertaken:

- Site walkover to visually identify any ACM fragments on site surfaces within footprint, carpark areas and nearby to the railway corridor;
- Excavation of three test pits (TP209 to TP211) in the former carpark area in the far southeast of the site where nearmap imagery indicates the historical storage and parking of vehicles;
- Collection of shallow soil samples (0.0 to 0.5 m bgl) at all three test pit locations for laboratory analysis of COPC including TRH, BTEX, PAHs, heavy metals and asbestos;
- Analysis of selected shallow soils (0.0 to 0.5 m bgl) from test pits (TP201, TP202, T206 and TP213) completed in the far northern and north western former stockpile footprints for COPC including TRH, BTEX, PAHs, heavy metals and asbestos; and
- Collection of three surface soil samples (RC1 to RC3) in the vicinity of the railway corridor for laboratory analysis of asbestos.

The sampling locations completed in the former carpark area in the far southeast of the site and the railway corridor are shown on Drawing 9a and 9b, respectively (Appendix B).

## 6.2 Sampling Procedure and QA/QC

All sampling data was recorded on DP bore logs (Appendix G) with samples also recorded on chain-of-custody (CoC) sheets. The general sampling procedure adopted for the collection of environmental soil 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;
- Transfer of samples into laboratory-prepared glass jars, completely filled to ensure the headspace within the sample jar was minimised, and capping immediately to minimise loss of volatiles;
- Label sample containers with individual and unique identification details, including project number, sample location and sample depth;
- Place the glass jars, with Teflon lined lid, into a cooled, insulated and sealed container for transport to the laboratory; and
- Collection of additional replicate samples at a rate of 10% for 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.

## 6.3 Site Assessment Criteria

The Site Assessment Criteria (SAC) applied in this SCA have been informed by the proposed land use (i.e. commercial/industrial) and the CSM - which identified human and ecological receptors to potential contamination on the site (refer to Section 6). Analytical results 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 (NEPC, 2013).



Given the sites proposed land use and location within a commercial/industrial land use setting, 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 F and the adopted SAC are listed in the analytical results table (Tables H1 to H4 in Appendix H).

## **7. Field Work Observations and Results**

### **7.1 Geology**

With the exception of stockpiled materials (discussed in Table 3 Section 6.1.2) the geological conditions encountered during this SCA in the three main areas of test pitting is discussed in Sections 7.1.1 to 7.1.3 below.

#### **7.1.1 Far Northern Area**

Geology in the far northern area included the following strata:

- Filling – brown silty clay with gravel encountered from surface to 1.5 mbg; overlying
- Silty clay encountered at depths from 1.0 to 1.5 mbg.

Anthropogenic material including brick fragments, ceramics, plastic and concrete were variously encountered in filling at most locations across the far northern stockpile footprint. Fragments of bonded ACM were also encountered within filling material in test pits TP205 and TP208 and are further discussed in Sections 7.3 and 8.1.

#### **7.1.2 North Western Area**

Geology in the north western footprint included the following strata:

- Filling – pale grey sandy gravel and crushed sandstone encountered from surface to 1.4 m bgl; overlying
- Silty clay encountered at depths from 1.0 to 1.4 mbg.

Anthropogenic material including brick and plastic fragments were encountered within filling in test pits TP212, TP213 and TP215.

#### **7.1.3 Southern Carpark**

Geology in the southern carpark included the following strata:

- Filling – Brown gravelly clay with silt and sand encountered from surface to 0.6 m bgl; overlying
- Silty clay encountered at depths from 0.3 to 0.6 m bgl.

### 7.1.4 Remaining Areas of the Site

Relatively uniform conditions were encountered across most of the site during the previous PSI. The general strata encountered across the site during the PSI is summarised as follows:

- **FILLING / TOPSOIL** – Slightly silty sandy gravel topsoil filling with some vegetation and rootlets to a depth of 0.12 m in TP 113.
- **FILLING** – Typically sandy gravel, gravelly sand or clayey gravel filling with inclusions of sand, sandstone gravel, plastic, glass and brick fragments to depths ranging between 0.4 m and 3.5 m in all test pits and boreholes.
- **NATURAL SOILS** – Typically stiff to hard, brown silty clay or gravelly clay with traces of fine gravel in all boreholes and test pits except for TP 109 and TP 110. In TP 112 a layer of silty sand was encountered from 1.3 m to 1.5 m depth.
- **WEATHERED BEDROCK** – Generally extremely low strength shale at depths of between 7.5 m and 10 m in BH 101, BH 102 and BH 104.

## 7.2 Hydrogeology

Groundwater was observed during the PSI fieldworks at depths of approximately depths of 7.0 m and 3.5 m in BH 102 and BH 103 respectively, during drilling. Groundwater was not observed during the drilling of the remaining boreholes or during the excavation of the remaining test pits. Backfilling of the test pits at the completion of excavation precluded long-term monitoring of the groundwater levels at the test pit locations.

## 7.3 Laboratory Analytical Results

The analytical results for the soil samples collected during this SCA are summarised in Tables H1 to H4 in Appendix H, together with the adopted SAC. The laboratory certificate of analysis for this SCA is provided in Appendix I.

### TRH and BTEX

TRH and BTEX were not detected at concentrations exceeding SAC in all soil samples analysed.

### PAHs

Benzo(a) pyrene was detected at concentrations in excess of environmental screening levels (0.7 mg/kg) in soil samples collected from the following locations:

- Test pit TP209 at a depth of 0.1 – 0.2 m bgl (concentration of 2.5 mg/kg);
- At the base of power pole PP2 (concentration 9.0 mg/kg);
- Stockpile SP3 in test pit TP10 at a depth of 0.9 – 1.0 m bgl (concentration of 2.6 mg/kg);
- Stockpile SP3 in test pit TP11 at a depth of 0.6 – 0.7 m bgl (concentration of 2.2 mg/kg);
- Stockpile SP3 in test pit TP12 at a depth of 0.4 – 0.5 m bgl (concentration of 1.8 mg/kg);
- Stockpile SP4 in test pit TP5 at a depth of 0.4 – 0.5 m bgl (concentration of 1.4 mg/kg);

- Stockpile SP4 in test pit TP10 at a depth of 0.6 – 0.6 m bgl (concentration of 1.2 mg/kg); and
- Stockpile SP9 in test pit TP1 at a depth of 0.5 – 0.6 m bgl (concentration of 1.2 mg/kg).

PAHs were not detected at concentrations exceeding SAC in all remaining soil samples analysed.

### **Metals**

Arsenic was detected at a concentration (170 mg/kg) marginally in excess of environmental investigation levels (160 mg/kg) in the soil sample from stockpile SP10 within test pit TP3 at a depth of 1.9 – 2.0 m bgl.

Copper was detected at a concentration (420 mg/kg) in excess of environmental investigation levels (300 mg/kg) in the soil sample from stockpile SP10 within test pit TP3 at a depth of 1.9 – 2.0 m bgl.

Copper was detected at a concentration (350 mg/kg) in excess of environmental investigation levels (300 mg/kg) in the soil sample from stockpile SP4 within test pit TP5 at a depth of 0.4 - 0.5 m bgl.

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

### **OCPs, OPPs and PCBs**

OCPs, OPPs and PCBs were not detected at concentrations exceeding SAC in all soil samples analysed.

### **Asbestos**

Concentrations of asbestos detected within the fragments of ACM in the 10 L bulk samples collected from test pits TP205 and TP208 were calculated to exceed commercial / industrial HSLs.

Asbestos was detected by the laboratory as amosite, crocidolite and chrysotile asbestos in the fibre cement samples identified in the fill sample collected from TP205 at concentrations exceeding commercial/industrial HSLs.

Asbestos was not detected or identified in any other soil samples analysed.

## **7.4 QAQC**

A review of the adopted QA/QC procedures and results (Appendix J) 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 F).

## 8. Discussion and Remedial Requirements

### 8.1 ACM in Filling and on surface soils in Northern Portion of Site (PAEC 1)

A fragment of ACM was previously observed during the PSI on the ground surface within the former stockpile footprint in the far northern portion of the site. Results of grid based test pits completed across the far northern area during the SCA identified concentrations of asbestos detected within the fragments of ACM in the 10 L bulk samples collected from filling in test pits TP205 and TP208 was calculated to exceed commercial / industrial HSLs.

Given that percentage asbestos has been identified in the 10 L fill (soil) samples from TP205 and TP208 at concentrations exceeding commercial / industrial HSLs the filling in the vicinity of TP205 and TP208 will require remediation for the site to be suitable for the proposed commercial / industrial redevelopment. The extent of ACM impact to fill however is considered likely to be limited given that ACM was not detected at concentrations exceeding residential HSLs in any of the remaining grid or delineation based samples completed within the far northern portion of the site.

The absence of ACM in grid based and delineation based samples therefore delineates the approximate lateral extent of fill requiring remediation to the east, north, south and west of TP205 and TP208. The lateral extent however will require confirmation/validation during future remediation of impacted fill. The approximate extent of fill soils requiring remediation in the far northern stockpile footprint is presented on Drawing 10 (Appendix B).

### 8.2 Metals and PAH Impact to Stockpiled and Site Soils Exceeding EILs

Metals (arsenic and copper) and PAHs, in the form of benzo(a)pyrene, were variously detected at concentrations in excess of environmental investigation and screening levels in soil samples collected from the following locations:

- A one test pit (TP209) location in the southern portion of the site – benzo(a) pyrene (2.5 mg/kg);
- At the base of one power pole (PP2) - benzo(a) pyrene (9.0 mg/kg);
- Three test pits (TP10 to TP12) completed within Stockpile SP3 - benzo(a) pyrene (max concentration 2.6 mg/kg), Arsenic (170 mg/kg) and copper (420 mg/kg);
- Two test pits (TP5 and TP10) completed within Stockpile SP4 - benzo(a) pyrene (1.4 mg/kg), and copper (350 mg/kg);
- One test pit (TP1) completed within Stockpile SP9 - benzo(a) pyrene (1.2 mg/kg) - ; and
- One test pit (TP3) completed within Stockpile SP10 – copper (420 mg/kg) .

The metals (arsenic and copper) and PAHs exceedances for EILs and / or ESLs at the test pit location, the base of the stockpile and at limited locations within stockpiles are not considered to affect the suitability of the site for commercial / industrial purposes given:

- The majority of the proposed intermodal freight terminal is to be covered with a concrete slab hardstand which will limit ecological access to soils across the site; and
- Concentrations of metals and PAHs were not detected at levels exceeding EILs in the majority of stockpile and test pit samples indicating the extent of arsenic, copper and PAH impact is limited in extent and not indicative of widespread gross impact to stockpiled and site's soils.

### 8.3 Pesticide Concentrations in Stockpile SP4

Pesticides (DDT, DDD and DDE) have been identified in a soil sample collected from test pit TP10 completed on the southern portion of stockpile SP4 at concentrations (maximum total concentration of DDT+DDD+DDE - 2.8 mg/kg) exceeding scheduled chemical waste criteria (2 mg/kg).

The concentrations of pesticides do not exceed commercial / industrial health investigation levels (3600 mg/kg) or Environmental Investigation Levels (640 mg/kg) and therefore do not prevent the site's suitability for the proposed land use. It should be noted however that in the event soils are to be disposed of offsite the stockpiled soil in the vicinity of TP10 may require classification as scheduled chemical waste (SCW) in accordance with clause 4.14 *Scheduled Chemical Wastes Chemical Control Order 2004* (CCO).

### 8.4 Potential former site use by James Hardie

DP understands that Stockpile (SP)3 was generated through the stripping of the site surface following the site ownership by James Hardie and prior to filling. Further investigation of SP3 was undertaken to assess potential site surface impacts during the ownership of the site by James Hardie. The SCA included the excavation of 30 test pits within SP3 and analysis of COPC including asbestos. Suspected asbestos containing materials, or indicators of potential asbestos contamination (i.e. building demolition waste), were not observed in the test pits, and asbestos was not reported during laboratory analysis.

Based on the findings of the aerial photograph review completed during the PSI, the findings of this investigation and the information outlined in Section 5.6, DP considers that it is unlikely that the site was used by James Hardie Industries for asbestos disposal.

## 9. Conclusions and Recommendations

Based on the findings of the SCA, DP considers that the site can be made suitable for the proposed development subject to the successful remediation and validation of asbestos impacted soil at PAEC 1 (former stockpile footprint) located in the far northern portion of the site. DP has been engaged by Pacific National to prepare a remediation action plan (RAP) which details a strategy to render PAEC 1 suitable for the proposed use.

Remaining COPC were not detected in the soil samples collected during this SCA at levels that would prevent the remainder of the site being redeveloped for the proposed landuse.

Notwithstanding the above, the potential remains for isolated pockets of contamination to be present in untested areas of the site. To appropriately manage unexpected potential contamination issues encountered during development works, DP recommends the implementation of an Unexpected Finds Protocol at this site. Additionally, any materials requiring off-site disposal must be classified, managed and disposed in accordance with the *Protection of the Environment Operations Act 1997*.

## 10. References

1. DP *Report on Preliminary Site Investigation, Proposed St Marys Freight Hub, 2 Forrester Road, St Marys NSW*, Project 94525.02.R.001.Rev0 (PSI; DP, March 2019).
2. Environmental Resources Management Australia Pty Ltd (ERM) report on *55 - 67 and 69 - 81 Lee Holm Drive, St Marys, NSW, Phase 1 Environmental Site Assessment, Project No: 0030809 Draft* dated 15 April 2005 (ERM, 2005a);
3. ERM report on *55 - 67 and 69 - 81 Lee Holm Drive, St Marys, NSW, Phase 2 Soil and Groundwater Investigation, Project No: 0030809RP2V3 Final* dated 30 August 2005 (ERM, 2005b).
4. National Environment Protection Council (2013), *National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013*, 11 April 2013.
5. NSW EPA, Contaminated Site, *Guidelines for the NSW Site Auditor Scheme 2nd Edition*, April 2006.
6. NSW EPA, *Managing Land Contamination, Planning Guidelines, SEPP55 - Remediation of Land*, 1988.
7. NSW EPA Contaminated Sites (2011), *Guidelines for Consultants Reporting on Contaminated Sites*, August 2011.
8. Parsons Brinckerhoff Australia Pty Limited (PB) report on *Proposed Container Freight Terminal at 6-8 Forrester Road, St Marys, Geotechnical Investigation Report, Document No: 2135587S-GEO-REP-350A Rev A* dated 2 September 2015 (PB, 2015).

## 11. Limitations

Douglas Partners Pty Ltd (DP) has prepared this report for this project at 2 Forrester Road, St Marys NSW in accordance with DP's proposal NWS180083.P.003.Rev0 dated 1 March 2019 and acceptance received from My Guy Evans on behalf of Pacific National Pty Ltd dated 12 March 2019. The work was carried out under DP's Conditions of Engagement. This report is provided for the exclusive use of Pacific National Pty Ltd for this project only and for the purposes as described in the report. It should not be used by or relied upon for other projects or purposes on the same or other site or by a third party. Any party so relying upon this report beyond its exclusive use and purpose as stated above, and without the express written consent of DP, does so entirely at its own risk and without recourse to DP for any loss or damage. In preparing this report DP has necessarily relied upon information provided by the client and/or their agents.

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

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

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

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

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

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**Douglas Partners Pty Ltd**

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## Appendix A

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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.



## 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 - 2007. The terms used to describe rock strength are as follows:

Term	Abbreviation	Point Load Index $Is_{(50)}$ MPa	Approximate 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  $Is_{(50)}$ . It should be noted that the UCS to  $Is_{(50)}$  ratio varies significantly for different rock types and specific ratios should be determined for each site.

## Degree of Weathering

The degree of weathering of rock is classified as follows:

Term	Abbreviation	Description
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



## 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.



## Description and Classification Methods

The methods of description and classification of soils and rocks used in this report are based on Australian Standard AS 1726-1993, 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.



# Symbols & Abbreviations

## Douglas Partners



### Introduction

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

### Drilling or Excavation Methods

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

### Water

▷	Water seep
▽	Water level

### Sampling and Testing

A	Auger sample
B	Bulk sample
D	Disturbed sample
E	Environmental sample
U <sub>50</sub>	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

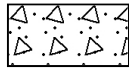
### General



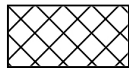
Asphalt



Road base



Concrete



Filling

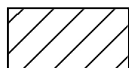
### Soils



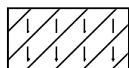
Topsoil



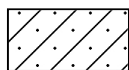
Peat



Clay



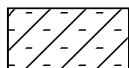
Silty clay



Sandy clay



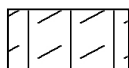
Gravelly clay



Shaly clay



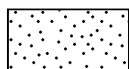
Silt



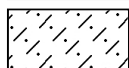
Clayey silt



Sandy silt



Sand



Clayey sand



Silty sand



Gravel



Sandy gravel



Cobbles, boulders



Talus

### Sedimentary Rocks



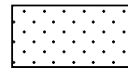
Boulder conglomerate



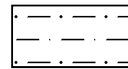
Conglomerate



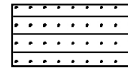
Conglomeratic sandstone



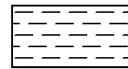
Sandstone



Siltstone



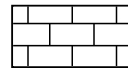
Laminite



Mudstone, claystone, shale

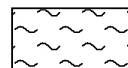


Coal

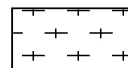


Limestone

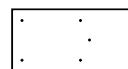
### Metamorphic Rocks



Slate, phyllite, schist

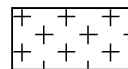


Gneiss

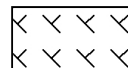


Quartzite

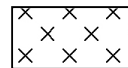
### Igneous Rocks



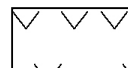
Granite



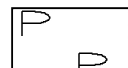
Dolerite, basalt, andesite



Dacite, epidote



Tuff, breccia



Porphyry

---

## **Appendix B**

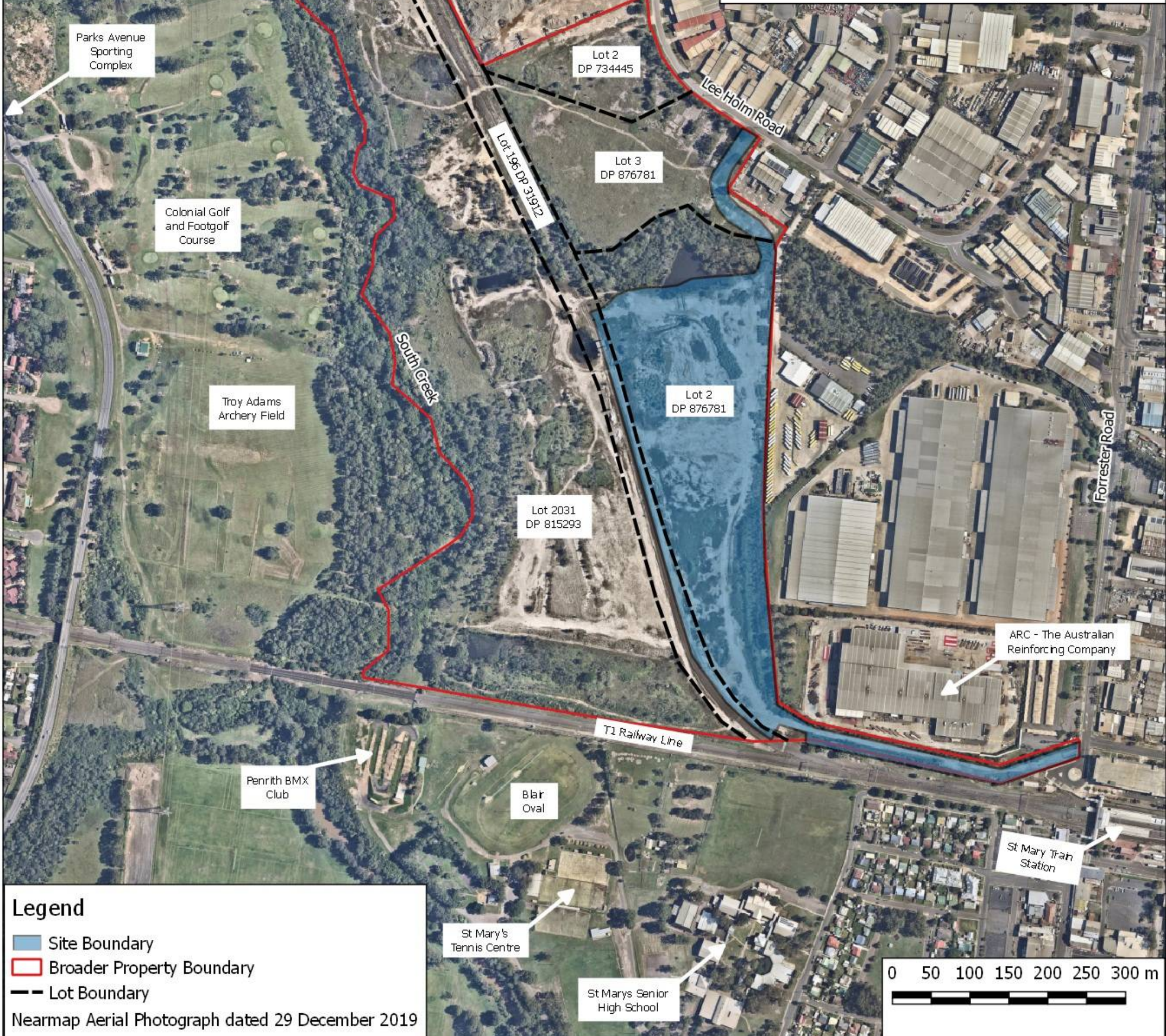
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Drawings 1 to 10





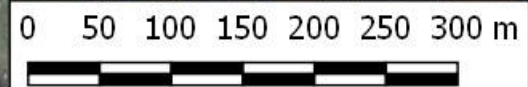
Site Locality



Legend

- Site Boundary
- Broader Property Boundary
- Lot Boundary

Nearmap Aerial Photograph dated 29 December 2019



TITLE: **Site Layout and Locality**  
**Supplementary Contamination Assessment**  
**2 Forrester Rd, St Marys, NSW**



OFFICE: Macarthur  
DRAWN: CKM  
DATE: 28.2.19  
SCALE: As Shown

CLIENT: Pacific National (NSW) Pty Ltd

PROJ. 94525.02

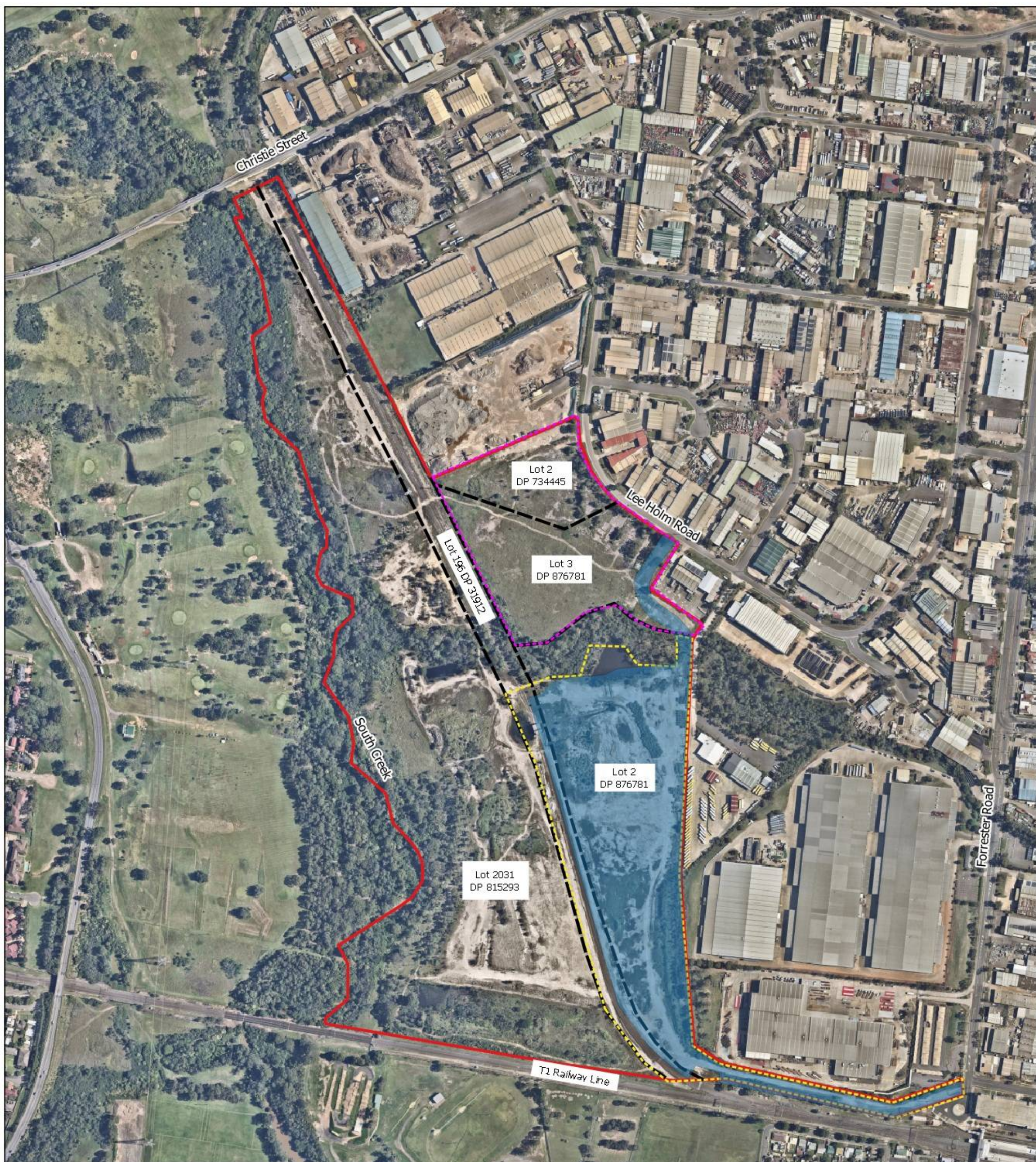
DRAWING No: 1

REVISION: 0









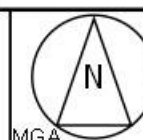
## Legend

- Site Boundary
- ERM (2005a, 2005b & 2005c)
- PB 2015
- Lot Boundary
- Broader Site Boundary

nearmap Aerial Photograph dated 29 December 2018



TITLE: **Former Investigation Boundaries  
Supplementary Contamination Assessment  
2 Forrester Rd, St Marys, NSW**



OFFICE: Macarthur

DRAWN BY: CKM

DATE: 28.2.19

SCALE: As Shown

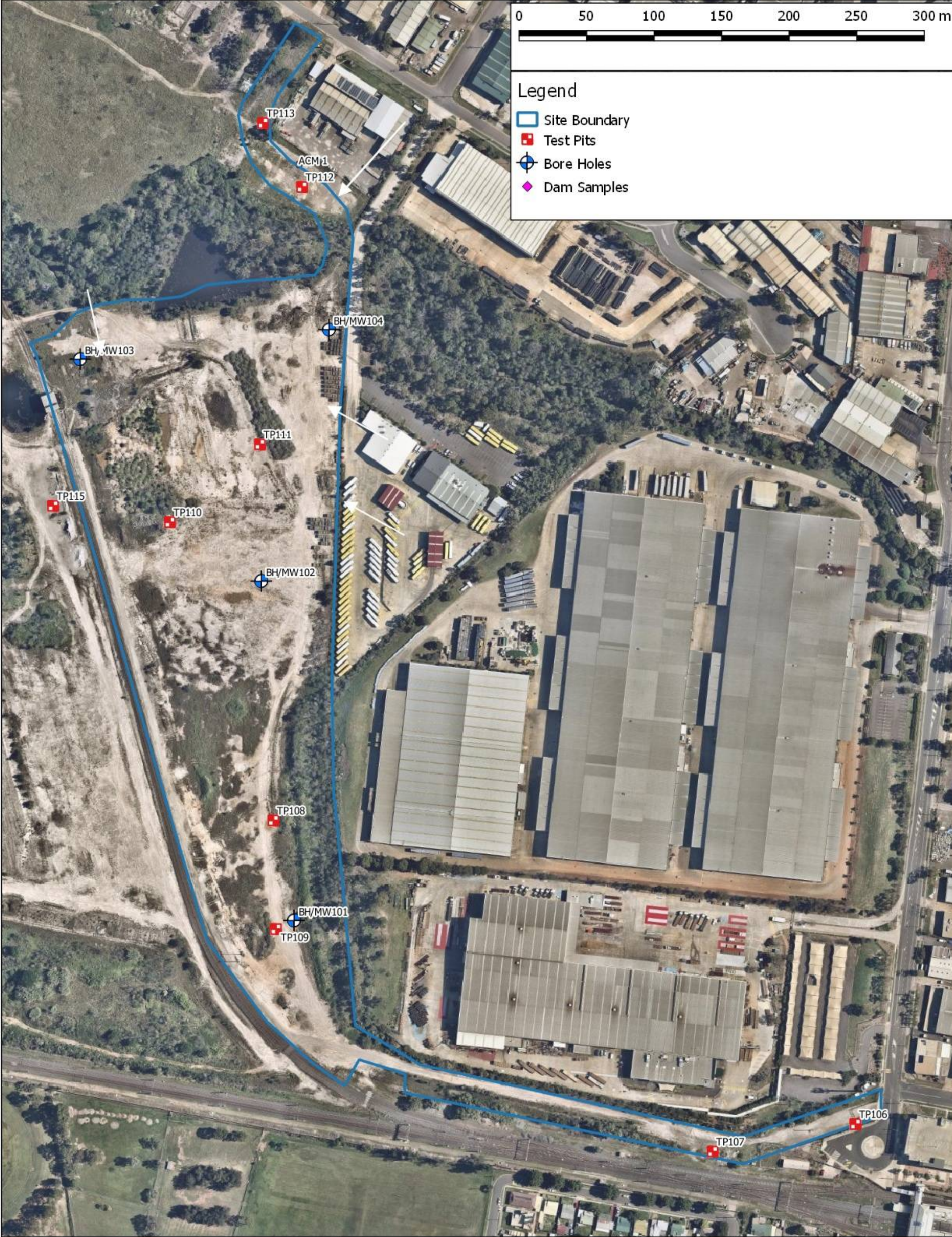
CLIENT: Pacific National (NSW) Pty Ltd

PROJ. 94525.02

DRAWING No: 3

REVISION: 0










**Legend**

- Site Boundary
- PSI Test Pit Locations
- SCA Test Pit Locations

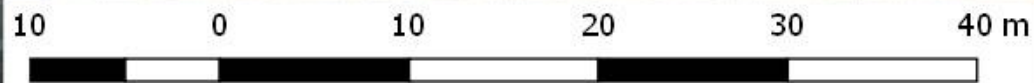
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CLIENT: Pacific National (NSW) Pty Ltd		PROJ. 94525.02	DRAWING No: 5	REVISION: 0		DRAWN GAR
						DATE: 28.2.19
						SCALE: As Shown






**Legend**



- Site Boundary
- PSI Test Pit Locations
- SCA Test Pit Locations
- Bore Holes



 <b>Douglas Partners</b> <i>Geotechnics   Environment   Groundwater</i>	TITLE: PAEC 1 - North-Western Former Stockpile Footprint Sample Locations Supplementary Contamination Assessment 2 Forrester Rd, St Marys, NSW			 MGA	OFFICE: Macarthur	
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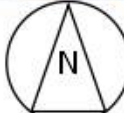




 <b>Douglas Partners</b> Geotechnics   Environment   Groundwater	TITLE: PAEC 3 - Stockpiles SP2, SP3 and SP5 Sample Locations Supplementary Contamination Assessment 2 Forrester Rd, St Marys, NSW				OFFICE: Macarthur DRAWN: GAR DATE: 28.2.19
CLIENT: Pacific National (NSW) Pty Ltd	PROJ. 94525.02	DRAWING No: 7	REVISION: 0	SCALE: As Shown	





 <b>Douglas Partners</b> Geotechnics   Environment   Groundwater	TITLE: PAEC 3 - Stockpiles SP4, SP7, SP8, SP9 and SP10 Sample Locations Supplementary Contamination Assessment 2 Forrester Rd, St Marys, NSW			 MGA	OFFICE: Macarthur DRAWN: GAR DATE: 28.2.19
CLIENT: Pacific National (NSW) Pty Ltd	PROJ. 94525.02	DRAWING No: 8	REVISION: 0	SCALE: As Shown	



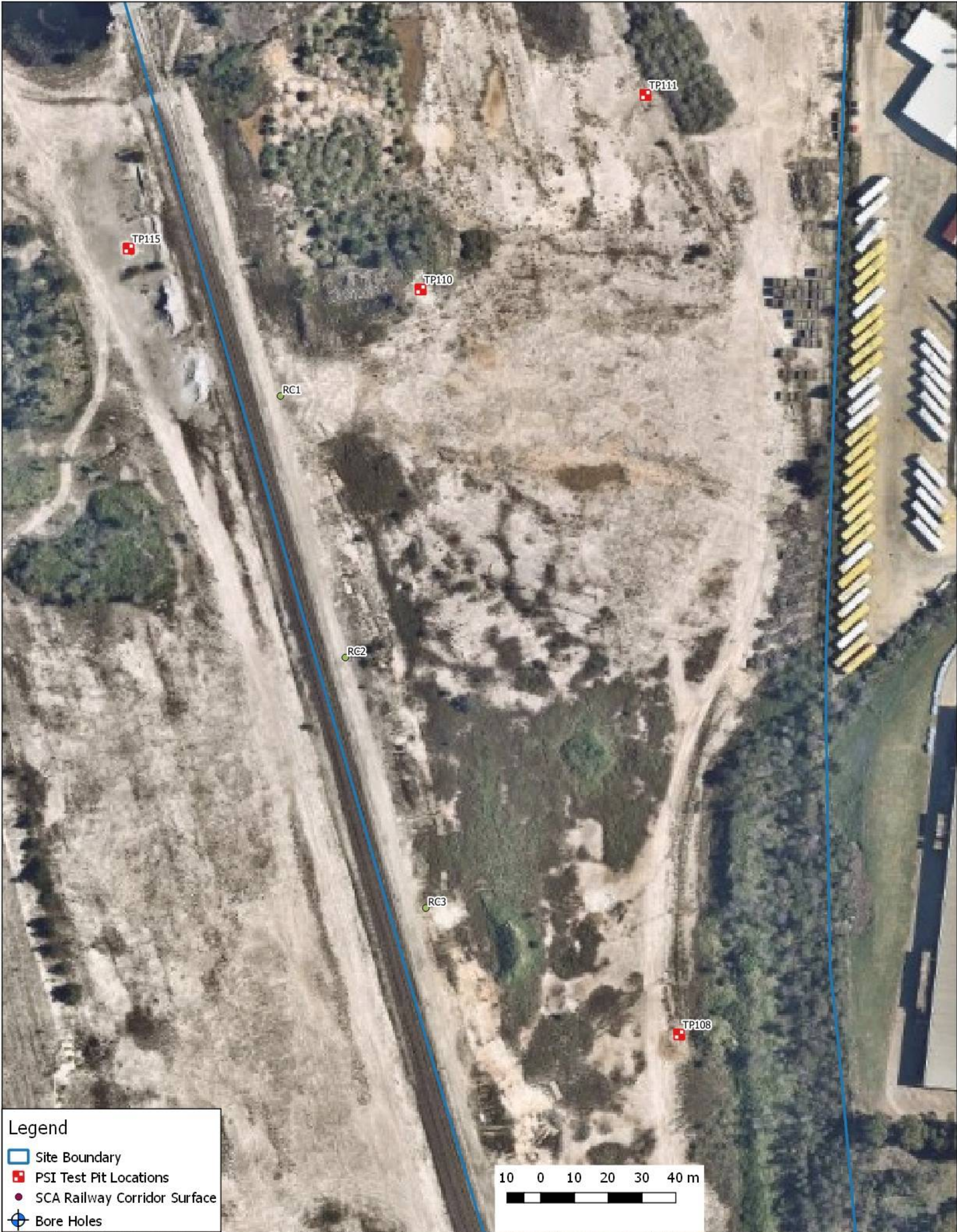


**Legend**

- Site Boundary
- PSI Test Pit Locations
- SCA Test Pit Locations
- Bore Holes

 <b>Douglas Partners</b> <i>Geotechnics   Environment   Groundwater</i>		TITLE: PAEC 6 - Former Carpark Sample Locations Supplementary Contamination Assessment 2 Forrester Rd, St Marys, NSW			
CLIENT: Pacific National (NSW) Pty Ltd		PROJ. #: 94525.02	DRAWING No: 9a	REVISION: 0	
					OFFICE: Macarthur
					DRAWN BY: GAR
					DATE: 28.2.19
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**Legend**

- Site Boundary
- PSI Test Pit Locations
- SCA Railway Corridor Surface
- Bore Holes



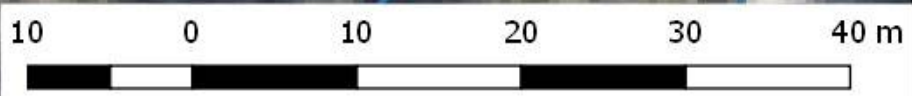
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					DRAWN BY: GAR	
					DATE: 28.2.19	
					SCALE: As Shown	
CLIENT: Pacific National (NSW) Pty Ltd	PROJ. #: 94525.02	DRAWING No: 9b	REVISION: 0			







**Legend**

- Site Boundary
- PSI Test Pit Locations
- SCA Test Pit Locations
- Estimated Extent of ACM Impact to filling Requiring Remediation



 <b>Douglas Partners</b> <i>Geotechnics   Environment   Groundwater</i>	TITLE: Far Northern Footprint- Estimated Extent of ACM Impacted Fill Requiring Remediation Supplementary Contamination Assessment 2 Forrester Rd, St Marvs, NSW				OFFICE: Macarthur
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CLIENT: Pacific National (NSW) Pty Ltd	PROJ. #: 94525.02	DRAWING No: 10	REVISION: 0		DATE: 28.2.19
					SCALE: As Shown



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## Appendix C

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Site Photographs



Photo 1 - Site surface covered with overgrown vegetation in parts of site



Photo 2 - Unloading facility along the railway corridor



Site Photographs

Preliminary Site Contamination Investigation

Proposed St Marys Freight Hub - Stage 1,  
2 Forrester Road, St Marys, NSW

CLIENT: Pacific National

PROJ: 94525.00

PLATE: 1

REV: A

DATE: 5-Apr-19





Photo 3 - Refuse on the side of access pathway from the Forrester Road entrance



Photo 4 - Exposed site surface comprising aggregate filling with some anthropogenic material near  
Road entrance

Forrester


	Site Photographs	PROJ:	94525.00
	Preliminary Site Contamination Investigation	PLATE:	2
	Proposed St Marys Freight Hub - Stage 1, 2 Forrester Road, St Marys, NSW	REV:	A
	CLIENT: Pacific National	DATE:	5-Apr-19





Photo 5 - Soil stockpile covered with overgrown vegetation along the eastern boundary



Photo 6 - Soil stockpile with demolition waste on top

	Site Photographs	PROJ:	94525.00
	Preliminary Site Contamination Investigation	PLATE:	3
	Proposed St Marys Freight Hub - Stage 1, 2 Forrester Road, St Marys, NSW	REV:	A
	CLIENT: Pacific National	DATE:	5-Apr-19





Photo 7- Some railway sleepers scattered on site surface and stockpile of construction material



Photo 8 - Stockpile of old timber with wire mesh.





Photo 9 - Stockpile of sandstone boulders and pieces of concrete pipes nearby.



Photo 10 - Stockpile SP1 containing concrete, sandstone boulders, I beam, wire mesh etc






Photo 11 - Stockpile of soil containing building demolition waste in the southeast corner of Lot3, D.P876781.



Photo 16 - Timber power poles at the site

	Site Photographs	PROJ:	94525.00
	Preliminary Site Contamination Investigation	PLATE:	6
	Proposed St Marys Freight Hub - Stage 1, 2 Forrester Road, St Marys, NSW	REV:	A
	CLIENT: Pacific National	DATE:	5-Apr-19



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## **Appendix D**

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### Site Environmental Setting Maps and Bore Search Results

## Appendix D: Site Environmental Setting – Extracts of Maps

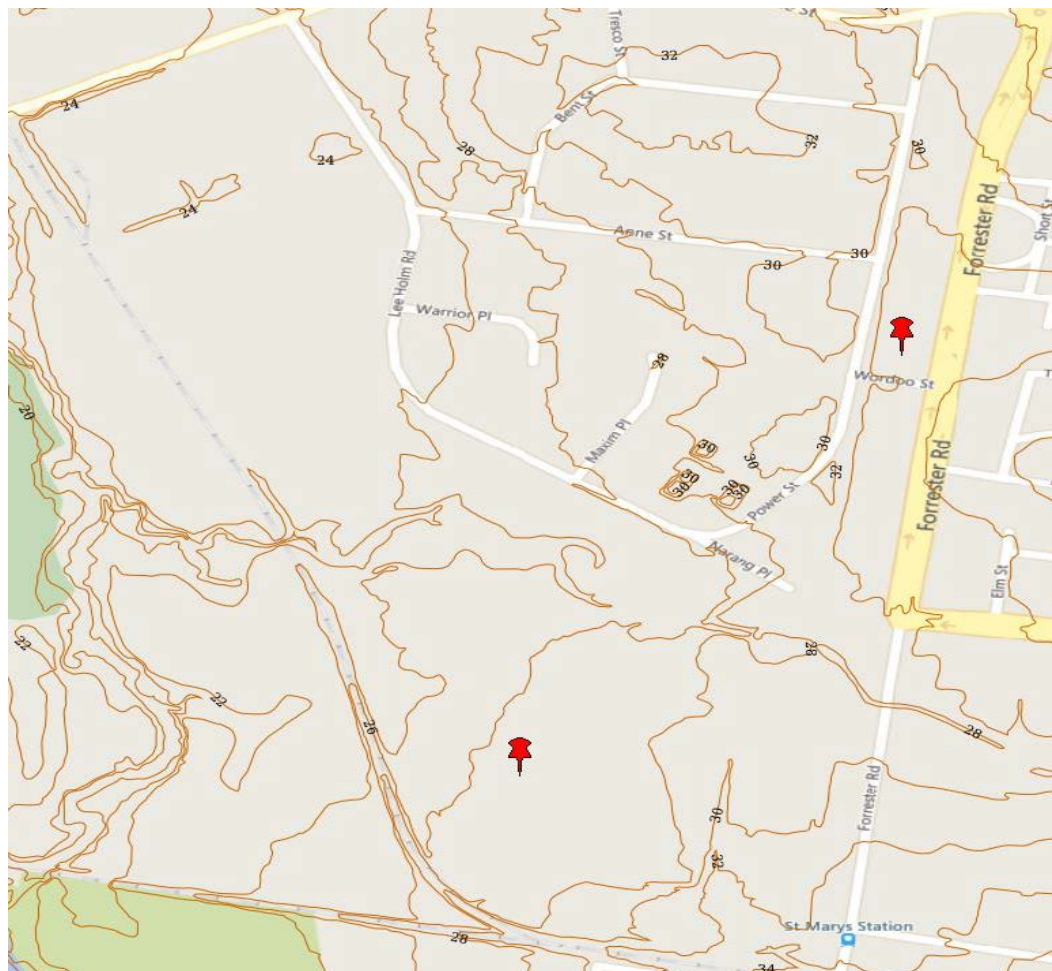


Figure D1: Extract of Topographic Map of NSW – 2 m Elevation Contour, NSW Department of Lands, April 2009.

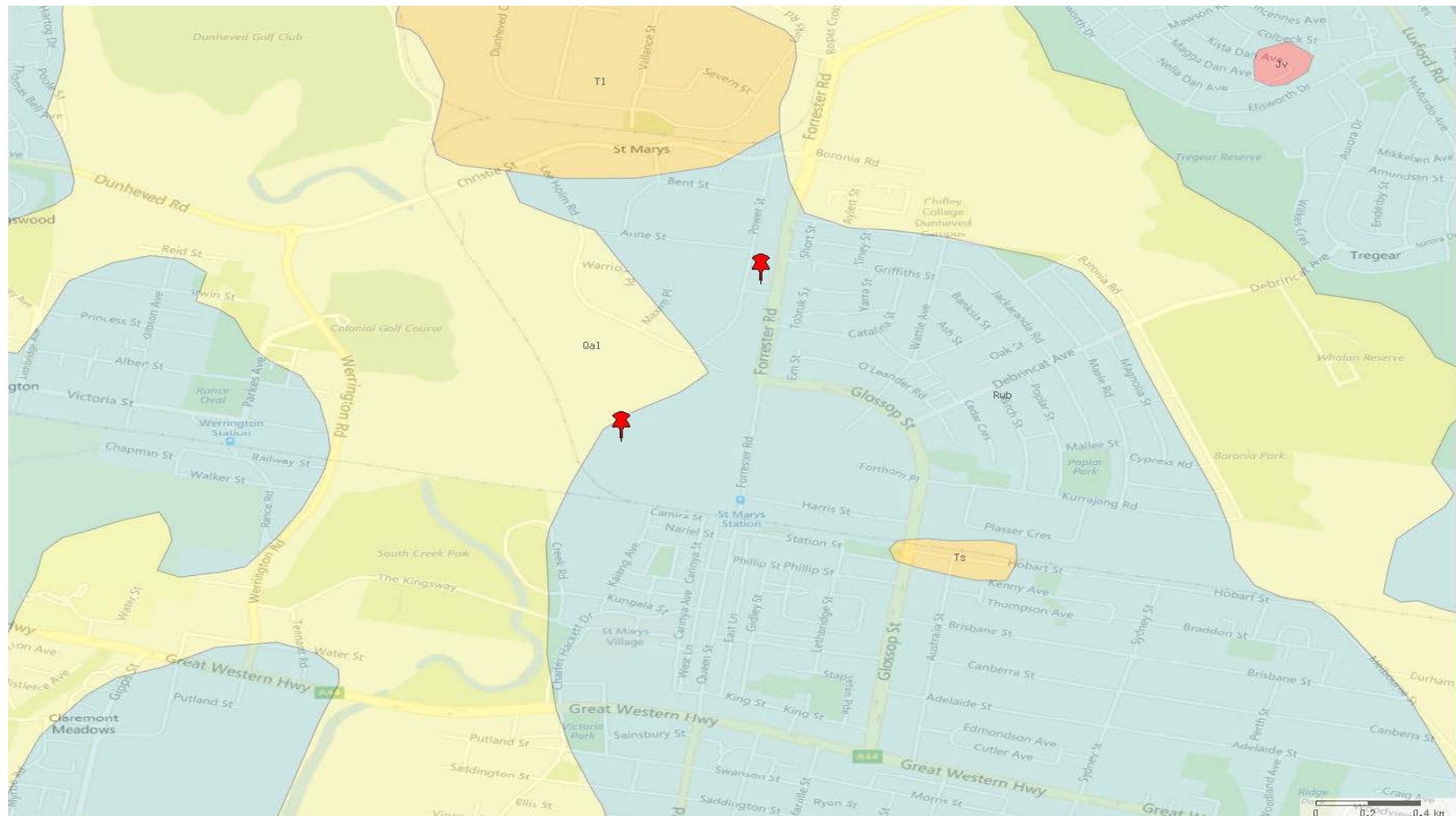


Figure D2: Extract of Penrith 1:100,000 Geology Sheet, Edition 1, 1991

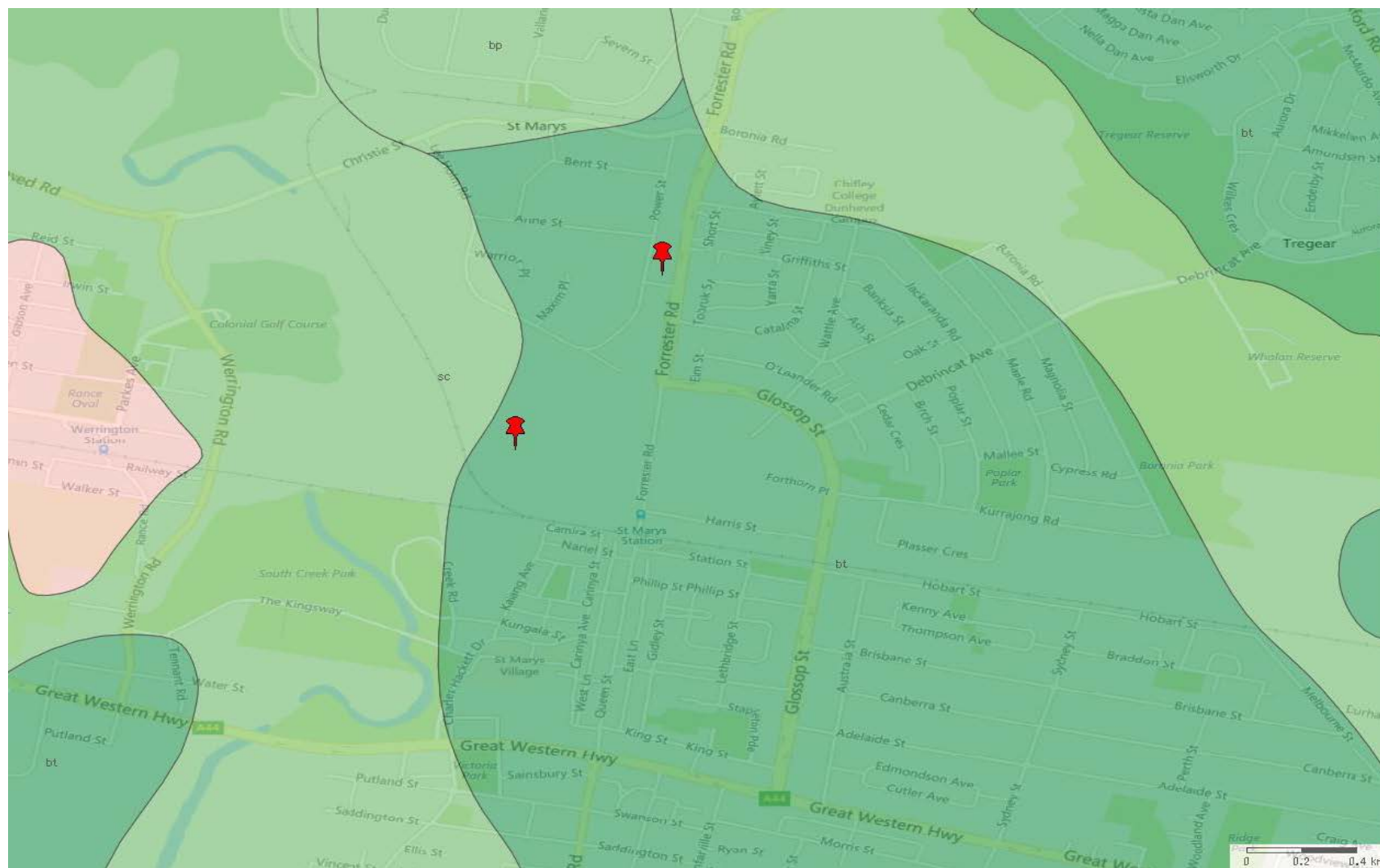


Figure D3: Extract of Penrith 1:100,000 Soil Landscape Sheet, Edition 1, 1989



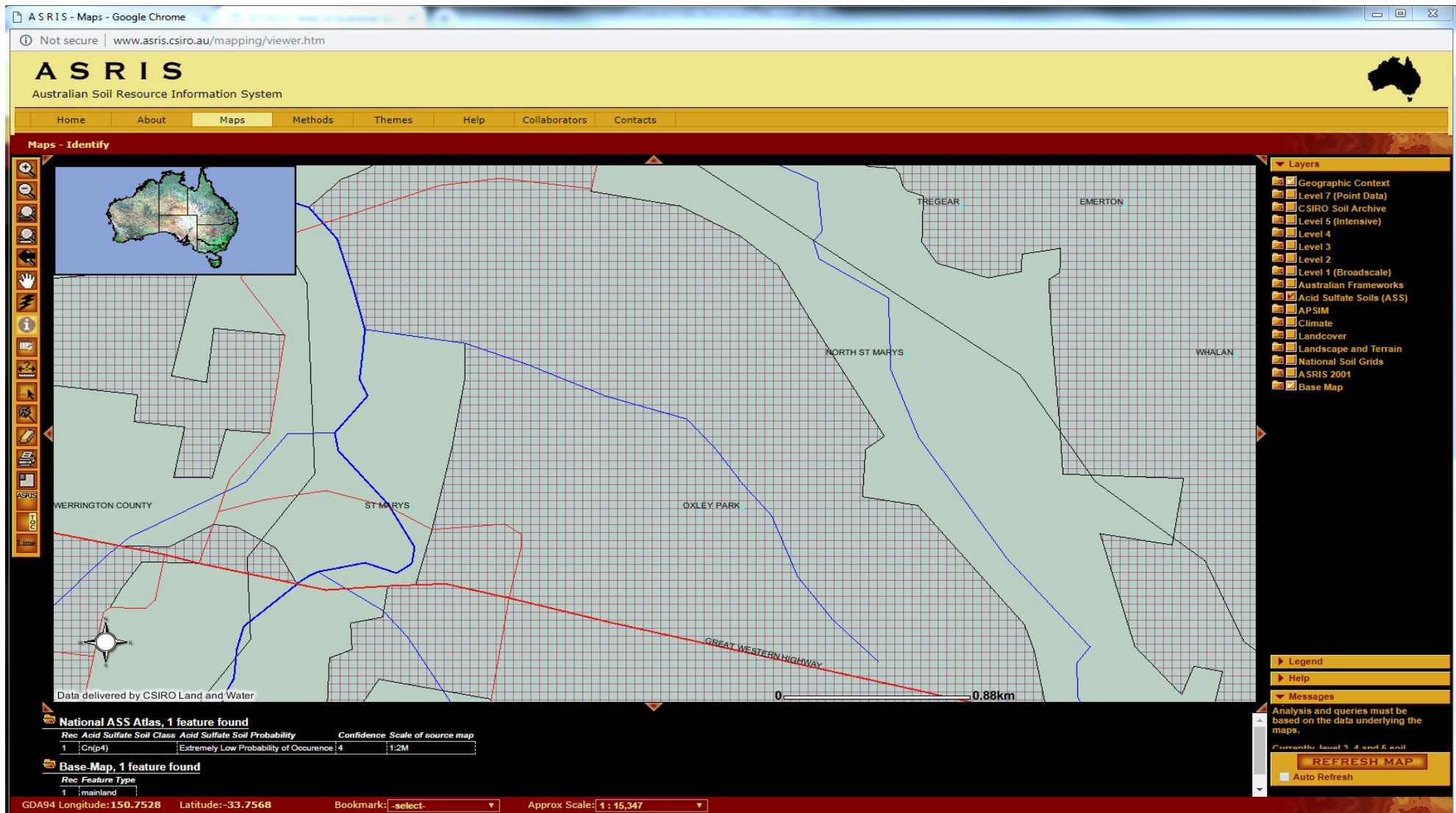


Figure D4: Output from CSIRO - The Atlas of Australian Acid Sulfate Soils

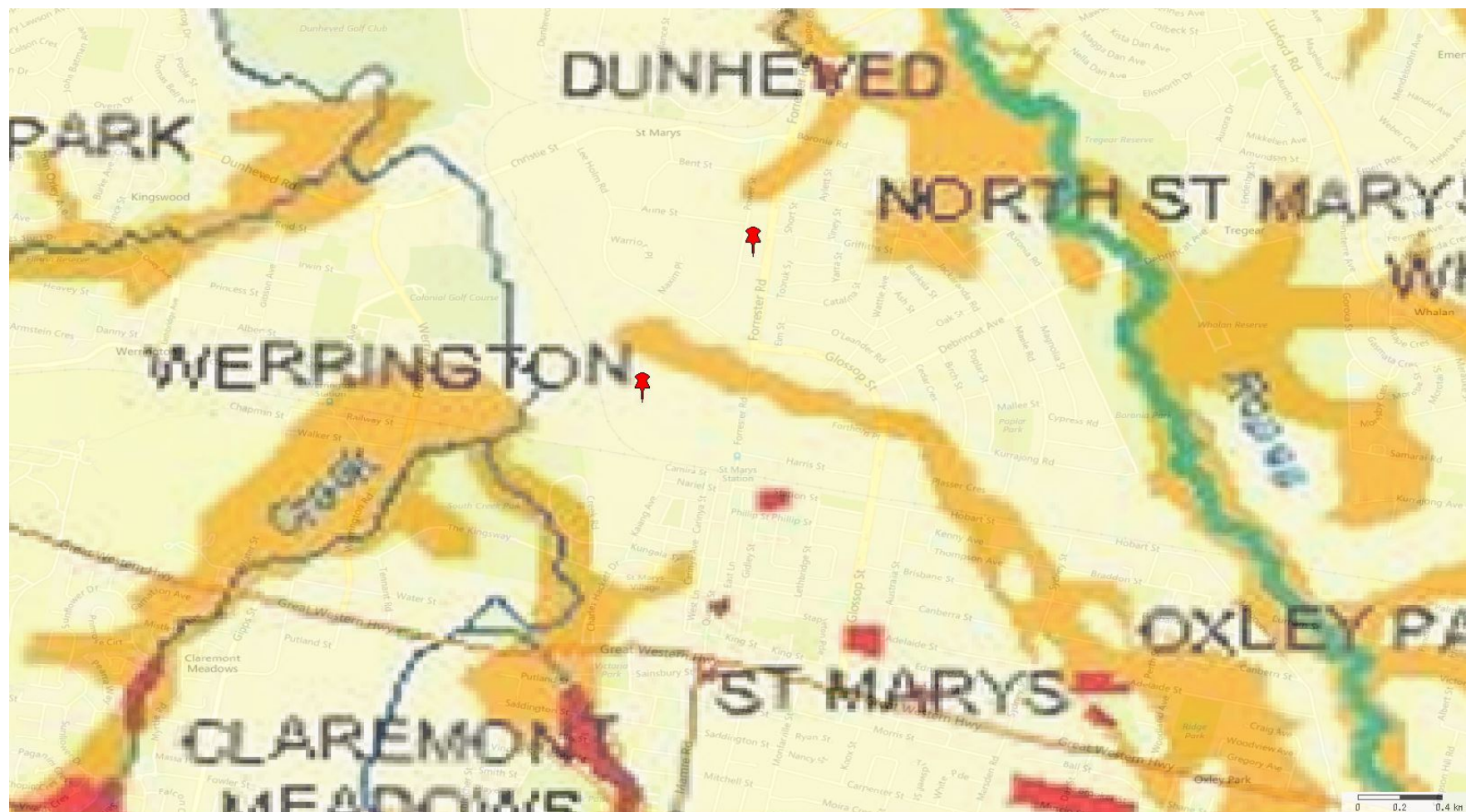


Figure D5: Extract of Map of Salinity Potential in Western Sydney – 2002, NSW Department of Infrastructure, Planning and Natural Resources



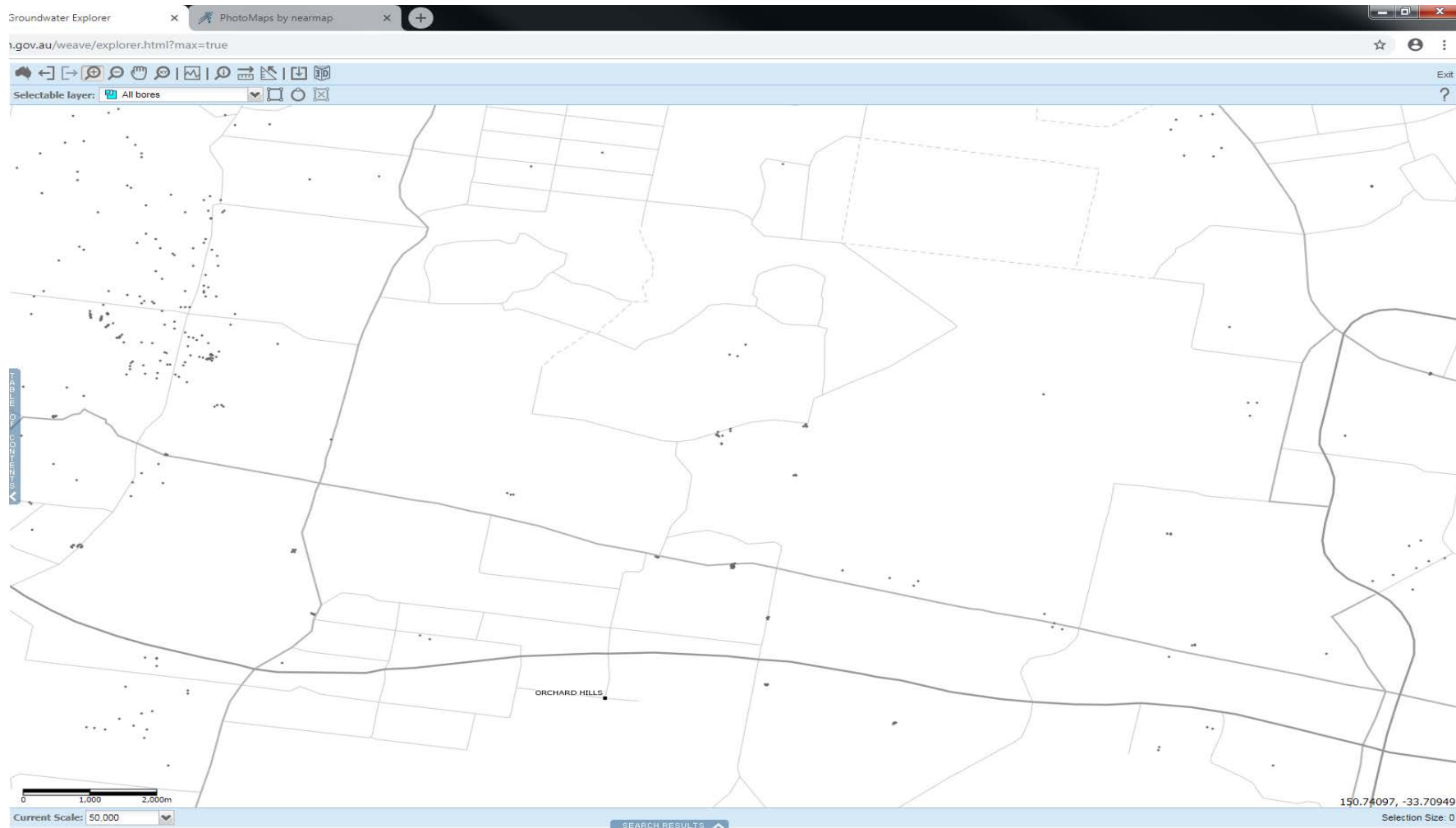


Figure D6: Groundwater Bore Search Results – Australian Groundwater Explorer

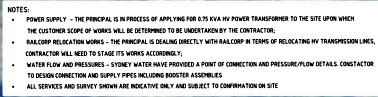


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## Appendix E

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Extract Figures from Previous Investigation Reports

[illegible]

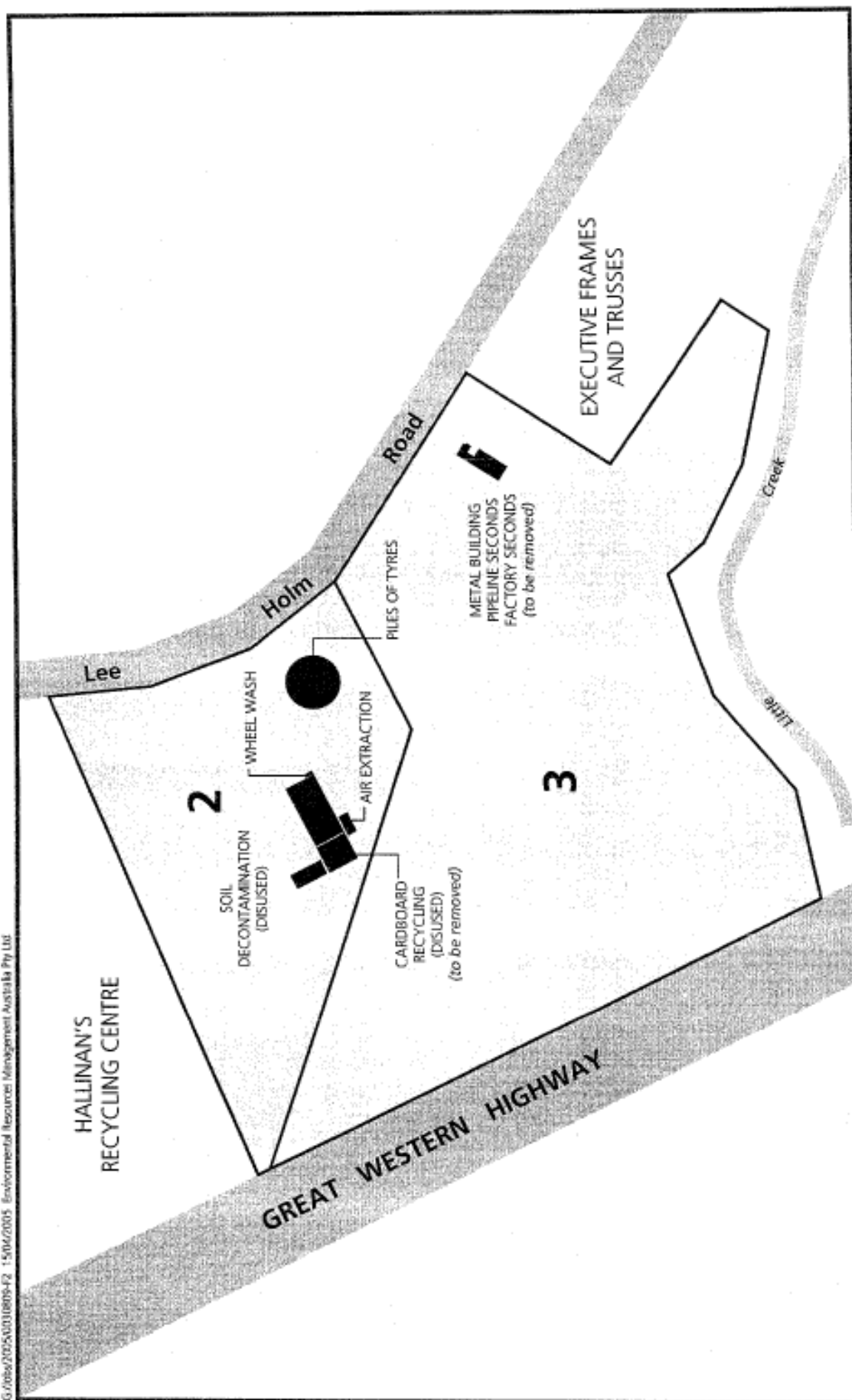


Figure 2 Site Layout

NOT TO SCALE



Project White  
55-67 and 69-81 Lee Holm Road,  
St Marys, NSW.

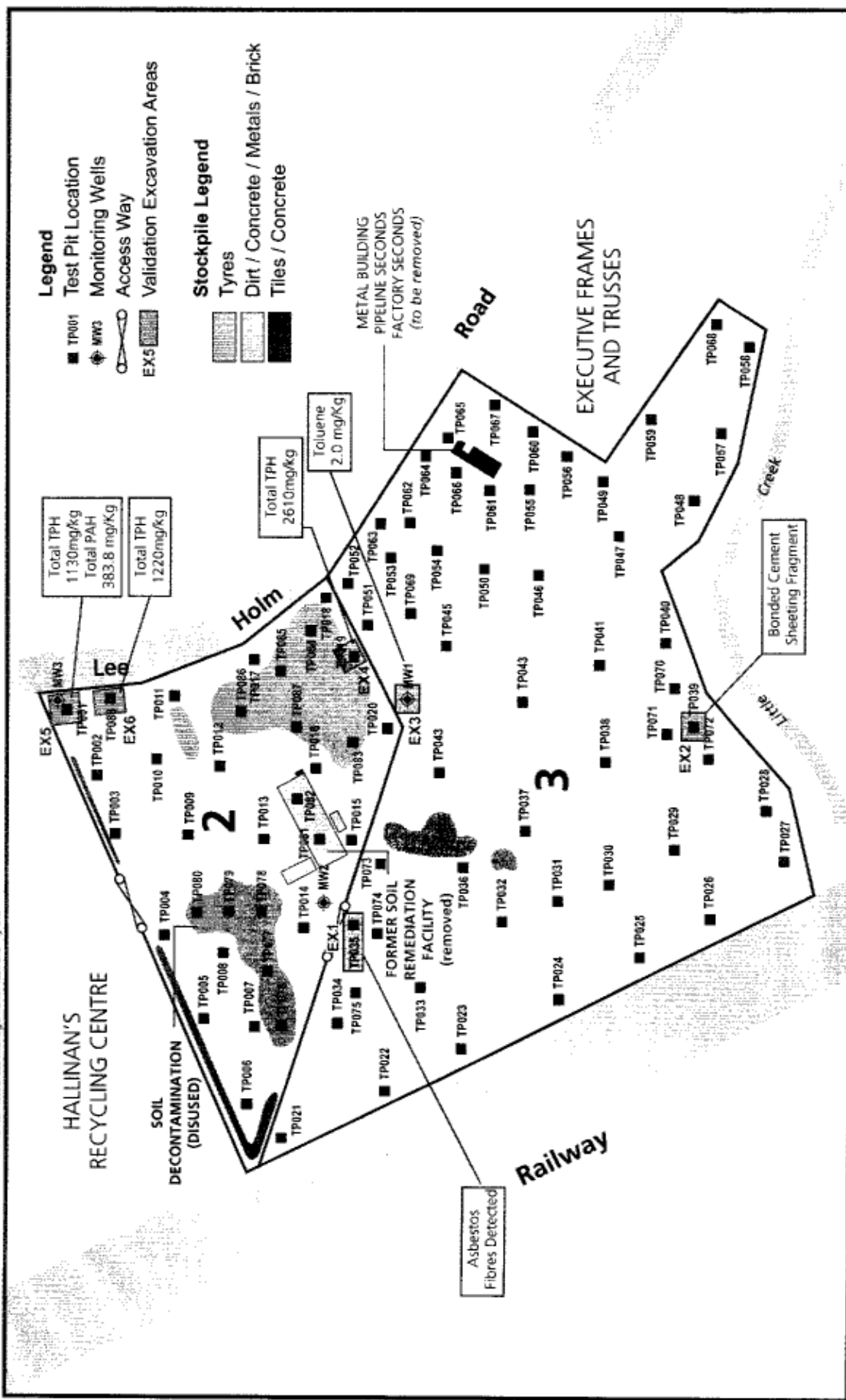


Figure 2

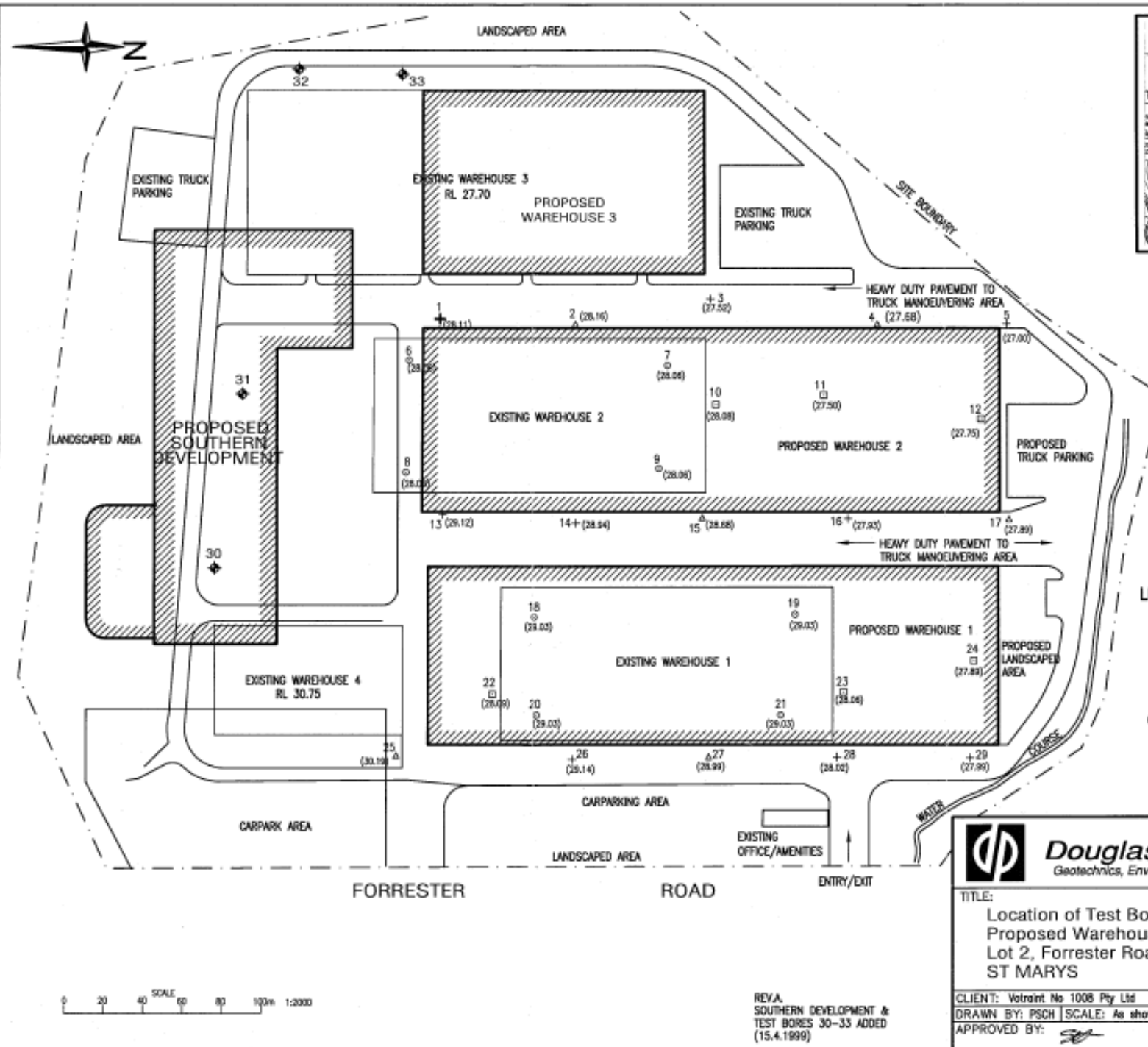
Site Layout and Remediation Locations



NOT TO SCALE

Project White  
55-67 and 69-81 Lee Holm Road,  
St Marys, NSW.





LOCALITY PLAN

**LEGEND**

- ▲ TEST BORE LOCATION
  - TEST PIT LOCATION
  - CONCRETE CORE & DYNAMIC CONE PENETRATION TEST LOCATION
  - + CONE PENETRATION TEST LOCATION
  - (25.53) SURFACE LEVEL OF BORE (AHD)
  - ◆ TEST BORE LOCATION (SOUTHERN DEVELOPMENT)
- PREVIOUS INVESTIGATION SEPT. 1998



**Douglas Partners**  
Geotechnics, Environmental, Groundwater

Sydney, Newcastle, Brisbane,  
Melbourne, Perth, Wyang,  
Singleton, Campbelltown,  
Tennantville, Coimbs, Wollongong

**TITLE:**  
Location of Test Bores, Test Pits, DCPs & CPTs  
Proposed Warehouses  
Lot 2, Forrester Road  
ST MARYS

CLIENT: Voltraint No 1008 Pty Ltd  
DRAWN BY: PSCH SCALE: As shown PROJECT No: 27638 OFFICE: SYDNEY  
APPROVED BY: [Signature] DATE: 15.4.1999 DRAWING No: 1/A

REVA  
SOUTHERN DEVELOPMENT &  
TEST BORES 30-33 ADDED  
(15.4.1999)

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## Appendix F

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DQOs and SAC

## Appendix F1: Data Quality Objectives

The SCA has been devised broadly in accordance with the seven step data quality objective (DQO) process which is provided in Appendix B, Schedule B2 of the *National Environment Protection (Assessment of Site Contamination) Measure* 1999 as amended 2013 (NEPC, 2013). The DQO process is outlined below:

### F1.1 State the Problem

The site is proposed for redevelopment as the St Marys Freight Hub, a State Significant Development under the provision of Schedule 1, Clause 19(1b) of the State Environmental Planning Policy - State and Regional Development 2011.

A Preliminary Site Assessment (PSI) of the Site completed in March 2019 identified the following areas of potential areas of environmental concern (PAEC) which required further investigation and/or remediation for the Site to be considered suitable for the proposed development:

- PAEC 1: Former building and stockpile footprints - A fragment of ACM was identified in one former stockpile footprint area in the far northern portion of the site;
- PAEC 3: Current Stockpiles - Multiple soil stockpiles were identified within the site. A limited visual assessment of the stockpiles was undertaken as part of the PSI. Given the preliminary nature of the PSI and the significant number/volume of soil stockpiles observed on-site, the presence of fill related COPC impact to stockpiles at the site could not be ruled out and therefore required further investigation;
- PAEC 4: Soil surrounding timber power poles - Five timber power poles were identified within the site. Leached timber treatment chemical from poles have the potential to impacted soil in close vicinity to the poles. Further investigation is required to determine the contamination status and any remediation requirements for PAEC 4 ;
- PAEC 5: Surficial ACM - Surficial ACM was identified in one area of the site associated with a former stockpile footprint (PAEC 1). DP also considered that there is a potential for surficial ACM to also be present within the rail corridor associated with abandoned train brake pads; and
- PAEC 6: Fuel and chemical leaks and spills - There is a potential that any fuel and chemical leaks and spills of fuel from vehicles (and stored chemicals within the former structures) have a potential to contaminate soil at the site. A limited visual assessment of PAEC 6 was undertaken as part of the PSI assessment.

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

The objective of the investigation is as follows:

- Assess and confirm the extent of contamination issues at the site requiring remediation, from a contamination standpoint, for site to be considered suitable for the proposed residential development.

## F1.2 Identify the Decision/Goal of the Study

The suitability of the site for the proposed 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 and groundwater as detailed in Appendix F2 below. Based on the proposed development, the SAC for this PSI were based on the commercial/industrial land use criteria provided in NEPC (2013).

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), organophosphate pesticides (OPP) and polychlorinated, biphenyls (PCB), volatile organic compounds (VOC).

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

- Did field observation and analytical results identify potential contamination sources which were not included in the preliminary CSM?
- Were COPC present in soil and groundwater 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?

## F1.3 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 G);
- Soil sampling via drilling of four soil bores and excavation of eight test pits. Collection of additional surface samples;
- Groundwater sampling via installation of four monitoring wells;
- Field and laboratory QA/QC data to assess the suitability of the environmental data for the PSI (Appendix P); and
- Laboratory reported concentrations of COPC were compared against the SAC adopted from NEPC (2013).



#### **F1.4 Define the Study Boundaries**

The site is located in the suburb of St Marys within the local government area of Penrith City Council ("Council") and is identified as:

- Part Lot 2 Deposited Plan (D.P.) 876781;
- Part Lot 2 and 3 in D.P. 876781; and
- Part Lot 196 in D.P. 31912.

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

Soil investigation completed during this SCA was undertaken on 19 to 22 and 25 March 2019

#### **F1.5 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;
- The contaminant concentrations in soil were compared to the adopted SAC to determine whether further investigation or remedial action was required; and
- The contaminant concentrations in groundwater 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 J).

#### **F1.6 Specify the Performance or Acceptable Criteria**

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

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

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

- The sampling regime targeted each stratum identified to account for site variability;
- Sample collection and handling techniques were in accordance with DP's *Field Procedures Manual*;
- Samples were prepared and analysed by a NATA-accredited laboratory with the acceptance limits for laboratory QA/QC parameters based on the laboratory reported acceptance limits and those stated in NEPC (2013);
- The analyte selection is based on the available site history, past site activities 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.

### **F1.7 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 were selected targeting potential contamination sources (based on the site history review and observations made during a site walkover) and general site coverage;
- Given that the entire site is filled, filling present at the site was considered to present a greater risk, if contamination is detected. Therefore, soil samples collected from various fill strata were selected for analysis (at a rate of one fill sample per fill layer), keeping other sub-surface soil samples on hold. Similarly, samples collected from some of the potential areas of concerns (PAEC) were also put on hold from analysis;
- 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 F2: Adopted Assessment Criteria**

### **F.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 8). 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 NEPC (2013). Considerations were also given to protection of intrusive maintenance workers during sub-surface works, as well as ecological receptors from contamination present in soil.

### F2.1.1 Health Investigation and Screening Levels

The generic Health Investigation Levels (HILs) and Health Screening Levels (HSLs) are considered to be appropriate for the assessment of human health risk associated with contamination at the site. The adopted soil HILs and HSLs for the potential contaminants of concern (COPC) are presented in Table F2, with inputs into their derivation shown in Table F1.

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.

**Table F1: 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	Sand	Sand has been adopted as a conservative approach for this SCA given the presence of sandy gravelly fill at the site (see Test Pit Logs – Appendix L)
Depth to contamination	0 m to <1 m	As filling was identified from the surface a conservative contamination depth has been adopted for this PSI.

**Table F2: HIL and HSL for Soil in mg/kg Unless Otherwise Indicated**

Contaminants		HIL- D	HSL- D	Intrusive Worker
<b>Metals</b>	Arsenic	3000	NC	NC
	Cadmium	900	NC	NC
	Chromium (VI)	3600	NC	NC
	Copper	240000	NC	NC
	Lead	1500	NC	NC
	Mercury (inorganic)	730/180	NC	NC
	Nickel	6000	NC	NC
	Zinc	400000	NC	NC
<b>PAH</b>	Benzo(a)pyrene TEQ <sup>1</sup>	40	NC	NC
	Naphthalene	NC	NL <sup>3</sup>	NL <sup>3</sup>
	Total PAH	4000	NC	NC
<b>TRH</b>	C6 – C10 (less BTEX) [F1]	NC	260	NL <sup>3</sup>
	>C10-C16 (less Naphthalene) [F2]	NC	NL <sup>3</sup>	NL <sup>3</sup>
	>C16-C34 [F3]	NC	NC	NC
	>C34-C40 [F4]	NC	NC	NC

Contaminants		HIL- D	HSL- D	Intrusive Worker
BTEX	Benzene	NC	3	77
	Toluene	NC	NL <sup>3</sup>	NL <sup>3</sup>
	Ethylbenzene	NC	NL <sup>3</sup>	NL <sup>3</sup>
	Xylenes	NC	230	NL <sup>3</sup>
Phenol	Pentachlorophenol used as a screen	660	NC	NC
OCP	Aldrin + Dieldrin	45	NC	NC
	Chlordane	530	NC	NC
	DDT+DDE+DDD	3600	NC	NC
	Endosulfan	2000	NC	NC
	Endrin	100	NC	NC
	Heptachlor	50	NC	NC
	HCB	80	NC	NC
	Methoxychlor	2500	NC	NC
OPP	Chlorpyrifos	2000	NC	NC
PCB <sup>2</sup>		7	NC	NC

Notes:

- 1 Sum of carcinogenic PAH
- 2 Non dioxin-like PCBs only.
- 3 The soil saturation concentration (Csat) is defined as the soil concentration at which the porewater phase cannot dissolve any more of an individual chemical. The soil vapour that is in equilibrium with the porewater will be at its maximum. If the derived soil HSL exceeds Csat, a soil vapour source concentration for a petroleum mixture could not exceed a level that would 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

## F2.1.2 Ecological Investigation Levels

Ecological Investigation Levels (EILs) and Added Contaminant Limits (ACLs), where appropriate, have been derived in NEPC (2013) for only a short list of contaminants comprising As, Cu, Cr (III), DDT, naphthalene, Ni, Pb and Zn. The adopted EILs, derived using the *Interactive (Excel) Calculation Spreadsheet* (Standing Council on Environment and Water (SCEW) website (<http://www.scew.gov.au/node/941>)) are shown in the following Table K4, with inputs into their derivation shown on Table K3.

**Table L3: 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	7.85	Two selected samples (BH101/0.4-0.5 and BH103/0.9-1.0) were tested for pH during the PSI. The mean pH value (7.85) was adopted for initial screening.



Variable	Input	Rationale
CEC	10.6 cmol <sub>c</sub> /kg	Two selected samples (BH101/0.4-0.5 and BH103/0.9-1.0) were tested for CEC during the PSI. The mean CEC value (10.6 cmol <sub>c</sub> /kg ) was adopted for initial 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 F4: EIL in mg/kg**

Analyte		EIL
Metals	Arsenic	160
	Copper	300
	Nickel	300
	Chromium III	670
	Lead	1800
	Zinc	730
PAH	Naphthalene	370
OCP	DDT	640

### F2.1.3 Ecological Screening Levels

Ecological Screening Levels (ESLs) are used to assess the risk of selected petroleum hydrocarbon compounds, BTEX and benzo(a)pyrene, to terrestrial ecosystems. The adopted ESLs, based on a coarse soil type, are shown in the following Table F5.

**Table F5: ESL in mg/kg**

Analyte		ESL <sup>1</sup>	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]	1700	
	>C34-C40 [F4]	3300	
BTEX	Benzene	75	
	Toluene	135	
	Ethylbenzene	165	
	Xylenes	180	

Analyte		ESL <sup>1</sup>	Comments
PAH	Benzo(a)pyrene	0.7	

#### F2.1.4 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 F6.

**Table F6: Management Limits in mg/kg**

Analyte		Management Limit
TRH	C <sub>6</sub> – C <sub>10</sub> (F1) <sup>#</sup>	700
	>C <sub>10</sub> -C <sub>16</sub> (F2) <sup>#</sup>	1000
	>C <sub>16</sub> -C <sub>34</sub> (F3)	3500
	>C <sub>34</sub> -C <sub>40</sub> (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

#### L2.1.5 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 PSI as the site surface will be concrete paved during the proposed development. Therefore the presence or absence of asbestos at a limit of reporting of 0.1 g/kg has been adopted for this assessment as an initial screen. 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.



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## Appendix G

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Test Pit Logs

# TEST PIT LOG

**CLIENT:** Pacific National (NSW) Pty Ltd  
**PROJECT:** Proposed St Marys Intermodal Freight Terminal  
**LOCATION:** Lot 2 Forrester Road, St Marys, NSW

**SURFACE LEVEL:** 24.4 mAHD  
**EASTING:** 293525  
**NORTHING:** 6262758

**PIT No:** 201  
**PROJECT No:** 94525.02  
**DATE:** 19/3/2019  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
24.0		FILL - brown silty clay with fine to coarse gravel and a trace of brick fragments, plastic, metal wire and rootlets, dry		D/E	0.1							
				B	0.2							
				D/E	0.5							
					0.6							
1												
1.2		SILTY CLAY - very stiff, brown silty clay with a trace of rootlets, damp Pit discontinued at 1.4m - target depth reached										
1.4												
2												
2.2												
3												
2.1												
4												
2.0												
5												
1.9												
6												
1.8												
7												
1.7												

**RIG:** 8 tonne backhoe fitted - 450mm bucket

**LOGGED:** JY

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:**

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

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	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:** Pacific National (NSW) Pty Ltd  
**PROJECT:** Proposed St Marys Intermodal Freight Terminal  
**LOCATION:** Lot 2 Forrester Road, St Marys, NSW

**SURFACE LEVEL:** 24.3 mAH  
**EASTING:** 293513  
**NORTHING:** 6262751

**PIT No:** 202  
**PROJECT No:** 94525.02  
**DATE:** 19/3/2019  
**SHEET** 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
24		FILL - brown silty clay with gravel and a trace of ceramic tile, brick fragments and rootlets, damp		D/E	0.1							
				B	0.2							
				D/E	0.5							
					0.6							
1												
23												
	1.4	SILTY SAND - pale brown silty sand with clay, damp										
	1.5	Pit discontinued at 1.5m - target depth reached										
2												
22												
3												
21												
4												
20												
5												
19												
6												
18												
7												
17												

**RIG:** 8 tonne backhoe fitted - 450mm bucket

**LOGGED:** JY

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:**

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



SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	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	WL	Water level	V	Shear vane (kPa)

# TEST PIT LOG

**CLIENT:** Pacific National (NSW) Pty Ltd  
**PROJECT:** Proposed St Marys Intermodal Freight Terminal  
**LOCATION:** Lot 2 Forrester Road, St Marys, NSW

**SURFACE LEVEL:** 24.2 mAH  
**EASTING:** 293503  
**NORTHING:** 6262771

**PIT No:** 203  
**PROJECT No:** 94525.02  
**DATE:** 19/3/2019  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
24		FILL - brown silty clay with fine to coarse gravel, sand and a trace of brick fragments, rubber and plastic		D/E	0.1							
				B	0.2							
				D/E	0.5							
					0.6							
1	1.0	SILTY CLAY - very stiff, pale brown mottled grey silty clay with fine to medium sand, damp										
23	1.2	Pit discontinued at 1.2m - target depth reached										
2												
22												
3												
21												
4												
20												
5												
19												
6												
18												
7												
17												

**RIG:** 8 tonne backhoe fitted - 450mm bucket

**LOGGED:** JY

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:**

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

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	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:** Pacific National (NSW) Pty Ltd  
**PROJECT:** Proposed St Marys Intermodal Freight Terminal  
**LOCATION:** Lot 2 Forrester Road, St Marys, NSW

**SURFACE LEVEL:** 23.8 mAHD  
**EASTING:** 293487  
**NORTHING:** 6262760

**PIT No:** 204  
**PROJECT No:** 94525.02  
**DATE:** 19/3/2019  
**SHEET** 1 OF 1

[illegible]

**RIG:** 8 tonne backhoe fitted - 450mm bucket

**LOGGED: JY**

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

## REMARKS:

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

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	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 <sub>s</sub>	Water seep	S	Standard penetration test
E	Environmental sample	W <sub>l</sub>	Water level	V	Shear vane (kPa)



# TEST PIT LOG

**CLIENT:** Pacific National (NSW) Pty Ltd  
**PROJECT:** Proposed St Marys Intermodal Freight Terminal  
**LOCATION:** Lot 2 Forrester Road, St Marys, NSW

**SURFACE LEVEL:** 23.6 mAHD  
**EASTING:** 293465  
**NORTHING:** 6262775

**PIT No:** 205  
**PROJECT No:** 94525.02  
**DATE:** 19/3/2019  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
	0.1	TOPSOIL FILL - brown silty clay with fine to coarse gravel and a trace of rootlets, moist		D/E	0.1							
	0.2	FILL - brown silty clay with fine to coarse gravel and a trace of brick fragments			0.2							
		- side wall above asbestos is moist from 0.5m										
1	1.0	- asbestos sheets adjacent to plastic covered metal wire		B/D/E	0.9		Asbestos fragments	1				
	1.3	GRAVELLY CLAY - very stiff, red brown mottled grey fine to medium gravelly clay with silt, moist			1.0							
		Pit discontinued at 1.3m										
		- target depth reached										
	2							2				
	3							3				
	4							4				
	5							5				
	6							6				
	7							7				

**RIG:** 8 tonne backhoe fitted - 450mm bucket

**LOGGED:** JY

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:**

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

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	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	WL	Water level	V	Shear vane (kPa)





# TEST PIT LOG

**CLIENT:** Pacific National (NSW) Pty Ltd  
**PROJECT:** Proposed St Marys Intermodal Freight Terminal  
**LOCATION:** Lot 2 Forrester Road, St Marys, NSW

**SURFACE LEVEL:** 23.6 mAH  
**EASTING:** 293463  
**NORTHING:** 6262768

**PIT No:** 206  
**PROJECT No:** 94525.02  
**DATE:** 19/3/2019  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
23	0.09	TOPSOIL FILL - grey brown silty clay with fine to coarse gravel and a trace of plastic and rootlets, moist		D*	0.1							
					0.2							
		FILL - grey brown silty clay with fine to coarse gravel and a trace of plastic, tile, brick fragments and rootlets, moist		B	0.5							
1	1.0	SILTY CLAY - stiff to very stiff, grey mottled pale brown silty clay with fine to medium sand, moist										
	1.3	Pit discontinued at 1.3m - target depth reached										
2												
3												
4												
5												
6												
7												

**RIG:** 8 tonne backhoe fitted - 450mm bucket

**LOGGED:** JY

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** \* Replicate sample BD1/20190319 collected at 0.1 - 0.2m

☐ 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	>	Water seep	sp	Standard penetration test
E	Environmental sample	≡	Water level	V	Shear vane (kPa)

# TEST PIT LOG

**CLIENT:** Pacific National (NSW) Pty Ltd  
**PROJECT:** Proposed St Marys Intermodal Freight Terminal  
**LOCATION:** Lot 2 Forrester Road, St Marys, NSW

**SURFACE LEVEL:** 23.7 mAHD  
**EASTING:** 293459  
**NORTHING:** 6262779

**PIT No:** 207  
**PROJECT No:** 94525.02  
**DATE:** 19/3/2019  
**SHEET** 1 OF 1

[illegible]

**RIG:** 8 tonne backhoe fitted - 450mm bucket

LOGGED: JY

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** \* Replicate sample BD2/20190319 collected at 0.5 - 0.6m

- ☐ 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:** Pacific National (NSW) Pty Ltd  
**PROJECT:** Proposed St Marys Intermodal Freight Terminal  
**LOCATION:** Lot 2 Forrester Road, St Marys, NSW

**SURFACE LEVEL:** 23.7 mAHD  
**EASTING:** 293472  
**NORTHING:** 6262784

**PIT No:** 208  
**PROJECT No:** 94525.02  
**DATE:** 19/3/2019  
**SHEET 1 OF 1**

[illegible]

**RIG:** 8 tonne backhoe fitted - 450mm bucket

LOGGED: JY

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** \* Replicate sample BD3/20190319 collected at 0.5 - 0.6m

- ☐ 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 ls(50) (MPa)
		PL(D)	Point load diametral test ls(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)





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Geotechnics | Environment | Groundwater

# TEST PIT LOG

**CLIENT:** Pacific National (NSW) Pty Ltd  
**PROJECT:** Proposed St Marys Intermodal Freight Terminal  
**LOCATION:** Lot 2 Forrester Road, St Marys, NSW

**SURFACE LEVEL:** --  
**EASTING:** 293894  
**NORTHING:** 6262070

**PIT No:** 209  
**PROJECT No:** 94525.02  
**DATE:** 19/3/2019  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
		FILL - brown gravelly clay with silt and sand and a trace of concrete fragments and brick fragments, moist		*B/D/E	0.1 0.2							
	0.6	SILTY CLAY - very stiff, pale brown silty clay, damp										
	0.8	Pit discontinued at 0.8m - target depth reached										
1												
2												
3												
4												
5												
6												
7												

**RIG:** 8 tonne backhoe fitted - 450mm bucket

**LOGGED:** JY

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** \* Replicate sample BD4/20190319 collected at 0.1 - 0.2m

☐ 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:** Pacific National (NSW) Pty Ltd  
**PROJECT:** Proposed St Marys Intermodal Freight Terminal  
**LOCATION:** Lot 2 Forrester Road, St Marys, NSW

**SURFACE LEVEL:** --  
**EASTING:** 293876  
**NORTHING:** 6262064

**PIT No:** 210  
**PROJECT No:** 94525.02  
**DATE:** 19/3/2019  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
	0.6	FILL - brown gravelly clay with silt and sand and a trace of concrete fragments and brick fragments, moist		B/D/E	0.4 0.5							
	0.8	SILTY CLAY - very stiff, pale brown silty clay, moist										
	1	Pit discontinued at 0.8m - target depth reached										
	2											
	3											
	4											
	5											
	6											
	7											

**RIG:** 8 tonne backhoe fitted - 450mm bucket

**LOGGED:** JY

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:**

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




SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U <sub>s</sub>	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:** Pacific National (NSW) Pty Ltd  
**PROJECT:** Proposed St Marys Intermodal Freight Terminal  
**LOCATION:** Lot 2 Forrester Road, St Marys, NSW

**SURFACE LEVEL:** --  
**EASTING:** 293852  
**NORTHING:** 6262056

**PIT No:** 211  
**PROJECT No:** 94525.02  
**DATE:** 20/3/2019  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
	0.3	FILL - red brown mottled grey gravelly clay with silt and sand and a trace of soft plastic, moist		D/E	0.1 0.2							
		FILL - grey ripped mudstone with clay, dry		B/D/E	0.4 0.5							
	1.2	SILTY CLAY - very stiff, pale brown silty clay, moist										
	1.5	Pit discontinued at 1.5m - target depth reached										
	2											
	3											
	4											
	5											
	6											
	7											

**RIG:** 8 tonne backhoe fitted - 450mm bucket

**LOGGED:** JY

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:**

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

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	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:** Pacific National (NSW) Pty Ltd  
**PROJECT:** Proposed St Marys Intermodal Freight Terminal  
**LOCATION:** Lot 2 Forrester Road, St Marys, NSW

**SURFACE LEVEL:** 23.4 mAHD  
**EASTING:** 293327  
**NORTHING:** 6262659

**PIT No:** 212  
**PROJECT No:** 94525.02  
**DATE:** 20/3/2019  
**SHEET** 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
23.0	0.3	FILL - pale grey fine to medium sandy fine to coarse gravel, moist		B/D/E	0.1							
					0.2							
22.5		FILL - grey ripped sandstone with sand and a trace of plastic and timber, dry		D/E	0.4							
					0.5							
22.0		- petrol odour noted at 0.7m		D/E	0.7							
					0.8							
21.5	1.0	SILTY CLAY - hard, red brown mottled pale grey silty clay, damp										
21.0	1.4	Pit discontinued at 1.4m - target depth reached										
20.5												
20.0												
19.5												
19.0												
18.5												
18.0												
17.5												
17.0												
16.5												
16.0												
15.5												
15.0												
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3.5												
3.0												
2.5												
2.0												
1.5												
1.0												
0.5												
0.0												

**RIG:** 8 tonne backhoe fitted - 450mm bucket

**LOGGED:** JY

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:**

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



SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
BB	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:** Pacific National (NSW) Pty Ltd  
**PROJECT:** Proposed St Marys Intermodal Freight Terminal  
**LOCATION:** Lot 2 Forrester Road, St Marys, NSW

**SURFACE LEVEL:** 23.8 mAH  
**EASTING:** 293341  
**NORTHING:** 6262644

**PIT No:** 213  
**PROJECT No:** 94525.02  
**DATE:** 20/3/2019  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
23.8		FILL - pale grey ripped sandstone with fine to medium sand and a trace of plastic, humid - becoming damp below 0.2m		B/D/E	0.4 0.5							
1	1.0	SILTY CLAY - hard, brown silty clay with a trace of fine gravel and sand, damp										
1.4	1.4	Pit discontinued at 1.4m - target depth reached										
2												
3												
4												
5												
6												
7												

**RIG:** 8 tonne backhoe fitted - 450mm bucket

**LOGGED:** JY

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:**

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

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
BB	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:** Pacific National (NSW) Pty Ltd  
**PROJECT:** Proposed St Marys Intermodal Freight Terminal  
**LOCATION:** Lot 2 Forrester Road, St Marys, NSW

**SURFACE LEVEL:** 23.8 mAHD  
**EASTING:** 293306  
**NORTHING:** 6262649

**PIT No:** 214  
**PROJECT No:** 94525.02  
**DATE:** 20/3/2019  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
23	0.1	TOPSOIL FILL - pale grey sandy fine to coarse gravel, moist		B/D/E	0.2							
		FILL - dark grey clayey ripped siltstone and sandstone gravel with a trace of sand, damp			0.3							
	0.9	FILL - green-grey silty clay with fine to coarse gravel, moist, slight odour noted			0.9							
1	1.4	SILTY CLAY - very stiff, pale brown mottled grey silty clay with a trace of sand, moist			1.0							
2	1.7	Pit discontinued at 1.7m - target depth reached										
2	2											
2	3											
2	4											
2	5											
2	6											
2	7											

**RIG:** 8 tonne backhoe fitted - 450mm bucket

**LOGGED:** JY

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:**

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

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
BB	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:** Pacific National (NSW) Pty Ltd  
**PROJECT:** Proposed St Marys Intermodal Freight Terminal  
**LOCATION:** Lot 2 Forrester Road, St Marys, NSW

**SURFACE LEVEL:** 24.3 mAH  
**EASTING:** 293321  
**NORTHING:** 6262632

**PIT No:** 215  
**PROJECT No:** 94525.02  
**DATE:** 20/3/2019  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
24	0.15	TOPSOIL FILL - pale grey sandy gravel with clay, moist		B/D/E	0.2							
		FILL - pale brown silty clay with fine to medium sand and a trace of brick fragments and plastic, damp			0.3							
23				B/D/E	1.4							
		- becoming grey below 1.4m			1.5							
22	1.7	SILTY CLAY - hard, pale brown mottled pale grey silty clay with a trace of sand, damp										
21	2.0	Pit discontinued at 2.0m - target depth reached										
20												
19												
18												
17												

**RIG:** 8 tonne backhoe fitted - 450mm bucket

**LOGGED:** JY

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:**

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

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	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	sp	Standard penetration test
E	Environmental sample	≡	Water level	V	Shear vane (kPa)



# TEST PIT LOG

**CLIENT:** Pacific National (NSW) Pty Ltd  
**PROJECT:** Proposed St Marys Intermodal Freight Terminal  
**LOCATION:** Lot 2 Forrester Road, St Marys, NSW

**SURFACE LEVEL:** 23.8 mAHD  
**EASTING:** 293474  
**NORTHING:** 6262790

**PIT No:** 216  
**PROJECT No:** 94525.02  
**DATE:** 22/3/2019  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
	0.1	TOPSOIL FILL - brown silty clay with gravel and surficial vegetation, moist		B/D	0.0							
	0.5	FILL - brown silty clay with gravel and a trace of tile fragments and bitumen, moist										
	0.7	SANDY CLAY - pale brown sandy clay with a trace of charcoal, moist			0.5							
23		Pit discontinued at 0.7m - target depth reached										
1												
22												
2												
21												
3												
20												
4												
19												
5												
18												
6												
17												
7												
16												

**RIG:** 8 tonne backhoe fitted - 450mm bucket

**LOGGED:** JY

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:**

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

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
BB	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:** Pacific National (NSW) Pty Ltd  
**PROJECT:** Proposed St Marys Intermodal Freight Terminal  
**LOCATION:** Lot 2 Forrester Road, St Marys, NSW

**SURFACE LEVEL:** 23.7 mAHD  
**EASTING:** 293467  
**NORTHING:** 6262787

**PIT No:** 217  
**PROJECT No:** 94525.02  
**DATE:** 22/3/2019  
**SHEET** 1 OF 1

[illegible]

**RIG:** 8 tonne backhoe fitted - 450mm bucket

**LOGGED: JY**

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

## REMARKS:

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

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
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 <sub>s</sub>	Water seep
E	Environmental sample	W <sub>l</sub>	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:** Pacific National (NSW) Pty Ltd  
**PROJECT:** Proposed St Marys Intermodal Freight Terminal  
**LOCATION:** Lot 2 Forrester Road, St Marys, NSW

**SURFACE LEVEL:** 23.6 mAHD  
**EASTING:** 293462  
**NORTHING:** 6262782

**PIT No:** 218  
**PROJECT No:** 94525.02  
**DATE:** 22/3/2019  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
	0.2	FILL - grey gravelly sand, humid		B/D	0.0							
		FILL - brown silty clay with gravel and a trace of plastic, concrete and brick fragments, moist			0.7							
	1.1	SILTY CLAY - red-brown silty clay with a trace of carbonaceous material, damp										
	1.5	Pit discontinued at 1.5m - target depth reached										
	2											
	3											
	4											
	5											
	6											
	7											

**RIG:** 8 tonne backhoe fitted - 450mm bucket

**LOGGED:** JY

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:**

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



SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
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:** Pacific National (NSW) Pty Ltd  
**PROJECT:** Proposed St Marys Intermodal Freight Terminal  
**LOCATION:** Lot 2 Forrester Road, St Marys, NSW

**SURFACE LEVEL:** 23.5 mAH  
**EASTING:** 293458  
**NORTHING:** 6262774

**PIT No:** 219  
**PROJECT No:** 94525.02  
**DATE:** 22/3/2019  
**SHEET** 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
		FILL - brown silty clay with gravel and a trace of concrete fragments, plastic and timber, moist		B/D	0.0							
					1.1							
	1.4	SILTY CLAY - pale brown silty clay with sand, moist										
	1.6	Pit discontinued at 1.6m - target depth reached										
	2											
	3											
	4											
	5											
	6											
	7											

**RIG:** 8 tonne backhoe fitted - 450mm bucket

**LOGGED:** JY

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:**

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

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
BB	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:** Pacific National (NSW) Pty Ltd  
**PROJECT:** Proposed St Marys Intermodal Freight Terminal  
**LOCATION:** Lot 2 Forrester Road, St Marys, NSW

**SURFACE LEVEL:** 23.5 mAHD  
**EASTING:** 293460  
**NORTHING:** 6262768

**PIT No:** 220  
**PROJECT No:** 94525.02  
**DATE:** 22/3/2019  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
		FILL - brown silty clay with gravel and a trace of metal, wire, ceramics, tiles, timber, plastics and cloth, moist			0.0							
				B/D								
	1.4	SILTY CLAY - grey-brown silty clay with sand and a trace of carbonaceous material, moist			1.4							
	1.6	Pit discontinued at 1.6m - target depth reached										
	2											
	2.1											
	3											
	20											
	4											
	19											
	5											
	18											
	6											
	17											
	7											
	16											

**RIG:** 8 tonne backhoe fitted - 450mm bucket

**LOGGED:** JY

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:**

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

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	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:** Pacific National (NSW) Pty Ltd  
**PROJECT:** Proposed St Marys Intermodal Freight Terminal  
**LOCATION:** Lot 2 Forrester Road, St Marys, NSW

**SURFACE LEVEL:** 23.7 mAHD  
**EASTING:** 293474  
**NORTHING:** 6262769

**PIT No:** 221  
**PROJECT No:** 94525.02  
**DATE:** 22/3/2019  
**SHEET** 1 OF 1

[illegible]

**RIG:** 8 tonne backhoe fitted - 450mm bucket

LOGGED: JY

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

## REMARKS:

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

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
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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# TEST PIT LOG

**CLIENT:** Pacific National (NSW) Pty Ltd  
**PROJECT:** Proposed St Marys Intermodal Freight Terminal  
**LOCATION:** Lot 2 Forrester Road, St Marys, NSW

**SURFACE LEVEL:** 23.7 mAHD  
**EASTING:** 293476  
**NORTHING:** 6262778

**PIT No:** 222  
**PROJECT No:** 94525.02  
**DATE:** 22/3/2019  
**SHEET** 1 OF 1

[illegible]

**RIG:** 8 tonne backhoe fitted - 450mm bucket

LOGGED: JY

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

## REMARKS:

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

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
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 ls(50) (MPa)
		PL(D)	Point load diametral test ls(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)




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# TEST PIT LOG

**CLIENT:** Pacific National (NSW) Pty Ltd  
**PROJECT:** Proposed St Marys Intermodal Freight Terminal  
**LOCATION:** Lot 2 Forrester Road, St Marys, NSW

**SURFACE LEVEL:** 29.1 mAH  
**EASTING:** 293469  
**NORTHING:** 6262225

**PIT No:** SP2-TP1  
**PROJECT No:** 94525.02  
**DATE:** 22/3/2019  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
29		FILL - dark brown clayey gravel with sand and railway ballast and large concrete fragments										
				D/E	0.7 0.8							
1	1.2	Pit discontinued at 1.2m - target depth reached										
28												
2												
27												
3												
26												
4												
25												
5												
24												
6												
23												
7												
22												

**RIG:** 8 tonne backhoe fitted - 450mm bucket

**LOGGED:** JY

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** Stockpile estimated to be approximately 2.0m in height

☐ 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:** Pacific National (NSW) Pty Ltd  
**PROJECT:** Proposed St Marys Intermodal Freight Terminal  
**LOCATION:** Lot 2 Forrester Road, St Marys, NSW

**SURFACE LEVEL:** 29.4 mAH  
**EASTING:** 293472  
**NORTHING:** 6262214

**PIT No:** SP2-TP2  
**PROJECT No:** 94525.02  
**DATE:** 22/3/2019  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
		FILL - dark brown clayey gravel with sand and railway ballast and large concrete fragments		D/E	0.2 0.3							
	1.5	Pit discontinued at 1.5m - target depth reached										
	2											
	3											
	4											
	5											
	6											
	7											

**RIG:** 8 tonne backhoe fitted - 450mm bucket

**LOGGED:** JY

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** Stockpile estimated to be approximately 2.0m in height

☐ 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)
BB	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:** Pacific National (NSW) Pty Ltd  
**PROJECT:** Proposed St Marys Intermodal Freight Terminal  
**LOCATION:** Lot 2 Forrester Road, St Marys, NSW

**SURFACE LEVEL:** 29.5 mAHD  
**EASTING:** 293473  
**NORTHING:** 6262203

**PIT No:** SP2-TP3  
**PROJECT No:** 94525.02  
**DATE:** 22/3/2019  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
29.5		FILL - dark brown and grey sandy gravel and clay and railway ballast										
28.5	1											
27.5	2	Pit discontinued at 2.0m - target depth reached										
26.5	3											
25.5	4											
24.5	5											
23.5	6											
22.5	7											

**RIG:** 8 tonne backhoe fitted - 450mm bucket

**LOGGED:** JY

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** Stockpile estimated to be approximately 2.0m in height

- ☐ 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)
BB	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:** Pacific National (NSW) Pty Ltd  
**PROJECT:** Proposed St Marys Intermodal Freight Terminal  
**LOCATION:** Lot 2 Forrester Road, St Marys, NSW

**SURFACE LEVEL:** 29.6 mAHD  
**EASTING:** 293468  
**NORTHING:** 6262195

**PIT No:** SP2-TP4  
**PROJECT No:** 94525.02  
**DATE:** 22/3/2019  
**SHEET** 1 OF 1

[illegible]

**RIG:** 8 tonne backhoe fitted - 450mm bucket

LOGGED: JY

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** Stockpile estimated to be approximately 2.0m in height

- ☐ 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:** Pacific National (NSW) Pty Ltd  
**PROJECT:** Proposed St Marys Intermodal Freight Terminal  
**LOCATION:** Lot 2 Forrester Road, St Marys, NSW

**SURFACE LEVEL:** 29.5 mAHD  
**EASTING:** 293457  
**NORTHING:** 6262196

**PIT No:** SP2-TP5  
**PROJECT No:** 94525.02  
**DATE:** 22/3/2019  
**SHEET** 1 OF 1

[illegible]

**RIG:** 8 tonne backhoe fitted - 450mm bucket

LOGGED: JY

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** Stockpile estimated to be approximately 1.6m in height

- ☐ 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 <sub>s</sub>	Water seep
E	Environmental sample	W <sub>l</sub>	Water level
		PID	Photo ionisation detector (ppm)
		PL(A)	Point load axial test (s(50) (MPa)
		PL(D)	Point load diametral test (s(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)



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# TEST PIT LOG

**CLIENT:** Pacific National (NSW) Pty Ltd  
**PROJECT:** Proposed St Marys Intermodal Freight Terminal  
**LOCATION:** Lot 2 Forrester Road, St Marys, NSW

**SURFACE LEVEL:** 29.2 mAH  
**EASTING:** 293454  
**NORTHING:** 6262209

**PIT No:** SP2-TP6  
**PROJECT No:** 94525.02  
**DATE:** 22/3/2019  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
29		FILL - dark grey railway ballast and sandy gravel with clay, moist										
1	1.0	Pit discontinued at 1.0m - target depth reached		D/E	0.9 1.0							
28												
2												
27												
3												
26												
4												
25												
5												
24												
6												
23												
7												
22												

**RIG:** 8 tonne backhoe fitted - 450mm bucket

**LOGGED:** JY

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** Stockpile estimated to be approximately 2.0m in height

☐ 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:** Pacific National (NSW) Pty Ltd  
**PROJECT:** Proposed St Marys Intermodal Freight Terminal  
**LOCATION:** Lot 2 Forrester Road, St Marys, NSW

**SURFACE LEVEL:** 29.1 mAHD  
**EASTING:** 293448  
**NORTHING:** 6262214

**PIT No:** SP2-TP7  
**PROJECT No:** 94525.02  
**DATE:** 22/3/2019  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
29		FILL - grey poorly graded 10mm gravel and dark grey sandy gravel with railway ballast, damp										
1												
28												
	1.6	Pit discontinued at 1.6m - target depth reached		D/E	1.3 1.4							
2												
27												
3												
26												
4												
25												
5												
24												
6												
23												
7												
22												

**RIG:** 8 tonne backhoe fitted - 450mm bucket

**LOGGED:** JY

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** Stockpile estimated to be approximately 1.6m in height

☐ 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:** Pacific National (NSW) Pty Ltd  
**PROJECT:** Proposed St Marys Intermodal Freight Terminal  
**LOCATION:** Lot 2 Forrester Road, St Marys, NSW

**SURFACE LEVEL:** 29.1 mAHD  
**EASTING:** 293457  
**NORTHING:** 6262219

**PIT No:** SP2-TP8  
**PROJECT No:** 94525.02  
**DATE:** 22/3/2019  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
29		FILL - railway ballast and dark grey sandy gravel with clay and a trace of timber, rail sleepers and metal, moist										
1												
2	2.0	Pit discontinued at 2.0m - target depth reached		D/E	1.9 2.0							
3												
4												
5												
6												
7												

**RIG:** 8 tonne backhoe fitted - 450mm bucket

**LOGGED:** JY

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** Stockpile estimated to be approximately 3.0m in height

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

# TEST PIT LOG

**CLIENT:** Pacific National (NSW) Pty Ltd  
**PROJECT:** Proposed St Marys Intermodal Freight Terminal  
**LOCATION:** Lot 2 Forrester Road, St Marys, NSW

**SURFACE LEVEL:** 29.1 mAH  
**EASTING:** 293461  
**NORTHING:** 6262222

**PIT No:** SP2-TP9  
**PROJECT No:** 94525.02  
**DATE:** 22/3/2019  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
29.1		FILL - brown gravelly sand with clay and railway ballast, moist		D/E	0.4 0.5							
1	1.4	Pit discontinued at 1.4m - target depth reached										
28.1												
27.1												
26.1												
25.1												
24.1												
23.1												
22.1												

**RIG:** 8 tonne backhoe fitted - 450mm bucket

**LOGGED:** JY

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** Stockpile estimated to be approximately 1.4m in height

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

# TEST PIT LOG

**CLIENT:** Pacific National (NSW) Pty Ltd  
**PROJECT:** Proposed St Marys Intermodal Freight Terminal  
**LOCATION:** Lot 2 Forrester Road, St Marys, NSW

**SURFACE LEVEL:** 29.1 mAHD  
**EASTING:** 293463  
**NORTHING:** 6262227

**PIT No:** SP2-TP10  
**PROJECT No:** 94525.02  
**DATE:** 22/3/2019  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
29.1	0.3	FILL - pale brown gravelly sand with railway ballast, bitumen and concrete with a trace of brick fragments, moist		D/E	0.1 0.2							
		Pit discontinued at 0.3m - target depth reached										
28.1	1											
27.1	2											
26.1	3											
25.1	4											
24.1	5											
23.1	6											
22.1	7											

**RIG:** 8 tonne backhoe fitted - 450mm bucket

**LOGGED:** JY

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** Stockpile estimated to be approximately 0.3m in height

☐ 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:** Pacific National (NSW) Pty Ltd  
**PROJECT:** Proposed St Marys Intermodal Freight Terminal  
**LOCATION:** Lot 2 Forrester Road, St Marys, NSW

**SURFACE LEVEL:** 26.2 mAH  
**EASTING:** 293490  
**NORTHING:** 6262384

**PIT No:** SP3-TP1  
**PROJECT No:** 94525.02  
**DATE:** 20/3/2019  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
26		FILL - brown silty clay with sand										
1												
25												
2												
24												
3		- black plastic pipe at 3.1m										
3.5		Pit discontinued at 3.5m - target depth reached		D/E	3.4 3.5							
4												
22												
5												
21												
6												
20												
7												
19												

**RIG:** 8 tonne backhoe fitted - 450mm bucket

**LOGGED:** JY

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** Stockpile estimated to be approximately 3.5m in height

☐ 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:** Pacific National (NSW) Pty Ltd  
**PROJECT:** Proposed St Marys Intermodal Freight Terminal  
**LOCATION:** Lot 2 Forrester Road, St Marys, NSW

**SURFACE LEVEL:** 26.6 mAHD  
**EASTING:** 293485  
**NORTHING:** 6262369

**PIT No:** SP3-TP2  
**PROJECT No:** 94525.02  
**DATE:** 20/3/2019  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
		FILL - brown silty clay										
	1											
	2											
	2.7											
	2.8											
	3											
	3.5	Pit discontinued at 3.5m - target depth reached										
	4											
	5											
	6											
	7											

**RIG:** 8 tonne backhoe fitted - 450mm bucket

**LOGGED:** JY

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** Stockpile estimated to be approximately 3.5m in height

☐ 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:** Pacific National (NSW) Pty Ltd  
**PROJECT:** Proposed St Marys Intermodal Freight Terminal  
**LOCATION:** Lot 2 Forrester Road, St Marys, NSW

**SURFACE LEVEL:** 26.8 mAHD  
**EASTING:** 293482  
**NORTHING:** 6262359

**PIT No:** SP3-TP3  
**PROJECT No:** 94525.02  
**DATE:** 20/3/2019  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
26.8	0	FILL - brown silty clay with gravel and surficial vegetation, damp										
26.1	1											
25.4	2											
24.7	3			D/E	3.0 3.1							
23.0	4											
22.3	4.5	Pit discontinued at 4.5m - target depth reached										
21.6	5											
20.9	6											
20.2	7											
19.5												

**RIG:** 8 tonne backhoe fitted - 450mm bucket

**LOGGED:** JY

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** Stockpile estimated to be approximately 6.0m in height

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

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
BB	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:** Pacific National (NSW) Pty Ltd  
**PROJECT:** Proposed St Marys Intermodal Freight Terminal  
**LOCATION:** Lot 2 Forrester Road, St Marys, NSW

**SURFACE LEVEL:** 26.9 mAHD  
**EASTING:** 293481  
**NORTHING:** 6262351

**PIT No:** SP3-TP4  
**PROJECT No:** 94525.02  
**DATE:** 20/3/2019  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
		FILL - brown silty clay, moist										
26.8	1											
26.5	2											
26.2	3											
25.9	4											
25.6	4.5	FILL - grey ripped sandstone and clay										
25.3	5											
25.0				D/E	5.5							
24.7					5.6							
24.4	6	Pit discontinued at 6.0m - target depth reached										
24.1												
23.8	7											
23.5												
23.2												
22.9												
22.6												
22.3												
22.0												
21.7												
21.4												
21.1												
20.8												
20.5												
20.2												
19.9												
19.6												
19.3												
19.0												

**RIG:** 8 tonne backhoe fitted - 450mm bucket

**LOGGED:** JY

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** Stockpile estimated to be approximately 6.0m in height

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

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
BB	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:** Pacific National (NSW) Pty Ltd  
**PROJECT:** Proposed St Marys Intermodal Freight Terminal  
**LOCATION:** Lot 2 Forrester Road, St Marys, NSW

**SURFACE LEVEL:** 27.0 mAHD  
**EASTING:** 293482  
**NORTHING:** 6262339

**PIT No:** SP3-TP5  
**PROJECT No:** 94525.02  
**DATE:** 20/3/2019  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
27		FILL - grey mottled red silty clay, moist										
26	1											
25	2											
24	2.2	FILL - pale brown silty clay with gravel and sand, damp		D/E	2.0 2.1							
23	3											
22	3.9	Pit discontinued at 3.9m - target depth reached										
21	4											
20	5											
19	6											
18	7											

**RIG:** 8 tonne backhoe fitted - 450mm bucket

**LOGGED:** JY

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** \* Replicate sample BD5/20190320 collected at 2.0 - 2.1m; Stockpile estimated to be approximately 5.0m in height

☐ 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:** Pacific National (NSW) Pty Ltd  
**PROJECT:** Proposed St Marys Intermodal Freight Terminal  
**LOCATION:** Lot 2 Forrester Road, St Marys, NSW

**SURFACE LEVEL:** 27.2 mAH  
**EASTING:** 293481  
**NORTHING:** 6262333

**PIT No:** SP3-TP6  
**PROJECT No:** 94525.02  
**DATE:** 20/3/2019  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
27		FILL - brown silty clay and gravel with plastic bottles, rubbish, glass bottles, rusty shopping trolley and surficial vegetation										
	0.8			D/E	0.5 0.6							
	1	Pit discontinued at 0.8m - target depth reached										
26												
	2											
25												
	3											
24												
	4											
23												
	5											
22												
	6											
21												
	7											
20												

**RIG:** 8 tonne backhoe fitted - 450mm bucket

**LOGGED:** JY

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** Stockpile estimated to be approximately 0.8m in height

☐ 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:** Pacific National (NSW) Pty Ltd  
**PROJECT:** Proposed St Marys Intermodal Freight Terminal  
**LOCATION:** Lot 2 Forrester Road, St Marys, NSW

**SURFACE LEVEL:** 27.2 mAH  
**EASTING:** 293479  
**NORTHING:** 6262331

**PIT No:** SP3-TP7  
**PROJECT No:** 94525.02  
**DATE:** 20/3/2019  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
27		FILL - brown silty clay and gravel with plastic bottles, rubbish, glass bottles, soft plastic, wire and surficial vegetation										
				D/E	0.4 0.5							
0.8		Pit discontinued at 0.8m - target depth reached										
1												
26												
2												
25												
3												
24												
4												
23												
5												
22												
6												
21												
7												
20												

**RIG:** 8 tonne backhoe fitted - 450mm bucket

**LOGGED:** JY

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** Stockpile estimated to be approximately 0.8m in height

☐ 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:** Pacific National (NSW) Pty Ltd  
**PROJECT:** Proposed St Marys Intermodal Freight Terminal  
**LOCATION:** Lot 2 Forrester Road, St Marys, NSW

**SURFACE LEVEL:** 27.5 mAHD  
**EASTING:** 293479  
**NORTHING:** 6262317

**PIT No:** SP3-TP8  
**PROJECT No:** 94525.02  
**DATE:** 20/3/2019  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
		FILL - brown silty clay with a trace of brick fragments, plastic, concrete fragments and surficial vegetation		D/E	0.2 0.3							
	0.9	Pit discontinued at 0.9m - target depth reached										
	1											
	2											
	3											
	4											
	5											
	6											
	7											

**RIG:** 8 tonne backhoe fitted - 450mm bucket

**LOGGED:** JY

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** Stockpile estimated to be approximately 0.9m in height

☐ 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:** Pacific National (NSW) Pty Ltd  
**PROJECT:** Proposed St Marys Intermodal Freight Terminal  
**LOCATION:** Lot 2 Forrester Road, St Marys, NSW

**SURFACE LEVEL:** 27.4 mAH  
**EASTING:** 293478  
**NORTHING:** 6262314

**PIT No:** SP3-TP9  
**PROJECT No:** 94525.02  
**DATE:** 20/3/2019  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
27.4		FILL - brown silty clay with gravel and a trace of plastic, brick fragments and surficial vegetation			0.6							
				D/E	0.7							
1.2		Pit discontinued at 1.2m - target depth reached										
2												
3												
4												
5												
6												
7												

**RIG:** 8 tonne backhoe fitted - 450mm bucket

**LOGGED:** JY

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** Stockpile estimated to be approximately 1.2m in height

- ☐ 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)
BB	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:** Pacific National (NSW) Pty Ltd  
**PROJECT:** Proposed St Marys Intermodal Freight Terminal  
**LOCATION:** Lot 2 Forrester Road, St Marys, NSW

**SURFACE LEVEL:** 27.6 mAHD  
**EASTING:** 293475  
**NORTHING:** 6262301

**PIT No:** SP3-TP10  
**PROJECT No:** 94525.02  
**DATE:** 20/3/2019  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
27.6	0.0	FILL - brown silty clay with gravel and a trace of bitumen at 0.7m and 2.1m										
26.4	1.2											
25.4	2.2	Pit discontinued at 2.1m - target depth reached		D/E	2.0 2.1							
24.4	3.2											
23.4	4.2											
22.4	5.2											
21.4	6.2											
20.4	7.2											

**RIG:** 8 tonne backhoe fitted - 450mm bucket

**LOGGED:** JY

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** Stockpile estimated to be approximately 3.0m in height

☐ 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:** Pacific National (NSW) Pty Ltd  
**PROJECT:** Proposed St Marys Intermodal Freight Terminal  
**LOCATION:** Lot 2 Forrester Road, St Marys, NSW

**SURFACE LEVEL:** 27.6 mAHD  
**EASTING:** 293476  
**NORTHING:** 6262290

**PIT No:** SP3-TP11  
**PROJECT No:** 94525.02  
**DATE:** 20/3/2019  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
27		FILL - brown silty clay with gravel, moist										
1		- brick and a trace of ripped shale below 1.0m		D/E	0.9 1.0							
1.6		Pit discontinued at 1.6m - target depth reached										
2												
2.5												
3												
2.4												
4												
2.3												
5												
2.2												
6												
2.1												
7												
2.0												

**RIG:** 8 tonne backhoe fitted - 450mm bucket

**LOGGED:** JY

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** Stockpile estimated to be approximately 1.6m in height

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

# TEST PIT LOG

**CLIENT:** Pacific National (NSW) Pty Ltd  
**PROJECT:** Proposed St Marys Intermodal Freight Terminal  
**LOCATION:** Lot 2 Forrester Road, St Marys, NSW

**SURFACE LEVEL:** 27.7 mAH  
**EASTING:** 293480  
**NORTHING:** 6262283

**PIT No:** SP3-TP12  
**PROJECT No:** 94525.02  
**DATE:** 20/3/2019  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
		FILL - brown silty clay with gravel			0.4 0.5							
27.1	1.0	Pit discontinued at 1.0m - target depth reached										
26.1	2.0											
25.1	3.0											
24.1	4.0											
23.1	5.0											
22.1	6.0											
21.1	7.0											
20.1												

**RIG:** 8 tonne backhoe fitted - 450mm bucket

**LOGGED:** JY

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** Stockpile estimated to be approximately 1.0m in height

☐ 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:** Pacific National (NSW) Pty Ltd  
**PROJECT:** Proposed St Marys Intermodal Freight Terminal  
**LOCATION:** Lot 2 Forrester Road, St Marys, NSW

**SURFACE LEVEL:** 27.8 mAHD  
**EASTING:** 293486  
**NORTHING:** 6262280

**PIT No:** SP3-TP13  
**PROJECT No:** 94525.02  
**DATE:** 20/3/2019  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
27	1	FILL - brown silty clay with gravel										
26	2											
25	3	- with a trace of brick fragments between 2.5 - 3.1m		D/E	2.5 2.6							
24	3.5	- roof tile at 3.4m Pit discontinued at 3.5m - target depth reached										
23	4											
22	5											
21	6											
20	7											

**RIG:** 8 tonne backhoe fitted - 450mm bucket

**LOGGED:** JY

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** \* Replicate sample BD4/20190320 collected at 0.1 - 0.2m; Stockpile estimated to be approximately 3.5m in height

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


SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
BB	Bulk sample	P	Piston sample
BLK	Block sample	U <sub>s</sub>	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	W <sub>s</sub>	Water seep
E	Environmental sample	W <sub>l</sub>	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:** Pacific National (NSW) Pty Ltd  
**PROJECT:** Proposed St Marys Intermodal Freight Terminal  
**LOCATION:** Lot 2 Forrester Road, St Marys, NSW

**SURFACE LEVEL:** 27.8 mAHD  
**EASTING:** 293486  
**NORTHING:** 6262277

**PIT No:** SP3-TP14  
**PROJECT No:** 94525.02  
**DATE:** 21/3/2019  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
		FILL - brown clayey gravel		D/E	0.2 0.3							
	0.6	Pit discontinued at 0.6m - target depth reached										
27	1											
26	2											
25	3											
24	4											
23	5											
22	6											
21	7											
20												

**RIG:** 8 tonne backhoe fitted - 450mm bucket

**LOGGED:** JY

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** Stockpile estimated to be approximately 0.6m in height with scattered rubbish, concrete and metal at surface nearby

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

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
BB	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:** Pacific National (NSW) Pty Ltd  
**PROJECT:** Proposed St Marys Intermodal Freight Terminal  
**LOCATION:** Lot 2 Forrester Road, St Marys, NSW

**SURFACE LEVEL:** 27.9 mAHD  
**EASTING:** 293489  
**NORTHING:** 6262268

**PIT No:** SP3-TP15  
**PROJECT No:** 94525.02  
**DATE:** 21/3/2019  
**SHEET** 1 OF 1

[illegible]

**RIG:** 8 tonne backhoe fitted - 450mm bucket

LOGGED: JY

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** Stockpile estimated to be approximately 3.0m in height

- ☐ 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 ls(50) (MPa)
		PL(D)	Point load diametral test ls(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)



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# TEST PIT LOG

**CLIENT:** Pacific National (NSW) Pty Ltd  
**PROJECT:** Proposed St Marys Intermodal Freight Terminal  
**LOCATION:** Lot 2 Forrester Road, St Marys, NSW

**SURFACE LEVEL:** 28.1 mAHD  
**EASTING:** 293489  
**NORTHING:** 6262253

**PIT No:** SP3-TP16  
**PROJECT No:** 94525.02  
**DATE:** 21/3/2019  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
28		FILL - brown silty clay with gravel										
27	1											
26	2	FILL - pale grey ripped sandstone and gravel with silty clay - plastic pipe at 2.1m		D/E	2.2 2.3							
25	3	Pit discontinued at 3.0m - target depth reached										
24	4											
23	5											
22	6											
21	7											

**RIG:** 8 tonne backhoe fitted - 450mm bucket

**LOGGED:** JY

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** Stockpile estimated to be approximately 3.0m in height

☐ 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:** Pacific National (NSW) Pty Ltd  
**PROJECT:** Proposed St Marys Intermodal Freight Terminal  
**LOCATION:** Lot 2 Forrester Road, St Marys, NSW

**SURFACE LEVEL:** 28.7 mAH  
**EASTING:** 293491  
**NORTHING:** 6262232

**PIT No:** SP3-TP17  
**PROJECT No:** 94525.02  
**DATE:** 21/3/2019  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
28.7	0	FILL - brown silty clay with gravel										
27.5	1.2	FILL - silty clay and gravel		D/E	1.4 1.5							
26.7	2											
26.0	3	Pit discontinued at 3.0m - target depth reached										
25.0	4											
24.0	5											
23.0	6											
22.0	7											
21.0												

**RIG:** 8 tonne backhoe fitted - 450mm bucket

**LOGGED:** JY

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** Stockpile estimated to be approximately 3.0m in height

☐ 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:** Pacific National (NSW) Pty Ltd  
**PROJECT:** Proposed St Marys Intermodal Freight Terminal  
**LOCATION:** Lot 2 Forrester Road, St Marys, NSW

**SURFACE LEVEL:** 29.4 mAH  
**EASTING:** 293494  
**NORTHING:** 6262214

**PIT No:** SP3-TP18  
**PROJECT No:** 94525.02  
**DATE:** 21/3/2019  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
28.0		FILL - brown silty clay with gravel										
27.0	2.0	FILL - pale grey ripped sandstone and gravel with clay										
26.5	2.5			D/E	2.5							
26.0	2.6				2.6							
25.0	3.5	Pit discontinued at 3.5m - target depth reached										
24.0												
23.0												
22.0												

**RIG:** 8 tonne backhoe fitted - 450mm bucket

**LOGGED:** JY

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** Stockpile estimated to be approximately 3.5m in height

☐ 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:** Pacific National (NSW) Pty Ltd  
**PROJECT:** Proposed St Marys Intermodal Freight Terminal  
**LOCATION:** Lot 2 Forrester Road, St Marys, NSW

**SURFACE LEVEL:** 29.5 mAH  
**EASTING:** 293499  
**NORTHING:** 6262196

**PIT No:** SP3-TP19  
**PROJECT No:** 94525.02  
**DATE:** 21/3/2019  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
29.5	0	FILL - brown silty clay with gravel and surficial vegetation, damp										
27.5	2.0											
27.0	2.3	FILL - pale grey ripped sandstone and gravel with clay - single brick at 2.5m		D/E	2.4 2.5							
26.5	3.0											
26.0	3.5	Pit discontinued at 3.5m - target depth reached										
25.0	4.0											
24.0	5.0											
23.0	6.0											
22.0	7.0											

**RIG:** 8 tonne backhoe fitted - 450mm bucket

**LOGGED:** JY

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** Stockpile estimated to be approximately 3.5m in height

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

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
BB	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:** Pacific National (NSW) Pty Ltd  
**PROJECT:** Proposed St Marys Intermodal Freight Terminal  
**LOCATION:** Lot 2 Forrester Road, St Marys, NSW

**SURFACE LEVEL:** 29.6 mAH  
**EASTING:** 293505  
**NORTHING:** 6262173

**PIT No:** SP3-TP20  
**PROJECT No:** 94525.02  
**DATE:** 21/3/2019  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
29.6	0	FILL - brown silty clay with gravel and surficial vegetation, damp										
28.1	1.5	FILL - brown clayey gravel										
27.7	1.9			D/E	1.9							
26.7	2.0				2.0							
23.0	3.0	Pit discontinued at 3.0m - target depth reached										
22.0	4.0											
21.0	5.0											
20.0	6.0											
19.0	7.0											

**RIG:** 8 tonne backhoe fitted - 450mm bucket

**LOGGED:** JY

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** Stockpile estimated to be approximately 3.0m in height

☐ 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:** Pacific National (NSW) Pty Ltd  
**PROJECT:** Proposed St Marys Intermodal Freight Terminal  
**LOCATION:** Lot 2 Forrester Road, St Marys, NSW

**SURFACE LEVEL:** 29.6 mAHD  
**EASTING:** 293511  
**NORTHING:** 6262162

**PIT No:** SP3-TP21  
**PROJECT No:** 94525.02  
**DATE:** 21/3/2019  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
29.6		FILL - brown silty clay with gravel and surficial vegetation, damp		D/E	0.4 0.5							
1	1.0	FILL - brown clayey gravel										
2	2.0	Pit discontinued at 2.0m - target depth reached										
27												
3												
26												
4												
25												
5												
24												
6												
23												
7												
22												

**RIG:** 8 tonne backhoe fitted - 450mm bucket

**LOGGED:** JY

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** Stockpile estimated to be approximately 2.0m in height

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



# TEST PIT LOG

**CLIENT:** Pacific National (NSW) Pty Ltd  
**PROJECT:** Proposed St Marys Intermodal Freight Terminal  
**LOCATION:** Lot 2 Forrester Road, St Marys, NSW

**SURFACE LEVEL:** 29.6 mAHD  
**EASTING:** 293507  
**NORTHING:** 6262168

**PIT No:** SP3-TP22  
**PROJECT No:** 94525.02  
**DATE:** 21/3/2019  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
		FILL - brown silty clay with gravel and surface vegetation, damp										
	0.5	FILL - brown clayey gravel with a trace of brick fragments										
				D/E	0.9 1.0							
	1											
	2											
	3											
	3.0	Pit discontinued at 3.0m - target depth reached										
	4											
	5											
	6											
	7											

**RIG:** 8 tonne backhoe fitted - 450mm bucket

**LOGGED:** JY

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** Stockpile estimated to be approximately 3.0m in height

☐ 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:** Pacific National (NSW) Pty Ltd  
**PROJECT:** Proposed St Marys Intermodal Freight Terminal  
**LOCATION:** Lot 2 Forrester Road, St Marys, NSW

**SURFACE LEVEL:** 29.5 mAHD  
**EASTING:** 293496  
**NORTHING:** 6262206

**PIT No:** SP3-TP23  
**PROJECT No:** 94525.02  
**DATE:** 21/3/2019  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
29.5	0.5	FILL - brown silty clay and surface vegetation, damp										
		FILL - brown clayey gravel										
28.5	1.4			D/E	1.4							
28.0	1.5				1.5							
27.0	2.0	- with a trace of bitumen at 2.0m										
26.0	3.5	Pit discontinued at 3.5m - target depth reached										
25.0	4.0											
24.0	5.0											
23.0	6.0											
22.0	7.0											

**RIG:** 8 tonne backhoe fitted - 450mm bucket

**LOGGED:** JY

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** Stockpile estimated to be approximately 3.5m in height

☐ 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)
BB	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:** Pacific National (NSW) Pty Ltd  
**PROJECT:** Proposed St Marys Intermodal Freight Terminal  
**LOCATION:** Lot 2 Forrester Road, St Marys, NSW

**SURFACE LEVEL:** 28.6 mAHD  
**EASTING:** 293490  
**NORTHING:** 6262239

**PIT No:** SP3-TP24  
**PROJECT No:** 94525.02  
**DATE:** 21/3/2019  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
28.6	0	FILL - brown silty clay with gravel and a trace of ripped sandstone and surface vegetation										
28.5	0.1			D/E	0.9							
28.4	1.0				1.0							
27.4	2.0											
26.4	3.0											
25.4	4.0	Pit discontinued at 4.0m - target depth reached										
24.4	5.0											
23.4	6.0											
22.4	7.0											
21.4												

**RIG:** 8 tonne backhoe fitted - 450mm bucket

**LOGGED:** JY

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** Stockpile estimated to be approximately 4.0m in height

☐ 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	WL	Water level	V	Shear vane (kPa)



# TEST PIT LOG

**CLIENT:** Pacific National (NSW) Pty Ltd  
**PROJECT:** Proposed St Marys Intermodal Freight Terminal  
**LOCATION:** Lot 2 Forrester Road, St Marys, NSW

**SURFACE LEVEL:** 28.3 mAHD  
**EASTING:** 293490  
**NORTHING:** 6262243

**PIT No:** SP3-TP25  
**PROJECT No:** 94525.02  
**DATE:** 21/3/2019  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
28		FILL - brown silty clay with gravel and surface vegetation, moist										
1		- becoming damp below 1.0m										
27												
2												
26					1.4 1.5							
3												
25												
4	4.0	Pit discontinued at 4.0m - target depth reached										
24												
5												
23												
6												
22												
7												
21												

**RIG:** 8 tonne backhoe fitted - 450mm bucket

**LOGGED:** JY

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** \* Replicate sample BD8/20190321 collected at 1.4 - 1.5m; Stockpile estimated to be approximately 4.0m in height

☐ 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:** Pacific National (NSW) Pty Ltd  
**PROJECT:** Proposed St Marys Intermodal Freight Terminal  
**LOCATION:** Lot 2 Forrester Road, St Marys, NSW

**SURFACE LEVEL:** 27.6 mAHD  
**EASTING:** 293478  
**NORTHING:** 6262308

**PIT No:** SP3-TP26  
**PROJECT No:** 94525.02  
**DATE:** 21/3/2019  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
27		FILL - dark brown silty clay with gravel and a trace of wire, plastic, glass, bitumen and surface vegetation										
1	1.0	Pit discontinued at 1.0m - target depth reached		D/E	0.9 1.0							
26												
2												
25												
3												
24												
4												
23												
5												
22												
6												
21												
7												
20												

**RIG:** 8 tonne backhoe fitted - 450mm bucket

**LOGGED:** JY

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** Stockpile estimated to be approximately 1.0m in height between SP3 and road

☐ 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:** Pacific National (NSW) Pty Ltd  
**PROJECT:** Proposed St Marys Intermodal Freight Terminal  
**LOCATION:** Lot 2 Forrester Road, St Marys, NSW

**SURFACE LEVEL:** 27.1 mAHD  
**EASTING:** 293476  
**NORTHING:** 6262324

**PIT No:** SP3-TP27  
**PROJECT No:** 94525.02  
**DATE:** 21/3/2019  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
27	0.6	FILL - brown silty clay with gravel and ripped siltstone and a trace of plastic, metal, glass, tile, brick and surface vegetation		D/E	0.4 0.5							
		Pit discontinued at 0.6m - target depth reached										
1												
2												
3												
4												
5												
6												
7												

**RIG:** 8 tonne backhoe fitted - 450mm bucket

**LOGGED:** JY

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** Stockpile estimated to be approximately 0.6m in height

☐ 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:** Pacific National (NSW) Pty Ltd  
**PROJECT:** Proposed St Marys Intermodal Freight Terminal  
**LOCATION:** Lot 2 Forrester Road, St Marys, NSW

**SURFACE LEVEL:** 26.9 mAH  
**EASTING:** 293481  
**NORTHING:** 6262345

**PIT No:** SP3-TP28  
**PROJECT No:** 94525.02  
**DATE:** 21/3/2019  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
		FILL - pale brown silty clay with gravel, sand and surface vegetation										
	1											
	2			D/E	1.9 2.0							
	3											
	4											
	5	Pit discontinued at 5.0m - target depth reached										
	6											
	7											

**RIG:** 8 tonne backhoe fitted - 450mm bucket

**LOGGED:** JY

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** Stockpile estimated to be approximately 5.0m in height

☐ 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)
BB	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:** Pacific National (NSW) Pty Ltd  
**PROJECT:** Proposed St Marys Intermodal Freight Terminal  
**LOCATION:** Lot 2 Forrester Road, St Marys, NSW

**SURFACE LEVEL:** 26.6 mAHD  
**EASTING:** 293486  
**NORTHING:** 6262374

**PIT No:** SP3-TP29  
**PROJECT No:** 94525.02  
**DATE:** 21/3/2019  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
26.6	0	FILL - pale brown silty clay with gravel, sand and surface vegetation										
25.6	1											
24.6	2											
24.4	2.4			D/E	2.4							
24.2	2.5				2.5							
23.6	3	- with a trace of metal, brick fragments and a small concrete block at 3.0m										
22.6	4											
21.6	5	Pit discontinued at 5.0m - target depth reached										
20.6	6											
19.6	7											
18.6												

**RIG:** 8 tonne backhoe fitted - 450mm bucket

**LOGGED:** JY

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** Stockpile estimated to be approximately 5.0m in height

☐ 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:** Pacific National (NSW) Pty Ltd  
**PROJECT:** Proposed St Marys Intermodal Freight Terminal  
**LOCATION:** Lot 2 Forrester Road, St Marys, NSW

**SURFACE LEVEL:** 26.3 mAHD  
**EASTING:** 293493  
**NORTHING:** 6262385

**PIT No:** SP3-TP30  
**PROJECT No:** 94525.02  
**DATE:** 21/3/2019  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
26		FILL - brown silty clay with gravel and surface vegetation		D/E	0.2 0.3							
1												
25	1.5	Pit discontinued at 1.5m - target depth reached										
2												
24												
3												
23												
4												
22												
5												
21												
6												
20												
7												
19												

**RIG:** 8 tonne backhoe fitted - 450mm bucket

**LOGGED:** JY

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** Stockpile estimated to be approximately 2.5m in height

☐ 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)
BB	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:** Pacific National (NSW) Pty Ltd  
**PROJECT:** Proposed St Marys Intermodal Freight Terminal  
**LOCATION:** Lot 2 Forrester Road, St Marys, NSW

**SURFACE LEVEL:** 25.9 mAH  
**EASTING:** 293483  
**NORTHING:** 6262564

**PIT No:** SP4-TP1  
**PROJECT No:** 94525.02  
**DATE:** 21/3/2019  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
	0.6	FILL - dark grey clayey sand and railway ballast with a trace of timber, moist		D/E	0.4 0.5							
		Pit discontinued at 0.6m - target depth reached										
	1											
	2											
	3											
	4											
	5											
	6											
	7											

**RIG:** 8 tonne backhoe fitted - 450mm bucket

**LOGGED:** JY

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** Stockpile estimated to be approximately 1.8m in height

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

# TEST PIT LOG

**CLIENT:** Pacific National (NSW) Pty Ltd  
**PROJECT:** Proposed St Marys Intermodal Freight Terminal  
**LOCATION:** Lot 2 Forrester Road, St Marys, NSW

**SURFACE LEVEL:** 25.5 mAHD  
**EASTING:** 293460  
**NORTHING:** 6262580

**PIT No:** SP4-TP2  
**PROJECT No:** 94525.02  
**DATE:** 21/3/2019  
**SHEET** 1 OF 1

[illegible]

**RIG:** 8 tonne backhoe fitted - 450mm bucket

**LOGGED: JY**

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** Stockpile estimated to be approximately 2.0m in height.

- ☐ 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:** Pacific National (NSW) Pty Ltd  
**PROJECT:** Proposed St Marys Intermodal Freight Terminal  
**LOCATION:** Lot 2 Forrester Road, St Marys, NSW

**SURFACE LEVEL:** 25.6 mAHD  
**EASTING:** 293457  
**NORTHING:** 6262594

**PIT No:** SP4-TP3  
**PROJECT No:** 94525.02  
**DATE:** 21/3/2019  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
25	0	FILL - dark grey sandy gravel with railway ballast and a trace of brick fragments	[Cross-hatched pattern]									
24	1											
23	2											
22	3											
21	3.5	Pit discontinued at 3.5m - target depth reached										
20	4											
19	5											
18	6											
17	7											

**RIG:** 8 tonne backhoe fitted - 450mm bucket

**LOGGED:** JY

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** Stockpile estimated to be approximately 5.0m in height

☐ 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:** Pacific National (NSW) Pty Ltd  
**PROJECT:** Proposed St Marys Intermodal Freight Terminal  
**LOCATION:** Lot 2 Forrester Road, St Marys, NSW

**SURFACE LEVEL:** 25.3 mAHD  
**EASTING:** 293444  
**NORTHING:** 6262622

**PIT No:** SP4-TP4  
**PROJECT No:** 94525.02  
**DATE:** 21/3/2019  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
25		FILL - dark grey sandy gravel with a trace of timber, glass, plastic sheeting and metal		D/E	0.2							
					0.3							
1												
24												
1.5		Pit discontinued at 1.5m - target depth reached										
2												
23												
3												
22												
4												
21												
5												
20												
6												
19												
7												
18												

**RIG:** 8 tonne backhoe fitted - 450mm bucket

**LOGGED:** JY

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** Stockpile estimated to be approximately 1.5m in height

☐ 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:** Pacific National (NSW) Pty Ltd  
**PROJECT:** Proposed St Marys Intermodal Freight Terminal  
**LOCATION:** Lot 2 Forrester Road, St Marys, NSW

**SURFACE LEVEL:** 25.2 mAH  
**EASTING:** 293440  
**NORTHING:** 6262642

**PIT No:** SP4-TP5  
**PROJECT No:** 94525.02  
**DATE:** 21/3/2019  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
25		FILL - dark grey sandy gravel with a trace of metal plates, metal bolts and timber		D/E	0.4 0.5							
1												
24												
1.5		Pit discontinued at 1.5m - target depth reached										
2												
23												
3												
22												
4												
21												
5												
20												
6												
19												
7												
18												

**RIG:** 8 tonne backhoe fitted - 450mm bucket

**LOGGED:** JY

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** Stockpile estimated to be approximately 1.5m in height

☐ 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)
BB	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:** Pacific National (NSW) Pty Ltd  
**PROJECT:** Proposed St Marys Intermodal Freight Terminal  
**LOCATION:** Lot 2 Forrester Road, St Marys, NSW

**SURFACE LEVEL:** 25.3 mAH  
**EASTING:** 293459  
**NORTHING:** 6262631

**PIT No:** SP4-TP6  
**PROJECT No:** 94525.02  
**DATE:** 21/3/2019  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
25		FILL - dark grey sandy gravel										
				D/E	0.7 0.8							
1												
24												
	1.6	Pit discontinued at 1.6m - target depth reached										
2												
23												
3												
22												
4												
21												
5												
20												
6												
19												
7												
18												

**RIG:** 8 tonne backhoe fitted - 450mm bucket

**LOGGED:** JY

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** Stockpile estimated to be approximately 1.6m in height

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



# TEST PIT LOG

**CLIENT:** Pacific National (NSW) Pty Ltd  
**PROJECT:** Proposed St Marys Intermodal Freight Terminal  
**LOCATION:** Lot 2 Forrester Road, St Marys, NSW

**SURFACE LEVEL:** 25.5 mAHD  
**EASTING:** 293463  
**NORTHING:** 6262611

**PIT No:** SP4-TP7  
**PROJECT No:** 94525.02  
**DATE:** 21/3/2019  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
25		FILL - dark grey sandy gravel with railway ballast		D/E	0.3							
					0.4							
1												
1.4		Pit discontinued at 1.4m - target depth reached										
2												
2.3												
3												
2.2												
4												
2.1												
5												
2.0												
6												
1.9												
7												
1.8												

**RIG:** 8 tonne backhoe fitted - 450mm bucket

**LOGGED:** JY

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** Stockpile estimated to be approximately 1.4m in height

☐ 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:** Pacific National (NSW) Pty Ltd  
**PROJECT:** Proposed St Marys Intermodal Freight Terminal  
**LOCATION:** Lot 2 Forrester Road, St Marys, NSW

**SURFACE LEVEL:** 25.6 mAHD  
**EASTING:** 293470  
**NORTHING:** 6262601

**PIT No:** SP4-TP8  
**PROJECT No:** 94525.02  
**DATE:** 21/3/2019  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
		FILL - dark grey sandy gravel with a trace of timber, soft plastic and brick fragments		D/E	0.4 0.5							
	1.6	Pit discontinued at 1.6m - target depth reached										
	2											
	3											
	4											
	5											
	6											
	7											

**RIG:** 8 tonne backhoe fitted - 450mm bucket

**LOGGED:** JY

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** Stockpile estimated to be approximately 1.6m in height

☐ 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:** Pacific National (NSW) Pty Ltd  
**PROJECT:** Proposed St Marys Intermodal Freight Terminal  
**LOCATION:** Lot 2 Forrester Road, St Marys, NSW

**SURFACE LEVEL:** 25.9 mAHD  
**EASTING:** 293483  
**NORTHING:** 6262582

**PIT No:** SP4-TP9  
**PROJECT No:** 94525.02  
**DATE:** 21/3/2019  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
		FILL - dark grey sandy gravel with railway ballast			0.6 0.7							
1	1.0	Pit discontinued at 1.0m - target depth reached										
2												
3												
4												
5												
6												
7												

**RIG:** 8 tonne backhoe fitted - 450mm bucket

**LOGGED:** JY

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** Stockpile estimated to be approximately 1.5m in height

- ☐ 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)
BB	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:** Pacific National (NSW) Pty Ltd  
**PROJECT:** Proposed St Marys Intermodal Freight Terminal  
**LOCATION:** Lot 2 Forrester Road, St Marys, NSW

**SURFACE LEVEL:** 26.0 mAH  
**EASTING:** 293489  
**NORTHING:** 6262571

**PIT No:** SP4-TP10  
**PROJECT No:** 94525.02  
**DATE:** 21/3/2019  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
26.0		FILL - dark grey sandy gravel with railway ballast		D/E	0.5 0.6							
25.0	1.0	Pit discontinued at 1.0m - target depth reached										
24.0	2											
23.0	3											
22.0	4											
21.0	5											
20.0	6											
19.0	7											

**RIG:** 8 tonne backhoe fitted - 450mm bucket

**LOGGED:** JY

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** Stockpile estimated to be approximately 1.5m in height

- ☐ 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:** Pacific National (NSW) Pty Ltd  
**PROJECT:** Proposed St Marys Intermodal Freight Terminal  
**LOCATION:** Lot 2 Forrester Road, St Marys, NSW

**SURFACE LEVEL:** 28.3 mAH  
**EASTING:** 293429  
**NORTHING:** 6262316

**PIT No:** SP5-TP1  
**PROJECT No:** 94525.02  
**DATE:** 22/3/2019  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
28		FILL - pale brown gravelly sand with a trace of soft plastic, damp										
1												
27												
2				D/E	1.9 2.0							
26												
2.5		Pit discontinued at 2.5m - target depth reached										
3												
25												
4												
24												
5												
23												
6												
22												
7												
21												

**RIG:** 8 tonne backhoe fitted - 450mm bucket

**LOGGED:** JY

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** Stockpile estimated to be approximately 5.0m in height

☐ 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	WL	Water level	V	Shear vane (kPa)

# TEST PIT LOG

**CLIENT:** Pacific National (NSW) Pty Ltd  
**PROJECT:** Proposed St Marys Intermodal Freight Terminal  
**LOCATION:** Lot 2 Forrester Road, St Marys, NSW

**SURFACE LEVEL:** 28.3 mAHD  
**EASTING:** 293427  
**NORTHING:** 6262313

**PIT No:** SP5-TP2  
**PROJECT No:** 94525.02  
**DATE:** 22/3/2019  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
28		FILL - brown sandy clay with gravel and a trace of soft plastic, damp										
1												
27												
2												
26												
3												
25												
4					4.0							
24				D/E	4.1							
5	5.0	Pit discontinued at 5.0m - target depth reached										
23												
6												
22												
7												
21												

**RIG:** 8 tonne backhoe fitted - 450mm bucket

**LOGGED:** JY

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** Stockpile estimated to be approximately 5.0m in height

☐ 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:** Pacific National (NSW) Pty Ltd  
**PROJECT:** Proposed St Marys Intermodal Freight Terminal  
**LOCATION:** Lot 2 Forrester Road, St Marys, NSW

**SURFACE LEVEL:** 28.5 mAHD  
**EASTING:** 293423  
**NORTHING:** 6262311

**PIT No:** SP5-TP3  
**PROJECT No:** 94525.02  
**DATE:** 22/3/2019  
**SHEET** 1 OF 1

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**RIG:** 8 tonne backhoe fitted - 450mm bucket

**LOGGED: JY**

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** Stockpile estimated to be approximately 3.0m in height

☐ 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 ls(50) (MPa)
		PL(D)	Point load diametral test ls(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)



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# TEST PIT LOG

**CLIENT:** Pacific National (NSW) Pty Ltd  
**PROJECT:** Proposed St Marys Intermodal Freight Terminal  
**LOCATION:** Lot 2 Forrester Road, St Marys, NSW

**SURFACE LEVEL:** 28.4 mAH  
**EASTING:** 293419  
**NORTHING:** 6262315

**PIT No:** SP5-TP4  
**PROJECT No:** 94525.02  
**DATE:** 22/3/2019  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
		FILL - brown sandy clay with gravel, damp										
	0.5	FILL - pale brown gravelly sand, dry										
	1											
	2											
	2.5	Pit discontinued at 2.5m - target depth reached		E	2.4 2.5							
	3											
	4											
	5											
	6											
	7											

**RIG:** 8 tonne backhoe fitted - 450mm bucket

**LOGGED:** JY

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** Stockpile estimated to be approximately 3.0m in height

☐ 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)
BB	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:** Pacific National (NSW) Pty Ltd  
**PROJECT:** Proposed St Marys Intermodal Freight Terminal  
**LOCATION:** Lot 2 Forrester Road, St Marys, NSW

**SURFACE LEVEL:** 28.1 mAHD  
**EASTING:** 293419  
**NORTHING:** 6262321

**PIT No:** SP5-TP5  
**PROJECT No:** 94525.02  
**DATE:** 22/3/2019  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
28		FILL - brown sandy clay with gravel, damp										
1	1.0	FILL - pale brown gravelly sand, dry										
2												
3	3.0	Pit discontinued at 3.0m - target depth reached		D/E	2.9 3.0							
4												
5												
6												
7												

**RIG:** 8 tonne backhoe fitted - 450mm bucket

**LOGGED:** JY

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** Stockpile estimated to be approximately 5.0m in height

- ☐ 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:** Pacific National (NSW) Pty Ltd  
**PROJECT:** Proposed St Marys Intermodal Freight Terminal  
**LOCATION:** Lot 2 Forrester Road, St Marys, NSW

**SURFACE LEVEL:** 28.0 mAHD  
**EASTING:** 293417  
**NORTHING:** 6262328

**PIT No:** SP5-TP6  
**PROJECT No:** 94525.02  
**DATE:** 22/3/2019  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
28		FILL - brown sandy clay with gravel and a trace of plastic and surface vegetation, damp										
27	1				1.4 1.5							
26	1.7	Pit discontinued at 1.7m - target depth reached										
25	2											
24	3											
23	4											
22	5											
21	6											
20	7											

**RIG:** 8 tonne backhoe fitted - 450mm bucket

**LOGGED:** JY

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** Stockpile estimated to be approximately 2.0m in height

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

# TEST PIT LOG

**CLIENT:** Pacific National (NSW) Pty Ltd  
**PROJECT:** Proposed St Marys Intermodal Freight Terminal  
**LOCATION:** Lot 2 Forrester Road, St Marys, NSW

**SURFACE LEVEL:** 27.8 mAHD  
**EASTING:** 293414  
**NORTHING:** 6262334

**PIT No:** SP5-TP7  
**PROJECT No:** 94525.02  
**DATE:** 22/3/2019  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
	0.6	FILL - brown silty clay with sand and a trace of gravel and surface vegetation, damp										
	0.6	Pit discontinued at 0.6m - target depth reached		D/E	0.5-0.6							
27	1											
26	2											
25	3											
24	4											
23	5											
22	6											
21	7											
20												

**RIG:** 8 tonne backhoe fitted - 450mm bucket

**LOGGED:** JY

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** Stockpile estimated to be approximately 0.6m in height

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

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
BB	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:** Pacific National (NSW) Pty Ltd  
**PROJECT:** Proposed St Marys Intermodal Freight Terminal  
**LOCATION:** Lot 2 Forrester Road, St Marys, NSW

**SURFACE LEVEL:** 28.0 mAHD  
**EASTING:** 293423  
**NORTHING:** 6262331

**PIT No:** SP5-TP8  
**PROJECT No:** 94525.02  
**DATE:** 22/3/2019  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
28		FILL - pale brown sandy clay with gravel and a trace of hard and soft plastic and surface vegetation, dry										
27	1											
26	2			D/E	1.9 2.0							
25	3											
3.5		Pit discontinued at 3.5m - target depth reached										
24	4											
23	5											
22	6											
21	7											

**RIG:** 8 tonne backhoe fitted - 450mm bucket

**LOGGED:** JY

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** Stockpile estimated to be approximately 4.0m in height

☐ 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 <sub>s</sub>	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:** Pacific National (NSW) Pty Ltd  
**PROJECT:** Proposed St Marys Intermodal Freight Terminal  
**LOCATION:** Lot 2 Forrester Road, St Marys, NSW

**SURFACE LEVEL:** 25.5 mAH  
**EASTING:** 293451  
**NORTHING:** 6262661

**PIT No:** SP7-TP1  
**PROJECT No:** 94525.02  
**DATE:** 20/3/2019  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
		FILL - pale brown and grey sandy gravel, damp		D/E	0.2							
					0.3							
25	0.8	Pit discontinued at 0.8m - target depth reached										
1												
24												
2												
23												
3												
22												
4												
21												
5												
20												
6												
19												
7												
18												

**RIG:** 8 tonne backhoe fitted - 450mm bucket

**LOGGED:** JY

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** Stockpile estimated to be approximately 0.8m in height

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

# TEST PIT LOG

**CLIENT:** Pacific National (NSW) Pty Ltd  
**PROJECT:** Proposed St Marys Intermodal Freight Terminal  
**LOCATION:** Lot 2 Forrester Road, St Marys, NSW

**SURFACE LEVEL:** 25.6 mAHD  
**EASTING:** 293451  
**NORTHING:** 6262659

**PIT No:** SP7-TP2  
**PROJECT No:** 94525.02  
**DATE:** 20/3/2019  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
		FILL - pale brown and grey sandy gravel, damp										
	0.8	Pit discontinued at 0.8m - target depth reached		D/E	0.4 0.5							
	1											
	2											
	3											
	4											
	5											
	6											
	7											

**RIG:** 8 tonne backhoe fitted - 450mm bucket

**LOGGED:** JY

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** Stockpile estimated to be approximately 0.8m in height

☐ 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:** Pacific National (NSW) Pty Ltd  
**PROJECT:** Proposed St Marys Intermodal Freight Terminal  
**LOCATION:** Lot 2 Forrester Road, St Marys, NSW

**SURFACE LEVEL:** 25.0 mAH  
**EASTING:** 293417  
**NORTHING:** 6262655

**PIT No:** SP8-TP1  
**PROJECT No:** 94525.02  
**DATE:** 20/3/2019  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
25		FILL - pale brown gravelly sand, moist										
	0.6	Pit discontinued at 0.6m - target depth reached		D/E	0.5-0.6							
24	1											
23	2											
22	3											
21	4											
20	5											
19	6											
18	7											

**RIG:** 8 tonne backhoe fitted - 450mm bucket

**LOGGED:** JY

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** Stockpile estimated to be approximately 0.6m in height

☐ 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:** Pacific National (NSW) Pty Ltd  
**PROJECT:** Proposed St Marys Intermodal Freight Terminal  
**LOCATION:** Lot 2 Forrester Road, St Marys, NSW

**SURFACE LEVEL:** 24.7 mAH  
**EASTING:** 293416  
**NORTHING:** 6262663

**PIT No:** SP8-TP2  
**PROJECT No:** 94525.02  
**DATE:** 20/3/2019  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
		FILL - pale brown gravelly sand, moist										
	0.6	Pit discontinued at 0.6m - target depth reached		D/E	0.5-0.6							
	1											
	2											
	3											
	4											
	5											
	6											
	7											

**RIG:** 8 tonne backhoe fitted - 450mm bucket

**LOGGED:** JY

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** Stockpile estimated to be approximately 0.6m in height

☐ 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:** Pacific National (NSW) Pty Ltd  
**PROJECT:** Proposed St Marys Intermodal Freight Terminal  
**LOCATION:** Lot 2 Forrester Road, St Marys, NSW

**SURFACE LEVEL:** 24.3 mAHD  
**EASTING:** 293458  
**NORTHING:** 6262801

**PIT No:** SP9-TP1  
**PROJECT No:** 94525.02  
**DATE:** 19/3/2019  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
24		FILL - brown silty clay with fine to coarse gravel and timber, railway sleepers, concrete, bricks, vegetation, tiles, plastic, barbed wire, plastic pipes and chipboard			0.5							
				D/E	0.6							
1	1.0	Pit discontinued at 1.0m - target depth reached										
23												
2												
22												
3												
21												
4												
20												
5												
19												
6												
18												
7												
17												

**RIG:** 8 tonne backhoe fitted - 450mm bucket

**LOGGED:** JY

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** Stockpile estimated to be approximately 1.0m in height

☐ 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:** Pacific National (NSW) Pty Ltd  
**PROJECT:** Proposed St Marys Intermodal Freight Terminal  
**LOCATION:** Lot 2 Forrester Road, St Marys, NSW

**SURFACE LEVEL:** 24.3 mAH  
**EASTING:** 293458  
**NORTHING:** 6262802

**PIT No:** SP9-TP2  
**PROJECT No:** 94525.02  
**DATE:** 19/3/2019  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
24.3		FILL - brown silty clay with fine to coarse gravel and timber, railway sleepers, concrete, bricks, vegetation, tiles, plastic, barbed wire, plastic pipes and chipboard		D/E	0.5 0.6							
1	1.0	Pit discontinued at 1.0m - target depth reached										
23												
2												
22												
3												
21												
4												
20												
5												
19												
6												
18												
7												
17												

**RIG:** 8 tonne backhoe fitted - 450mm bucket

**LOGGED:** JY

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** Stockpile estimated to be approximately 1.0m in height

☐ 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:** Pacific National (NSW) Pty Ltd  
**PROJECT:** Proposed St Marys Intermodal Freight Terminal  
**LOCATION:** Lot 2 Forrester Road, St Marys, NSW

**SURFACE LEVEL:** 25.7 mAHD  
**EASTING:** 293403  
**NORTHING:** 6262523

**PIT No:** SP10-TP1  
**PROJECT No:** 94525.02  
**DATE:** 21/3/2019  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
		FILL - dark grey sandy gravel with a trace of rootlets										
	1	- with a trace of brick fragments at 1.0m										
	2											
	3											
					3.4							
				D/E	3.5							
	4.0	Pit discontinued at 4.0m - target depth reached										
	5											
	6											
	7											

**RIG:** 8 tonne backhoe fitted - 450mm bucket

**LOGGED:** JY

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** Stockpile estimated to be approximately 4.0m in height

☐ 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:** Pacific National (NSW) Pty Ltd  
**PROJECT:** Proposed St Marys Intermodal Freight Terminal  
**LOCATION:** Lot 2 Forrester Road, St Marys, NSW

**SURFACE LEVEL:** 25.5 mAHD  
**EASTING:** 293391  
**NORTHING:** 6262520

**PIT No:** SP10-TP2  
**PROJECT No:** 94525.02  
**DATE:** 21/3/2019  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
25		FILL - dark grey sandy gravel with a trace of rootlets										
1												
24												
2												
23												
3				D/E	2.9 3.0							
22												
4	4.0	Pit discontinued at 4.0m - target depth reached										
21												
5												
20												
6												
19												
7												
18												

**RIG:** 8 tonne backhoe fitted - 450mm bucket

**LOGGED:** JY

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** Stockpile estimated to be approximately 4.0m in height

☐ 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:** Pacific National (NSW) Pty Ltd  
**PROJECT:** Proposed St Marys Intermodal Freight Terminal  
**LOCATION:** Lot 2 Forrester Road, St Marys, NSW

**SURFACE LEVEL:** 25.5 mAH  
**EASTING:** 293403  
**NORTHING:** 6262532

**PIT No:** SP10-TP3  
**PROJECT No:** 94525.02  
**DATE:** 21/3/2019  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
25		FILL - dark grey sandy gravel with a trace of rootlets										
1												
24												
2				D/E	1.9 2.0							
23												
3												
22												
4	4.0	Pit discontinued at 4.0m - target depth reached										
21												
5												
20												
6												
19												
7												
18												

**RIG:** 8 tonne backhoe fitted - 450mm bucket

**LOGGED:** JY

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** Stockpile estimated to be approximately 4.0m in height

☐ 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:** Pacific National (NSW) Pty Ltd  
**PROJECT:** Proposed St Marys Intermodal Freight Terminal  
**LOCATION:** Lot 2 Forrester Road, St Marys, NSW

**SURFACE LEVEL:** 25.5 mAHD  
**EASTING:** 293399  
**NORTHING:** 6262537

**PIT No:** SP10-TP4  
**PROJECT No:** 94525.02  
**DATE:** 21/3/2019  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
		FILL - dark grey sandy gravel  - four bricks at 3.0m										
25												
1												
24												
2												
23												
3												
22												
4	4.0	Pit discontinued at 4.0m - target depth reached		D/E	3.9 4.0							
21												
5												
20												
6												
19												
7												
18												

**RIG:** 8 tonne backhoe fitted - 450mm bucket

**LOGGED:** JY

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** Stockpile estimated to be approximately 4.0m in height

☐ 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:** Pacific National (NSW) Pty Ltd  
**PROJECT:** Proposed St Marys Intermodal Freight Terminal  
**LOCATION:** Lot 2 Forrester Road, St Marys, NSW

**SURFACE LEVEL:** 25.4 mAH  
**EASTING:** 293393  
**NORTHING:** 6262545

**PIT No:** SP10-TP5  
**PROJECT No:** 94525.02  
**DATE:** 21/3/2019  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
		FILL - dark grey sandy gravel		D/E	0.2							
					0.3							
	1	- with a trace of roof tile fragments at 1.0m										
	1.5	Pit discontinued at 1.5m - target depth reached										
	2											
	3											
	4											
	5											
	6											
	7											

**RIG:** 8 tonne backhoe fitted - 450mm bucket

**LOGGED:** JY

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** Stockpile estimated to be approximately 1.5m in height

☐ 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)
BB	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U <sub>j</sub>	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	sp	Standard penetration test
E	Environmental sample	W	Water level	S	Shear vane (kPa)

# TEST PIT LOG

**CLIENT:** Pacific National (NSW) Pty Ltd  
**PROJECT:** Proposed St Marys Intermodal Freight Terminal  
**LOCATION:** Lot 2 Forrester Road, St Marys, NSW

**SURFACE LEVEL:** 25.5 mAHD  
**EASTING:** 293394  
**NORTHING:** 6262559

**PIT No:** SP10-TP6  
**PROJECT No:** 94525.02  
**DATE:** 21/3/2019  
**SHEET** 1 OF 1

[illegible]

**RIG:** 8 tonne backhoe fitted - 450mm bucket

LOGGED: JY

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** Stockpile estimated to be approximately 1.0m in height

☐ 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
D	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:** Pacific National (NSW) Pty Ltd  
**PROJECT:** Proposed St Marys Intermodal Freight Terminal  
**LOCATION:** Lot 2 Forrester Road, St Marys, NSW

**SURFACE LEVEL:** 25.5 mAHD  
**EASTING:** 293392  
**NORTHING:** 6262567

**PIT No:** SP10-TP7  
**PROJECT No:** 94525.02  
**DATE:** 21/3/2019  
**SHEET** 1 OF 1

[illegible]

**RIG:** 8 tonne backhoe fitted - 450mm bucket

LOGGED: JY

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** \* Replicate sample BD9/20190321 collected at 0.2 - 0.3m; Stockpile estimated to be approximately 1.0m in height

☐ 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 <sub>s</sub>	Water seep	S	Standard penetration test
E	Environmental sample	W <sub>l</sub>	Water level	V	Shear vane (kPa)



**Douglas Partners**  
Geotechnics | Environment | Groundwater

# TEST PIT LOG

**CLIENT:** Pacific National (NSW) Pty Ltd  
**PROJECT:** Proposed St Marys Intermodal Freight Terminal  
**LOCATION:** Lot 2 Forrester Road, St Marys, NSW

**SURFACE LEVEL:** 25.5 mAHD  
**EASTING:** 293388  
**NORTHING:** 6262599

**PIT No:** SP10-TP8  
**PROJECT No:** 94525.02  
**DATE:** 21/3/2019  
**SHEET** 1 OF 1

[illegible]

**RIG:** 8 tonne backhoe fitted - 450mm bucket

LOGGED: JY

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** Stockpile estimated to be approximately 1.0m in height

- ☐ 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 ls(50) (MPa)
		PL(D)	Point load diametral test ls(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)




# TEST PIT LOG

**CLIENT:** Pacific National (NSW) Pty Ltd  
**PROJECT:** Proposed St Marys Intermodal Freight Terminal  
**LOCATION:** Lot 2 Forrester Road, St Marys, NSW

**SURFACE LEVEL:** 25.3 mAHD  
**EASTING:** 293380  
**NORTHING:** 6262610

**PIT No:** SP10-TP9  
**PROJECT No:** 94525.02  
**DATE:** 21/3/2019  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
25		FILL - pale grey sandy gravel with clay and some cinder block, bitumen and concrete fragments										
1				D/E	0.9 1.0							
24	1.5	Pit discontinued at 1.5m - target depth reached										
2												
23												
3												
22												
4												
21												
5												
20												
6												
19												
7												
18												

**RIG:** 8 tonne backhoe fitted - 450mm bucket

**LOGGED:** JY

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** Stockpile estimated to be approximately 1.5m in height

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

# TEST PIT LOG

**CLIENT:** Pacific National (NSW) Pty Ltd  
**PROJECT:** Proposed St Marys Intermodal Freight Terminal  
**LOCATION:** Lot 2 Forrester Road, St Marys, NSW

**SURFACE LEVEL:** 25.3 mAH  
**EASTING:** 293375  
**NORTHING:** 6262607

**PIT No:** SP10-TP10  
**PROJECT No:** 94525.02  
**DATE:** 21/3/2019  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
25		FILL - pale grey mottled brown silty clay with gravel										
		- with a trace of plastic warning tape at 0.5m		D/E	0.4 0.5							
1	1.0	Pit discontinued at 1.0m - target depth reached										
24												
2												
23												
3												
22												
4												
21												
5												
20												
6												
19												
7												
18												

**RIG:** 8 tonne backhoe fitted - 450mm bucket

**LOGGED:** JY

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** Stockpile estimated to be approximately 1.0m in height

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



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## Appendix H

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Analytical Results Summary Tables H1 and H2

**Table H1- Summary of Bulk Soil Sampling and Analytical Results from Test Pits**

Sample Number	Weight of 10 Litre Bulk Sample (kg)	Number of fragments > 7mm	Condition of Fragments (good/poor)	Size range of Fragment (mm)	Weight of Screened ACM (g)	Concentration of asbestos in ACM in soil (% w/w)*
HSL D for Asbestos in soil	-	-	-	-	-	0.050
TP201 / 0.0 - 0.5	17.7	-	-	-	-	-
TP202 / 0.0 - 0.5	18.2	-	-	-	-	-
TP203 / 0.0 - 0.5	13.2	-	-	-	-	-
TP204 / 0.0 - 0.5	21.1	-	-	-	-	-
TP204 / 1.0 - 1.5	20.1	-	-	-	-	-
TP205 / 0.0 - 1.0	18.7	63	good	10 - 70	494	<b>0.4</b>
TP206 / 0.0 - 0.5	17.3	-	-	-	-	-
TP207 / 0.0 - 0.6	19.4	-	-	-	-	-
TP208 / 0.0 - 0.6	15.7	1	good	30	95	<b>0.09</b>
TP209 / 0.0 - 0.6	19.7	-	-	-	-	-
TP210 / 0.0 - 0.6	18.9	-	-	-	-	-
TP211 / 0.0 - 0.5	16.4	-	-	-	-	-
TP212 / 0.0 - 0.5	15.2	-	-	-	-	-
TP213 / 0.0 - 0.5	19.9	-	-	-	-	-
TP214 / 0.0 - 0.5	17.0	-	-	-	-	-
TP215 / 0.0 - 0.5	17.1	-	-	-	-	-
TP215 / 1.0 - 1.5	20.1	-	-	-	-	-
TP216 / 0.0 - 0.5	18.7	-	-	-	-	-
TP217 / 0.0 - 0.5	18.3	-	-	-	-	-
TP218 / 0.0 - 0.7	19.4	-	-	-	-	-
TP219 / 0.0 - 1.1	13.8	-	-	-	-	-
TP220 / 0.0 - 1.4	15.1	-	-	-	-	-
TP221 / 0.0 - 1.4	15.0	-	-	-	-	-
TP222 / 0.0 - 0.8	15.8	-	-	-	-	-

HSL D for Asbestos in soil

\*

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**Bold**

Table 7 of Schedule B(1), NEPC (2013) for commercial / industrial use

Based on % w/w asbestos in soil assuming 15% asbestos in ACM

Not applicable as no asbestos was detected

Concentration exceeds SAC

Table H2 -Laboratory Analytical Results Summary\_Soil (All results in mg/kg unless otherwise stated)

Sample Location ID <sup>a</sup>	Sample Depth	Sampling Date	Soil Type	Metals								PAH				Total Recoverable Hydrocarbons						BTEX				DDT + DDD + DDE	Organochlorine Pesticides (OCP)										OPP	PCB	Asbestos
				Arsenic	Cadmium	Chromium (VI) <sup>b</sup>	Copper	Lead	Mercury	Nickel	Zinc	Naphthalene	Benzo(a) Pyrene (BaP)	BaP TEQ	Total PAH	TRH C <sub>10</sub> -C <sub>30</sub>	TRH >C <sub>30</sub> *C <sub>40</sub>	F1	F2	F3	F4	Benzene	Toluene	Ethylbenzene	Total xylenes		Aldrin and Dieldrin	Chlordane	Endosulfan	Endrin	Heptachlor	HCB	Methoxychlor	Chlorpyrifos	PCB	Asbestos			
Practical Quantitation Limit (POL)				4	0.4	1	1	1	0.1	1	1	0.1	0.05	0.5	0.05	25	50	25	50	100	100	0.2	0.5	1	3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
Adopted Site Assessment Criteria (SAC) for Soil																																							
HIL D (Commercial/Industrial)				3,000	900	3,600	240,000	1,500	730/180	6,000	400,000	-	-	40	4,000	-	-	-	-	-	-	-	-	-	3600	45	530	2000	100	50	80	2500	2000	7	-	-			
HSL D (Commercial/Industrial) - Sand (0 m to <1m)				-	-	-	-	-	-	-	-	NL	-	-	-	-	-	260	NL	-	-	3	NL	NL	230	-	-	-	-	-	-	-	-	-	-	-	-		
HSL - Intrusive Maintenance Worker - Sand (0 m to <1m)				-	-	-	-	-	-	-	-	NL	-	-	-	-	-	NL	NL	-	-	77	NL	NL	NL												-		
EIL (Commercial/Industrial) - Coarse Material				160	-	670	300	1800	-	300	730	370	1.4	-	-	-	-	-	-	-	-	-	-	-	640*	-	-	-	-	-	-	-	-	-	-	-	-		
ESL (Commercial/Industrial) - Coarse Material				-	-	-	-	-	-	-	-	-	0.7	-	-			215	170	1700	3300	75	135	165	180	-	-	-	-	-	-	-	-	-	-	-	-		
Management Limits (Commercial/Industrial) - Coarse Material				-	-	-	-	-	-	-	-	-	-	-	-	-	-	700	1000	3500	10 000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
PAEC 1 and 6 - Testpit Samples																																							
TP201	0.1-0.2	19/03/2019	Fill	<4	<0.4	22	60	33	<0.1	13	360	<0.1	0.1	<0.5	0.75	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD		
TP202	0.1-0.2	19/03/2019	Fill	5	<0.4	28	60	34	<0.1	22	190	<0.1	0.09	<0.5	0.54	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	
TP203	0.5-0.6	19/03/2019	Fill	5	<0.4	22	48	27	<0.1	23	80	<0.1	0.2	<0.5	1.6	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	
TP204	0.5-0.6	19/03/2019	Fill	4	<0.4	16	45	30	<0.1	18	72	<0.1	0.2	<0.5	2.4	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	
TP205	0.9-1.0	19/03/2019	Fill	7	<0.4	24	50	40	<0.1	18	91	<0.1	0.08	<0.5	0.3	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Chr, Amo, Cro	
TP206	0.1-0.2	19/03/2019	Fill	6	<0.4	32	110	34	<0.1	26	150	<0.1	0.1	<0.5	0.87	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		
TP207	0.5-0.6	19/03/2019	Fill	8	<0.4	23	49	25	<0.1	14	91	<0.1	0.1	<0.5	0.58	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	
TP208	0.5-0.6	19/03/2019	Fill	<4	<0.4	13	7	7	<0.1	3	8	<0.1	<0.05	<0.5	<0.05	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Chr	
TP209	0.1-0.2	19/03/2019	Fill	9	<0.4	23	50	19	<0.1	20	42	<0.1	2.5	3.8	28	<25	<50	<25	<50	120	110	<0.2	<0.5	<1	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	
TP210	0.4-0.5	19/03/2019	Fill	8	<0.4	34	36	76	<0.1	33	70	<0.1	0.7	1	7.4	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	
TP211	0.1-0.2	19/03/2019	Fill	<4	<0.4	70	25	7	<0.1	68	29	<0.1	<0.05	<0.5	0.2	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	
TP212	0.4-0.5	19/03/2019	Fill	<4	<0.4	9	8	14	<0.1	6	24	<0.1	<0.05	<0.5	<0.05	<25	<50	<25	<50	1000	500	<0.2	<0.5	<1	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	
TP212	0.7-0.8	19/03/2019	Fill	5	<0.4	19	11	18	<0.1	6	20	<0.1	<0.05	<0.5	<0.05	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	
TP213	0.4-0.5	19/03/2019	Fill	<4	<0.4	8	7	11	<0.1	7	25	<0.1	<0.05	<0.5	<0.05	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	
TP214	0.2-0.3	19/03/2019	Fill	15	<0.4	13	73	37	<0.1	21	64	<0.1	<0.05	<0.5	<0.05	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	
TP215	0.2-0.3	19/03/2019	Fill	7	<0.4	21	2	32	<0.1	3	6	<0.1	<0.05	<0.5	<0.05	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	
TP216	0-0.5	22/03/2019	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NAD		
TP217	0-0.5	22/03/2019	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NAD		
TP218	0-0.7	22/03/2019	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NAD		
TP219	0-1.1	22/03/2019	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NAD		
TP220	0-1.4	22/03/2019	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NAD		
TP221	0-1.4	22/03/2019	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NAD		
TP222	0-0.8	22/03/2019	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NAD		
ACM Fragments - Surface Sample																																							
ACM 1	-	19/03/2019	Fragment	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Chr			

Notes  
a BH106 to 115 samples are actually from TP106 to TP115 and should be read as TP106 to TP115.  
b All Chromium are assumed to exist in the stable Cr(III) oxidation state, as Cr(VI) will be too reactive and unstable under the normal environment  
c Criteria for pentachlorophenol adopted for phenols  
HIL D / HSL D HIL / HSL for soil contaminants - NEPC 2013, Schedule B1, (Commercial/Industrial land use)  
EIL / ESL EIL / ESL soil for soil contaminant - NEPC 2013, Schedule B1.  
NAD No asbestos detected  
Chr Chrysotile asbestos detected  
Amo Amosite asbestos detected  
Cro Crocidolite asbestos detected  
- Not Analysed  
\* EIL applies to DDT only

Sample Location ID <sup>a</sup>	Sample Depth	Sampling Date	Soil Type	Metals							PAH				Total Recoverable Hydrocarbons						BTEX				DDT + DDD + DDE	Organochlorine Pesticides (OCP)								OPP	PCB	Asbestos		
				Arsenic	Cadmium	Chromium (VI) <sup>b</sup>	Copper	Lead	Mercury	Nickel	Zinc	Naphthalene	Benzo(a) Pyrene (BaP)	BaP TEQ	Total PAH	TRH C <sub>6</sub> -C <sub>10</sub>	TRH >C <sub>10</sub> -C <sub>14</sub>	F1	F2	F3	F4	Benzene	Toluene	Ethylbenzene		Total xylenes	Aldrin and Dieldrin	Chlordane	Endosulfan	Endrin	Heptachlor	HCB	Methoxychlor				Chlorpyrifos	PCB
Practical Quantitation Limit (POL)				4	0.4	1	1	1	0.1	1	1	0.1	0.05	0.5	0.05	25	50	25	50	100	100	0.2	0.5	1	3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1		
Adopted Site Assessment Criteria (SAC) for Soil																																						
HIL D (Commercial/Industrial)				3,000	900	3,600	240,000	1,500	730/180	6,000	400,000	-	-	40	4,000	-	-	-	-	-	-	-	-	-	3600	45	530	2000	100	50	80	2500	2000	7	-			
HSL D (Commercial/Industrial) - Sand (0 m to <1m)				-	-	-	-	-	-	-	-	NL	-	-	-	-	-	260	NL	-	-	3	NL	NL	230	-	-	-	-	-	-	-	-	-	-	-		
HSL - Intrusive Maintenance Worker - Sand (0 m to <1m)				-	-	-	-	-	-	-	-	NL	-	-	-	-	-	NL	NL	-	-	77	NL	NL	NL											-		
EIL (Commercial/Industrial) - Coarse Material				160	-	670	300	1800	-	300	730	370	1.4	-	-	-	-	-	-	-	-	-	-	-	640*	-	-	-	-	-	-	-	-	-	-	-		
ESL (Commercial/Industrial) - Coarse Material				-	-	-	-	-	-	-	-	-	0.7	-	-			215	170	1700	3300	75	135	165	180	-	-	-	-	-	-	-	-	-	-	-		
Management Limits (Commercial/Industrial) - Coarse Material				-	-	-	-	-	-	-	-	-	-	-	-	-	-	700	1000	3500	10 000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Stockpile SP2 Testpit Samples																																						
SP2-TP1	0.7-0.8	19/03/2019	Fill	<4	<0.4	10	77	22	<0.1	7	120	<0.1	<0.05	<0.5	<0.05	<0.05	<0.05	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	
SP2-TP4	0.4-0.5	19/03/2019	Fill	13	<0.4	9	61	16	<0.1	10	33	<0.1	<0.05	<0.5	<0.05	<0.05	<0.05	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	
SP2-TP8	1.9-2.0	19/03/2019	Fill	<4	<0.4	11	54	16	<0.1	18	43	<0.1	<0.05	<0.5	<0.05	<0.05	<0.05	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	
SP2-TP10	0.1-0.2	19/03/2019	Fill	<4	<0.4	7	38	9	<0.1	6	32	<0.1	0.2	<0.5	1.7	<25	<50	<25	<50	<100	130	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	
Stockpile SP3 Testpit Samples																																						
SP3/TP1	0.4-0.5	19/03/2019	Fill	<4	<0.4	15	9	22	<0.1	4	24	<0.1	0.07	<0.5	0.3	<25	<50	<25	<50	<100	<100	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD
SP3/TP2	0.7-0.8	19/03/2019	Fill	4	<0.4	18	7	15	<0.1	4	13	<0.1	0.05	<0.5	0.3	<25	<50	<25	<50	<100	<100	<100	<100															



Table H3 -Laboratory Analytical Results Summary\_Soil (All results in mg/kg unless otherwise stated)

Sample Location ID <sup>a</sup>	Sample Depth	Sampling Date	Soil Type	Metals								PAH				Total Recoverable Hydrocarbons						BTEX					Organochlorine Pesticides (OCP)										OPP	PCB	Asbestos
				Arsenic	Cadmium	Chromium (VI) <sup>b</sup>	Copper	Lead	Mercury	Nickel	Zinc	Naphthalene	Benzo(a) Pyrene (BaP)	BaP TEQ	Total PAH	TRH C <sub>9</sub> -C <sub>10</sub>	TRH >C <sub>10</sub> -C <sub>16</sub>	F1	F2	F3	F4	Benzene	Toluene	Ethylbenzene	Total xylenes		DDT + DDD + DDE	Aldrin and Dieldrin	Chlordane	Endosulfan	Endrin	Heptachlor	HCB	Methoxychlor	Chlorpyrifos	PCB	Asbestos		
Practical Quantitation Limit (POL)				4	0.4	1	1	1	0.1	1	1	0.1	0.05	0.5	0.05	25	50	25	50	100	100	0.2	0.5	1	3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1		
Adopted Site Assessment Criteria (SAC) for Soil																																							
HIL D (Commercial/Industrial)				3,000	900	3,600	240,000	1,500	730/180	6,000	400,000	-	-	40	4,000	-	-	-	-	-	-	-	-	-	3600	45	530	2000	100	50	80	2500	2000	7	-				
HSL D (Commercial/Industrial) - Sand (0 m to <1m)				-	-	-	-	-	-	-	-	NL	-	-	-	-	-	260	NL	-	-	3	NL	NL	230	-	-	-	-	-	-	-	-	-	-	-			
HSL - Intrusive Maintenance Worker - Sand (0 m to <1m)				-	-	-	-	-	-	-	-	NL	-	-	-	-	-	NL	NL	-	-	77	NL	NL	NL											-			
EIL (Commercial/Industrial) - Coarse Material				160	-	670	300	1800	-	300	730	370	1.4	-	-	-	-	-	-	-	-	-	-	-	640*	-	-	-	-	-	-	-	-	-	-	-	-		
ESL (Commercial/Industrial) - Coarse Material				-	-	-	-	-	-	-	-	-	0.7	-	-			215	170	1700	3300	75	135	165	180	-	-	-	-	-	-	-	-	-	-	-	-		
Management Limits (Commercial/Industrial) - Coarse Material				-	-	-	-	-	-	-	-	-	-	-	-	-	700	1000	3500	10 000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Stockpile SP4 Testpit Samples																																							
SP4-TP1	0.4-0.5	22/03/2019	FIII	24	0.7	9	150	80	0.2	13	130	<0.1	0.1	<0.5	1.3	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD		
SP4-TP5	0.4-0.5	22/03/2019	FIII	130	5.4	36	350	480	0.2	33	590	0.2	1.4	2.1	17	<25	<50	<25	<50	340	130	<0.2	<0.5	<1	<1	1.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD		
SP4-TP8	0.4-0.5	22/03/2019	FIII	150	5.2	19	270	400	0.2	23	490	0.2	0.5	0.8	6.5	<25	<50	<25	<50	220	<100	<0.2	<0.5	<1	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD		
SP4-TP10	0.5-0.6	22/03/2019	FIII	130	4	24	280	690	0.2	29	490	0.3	1.2	2	17	<25	<50	<25	<50	320	120	<0.2	<0.5	<1	<1	2.8	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD		

Notes

a BH106 to 115 samples are actually from TP106 to TP115 and should be read as TP106 to TP115.

b All Chromium are assumed to exist in the stable Cr(III) oxidation state, as Cr(VI) will be too reactive and unstable under the normal environment

c Criteria for pentachlorophenol adopted for phenols

HIL D / HSL D HIL / HSL for soil contaminants - NEPC 2013, Schedule B1, (Commercial/Industrial land use)

EIL / ESL EIL / ESL soil for soil contaminant - NEPC 2013, Schedule B1.

NAD No asbestos detected

Chr Chrysotile asbestos detected

Amo Amosite asbestos detected

Cro Crocidolite asbestos detected

- Not Analysed

\* EIL applies to DDT only

\*\* Exceeds Scheduled Chemical Waste criteria of 2 mg/kg for DDT+DDD+DDE

Table H4 -Laboratory Analytical Results Summary\_Soil (All results in mg/kg unless otherwise stated)

Sample Location ID *	Sample Depth	Sampling Date	Soil Type	Metals							PAH				Total Recoverable Hydrocarbons							BTEX					Organochlorine Pesticides (OCP)										OPP	PCB	Asbestos
				Arsenic	Cadmium	Chromium (VI) <sup>b</sup>	Copper	Lead	Mercury	Nickel	Zinc	Naphthalene	Benzo(a) Pyrene (BaP)	BaP TEQ	Total PAH	TRH C <sub>6</sub> -C <sub>10</sub>	TRH >C <sub>10</sub> -C <sub>14</sub>	F1	F2	F3	F4	Benzene	Toluene	Ethylbenzene	Total Xylenes		DDT + DDD + DDE	Aldrin and Dieldrin	Chlordane	Endosulfan	Endrin	Heptachlor	HCB	Methoxychlor	Chlorpyrifos	PCB	Asbestos		
Practical Quantitation Limit (POL)				4	0.4	1	1	1	0.1	1	1	0.1	0.05	0.5	0.05	25	50	25	50	100	100	0.2	0.5	1	3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Adopted Site Assessment Criteria (SAC) for Soil																																							
HIL D (Commercial/Industrial)				3,000	900	3,600	240,000	1,500	730/180	6,000	400,000	-	-	40	4,000	-	-	-	-	-	-	-	-	-	3600	45	530	2000	100	50	80	2500	2000	7	-	-			
HSL D (Commercial/Industrial) - Sand (0 m to <1m)				-	-	-	-	-	-	-	-	NL	-	-	-	-	-	260	NL	-	-	3	NL	NL	230	-	-	-	-	-	-	-	-	-	-	-	-	-	
HSL - Intrusive Maintenance Worker - Sand (0 m to <1m)				-	-	-	-	-	-	-	-	NL	-	-	-	-	-	NL	NL	-	-	77	NL	NL	NL													-	
EIL (Commercial/Industrial) - Coarse Material				160	-	670	300	1800	-	300	730	370	1.4	-	-	-	-	-	-	-	-	-	-	-	640*	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ESL (Commercial/Industrial) - Coarse Material				-	-	-	-	-	-	-	-	-	0.7	-	-			215	170	1700	3300	75	135	165	180	-	-	-	-	-	-	-	-	-	-	-	-	-	
Management Limits (Commercial/Industrial) - Coarse Material				-	-	-	-	-	-	-	-	-	-	-	-	-	700	1000	3500	10 000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stockpile SP5 Testpit Samples																																							
SP5-TP1	1.9-2.0	22/03/2019	Fill	<4	<0.4	13	11	17	<0.1	8	27	<0.1	<0.05	<0.5	<0.05	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD
SP5-TP3	0.9-1.0	22/03/2019	Fill	6	<0.4	22	11	19	<0.1	7	33	<0.1	<0.05	<0.5	<0.05	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD
SP5-TP6	1.4-1.5	22/03/2019	Fill	4	<0.4	15	12	18	<0.1	8	29	<0.1	<0.05	<0.5	<0.05	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD
SP5-TP8	1.9-2.0	22/03/2019	Fill	4	<0.4	11	10	16	<0.1	9	30	<0.1	<0.05	<0.5	<0.05	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD
Stockpile SP7 Testpit Samples																																							
SP7-TP1	0.2-0.3	19/03/2019	Fill	<4	<0.4	22	13	10	<0.1	12	53	<0.1	<0.05	<0.5	<0.05	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD
SP7-TP2	0.4-.05	19/03/2019	Fill	<4	<0.4	14	29	10	<0.1	8	45	<0.1	0.3	<0.5	3	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD
Stockpile SP8 Testpit Samples																																							
SP8-TP1	0.6-0.7	19/03/2019	Fill	<4	<0.4	7	4	10	<0.1	5	18	<0.1	<0.05	<0.5	<0.05	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD
SP8-TP2	0.6-0.7	19/03/2019	Fill	<4	<0.4	7	4	10	<0.1	5	18	<0.1	0.3	<0.5	<0.05	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD
Stockpile SP9 Testpit Samples																																							
SP9-TP1	0.5-0.6	19/03/2019	Fill	<4	<0.4	9	32	55	<0.1	8	79	<0.1	1.2	1.9	21	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD
SP9-TP2	0.5-0.6	19/03/2019	Fill	<4	<0.4	17	28	96	<0.1	10	120	<0.1	0.5	0.7	5.4	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD
Stockpile SP10 Testpit Samples																																							
SP10-TP1	3.4-3.5	22/03/2019	Fill	120	0.6	9	170	240	0.1	18	130	<0.1	0.09	<0.5	1.4	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD
SP10-TP3	1.9-2.0	22/03/2019	Fill	170	0.8	10	420	290	0.2	21	190	<0.1	0.1	<0.5	1.7	<25	<50	<25	<50	130	<100	<0.2	<0.5	<1	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD
SP10-TP6	0.6-0.7	22/03/2019	Fill	6	<0.4	18	23	18	<0.1	20	39	<0.1	0.2	<0.5	2.3	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD
SP10-TP10	0.4-0.5	22/03/2019	Fill	<4	<0.4	8	8	11	<0.1	3	9	<0.1	<0.05	<0.5	<0.05	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD
Power Pole Samples																																							
PP1-N-0.3/0.1	0.1-0.2	22/03/2019	Fill	8	<0.4	16	33	14	<0.1	8	65	<0.1	0.1	<0.5	1.5	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	
PP2-N-0.3/0.1	0.1-0.2	22/03/2019	Fill	5	<0.4	11	12	13	<0.1	8	100	0.1	9	14	76	<25	81	<25	81	990	240	<0.2	<0.5	<1	<1	<1	<1	7.7	<1	<1	<1	<1	<1	<1	<1	<1	-		
PP3-N-0.3/0.1	0.1-0.2	22/03/2019	Fill	<4	<0.4	9	9	12	<0.1	7	42	<0.1	<0.05	<0.5	<0.05	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	
PP4-N-0.3/0.1	0.1-0.2	22/03/2019	Fill	<4	<0.4	10	8	11	<0.1	6	120	<0.1	<0.05	<0.5	<0.05	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	
PP5-N-0.3/0.1	0.1-0.2	22/03/2019	Fill	<4	<0.4	9	5	16	<0.1	6	56	<0.1	0.06	<0.5	0.2	<25	<50	<25	<50	3100	1100	<0.2	<0.5	<1	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-		
Railway Corridor Samples																																							
RC1	0.1-0.2	22/03/2019	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NAD			
RC2	0.1-0.2	22/03/2019	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NAD			
RC3	0.1-0.2	22/03/2019	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NAD			

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## **Appendix I**

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Lab Certificates of Analysis and Chain-of-Custody documentation

## CERTIFICATE OF ANALYSIS 213992

### Client Details

<b>Client</b>	Douglas Partners Pty Ltd Smeaton Grange
<b>Attention</b>	Grant Russell
<b>Address</b>	18 Waler Crescent, Smeaton Grange, NSW, 2567

### Sample Details

<b>Your Reference</b>	<b><u>94525.02, St Marys</u></b>
<b>Number of Samples</b>	29 Soil
<b>Date samples received</b>	21/03/2019
<b>Date completed instructions received</b>	28/03/2019

### 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

<b>Date results requested by</b>	03/04/2019
<b>Date of Issue</b>	03/04/2019
NATA Accreditation Number 2901. This document shall not be reproduced except in full.	
Accredited for compliance with ISO/IEC 17025 - Testing. <b>Tests not covered by NATA are denoted with *</b>	

#### Asbestos Approved By

Analysed by Asbestos Approved Identifier: Aida Marner  
 Authorised by Asbestos Approved Signatory: Matt Tang

#### Results Approved By

Jeremy Faircloth, Operations Manager, Sydney  
 Ken Nguyen, Reporting Supervisor  
 Lucy Zhu, Senior Asbestos Analyst  
 Matthew Tang, Asbestos Supervisor  
 Nancy Zhang, Laboratory Manager, Sydney  
 Steven Luong, Organics Supervisor

#### Authorised By



Jacinta Hurst, Laboratory Manager



## vTRH(C6-C10)/BTEXN in Soil

Our Reference		213992-1	213992-2	213992-3	213992-4	213992-5
Your Reference	UNITS	SP3/TP1	SP3/TP2	SP3/TP3	SP3/TP4	SP3/TP5
Depth		0.4-0.5	0.7-0.8	2.9-3.0	0.4-0.5	2.9-3.0
Date Sampled		19/03/2019	19/03/2019	19/03/2019	19/03/2019	19/03/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	03/04/2019	03/04/2019	03/04/2019	03/04/2019	03/04/2019
TRH C <sub>6</sub> - C <sub>9</sub>	mg/kg	<25	<25	<25	<25	<25
TRH C <sub>6</sub> - C <sub>10</sub>	mg/kg	<25	<25	<25	<25	<25
vTPH C <sub>6</sub> - C <sub>10</sub> 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	%	85	81	82	78	84

## vTRH(C6-C10)/BTEXN in Soil

Our Reference		213992-6	213992-7	213992-8	213992-9	213992-10
Your Reference	UNITS	SP3/TP6	SP3/TP7	SP3/TP8	SP3/TP9	SP3/TP10
Depth		0.2-0.3	0.3-0.4	0.6-0.7	0.5-0.6	0.9-1.0
Date Sampled		19/03/2019	19/03/2019	19/03/2019	19/03/2019	19/03/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	03/04/2019	03/04/2019	03/04/2019	03/04/2019	03/04/2019
TRH C <sub>6</sub> - C <sub>9</sub>	mg/kg	<25	<25	<25	<25	<25
TRH C <sub>6</sub> - C <sub>10</sub>	mg/kg	<25	<25	<25	<25	<25
vTPH C <sub>6</sub> - C <sub>10</sub> 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	%	90	73	66	85	64

## vTRH(C6-C10)/BTEXN in Soil

Our Reference		213992-11	213992-12	213992-13	213992-14	213992-15
Your Reference	UNITS	SP3/TP11	SP3/TP12	SP7-TP1	SP7-TP2	SP8-TP1
Depth		0.6-0.7	0.4-0.5	0.2-0.3	0.4-.05	0.6
Date Sampled		19/03/2019	19/03/2019	19/03/2019	19/03/2019	19/03/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	03/04/2019	03/04/2019	03/04/2019	03/04/2019	03/04/2019
TRH C <sub>6</sub> - C <sub>9</sub>	mg/kg	<25	<25	<25	<25	<25
TRH C <sub>6</sub> - C <sub>10</sub>	mg/kg	<25	<25	<25	<25	<25
vTPH C <sub>6</sub> - C <sub>10</sub> 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	%	72	88	85	87	88

## vTRH(C6-C10)/BTEXN in Soil

Our Reference		213992-16	213992-17	213992-18	213992-19	213992-20
Your Reference	UNITS	SP8-TP2	SP9-TP1	SP9-TP2	BD1/20190319	BD2/20190319
Depth		0.6	0.5	0.5	-	-
Date Sampled		19/03/2019	19/03/2019	19/03/2019	19/03/2019	19/03/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	03/04/2019	03/04/2019	03/04/2019	03/04/2019	03/04/2019
TRH C <sub>6</sub> - C <sub>9</sub>	mg/kg	<25	<25	<25	<25	<25
TRH C <sub>6</sub> - C <sub>10</sub>	mg/kg	<25	<25	<25	<25	<25
vTPH C <sub>6</sub> - C <sub>10</sub> 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	%	87	84	78	76	72

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		213992-21	213992-22	213992-23	213992-24	213992-25
Your Reference	UNITS	BD3/20190319	BD4/20190319	BD5/20190319	BD6/20190319	SP3-TP13
Depth		-	-	-	-	0.9
Date Sampled		19/03/2019	19/03/2019	19/03/2019	19/03/2019	19/03/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	03/04/2019	03/04/2019	03/04/2019	03/04/2019	03/04/2019
TRH C <sub>6</sub> - C <sub>9</sub>	mg/kg	<25	<25	<25	<25	<25
TRH C <sub>6</sub> - C <sub>10</sub>	mg/kg	<25	<25	<25	<25	<25
vTPH C <sub>6</sub> - C <sub>10</sub> 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	%	87	80	84	88	70

vTRH(C6-C10)/BTEXN in Soil			
Our Reference		213992-26	213992-27
Your Reference	UNITS	TB/190319	TS/190319
Depth		-	-
Date Sampled		19/03/2019	19/03/2019
Type of sample		Soil	Soil
Date extracted	-	01/04/2019	01/04/2019
Date analysed	-	03/04/2019	03/04/2019
TRH C <sub>6</sub> - C <sub>9</sub>	mg/kg	<25	[NA]
TRH C <sub>6</sub> - C <sub>10</sub>	mg/kg	<25	[NA]
vTPH C <sub>6</sub> - C <sub>10</sub> less BTEX (F1)	mg/kg	<25	[NA]
Benzene	mg/kg	<0.2	92%
Toluene	mg/kg	<0.5	84%
Ethylbenzene	mg/kg	<1	75%
m+p-xylene	mg/kg	<2	77%
o-Xylene	mg/kg	<1	76%
naphthalene	mg/kg	<1	[NA]
Total +ve Xylenes	mg/kg	<1	[NA]
Surrogate aaa-Trifluorotoluene	%	75	77

svTRH (C10-C40) in Soil						
Our Reference	UNITS	213992-1	213992-2	213992-3	213992-4	213992-5
Your Reference		SP3/TP1	SP3/TP2	SP3/TP3	SP3/TP4	SP3/TP5
Depth		0.4-0.5	0.7-0.8	2.9-3.0	0.4-0.5	2.9-3.0
Date Sampled		19/03/2019	19/03/2019	19/03/2019	19/03/2019	19/03/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	03/04/2019	03/04/2019	03/04/2019	03/04/2019	03/04/2019
TRH C <sub>10</sub> - C <sub>14</sub>	mg/kg	<50	<50	<50	<50	<50
TRH C <sub>15</sub> - C <sub>28</sub>	mg/kg	<100	<100	<100	<100	<100
TRH C <sub>29</sub> - C <sub>36</sub>	mg/kg	<100	<100	<100	<100	<100
TRH >C <sub>10</sub> -C <sub>16</sub>	mg/kg	<50	<50	<50	<50	<50
TRH >C <sub>10</sub> - C <sub>16</sub> less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C <sub>16</sub> -C <sub>34</sub>	mg/kg	<100	<100	<100	<100	<100
TRH >C <sub>34</sub> -C <sub>40</sub>	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	89	89	91	89	90

svTRH (C10-C40) in Soil						
Our Reference	UNITS	213992-6	213992-7	213992-8	213992-9	213992-10
Your Reference		SP3/TP6	SP3/TP7	SP3/TP8	SP3/TP9	SP3/TP10
Depth		0.2-0.3	0.3-0.4	0.6-0.7	0.5-0.6	0.9-1.0
Date Sampled		19/03/2019	19/03/2019	19/03/2019	19/03/2019	19/03/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	03/04/2019	03/04/2019	03/04/2019	03/04/2019	03/04/2019
TRH C <sub>10</sub> - C <sub>14</sub>	mg/kg	<50	<50	<50	<50	<50
TRH C <sub>15</sub> - C <sub>28</sub>	mg/kg	<100	140	<100	<100	<100
TRH C <sub>29</sub> - C <sub>36</sub>	mg/kg	220	300	<100	<100	<100
TRH >C <sub>10</sub> -C <sub>16</sub>	mg/kg	<50	<50	<50	<50	<50
TRH >C <sub>10</sub> - C <sub>16</sub> less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C <sub>16</sub> -C <sub>34</sub>	mg/kg	230	340	<100	<100	<100
TRH >C <sub>34</sub> -C <sub>40</sub>	mg/kg	130	200	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	360	540	<50	<50	<50
Surrogate o-Terphenyl	%	93	101	89	88	90



## svTRH (C10-C40) in Soil

Our Reference		213992-11	213992-12	213992-13	213992-14	213992-15
Your Reference	UNITS	SP3/TP11	SP3/TP12	SP7-TP1	SP7-TP2	SP8-TP1
Depth		0.6-0.7	0.4-0.5	0.2-0.3	0.4-.05	0.6
Date Sampled		19/03/2019	19/03/2019	19/03/2019	19/03/2019	19/03/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	03/04/2019	03/04/2019	03/04/2019	03/04/2019	03/04/2019
TRH C <sub>10</sub> - C <sub>14</sub>	mg/kg	<50	<50	<50	<50	<50
TRH C <sub>15</sub> - C <sub>28</sub>	mg/kg	<100	<100	<100	<100	<100
TRH C <sub>29</sub> - C <sub>36</sub>	mg/kg	<100	<100	<100	<100	<100
TRH >C <sub>10</sub> -C <sub>16</sub>	mg/kg	<50	<50	<50	<50	<50
TRH >C <sub>10</sub> - C <sub>16</sub> less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C <sub>16</sub> -C <sub>34</sub>	mg/kg	<100	<100	<100	<100	<100
TRH >C <sub>34</sub> -C <sub>40</sub>	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	90	92	91	89	92

## svTRH (C10-C40) in Soil

Our Reference		213992-16	213992-17	213992-18	213992-19	213992-20
Your Reference	UNITS	SP8-TP2	SP9-TP1	SP9-TP2	BD1/20190319	BD2/20190319
Depth		0.6	0.5	0.5	-	-
Date Sampled		19/03/2019	19/03/2019	19/03/2019	19/03/2019	19/03/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	03/04/2019	03/04/2019	03/04/2019	03/04/2019	03/04/2019
TRH C <sub>10</sub> - C <sub>14</sub>	mg/kg	<50	<50	<50	<50	<50
TRH C <sub>15</sub> - C <sub>28</sub>	mg/kg	<100	<100	<100	<100	<100
TRH C <sub>29</sub> - C <sub>36</sub>	mg/kg	<100	<100	<100	<100	<100
TRH >C <sub>10</sub> -C <sub>16</sub>	mg/kg	<50	<50	<50	<50	<50
TRH >C <sub>10</sub> - C <sub>16</sub> less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C <sub>16</sub> -C <sub>34</sub>	mg/kg	<100	<100	<100	<100	<100
TRH >C <sub>34</sub> -C <sub>40</sub>	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	89	89	89	89	89

svTRH (C10-C40) in Soil						
Our Reference		213992-21	213992-22	213992-23	213992-24	213992-25
Your Reference	UNITS	BD3/20190319	BD4/20190319	BD5/20190319	BD6/20190319	SP3-TP13
Depth		-	-	-	-	0.9
Date Sampled		19/03/2019	19/03/2019	19/03/2019	19/03/2019	19/03/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	03/04/2019	03/04/2019	03/04/2019	03/04/2019	03/04/2019
TRH C <sub>10</sub> - C <sub>14</sub>	mg/kg	<50	<50	<50	<50	<50
TRH C <sub>15</sub> - C <sub>28</sub>	mg/kg	<100	<100	<100	<100	<100
TRH C <sub>29</sub> - C <sub>36</sub>	mg/kg	100	140	<100	<100	<100
TRH >C <sub>10</sub> -C <sub>16</sub>	mg/kg	<50	<50	<50	<50	<50
TRH >C <sub>10</sub> - C <sub>16</sub> less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C <sub>16</sub> -C <sub>34</sub>	mg/kg	120	160	<100	<100	<100
TRH >C <sub>34</sub> -C <sub>40</sub>	mg/kg	120	160	120	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	230	330	120	<50	<50
Surrogate o-Terphenyl	%	91	91	90	93	90

PAHs in Soil						
Our Reference		213992-1	213992-2	213992-3	213992-4	213992-5
Your Reference	UNITS	SP3/TP1	SP3/TP2	SP3/TP3	SP3/TP4	SP3/TP5
Depth		0.4-0.5	0.7-0.8	2.9-3.0	0.4-0.5	2.9-3.0
Date Sampled		19/03/2019	19/03/2019	19/03/2019	19/03/2019	19/03/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	03/04/2019	03/04/2019	03/04/2019	03/04/2019	03/04/2019
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	0.07	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	0.3	0.3	<0.05	<0.05	<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	%	110	116	115	112	110

PAHs in Soil						
Our Reference		213992-6	213992-7	213992-8	213992-9	213992-10
Your Reference	UNITS	SP3/TP6	SP3/TP7	SP3/TP8	SP3/TP9	SP3/TP10
Depth		0.2-0.3	0.3-0.4	0.6-0.7	0.5-0.6	0.9-1.0
Date Sampled		19/03/2019	19/03/2019	19/03/2019	19/03/2019	19/03/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	03/04/2019	03/04/2019	03/04/2019	03/04/2019	03/04/2019
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.2
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.2
Phenanthrene	mg/kg	0.1	0.1	0.3	<0.1	3.2
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.6
Fluoranthene	mg/kg	0.2	0.2	0.6	<0.1	6.5
Pyrene	mg/kg	0.2	0.2	0.6	<0.1	6.1
Benzo(a)anthracene	mg/kg	<0.1	0.1	0.3	<0.1	2.0
Chrysene	mg/kg	0.2	0.2	0.4	<0.1	2.5
Benzo(b,j+k)fluoranthene	mg/kg	0.2	0.3	0.6	<0.2	4.0
Benzo(a)pyrene	mg/kg	0.08	0.1	0.3	<0.05	2.6
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	0.2	<0.1	1.8
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.3
Benzo(g,h,i)perylene	mg/kg	0.1	0.2	0.2	<0.1	2.3
Total +ve PAH's	mg/kg	1.2	1.4	3.6	<0.05	33
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	3.8
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	3.8
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	0.5	<0.5	3.8
Surrogate p-Terphenyl-d14	%	112	114	113	114	110



PAHs in Soil						
Our Reference		213992-11	213992-12	213992-13	213992-14	213992-15
Your Reference	UNITS	SP3/TP11	SP3/TP12	SP7-TP1	SP7-TP2	SP8-TP1
Depth		0.6-0.7	0.4-0.5	0.2-0.3	0.4-.05	0.6
Date Sampled		19/03/2019	19/03/2019	19/03/2019	19/03/2019	19/03/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	03/04/2019	03/04/2019	03/04/2019	03/04/2019	03/04/2019
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	0.2	0.2	<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	3.6	2.2	<0.1	0.3	<0.1
Anthracene	mg/kg	0.7	0.4	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	6.6	4.6	<0.1	0.5	<0.1
Pyrene	mg/kg	6.3	4.4	<0.1	0.5	<0.1
Benzo(a)anthracene	mg/kg	2.1	1.4	<0.1	0.2	<0.1
Chrysene	mg/kg	2.2	1.7	<0.1	0.3	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	3.6	2.8	<0.2	0.4	<0.2
Benzo(a)pyrene	mg/kg	2.2	1.8	<0.05	0.3	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	1.5	1.2	<0.1	0.2	<0.1
Dibenzo(a,h)anthracene	mg/kg	0.3	0.2	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	2.0	1.6	<0.1	0.3	<0.1
Total +ve PAH's	mg/kg	31	23	<0.05	3.0	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	3.2	2.6	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	3.2	2.6	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	3.2	2.6	<0.5	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	108	107	114	107	120

PAHs in Soil						
Our Reference		213992-16	213992-17	213992-18	213992-19	213992-20
Your Reference	UNITS	SP8-TP2	SP9-TP1	SP9-TP2	BD1/20190319	BD2/20190319
Depth		0.6	0.5	0.5	-	-
Date Sampled		19/03/2019	19/03/2019	19/03/2019	19/03/2019	19/03/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	03/04/2019	03/04/2019	03/04/2019	03/04/2019	03/04/2019
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	0.2	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	3.9	0.5	0.1	0.1
Anthracene	mg/kg	<0.1	1.0	0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	4.0	1	0.2	0.2
Pyrene	mg/kg	<0.1	3.4	0.9	0.2	0.2
Benzo(a)anthracene	mg/kg	<0.1	1.6	0.4	0.1	0.1
Chrysene	mg/kg	<0.1	1.6	0.5	0.2	0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	2.1	0.8	0.3	0.3
Benzo(a)pyrene	mg/kg	<0.05	1.2	0.5	0.2	0.1
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	0.7	0.3	0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	0.2	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	0.8	0.4	0.2	0.1
Total +ve PAH's	mg/kg	<0.05	21	5.4	1.6	1.4
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	1.9	0.7	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	1.9	0.7	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	1.9	0.8	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	100	106	108	110	113

PAHs in Soil						
Our Reference		213992-21	213992-22	213992-23	213992-24	213992-25
Your Reference	UNITS	BD3/20190319	BD4/20190319	BD5/20190319	BD6/20190319	SP3-TP13
Depth		-	-	-	-	0.9
Date Sampled		19/03/2019	19/03/2019	19/03/2019	19/03/2019	19/03/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	03/04/2019	03/04/2019	03/04/2019	03/04/2019	03/04/2019
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	0.3	<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	0.4	1	<0.1	<0.1	0.4
Anthracene	mg/kg	0.2	0.3	<0.1	<0.1	0.1
Fluoranthene	mg/kg	2.0	3.0	<0.1	0.2	0.9
Pyrene	mg/kg	1.8	3.0	<0.1	0.3	1
Benzo(a)anthracene	mg/kg	1.0	1.2	<0.1	0.1	0.4
Chrysene	mg/kg	1.1	1.4	<0.1	0.1	0.6
Benzo(b,j+k)fluoranthene	mg/kg	1	2.7	<0.2	0.2	0.7
Benzo(a)pyrene	mg/kg	0.89	1.8	<0.05	0.1	0.4
Indeno(1,2,3-c,d)pyrene	mg/kg	0.4	1.3	<0.1	<0.1	0.2
Dibenzo(a,h)anthracene	mg/kg	0.2	0.2	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	0.5	1.8	<0.1	0.1	0.4
Total +ve PAH's	mg/kg	9.9	18	<0.05	1.3	5.1
Benzo(a)pyrene TEQ calc (zero)	mg/kg	1.4	2.5	<0.5	<0.5	0.6
Benzo(a)pyrene TEQ calc(half)	mg/kg	1.4	2.5	<0.5	<0.5	0.6
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	1.4	2.5	<0.5	<0.5	0.7
Surrogate p-Terphenyl-d14	%	112	112	113	111	114

Organochlorine Pesticides in soil						
Our Reference		213992-1	213992-2	213992-3	213992-4	213992-5
Your Reference	UNITS	SP3/TP1	SP3/TP2	SP3/TP3	SP3/TP4	SP3/TP5
Depth		0.4-0.5	0.7-0.8	2.9-3.0	0.4-0.5	2.9-3.0
Date Sampled		19/03/2019	19/03/2019	19/03/2019	19/03/2019	19/03/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
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	%	83	82	86	83	85



## Organochlorine Pesticides in soil

Our Reference		213992-6	213992-7	213992-8	213992-9	213992-10
Your Reference	UNITS	SP3/TP6	SP3/TP7	SP3/TP8	SP3/TP9	SP3/TP10
Depth		0.2-0.3	0.3-0.4	0.6-0.7	0.5-0.6	0.9-1.0
Date Sampled		19/03/2019	19/03/2019	19/03/2019	19/03/2019	19/03/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
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	%	82	83	82	83	83

Organochlorine Pesticides in soil						
Our Reference		213992-11	213992-12	213992-13	213992-14	213992-15
Your Reference	UNITS	SP3/TP11	SP3/TP12	SP7-TP1	SP7-TP2	SP8-TP1
Depth		0.6-0.7	0.4-0.5	0.2-0.3	0.4-.05	0.6
Date Sampled		19/03/2019	19/03/2019	19/03/2019	19/03/2019	19/03/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
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	%	83	83	81	81	85

Organochlorine Pesticides in soil					
Our Reference		213992-16	213992-17	213992-18	213992-25
Your Reference	UNITS	SP8-TP2	SP9-TP1	SP9-TP2	SP3-TP13
Depth		0.6	0.5	0.5	0.9
Date Sampled		19/03/2019	19/03/2019	19/03/2019	19/03/2019
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	81	82	82	79

## Organophosphorus Pesticides

Our Reference		213992-1	213992-2	213992-3	213992-4	213992-5
Your Reference	UNITS	SP3/TP1	SP3/TP2	SP3/TP3	SP3/TP4	SP3/TP5
Depth		0.4-0.5	0.7-0.8	2.9-3.0	0.4-0.5	2.9-3.0
Date Sampled		19/03/2019	19/03/2019	19/03/2019	19/03/2019	19/03/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
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	%	83	82	86	83	85

## Organophosphorus Pesticides

Our Reference		213992-6	213992-7	213992-8	213992-9	213992-10
Your Reference	UNITS	SP3/TP6	SP3/TP7	SP3/TP8	SP3/TP9	SP3/TP10
Depth		0.2-0.3	0.3-0.4	0.6-0.7	0.5-0.6	0.9-1.0
Date Sampled		19/03/2019	19/03/2019	19/03/2019	19/03/2019	19/03/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
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	%	82	83	82	83	83



**Organophosphorus Pesticides**

Our Reference		213992-11	213992-12	213992-13	213992-14	213992-15
Your Reference	UNITS	SP3/TP11	SP3/TP12	SP7-TP1	SP7-TP2	SP8-TP1
Depth		0.6-0.7	0.4-0.5	0.2-0.3	0.4-.05	0.6
Date Sampled		19/03/2019	19/03/2019	19/03/2019	19/03/2019	19/03/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
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	%	83	83	81	81	85

**Organophosphorus Pesticides**

Our Reference		213992-16	213992-17	213992-18	213992-25
Your Reference	UNITS	SP8-TP2	SP9-TP1	SP9-TP2	SP3-TP13
Depth		0.6	0.5	0.5	0.9
Date Sampled		19/03/2019	19/03/2019	19/03/2019	19/03/2019
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1
Chlorpyrifos	mg/kg	<0.1	<0.1	<0.1	<0.1
Chlorpyrifos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	81	82	82	79

PCBs in Soil						
Our Reference	UNITS	213992-1	213992-2	213992-3	213992-4	213992-5
Your Reference		SP3/TP1	SP3/TP2	SP3/TP3	SP3/TP4	SP3/TP5
Depth		0.4-0.5	0.7-0.8	2.9-3.0	0.4-0.5	2.9-3.0
Date Sampled		19/03/2019	19/03/2019	19/03/2019	19/03/2019	19/03/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
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	%	83	82	86	83	85

PCBs in Soil						
Our Reference	UNITS	213992-6	213992-7	213992-8	213992-9	213992-10
Your Reference		SP3/TP6	SP3/TP7	SP3/TP8	SP3/TP9	SP3/TP10
Depth		0.2-0.3	0.3-0.4	0.6-0.7	0.5-0.6	0.9-1.0
Date Sampled		19/03/2019	19/03/2019	19/03/2019	19/03/2019	19/03/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
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	%	82	83	82	83	83

PCBs in Soil						
Our Reference		213992-11	213992-12	213992-13	213992-14	213992-15
Your Reference	UNITS	SP3/TP11	SP3/TP12	SP7-TP1	SP7-TP2	SP8-TP1
Depth		0.6-0.7	0.4-0.5	0.2-0.3	0.4-.05	0.6
Date Sampled		19/03/2019	19/03/2019	19/03/2019	19/03/2019	19/03/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
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	%	83	83	81	81	85

PCBs in Soil					
Our Reference		213992-16	213992-17	213992-18	213992-25
Your Reference	UNITS	SP8-TP2	SP9-TP1	SP9-TP2	SP3-TP13
Depth		0.6	0.5	0.5	0.9
Date Sampled		19/03/2019	19/03/2019	19/03/2019	19/03/2019
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Aroclor 1016	mg/kg	<0.1	<0.1	<0.2	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.2	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.2	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.2	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.2	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.2	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.2	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.2	<0.1
Surrogate TCLMX	%	81	82	82	79

## Acid Extractable metals in soil

Our Reference		213992-1	213992-2	213992-3	213992-4	213992-5
Your Reference	UNITS	SP3/TP1	SP3/TP2	SP3/TP3	SP3/TP4	SP3/TP5
Depth		0.4-0.5	0.7-0.8	2.9-3.0	0.4-0.5	2.9-3.0
Date Sampled		19/03/2019	19/03/2019	19/03/2019	19/03/2019	19/03/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Arsenic	mg/kg	<4	4	5	5	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	15	18	37	19	6
Copper	mg/kg	9	7	6	8	5
Lead	mg/kg	22	15	12	17	5
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	4	4	7	5	1
Zinc	mg/kg	24	13	3	14	5

## Acid Extractable metals in soil

Our Reference		213992-6	213992-7	213992-8	213992-9	213992-10
Your Reference	UNITS	SP3/TP6	SP3/TP7	SP3/TP8	SP3/TP9	SP3/TP10
Depth		0.2-0.3	0.3-0.4	0.6-0.7	0.5-0.6	0.9-1.0
Date Sampled		19/03/2019	19/03/2019	19/03/2019	19/03/2019	19/03/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Arsenic	mg/kg	13	12	7	10	8
Cadmium	mg/kg	<0.4	0.5	<0.4	<0.4	<0.4
Chromium	mg/kg	21	22	17	17	29
Copper	mg/kg	92	85	43	46	13
Lead	mg/kg	70	61	270	19	24
Mercury	mg/kg	<0.1	<0.1	0.2	0.2	<0.1
Nickel	mg/kg	25	30	5	23	7
Zinc	mg/kg	520	430	160	74	20



## Acid Extractable metals in soil

Our Reference		213992-11	213992-12	213992-13	213992-14	213992-15
Your Reference	UNITS	SP3/TP11	SP3/TP12	SP7-TP1	SP7-TP2	SP8-TP1
Depth		0.6-0.7	0.4-0.5	0.2-0.3	0.4-.05	0.6
Date Sampled		19/03/2019	19/03/2019	19/03/2019	19/03/2019	19/03/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Arsenic	mg/kg	15	7	<4	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	22	29	22	14	7
Copper	mg/kg	16	15	13	29	4
Lead	mg/kg	24	24	10	10	10
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	7	10	12	8	5
Zinc	mg/kg	27	27	53	45	18

## Acid Extractable metals in soil

Our Reference		213992-16	213992-17	213992-18	213992-19	213992-20
Your Reference	UNITS	SP8-TP2	SP9-TP1	SP9-TP2	BD1/20190319	BD2/20190319
Depth		0.6	0.5	0.5	-	-
Date Sampled		19/03/2019	19/03/2019	19/03/2019	19/03/2019	19/03/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Arsenic	mg/kg	<4	<4	<4	4	5
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	7	9	17	22	19
Copper	mg/kg	4	32	28	78	37
Lead	mg/kg	10	55	96	24	24
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	5	8	10	19	9
Zinc	mg/kg	18	79	120	130	82

## Acid Extractable metals in soil

Our Reference		213992-21	213992-22	213992-23	213992-24	213992-25
Your Reference	UNITS	BD3/20190319	BD4/20190319	BD5/20190319	BD6/20190319	SP3-TP13
Depth		-	-	-	-	0.9
Date Sampled		19/03/2019	19/03/2019	19/03/2019	19/03/2019	19/03/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Arsenic	mg/kg	4	7	<4	6	7
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	13	27	14	19	19
Copper	mg/kg	40	29	4	14	12
Lead	mg/kg	25	26	8	68	30
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	11	17	1	6	5
Zinc	mg/kg	45	43	3	56	41

## Acid Extractable metals in soil

Our Reference		213992-30
Your Reference	UNITS	SP9-TP1 - [TRIPLICATE]
Depth		0.5
Date Sampled		19/03/2019
Type of sample		Soil
Date prepared	-	01/04/2019
Date analysed	-	01/04/2019
Arsenic	mg/kg	<4
Cadmium	mg/kg	<0.4
Chromium	mg/kg	12
Copper	mg/kg	26
Lead	mg/kg	76
Mercury	mg/kg	<0.1
Nickel	mg/kg	12
Zinc	mg/kg	110

Moisture						
Our Reference	UNITS	213992-1	213992-2	213992-3	213992-4	213992-5
Your Reference		SP3/TP1	SP3/TP2	SP3/TP3	SP3/TP4	SP3/TP5
Depth		0.4-0.5	0.7-0.8	2.9-3.0	0.4-0.5	2.9-3.0
Date Sampled		19/03/2019	19/03/2019	19/03/2019	19/03/2019	19/03/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	02/04/2019	02/04/2019	02/04/2019	02/04/2019	02/04/2019
Moisture	%	13	11	22	13	15

Moisture						
Our Reference	UNITS	213992-6	213992-7	213992-8	213992-9	213992-10
Your Reference		SP3/TP6	SP3/TP7	SP3/TP8	SP3/TP9	SP3/TP10
Depth		0.2-0.3	0.3-0.4	0.6-0.7	0.5-0.6	0.9-1.0
Date Sampled		19/03/2019	19/03/2019	19/03/2019	19/03/2019	19/03/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	02/04/2019	02/04/2019	02/04/2019	02/04/2019	02/04/2019
Moisture	%	12	8.7	12	10	8.1

Moisture						
Our Reference	UNITS	213992-11	213992-12	213992-13	213992-14	213992-15
Your Reference		SP3/TP11	SP3/TP12	SP7-TP1	SP7-TP2	SP8-TP1
Depth		0.6-0.7	0.4-0.5	0.2-0.3	0.4-.05	0.6
Date Sampled		19/03/2019	19/03/2019	19/03/2019	19/03/2019	19/03/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	02/04/2019	02/04/2019	02/04/2019	02/04/2019	02/04/2019
Moisture	%	14	14	6.7	9.0	5.3

Moisture						
Our Reference	UNITS	213992-16	213992-17	213992-18	213992-19	213992-20
Your Reference		SP8-TP2	SP9-TP1	SP9-TP2	BD1/20190319	BD2/20190319
Depth		0.6	0.5	0.5	-	-
Date Sampled		19/03/2019	19/03/2019	19/03/2019	19/03/2019	19/03/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	02/04/2019	02/04/2019	02/04/2019	02/04/2019	02/04/2019
Moisture	%	9.0	8.7	11	10	13

Moisture						
Our Reference		213992-21	213992-22	213992-23	213992-24	213992-25
Your Reference	UNITS	BD3/20190319	BD4/20190319	BD5/20190319	BD6/20190319	SP3-TP13
Depth		-	-	-	-	0.9
Date Sampled		19/03/2019	19/03/2019	19/03/2019	19/03/2019	19/03/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	02/04/2019	02/04/2019	02/04/2019	02/04/2019	02/04/2019
Moisture	%	11	7.7	19	6.5	8.2



Asbestos ID - soils NEPM						
Our Reference	UNITS	213992-1	213992-3	213992-4	213992-5	213992-6
Your Reference		SP3/TP1	SP3/TP3	SP3/TP4	SP3/TP5	SP3/TP6
Depth		0.4-0.5	2.9-3.0	0.4-0.5	2.9-3.0	0.2-0.3
Date Sampled		19/03/2019	19/03/2019	19/03/2019	19/03/2019	19/03/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	28/03/2019	28/03/2019	28/03/2019	28/03/2019	28/03/2019
Sample mass tested	g	787.01	814.48	927.74	761.59	730.67
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 (AS4964) >0.1g/kg	-	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
Total Asbestos <sup>#1</sup>	g/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Asbestos ID in soil <0.1g/kg*	-	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected
ACM >7mm Estimation*	g	—	—	—	—	—
FA and AF Estimation*	g	—	—	—	—	—
FA and AF Estimation*#2	%(w/w)	<0.001	<0.001	<0.001	<0.001	<0.001

Asbestos ID - soils NEPM						
Our Reference		213992-7	213992-8	213992-9	213992-10	213992-11
Your Reference	UNITS	SP3/TP7	SP3/TP8	SP3/TP9	SP3/TP10	SP3/TP11
Depth		0.3-0.4	0.6-0.7	0.5-0.6	0.9-1.0	0.6-0.7
Date Sampled		19/03/2019	19/03/2019	19/03/2019	19/03/2019	19/03/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	28/03/2019	28/03/2019	28/03/2019	28/03/2019	28/03/2019
Sample mass tested	g	507.05	923.99	1,006.01	1,021.55	854.13
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 (AS4964) >0.1g/kg	-	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
Total Asbestos <sup>#1</sup>	g/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Asbestos ID in soil <0.1g/kg*	-	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected
ACM >7mm Estimation*	g	—	—	—	—	—
FA and AF Estimation*	g	—	—	—	—	—
FA and AF Estimation*#2	%(w/w)	<0.001	<0.001	<0.001	<0.001	<0.001

Asbestos ID - soils NEPM						
Our Reference		213992-12	213992-13	213992-14	213992-15	213992-16
Your Reference	UNITS	SP3/TP12	SP7-TP1	SP7-TP2	SP8-TP1	SP8-TP2
Depth		0.4-0.5	0.2-0.3	0.4-.05	0.6	0.6
Date Sampled		19/03/2019	19/03/2019	19/03/2019	19/03/2019	19/03/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	28/03/2019	28/03/2019	28/03/2019	28/03/2019	28/03/2019
Sample mass tested	g	930.83	1,033.88	1,045.33	1,079.56	1,069.2
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 (AS4964) >0.1g/kg	-	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
Total Asbestos <sup>#1</sup>	g/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Asbestos ID in soil <0.1g/kg*	-	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected
ACM >7mm Estimation*	g	—	—	—	—	—
FA and AF Estimation*	g	—	—	—	—	—
FA and AF Estimation*#2	%(w/w)	<0.001	<0.001	<0.001	<0.001	<0.001

Asbestos ID - soils NEPM				
Our Reference		213992-17	213992-18	213992-25
Your Reference	UNITS	SP9-TP1	SP9-TP2	SP3-TP13
Depth		0.5	0.5	0.9
Date Sampled		19/03/2019	19/03/2019	19/03/2019
Type of sample		Soil	Soil	Soil
Date analysed	-	28/03/2019	28/03/2019	28/03/2019
Sample mass tested	g	850.8	972.58	988.43
Sample Description	-	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks
Asbestos ID in soil (AS4964) >0.1g/kg	-	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
Total Asbestos <sup>#1</sup>	g/kg	<0.1	<0.1	<0.1
Asbestos ID in soil <0.1g/kg*	-	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected
ACM >7mm Estimation*	g	—	—	—
FA and AF Estimation*	g	—	—	—
FA and AF Estimation*#2	%(w/w)	<0.001	<0.001	<0.001



Asbestos ID - soils		
Our Reference		213992-2
Your Reference	UNITS	SP3/TP2
Depth		0.7-0.8
Date Sampled		19/03/2019
Type of sample		Soil
Date analysed	-	01/04/2019
Sample mass tested	g	Approx. 30g
Sample Description	-	Brown coarse-grained soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg  Organic fibres detected
Asbestos comments	-	NO
Trace Analysis	-	No asbestos detected

Method ID	Methodology Summary
<b>ASB-001</b>	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.
<b>ASB-001</b>	<p>Asbestos ID - Identification of asbestos in soil samples using Polarised Light Microscopy and Dispersion Staining Techniques. Minimum 500mL soil sample was analysed as recommended by "National Environment Protection (Assessment of site contamination) Measure, Schedule B1 and "The Guidelines from the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia - May 2009" with a reporting limit of 0.1g/kg (0.01% w/w) as per Australian Standard AS4964-2004.</p> <p>Results reported denoted with * are outside our scope of NATA accreditation.</p> <p><b>NOTE #1</b> Total Asbestos g/kg was analysed and reported as per Australian Standard AS4964 (This is the sum of ACM &gt;7mm, &lt;7mm and FA/AF)</p> <p><b>NOTE #2</b> The screening level of 0.001% w/w asbestos in soil for FA and AF only applies where the FA and AF are able to be quantified by gravimetric procedures. This screening level is not applicable to free fibres.</p> <p>Estimation = Estimated asbestos weight</p> <p>Results reported with "--" is equivalent to no visible asbestos identified using Polarised Light microscopy and Dispersion Staining Techniques.</p>
<b>Inorg-008</b>	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
<b>Metals-020</b>	Determination of various metals by ICP-AES.
<b>Metals-021</b>	Determination of Mercury by Cold Vapour AAS.
<b>Org-003</b>	<p>Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID.</p> <p>F2 = (&gt;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.</p>
<b>Org-003</b>	<p>Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID.</p> <p>F2 = (&gt;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.</p> <p>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 (&gt;C10-C40).</p>
<b>Org-005</b>	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.

Method ID	Methodology Summary
<b>Org-005</b>	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.
<b>Org-006</b>	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
<b>Org-006</b>	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.
<b>Org-008</b>	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
<b>Org-012</b>	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.
<b>Org-014</b>	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
<b>Org-016</b>	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.
<b>Org-016</b>	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. 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-14	213992-2
Date extracted	-			01/04/2019	1	01/04/2019	01/04/2019		01/04/2019	01/04/2019
Date analysed	-			03/04/2019	1	03/04/2019	03/04/2019		03/04/2019	03/04/2019
TRH C <sub>6</sub> - C <sub>9</sub>	mg/kg	25	Org-016	<25	1	<25	<25	0	95	93
TRH C <sub>6</sub> - C <sub>10</sub>	mg/kg	25	Org-016	<25	1	<25	<25	0	95	93
Benzene	mg/kg	0.2	Org-016	<0.2	1	<0.2	<0.2	0	90	88
Toluene	mg/kg	0.5	Org-016	<0.5	1	<0.5	<0.5	0	94	91
Ethylbenzene	mg/kg	1	Org-016	<1	1	<1	<1	0	97	95
m+p-xylene	mg/kg	2	Org-016	<2	1	<2	<2	0	97	95
o-Xylene	mg/kg	1	Org-016	<1	1	<1	<1	0	98	95
naphthalene	mg/kg	1	Org-014	<1	1	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	88	1	85	65	27	89	84

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-15	213992-18
Date extracted	-			[NT]	11	01/04/2019	01/04/2019		01/04/2019	01/04/2019
Date analysed	-			[NT]	11	03/04/2019	03/04/2019		03/04/2019	03/04/2019
TRH C <sub>6</sub> - C <sub>9</sub>	mg/kg	25	Org-016	[NT]	11	<25	<25	0	86	97
TRH C <sub>6</sub> - C <sub>10</sub>	mg/kg	25	Org-016	[NT]	11	<25	<25	0	86	97
Benzene	mg/kg	0.2	Org-016	[NT]	11	<0.2	<0.2	0	82	92
Toluene	mg/kg	0.5	Org-016	[NT]	11	<0.5	<0.5	0	86	97
Ethylbenzene	mg/kg	1	Org-016	[NT]	11	<1	<1	0	88	100
m+p-xylene	mg/kg	2	Org-016	[NT]	11	<2	<2	0	87	97
o-Xylene	mg/kg	1	Org-016	[NT]	11	<1	<1	0	89	100
naphthalene	mg/kg	1	Org-014	[NT]	11	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	[NT]	11	72	82	13	82	89

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]	17	01/04/2019	01/04/2019		[NT]	[NT]
Date analysed	-			[NT]	17	03/04/2019	03/04/2019		[NT]	[NT]
TRH C <sub>6</sub> - C <sub>9</sub>	mg/kg	25	Org-016	[NT]	17	<25	<25	0	[NT]	[NT]
TRH C <sub>6</sub> - C <sub>10</sub>	mg/kg	25	Org-016	[NT]	17	<25	<25	0	[NT]	[NT]
Benzene	mg/kg	0.2	Org-016	[NT]	17	<0.2	<0.2	0	[NT]	[NT]
Toluene	mg/kg	0.5	Org-016	[NT]	17	<0.5	<0.5	0	[NT]	[NT]
Ethylbenzene	mg/kg	1	Org-016	[NT]	17	<1	<1	0	[NT]	[NT]
m+p-xylene	mg/kg	2	Org-016	[NT]	17	<2	<2	0	[NT]	[NT]
o-Xylene	mg/kg	1	Org-016	[NT]	17	<1	<1	0	[NT]	[NT]
naphthalene	mg/kg	1	Org-014	[NT]	17	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	[NT]	17	84	88	5	[NT]	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-14	213992-2
Date extracted	-			01/04/2019	1	01/04/2019	01/04/2019		01/04/2019	01/04/2019
Date analysed	-			03/04/2019	1	03/04/2019	03/04/2019		03/04/2019	03/04/2019
TRH C <sub>10</sub> - C <sub>14</sub>	mg/kg	50	Org-003	<50	1	<50	<50	0	108	93
TRH C <sub>15</sub> - C <sub>28</sub>	mg/kg	100	Org-003	<100	1	<100	<100	0	100	87
TRH C <sub>29</sub> - C <sub>36</sub>	mg/kg	100	Org-003	<100	1	<100	<100	0	100	102
TRH >C <sub>10</sub> -C <sub>16</sub>	mg/kg	50	Org-003	<50	1	<50	<50	0	108	93
TRH >C <sub>16</sub> -C <sub>34</sub>	mg/kg	100	Org-003	<100	1	<100	<100	0	100	87
TRH >C <sub>34</sub> -C <sub>40</sub>	mg/kg	100	Org-003	<100	1	<100	<100	0	100	102
Surrogate o-Terphenyl	%		Org-003	92	1	89	89	0	96	92

QUALITY CONTROL: svTRH (C10-C40) in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-15	213992-18
Date extracted	-			[NT]	11	01/04/2019	01/04/2019		01/04/2019	01/04/2019
Date analysed	-			[NT]	11	03/04/2019	03/04/2019		03/04/2019	03/04/2019
TRH C <sub>10</sub> - C <sub>14</sub>	mg/kg	50	Org-003	[NT]	11	<50	<50	0	106	99
TRH C <sub>15</sub> - C <sub>28</sub>	mg/kg	100	Org-003	[NT]	11	<100	<100	0	97	95
TRH C <sub>29</sub> - C <sub>36</sub>	mg/kg	100	Org-003	[NT]	11	<100	<100	0	100	96
TRH >C <sub>10</sub> -C <sub>16</sub>	mg/kg	50	Org-003	[NT]	11	<50	<50	0	106	99
TRH >C <sub>16</sub> -C <sub>34</sub>	mg/kg	100	Org-003	[NT]	11	<100	<100	0	97	95
TRH >C <sub>34</sub> -C <sub>40</sub>	mg/kg	100	Org-003	[NT]	11	<100	<100	0	100	96
Surrogate o-Terphenyl	%		Org-003	[NT]	11	90	89	1	98	93

QUALITY CONTROL: svTRH (C10-C40) in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	17	01/04/2019	01/04/2019		[NT]	[NT]
Date analysed	-			[NT]	17	03/04/2019	03/04/2019		[NT]	[NT]
TRH C <sub>10</sub> - C <sub>14</sub>	mg/kg	50	Org-003	[NT]	17	<50	<50	0	[NT]	[NT]
TRH C <sub>15</sub> - C <sub>28</sub>	mg/kg	100	Org-003	[NT]	17	<100	<100	0	[NT]	[NT]
TRH C <sub>29</sub> - C <sub>36</sub>	mg/kg	100	Org-003	[NT]	17	<100	<100	0	[NT]	[NT]
TRH >C <sub>10</sub> -C <sub>16</sub>	mg/kg	50	Org-003	[NT]	17	<50	<50	0	[NT]	[NT]
TRH >C <sub>16</sub> -C <sub>34</sub>	mg/kg	100	Org-003	[NT]	17	<100	<100	0	[NT]	[NT]
TRH >C <sub>34</sub> -C <sub>40</sub>	mg/kg	100	Org-003	[NT]	17	<100	<100	0	[NT]	[NT]
Surrogate o-Terphenyl	%		Org-003	[NT]	17	89	88	1	[NT]	[NT]



QUALITY CONTROL: PAHs in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-14	213992-2
Date extracted	-			01/04/2019	1	01/04/2019	01/04/2019		01/04/2019	01/04/2019
Date analysed	-			03/04/2019	1	03/04/2019	03/04/2019		03/04/2019	03/04/2019
Naphthalene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	100	92
Acenaphthylene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	106	98
Phenanthrene	mg/kg	0.1	Org-012	<0.1	1	<0.1	0.1	0	114	106
Anthracene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-012	<0.1	1	0.1	0.2	67	103	94
Pyrene	mg/kg	0.1	Org-012	<0.1	1	0.1	0.3	100	98	90
Benzo(a)anthracene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-012	<0.1	1	<0.1	0.1	0	114	106
Benzo(b,j,k)fluoranthene	mg/kg	0.2	Org-012	<0.2	1	<0.2	0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-012	<0.05	1	0.07	0.1	35	110	100
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012	<0.1	1	<0.1	0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012	112	1	110	108	2	102	94

QUALITY CONTROL: PAHs in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-15	213992-18
Date extracted	-			[NT]	11	01/04/2019	01/04/2019		01/04/2019	01/04/2019
Date analysed	-			[NT]	11	03/04/2019	03/04/2019		03/04/2019	03/04/2019
Naphthalene	mg/kg	0.1	Org-012	[NT]	11	<0.1	<0.1	0	93	95
Acenaphthylene	mg/kg	0.1	Org-012	[NT]	11	0.2	0.2	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-012	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-012	[NT]	11	0.1	<0.1	0	97	100
Phenanthrene	mg/kg	0.1	Org-012	[NT]	11	3.6	1.9	62	106	105
Anthracene	mg/kg	0.1	Org-012	[NT]	11	0.7	0.4	55	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-012	[NT]	11	6.6	4.5	38	96	96
Pyrene	mg/kg	0.1	Org-012	[NT]	11	6.3	4.4	36	91	90
Benzo(a)anthracene	mg/kg	0.1	Org-012	[NT]	11	2.1	1.5	33	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-012	[NT]	11	2.2	1.7	26	107	115
Benzo(b,j,k)fluoranthene	mg/kg	0.2	Org-012	[NT]	11	3.6	2.8	25	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-012	[NT]	11	2.2	1.8	20	104	103
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012	[NT]	11	1.5	1.2	22	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012	[NT]	11	0.3	0.2	40	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012	[NT]	11	2.0	1.7	16	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012	[NT]	11	108	109	1	97	98

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	17	01/04/2019	01/04/2019		[NT]	[NT]
Date analysed	-			[NT]	17	03/04/2019	03/04/2019		[NT]	[NT]
Naphthalene	mg/kg	0.1	Org-012	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Acenaphthylene	mg/kg	0.1	Org-012	[NT]	17	0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-012	[NT]	17	0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-012	[NT]	17	0.2	<0.1	67	[NT]	[NT]
Phenanthrene	mg/kg	0.1	Org-012	[NT]	17	3.9	0.2	180	[NT]	[NT]
Anthracene	mg/kg	0.1	Org-012	[NT]	17	1.0	<0.1	164	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-012	[NT]	17	4.0	0.5	156	[NT]	[NT]
Pyrene	mg/kg	0.1	Org-012	[NT]	17	3.4	0.5	149	[NT]	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-012	[NT]	17	1.6	0.2	156	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-012	[NT]	17	1.6	0.3	137	[NT]	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-012	[NT]	17	2.1	0.4	136	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-012	[NT]	17	1.2	0.3	120	[NT]	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012	[NT]	17	0.7	0.2	111	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012	[NT]	17	0.2	<0.1	67	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012	[NT]	17	0.8	0.3	91	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012	[NT]	17	106	111	5	[NT]	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-14	213992-2
Date extracted	-			01/04/2019	1	01/04/2019	01/04/2019		01/04/2019	01/04/2019
Date analysed	-			01/04/2019	1	01/04/2019	01/04/2019		01/04/2019	01/04/2019
HCB	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	94	87
gamma-BHC	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	86	77
Heptachlor	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	79	84
delta-BHC	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	96	84
Heptachlor Epoxide	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	100	88
gamma-Chlordane	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	96	84
Dieldrin	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	117	106
Endrin	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	91	91
pp-DDD	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	71	75
Endosulfan II	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	80	72
Methoxychlor	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-005	85	1	83	83	0	89	71

QUALITY CONTROL: Organochlorine Pesticides in soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	213992-18
Date extracted	-			[NT]	11	01/04/2019	01/04/2019		[NT]	01/04/2019
Date analysed	-			[NT]	11	01/04/2019	01/04/2019		[NT]	01/04/2019
HCB	mg/kg	0.1	Org-005	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-005	[NT]	11	<0.1	<0.1	0	[NT]	101
gamma-BHC	mg/kg	0.1	Org-005	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-005	[NT]	11	<0.1	<0.1	0	[NT]	80
Heptachlor	mg/kg	0.1	Org-005	[NT]	11	<0.1	<0.1	0	[NT]	88
delta-BHC	mg/kg	0.1	Org-005	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-005	[NT]	11	<0.1	<0.1	0	[NT]	85
Heptachlor Epoxide	mg/kg	0.1	Org-005	[NT]	11	<0.1	<0.1	0	[NT]	89
gamma-Chlordane	mg/kg	0.1	Org-005	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-005	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-005	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-005	[NT]	11	<0.1	<0.1	0	[NT]	84
Dieldrin	mg/kg	0.1	Org-005	[NT]	11	<0.1	<0.1	0	[NT]	106
Endrin	mg/kg	0.1	Org-005	[NT]	11	<0.1	<0.1	0	[NT]	94
pp-DDD	mg/kg	0.1	Org-005	[NT]	11	<0.1	<0.1	0	[NT]	79
Endosulfan II	mg/kg	0.1	Org-005	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-005	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-005	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-005	[NT]	11	<0.1	<0.1	0	[NT]	96
Methoxychlor	mg/kg	0.1	Org-005	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-005	[NT]	11	83	83	0	[NT]	71

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	17	01/04/2019	01/04/2019		[NT]	[NT]
Date analysed	-			[NT]	17	01/04/2019	01/04/2019		[NT]	[NT]
HCB	mg/kg	0.1	Org-005	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-005	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
gamma-BHC	mg/kg	0.1	Org-005	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-005	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-005	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
delta-BHC	mg/kg	0.1	Org-005	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-005	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-005	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
gamma-Chlordane	mg/kg	0.1	Org-005	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-005	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-005	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-005	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Dieldrin	mg/kg	0.1	Org-005	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Endrin	mg/kg	0.1	Org-005	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-005	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Endosulfan II	mg/kg	0.1	Org-005	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-005	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-005	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-005	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Methoxychlor	mg/kg	0.1	Org-005	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-005	[NT]	17	82	81	1	[NT]	[NT]



QUALITY CONTROL: Organophosphorus Pesticides					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-14	213992-2
Date extracted	-			01/04/2019	1	01/04/2019	01/04/2019		01/04/2019	01/04/2019
Date analysed	-			01/04/2019	1	01/04/2019	01/04/2019		01/04/2019	01/04/2019
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Chlorpyrifos	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	66	78
Chlorpyrifos-methyl	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Dichlorvos	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	71	77
Dimethoate	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	65	85
Fenitrothion	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	89	106
Malathion	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	70	101
Parathion	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	75	73
Ronnel	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	73	81
Surrogate TCMX	%		Org-008	85	1	83	83	0	82	83

QUALITY CONTROL: Organophosphorus Pesticides					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	213992-18
Date extracted	-			[NT]	11	01/04/2019	01/04/2019		[NT]	01/04/2019
Date analysed	-			[NT]	11	01/04/2019	01/04/2019		[NT]	01/04/2019
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-008	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-008	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Chlorpyrifos	mg/kg	0.1	Org-008	[NT]	11	<0.1	<0.1	0	[NT]	84
Chlorpyrifos-methyl	mg/kg	0.1	Org-008	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-008	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Dichlorvos	mg/kg	0.1	Org-008	[NT]	11	<0.1	<0.1	0	[NT]	80
Dimethoate	mg/kg	0.1	Org-008	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-008	[NT]	11	<0.1	<0.1	0	[NT]	91
Fenitrothion	mg/kg	0.1	Org-008	[NT]	11	<0.1	<0.1	0	[NT]	122
Malathion	mg/kg	0.1	Org-008	[NT]	11	<0.1	<0.1	0	[NT]	89
Parathion	mg/kg	0.1	Org-008	[NT]	11	<0.1	<0.1	0	[NT]	77
Ronnel	mg/kg	0.1	Org-008	[NT]	11	<0.1	<0.1	0	[NT]	87
Surrogate TCMX	%		Org-008	[NT]	11	83	83	0	[NT]	81

QUALITY CONTROL: Organophosphorus Pesticides						Duplicate		Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	17	01/04/2019	01/04/2019		[NT]	[NT]
Date analysed	-			[NT]	17	01/04/2019	01/04/2019		[NT]	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-008	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-008	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Chlorpyrifos	mg/kg	0.1	Org-008	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Chlorpyrifos-methyl	mg/kg	0.1	Org-008	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-008	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Dichlorvos	mg/kg	0.1	Org-008	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Dimethoate	mg/kg	0.1	Org-008	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-008	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Fenitrothion	mg/kg	0.1	Org-008	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Malathion	mg/kg	0.1	Org-008	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Parathion	mg/kg	0.1	Org-008	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-008	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-008	[NT]	17	82	81	1	[NT]	[NT]

QUALITY CONTROL: PCBs in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-14	213992-2
Date extracted	-			01/04/2019	1	01/04/2019	01/04/2019		01/04/2019	01/04/2019
Date analysed	-			01/04/2019	1	01/04/2019	01/04/2019		01/04/2019	01/04/2019
Aroclor 1016	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	102	104
Aroclor 1260	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCLMX	%		Org-006	85	1	83	83	0	82	83

QUALITY CONTROL: PCBs in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	213992-18
Date extracted	-			[NT]	11	01/04/2019	01/04/2019		[NT]	01/04/2019
Date analysed	-			[NT]	11	01/04/2019	01/04/2019		[NT]	01/04/2019
Aroclor 1016	mg/kg	0.1	Org-006	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-006	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-006	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-006	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-006	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-006	[NT]	11	<0.1	<0.1	0	[NT]	102
Aroclor 1260	mg/kg	0.1	Org-006	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCLMX	%		Org-006	[NT]	11	83	83	0	[NT]	81

QUALITY CONTROL: PCBs in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	17	01/04/2019	01/04/2019		[NT]	[NT]
Date analysed	-			[NT]	17	01/04/2019	01/04/2019		[NT]	[NT]
Aroclor 1016	mg/kg	0.1	Org-006	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-006	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-006	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-006	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-006	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-006	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1260	mg/kg	0.1	Org-006	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCLMX	%		Org-006	[NT]	17	82	81	1	[NT]	[NT]

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-16	213992-2
Date prepared	-			01/04/2019	1	01/04/2019	01/04/2019		01/04/2019	01/04/2019
Date analysed	-			01/04/2019	1	01/04/2019	01/04/2019		01/04/2019	01/04/2019
Arsenic	mg/kg	4	Metals-020	<4	1	<4	<4	0	91	77
Cadmium	mg/kg	0.4	Metals-020	<0.4	1	<0.4	<0.4	0	96	77
Chromium	mg/kg	1	Metals-020	<1	1	15	13	14	96	76
Copper	mg/kg	1	Metals-020	<1	1	9	12	29	103	100
Lead	mg/kg	1	Metals-020	<1	1	22	26	17	98	81
Mercury	mg/kg	0.1	Metals-021	<0.1	1	<0.1	0.1	0	100	100
Nickel	mg/kg	1	Metals-020	<1	1	4	5	22	97	80
Zinc	mg/kg	1	Metals-020	<1	1	24	36	40	94	75

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-17	213992-18
Date prepared	-			[NT]	11	01/04/2019	01/04/2019		01/04/2019	01/04/2019
Date analysed	-			[NT]	11	01/04/2019	01/04/2019		01/04/2019	01/04/2019
Arsenic	mg/kg	4	Metals-020	[NT]	11	15	10	40	97	91
Cadmium	mg/kg	0.4	Metals-020	[NT]	11	<0.4	<0.4	0	103	85
Chromium	mg/kg	1	Metals-020	[NT]	11	22	20	10	103	87
Copper	mg/kg	1	Metals-020	[NT]	11	16	13	21	110	#
Lead	mg/kg	1	Metals-020	[NT]	11	24	17	34	105	70
Mercury	mg/kg	0.1	Metals-021	[NT]	11	<0.1	<0.1	0	95	102
Nickel	mg/kg	1	Metals-020	[NT]	11	7	5	33	104	92
Zinc	mg/kg	1	Metals-020	[NT]	11	27	19	35	101	130

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	17	01/04/2019	01/04/2019		[NT]	[NT]
Date analysed	-			[NT]	17	01/04/2019	01/04/2019		[NT]	[NT]
Arsenic	mg/kg	4	Metals-020	[NT]	17	<4	<4	0	[NT]	[NT]
Cadmium	mg/kg	0.4	Metals-020	[NT]	17	<0.4	<0.4	0	[NT]	[NT]
Chromium	mg/kg	1	Metals-020	[NT]	17	9	67	153	[NT]	[NT]
Copper	mg/kg	1	Metals-020	[NT]	17	32	21	42	[NT]	[NT]
Lead	mg/kg	1	Metals-020	[NT]	17	55	51	8	[NT]	[NT]
Mercury	mg/kg	0.1	Metals-021	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Nickel	mg/kg	1	Metals-020	[NT]	17	8	7	13	[NT]	[NT]
Zinc	mg/kg	1	Metals-020	[NT]	17	79	79	0	[NT]	[NT]

## Result Definitions

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

## Quality Control Definitions

<b>Blank</b>	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.
<b>Duplicate</b>	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.
<b>Matrix Spike</b>	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.
<b>LCS (Laboratory Control Sample)</b>	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.
<b>Surrogate Spike</b>	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-ID in soil: NEPM

This report is consistent with the reporting recommendations in the National Environment Protection (Assessment of Site Contamination) Measure, Schedule B1, May 2013. This is reported outside our scope of NATA accreditation.

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 213992-2 was sub-sampled from a jar provided by the client.

Acid Extractable Metals in Soil: The laboratory RPD acceptance criteria has been exceeded for 213992-17 for Cr and Cu. Therefore a triplicate result has been issued as laboratory sample number 213992-30.

Acid Extractable Metals in Soil - Spike recovery for Cu in sample #18 at 145% which is outside lab acceptance criteria (70-130%), however, the LCS recovery is acceptable at 103%, sample heterogeneity suspected.

PAHs in Soil - The RPD for duplicate results is accepted due to the non homogenous nature of the sample/s.

PCBs in Soil - The PQL has been raised due to interferences from analytes (other than those being tested) in sample 18.

*Analysis rec'd 22/03/19*
**CHAIN OF CUSTODY DESPATCH SHEET**

<b>Project No:</b> 94525.02		<b>Suburb:</b> St Marys		<b>To:</b> Envirolab Services	
<b>Project Name:</b> St Marys		<b>Order Number</b>			
<b>Project Manager:</b> Grant Russell		<b>Sampler:</b> JY		<b>Attn:</b> Aileen Hie	
<b>Emails:</b> Grant.Russell@douglaspartners.com.au				<b>Phone:</b> 9910 6200	
<b>Date Required:</b> Same day <input type="checkbox"/> 24 hours <input type="checkbox"/> 48 hours <input type="checkbox"/> 72 hours <input type="checkbox"/> Standard <input type="checkbox"/>				<b>Email:</b>	
<b>Prior Storage:</b> <input type="checkbox"/> Esky <input type="checkbox"/> Fridge <input type="checkbox"/> Shelved		Do samples contain 'potential' HBM? Yes <input type="checkbox"/> No <input type="checkbox"/> (If YES, then handle, transport and store in accordance with FPM HAZID)			

Sample ID	Lab ID	Date Sampled	Sample Type	Container Type	Analytes										Notes/preservation
			S - soil W - water	G - glass P - plastic	Heavy Metals	OCP/OPP PCB	TRH and BTEX	PAH	Total Phenols	Asbestos 500 ml	COMB 6	VOCs			
SP3-TP1/0.4-0.5	1	19/03/19	S	G								X	X		
SP3-TP2/0.7-0.8	2	19/03/19	S	G								X	X		
SP3-TP3/2.9-3.0	3	19/03/19	S	G								X	X		
SP3-TP4/0.4-0.5	4	19/03/19	S	G								X	X		
SP3-TP5/2.9-3.0	5	19/03/19	S	G								X	X		
SP3-TP6/0.2-0.3	6	19/03/19	S	G								X	X		
SP3-TP7/0.3-0.4	7	19/03/19	S	G								X	X		
SP3-TP8/0.6-0.7	8	19/03/19	S	G								X	X		
SP3-TP9/0.5-0.6	9	19/03/19	S	G								X	X		
SP3-TP10/0.9-1.0	10	19/03/19	S	G								X	X		
SP3-TP11/0.6-0.7	11	19/03/19	S	G								X	X		
SP3-TP12/0.4-0.5	12	19/03/19	S	G								X	X		
SP7-TP1/0.2-0.3	13	19/03/19	S	G								X	X		
SP7-TP2/0.4-0.5	14	19/03/19	S	G								X	X		
SP3-TP13/0.9	2425	19/03/19	S	G								X	X		
<b>PQL (S) mg/kg</b>															<b>ANZECC PQLs req'd for all water analytes</b> <input type="checkbox"/>
<b>PQL = practical quantitation limit.</b> If none given, default to Laboratory Method Detection Limit															
<b>Metals to Analyse:</b> 8HM unless specified here:															
<b>Total number of samples in container:</b> <b>Relinquished by:</b> SJS <b>Transported to laboratory by:</b>															
<b>Send Results to:</b> Douglas Partners Pty Ltd <b>Address</b> <b>Phone:</b> <b>Fax:</b>															
<b>Signed:</b> GAR <b>Received by:</b> Ming Yan To <b>Date &amp; Time:</b> 21/3/19 16:57															

*Bags rec'd 26/3/19*

Rev4/October2016

Project No: 94525.02			Suburb: St Marys			To: Envirolab Services								
Project Name: St Marys			Order Number											
Project Manager: Grant Russell			Sampler: JY			Attn: Aileen Hie								
Emails: Grant.Russell@douglaspartners.com.au			Phone: 9910 6200			Email:								
Date Required: Same day <input type="checkbox"/> 24 hours <input type="checkbox"/> 48 hours <input type="checkbox"/> 72 hours <input type="checkbox"/> Standard <input type="checkbox"/>			Prior Storage: <input type="checkbox"/> Esky <input type="checkbox"/> Fridge <input type="checkbox"/> Shelved			Do samples contain 'potential' HBM? Yes <input type="checkbox"/> No <input type="checkbox"/> (If YES, then handle, transport and store in accordance with FPM HAZID)								
Sample ID	Lab ID	Date Sampled	Sample Type	Container Type	Analytes									Notes/preservation
			S - soil W - water	G - glass P - plastic	Heavy Metals	OCP/OPP PCB	TRH and BTEX	PAH	Total Phenols	Asbestos 500 ml	COMB 6	VOCs	Hold	
BD1/20190319	19	19/03/19	S	G	X		X	X						
BD2/20190319	20	19/03/19	S	G	X		X	X						
BD3/20190319	21	19/03/19	S	G	X		X	X						
BD4/20190319	22	19/03/19	S	G	X		X	X						
BD5/20190319	23	19/03/19	S	G	X		X	X						
BD6/20190319	24	19/03/19	S	G	X		X	X						
TB/190319	26	19/03/19	S	G			X							
TS/190319	27	19/03/19	S	G			X							
TB/200319	28	20/03/19	S	G									X	
TS/200319	29	20/03/19	S	G									X	
PQL (S) mg/kg														ANZECC PQLs req'd for all water analytes <input type="checkbox"/>
PQL = practical quantitation limit. If none given, default to Laboratory Method Detection Limit									Lab Report/Reference No: 213992					
Metals to Analyse: 8HM unless specified here:														
Total number of samples in container:			Relinquished by: SJS			Transported to laboratory by:								
Send Results to: Douglas Partners Pty Ltd			Address			Phone:			Fax:					
Signed: GAR			Received by:			Date & Time:								



## **CERTIFICATE OF ANALYSIS 214004**

### **Client Details**

<b>Client</b>	Douglas Partners Pty Ltd Smeaton Grange
<b>Attention</b>	Grant Russell
<b>Address</b>	18 Waler Crescent, Smeaton Grange, NSW, 2567

### **Sample Details**

<b>Your Reference</b>	<b><u>94525.02, St Marys</u></b>
<b>Number of Samples</b>	25 soil
<b>Date samples received</b>	21/03/2019
<b>Date completed instructions received</b>	28/03/2019

### **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**

<b>Date results requested by</b>	03/04/2019
<b>Date of Issue</b>	03/04/2019
NATA Accreditation Number 2901. This document shall not be reproduced except in full.	
Accredited for compliance with ISO/IEC 17025 - Testing. <b>Tests not covered by NATA are denoted with *</b>	

#### **Asbestos Approved By**

Analysed by Asbestos Approved Identifier: Aida Marner, Lucy Zhu, Matt Tang

Authorised by Asbestos Approved Signatory: Lucy Zhu

#### **Results Approved By**

Jaimie Loa-Kum-Cheung, Metals Supervisor

Lucy Zhu, Senior Asbestos Analyst

Steven Luong, Organics Supervisor

#### **Authorised By**



Jacinta Hurst, Laboratory Manager

## vTRH(C6-C10)/BTEXN in Soil

Our Reference		214004-1	214004-3	214004-6	214004-8	214004-10
Your Reference	UNITS	201	202	203	204	205
Depth		0.1-0.2	0.1-0.2	0.5-0.6	0.5-0.6	0.9-1.0
Date Sampled		19/03/2019	19/03/2019	19/03/2019	19/03/2019	19/03/2019
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	03/04/2019	03/04/2019	03/04/2019	03/04/2019	03/04/2019
TRH C <sub>6</sub> - C <sub>9</sub>	mg/kg	<25	<25	<25	<25	<25
TRH C <sub>6</sub> - C <sub>10</sub>	mg/kg	<25	<25	<25	<25	<25
vTPH C <sub>6</sub> - C <sub>10</sub> 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	%	115	117	114	116	117

## vTRH(C6-C10)/BTEXN in Soil

Our Reference		214004-11	214004-12	214004-13	214004-14	214004-15
Your Reference	UNITS	206	207	208	209	210
Depth		0.1-0.2	0.5-0.6	0.5-0.6	0.1-0.2	0.4-0.5
Date Sampled		19/03/2019	19/03/2019	19/03/2019	19/03/2019	19/03/2019
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	03/04/2019	03/04/2019	03/04/2019	03/04/2019	03/04/2019
TRH C <sub>6</sub> - C <sub>9</sub>	mg/kg	<25	<25	<25	<25	<25
TRH C <sub>6</sub> - C <sub>10</sub>	mg/kg	<25	<25	<25	<25	<25
vTPH C <sub>6</sub> - C <sub>10</sub> 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	%	114	117	117	121	120

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		214004-16	214004-19	214004-20	214004-21	214004-22
Your Reference	UNITS	211	212	212	213	214
Depth		0.1-0.2	0.4-0.5	0.7-0.8	0.4-0.5	0.2-0.3
Date Sampled		19/03/2019	19/03/2019	19/03/2019	19/03/2019	19/03/2019
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	03/04/2019	03/04/2019	03/04/2019	03/04/2019	03/04/2019
TRH C <sub>6</sub> - C <sub>9</sub>	mg/kg	<25	<25	<25	<25	<25
TRH C <sub>6</sub> - C <sub>10</sub>	mg/kg	<25	<25	<25	<25	<25
vTPH C <sub>6</sub> - C <sub>10</sub> 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	%	117	116	117	115	114

vTRH(C6-C10)/BTEXN in Soil		
Our Reference		214004-24
Your Reference	UNITS	215
Depth		0.2-0.3
Date Sampled		19/03/2019
Type of sample		soil
Date extracted	-	01/04/2019
Date analysed	-	03/04/2019
TRH C <sub>6</sub> - C <sub>9</sub>	mg/kg	<25
TRH C <sub>6</sub> - C <sub>10</sub>	mg/kg	<25
vTPH C <sub>6</sub> - C <sub>10</sub> 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	%	120

## svTRH (C10-C40) in Soil

Our Reference		214004-1	214004-3	214004-6	214004-8	214004-10
Your Reference	UNITS	201	202	203	204	205
Depth		0.1-0.2	0.1-0.2	0.5-0.6	0.5-0.6	0.9-1.0
Date Sampled		19/03/2019	19/03/2019	19/03/2019	19/03/2019	19/03/2019
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	02/04/2019	02/04/2019	02/04/2019	02/04/2019	02/04/2019
TRH C <sub>10</sub> - C <sub>14</sub>	mg/kg	<50	<50	<50	<50	<50
TRH C <sub>15</sub> - C <sub>28</sub>	mg/kg	<100	<100	<100	<100	<100
TRH C <sub>29</sub> - C <sub>36</sub>	mg/kg	<100	<100	<100	<100	<100
TRH >C <sub>10</sub> -C <sub>16</sub>	mg/kg	<50	<50	<50	<50	<50
TRH >C <sub>10</sub> - C <sub>16</sub> less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C <sub>16</sub> -C <sub>34</sub>	mg/kg	<100	<100	<100	<100	<100
TRH >C <sub>34</sub> -C <sub>40</sub>	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	88	95	97	95	93

## svTRH (C10-C40) in Soil

Our Reference		214004-11	214004-12	214004-13	214004-14	214004-15
Your Reference	UNITS	206	207	208	209	210
Depth		0.1-0.2	0.5-0.6	0.5-0.6	0.1-0.2	0.4-0.5
Date Sampled		19/03/2019	19/03/2019	19/03/2019	19/03/2019	19/03/2019
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	02/04/2019	02/04/2019	02/04/2019	02/04/2019	02/04/2019
TRH C <sub>10</sub> - C <sub>14</sub>	mg/kg	<50	<50	<50	<50	<50
TRH C <sub>15</sub> - C <sub>28</sub>	mg/kg	<100	<100	<100	<100	<100
TRH C <sub>29</sub> - C <sub>36</sub>	mg/kg	<100	<100	<100	100	<100
TRH >C <sub>10</sub> -C <sub>16</sub>	mg/kg	<50	<50	<50	<50	<50
TRH >C <sub>10</sub> - C <sub>16</sub> less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C <sub>16</sub> -C <sub>34</sub>	mg/kg	<100	<100	<100	120	<100
TRH >C <sub>34</sub> -C <sub>40</sub>	mg/kg	<100	<100	<100	110	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	230	<50
Surrogate o-Terphenyl	%	92	93	94	92	94

## svTRH (C10-C40) in Soil

Our Reference		214004-16	214004-19	214004-20	214004-21	214004-22
Your Reference	UNITS	211	212	212	213	214
Depth		0.1-0.2	0.4-0.5	0.7-0.8	0.4-0.5	0.2-0.3
Date Sampled		19/03/2019	19/03/2019	19/03/2019	19/03/2019	19/03/2019
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	02/04/2019	02/04/2019	02/04/2019	02/04/2019	02/04/2019
TRH C <sub>10</sub> - C <sub>14</sub>	mg/kg	<50	<50	<50	<50	<50
TRH C <sub>15</sub> - C <sub>28</sub>	mg/kg	<100	450	<100	<100	<100
TRH C <sub>29</sub> - C <sub>36</sub>	mg/kg	<100	790	<100	<100	<100
TRH >C <sub>10</sub> -C <sub>16</sub>	mg/kg	<50	<50	<50	<50	<50
TRH >C <sub>10</sub> - C <sub>16</sub> less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C <sub>16</sub> -C <sub>34</sub>	mg/kg	<100	1,000	<100	<100	<100
TRH >C <sub>34</sub> -C <sub>40</sub>	mg/kg	<100	500	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	1,500	<50	<50	<50
Surrogate o-Terphenyl	%	96	106	94	94	93

## svTRH (C10-C40) in Soil

Our Reference		214004-24
Your Reference	UNITS	215
Depth		0.2-0.3
Date Sampled		19/03/2019
Type of sample		soil
Date extracted	-	01/04/2019
Date analysed	-	02/04/2019
TRH C <sub>10</sub> - C <sub>14</sub>	mg/kg	<50
TRH C <sub>15</sub> - C <sub>28</sub>	mg/kg	<100
TRH C <sub>29</sub> - C <sub>36</sub>	mg/kg	<100
TRH >C <sub>10</sub> -C <sub>16</sub>	mg/kg	<50
TRH >C <sub>10</sub> - C <sub>16</sub> less Naphthalene (F2)	mg/kg	<50
TRH >C <sub>16</sub> -C <sub>34</sub>	mg/kg	<100
TRH >C <sub>34</sub> -C <sub>40</sub>	mg/kg	<100
Total +ve TRH (>C10-C40)	mg/kg	<50
Surrogate o-Terphenyl	%	96



PAHs in Soil						
Our Reference		214004-1	214004-3	214004-6	214004-8	214004-10
Your Reference	UNITS	201	202	203	204	205
Depth		0.1-0.2	0.1-0.2	0.5-0.6	0.5-0.6	0.9-1.0
Date Sampled		19/03/2019	19/03/2019	19/03/2019	19/03/2019	19/03/2019
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	03/04/2019	03/04/2019	03/04/2019	03/04/2019	03/04/2019
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	0.4	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.2	0.1	0.2	0.5	0.1
Pyrene	mg/kg	0.2	0.1	0.3	0.4	0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	0.1	0.2	<0.1
Chrysene	mg/kg	0.1	0.1	0.2	0.2	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	0.3	0.3	<0.2
Benzo(a)pyrene	mg/kg	0.1	0.09	0.2	0.2	0.08
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	0.75	0.54	1.6	2.4	0.3
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	%	104	105	109	111	103

PAHs in Soil						
Our Reference		214004-11	214004-12	214004-13	214004-14	214004-15
Your Reference	UNITS	206	207	208	209	210
Depth		0.1-0.2	0.5-0.6	0.5-0.6	0.1-0.2	0.4-0.5
Date Sampled		19/03/2019	19/03/2019	19/03/2019	19/03/2019	19/03/2019
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	03/04/2019	03/04/2019	03/04/2019	03/04/2019	03/04/2019
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	0.3	<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	2.4	0.5
Anthracene	mg/kg	<0.1	<0.1	<0.1	0.6	0.1
Fluoranthene	mg/kg	0.1	<0.1	<0.1	4.9	1.3
Pyrene	mg/kg	0.2	<0.1	<0.1	4.6	1.3
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	1.6	0.4
Chrysene	mg/kg	0.1	<0.1	<0.1	2.2	0.6
Benzo(b,j+k)fluoranthene	mg/kg	0.2	0.2	<0.2	3.9	1
Benzo(a)pyrene	mg/kg	0.1	0.1	<0.05	2.5	0.70
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	0.1	<0.1	1.7	0.5
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	0.5	0.1
Benzo(g,h,i)perylene	mg/kg	0.1	0.1	<0.1	2.4	0.7
Total +ve PAH's	mg/kg	0.87	0.58	<0.05	28	7.4
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	3.8	1.0
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	3.8	1.0
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	3.8	1.0
Surrogate p-Terphenyl-d14	%	108	108	111	116	107

PAHs in Soil						
Our Reference		214004-16	214004-19	214004-20	214004-21	214004-22
Your Reference	UNITS	211	212	212	213	214
Depth		0.1-0.2	0.4-0.5	0.7-0.8	0.4-0.5	0.2-0.3
Date Sampled		19/03/2019	19/03/2019	19/03/2019	19/03/2019	19/03/2019
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	03/04/2019	03/04/2019	03/04/2019	03/04/2019	03/04/2019
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	0.2	<0.05	<0.05	<0.05	<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 p-Terphenyl-d14	%	112	110	113	109	100

PAHs in Soil		
Our Reference		214004-24
Your Reference	UNITS	215
Depth		0.2-0.3
Date Sampled		19/03/2019
Type of sample		soil
Date extracted	-	01/04/2019
Date analysed	-	03/04/2019
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	%	114

Organochlorine Pesticides in soil						
Our Reference		214004-1	214004-3	214004-6	214004-8	214004-10
Your Reference	UNITS	201	202	203	204	205
Depth		0.1-0.2	0.1-0.2	0.5-0.6	0.5-0.6	0.9-1.0
Date Sampled		19/03/2019	19/03/2019	19/03/2019	19/03/2019	19/03/2019
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
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	%	95	98	99	100	95



Organochlorine Pesticides in soil						
Our Reference		214004-11	214004-12	214004-13	214004-14	214004-15
Your Reference	UNITS	206	207	208	209	210
Depth		0.1-0.2	0.5-0.6	0.5-0.6	0.1-0.2	0.4-0.5
Date Sampled		19/03/2019	19/03/2019	19/03/2019	19/03/2019	19/03/2019
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
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	%	95	96	96	95	96

Organochlorine Pesticides in soil						
Our Reference		214004-16	214004-19	214004-20	214004-21	214004-22
Your Reference	UNITS	211	212	212	213	214
Depth		0.1-0.2	0.4-0.5	0.7-0.8	0.4-0.5	0.2-0.3
Date Sampled		19/03/2019	19/03/2019	19/03/2019	19/03/2019	19/03/2019
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
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	%	96	96	101	96	95

Organochlorine Pesticides in soil		
Our Reference		214004-24
Your Reference	UNITS	215
Depth		0.2-0.3
Date Sampled		19/03/2019
Type of sample		soil
Date extracted	-	01/04/2019
Date analysed	-	01/04/2019
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	%	96

## Organophosphorus Pesticides

Our Reference		214004-1	214004-3	214004-6	214004-8	214004-10
Your Reference	UNITS	201	202	203	204	205
Depth		0.1-0.2	0.1-0.2	0.5-0.6	0.5-0.6	0.9-1.0
Date Sampled		19/03/2019	19/03/2019	19/03/2019	19/03/2019	19/03/2019
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
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	%	95	98	99	100	95

## Organophosphorus Pesticides

Our Reference		214004-11	214004-12	214004-13	214004-14	214004-15
Your Reference	UNITS	206	207	208	209	210
Depth		0.1-0.2	0.5-0.6	0.5-0.6	0.1-0.2	0.4-0.5
Date Sampled		19/03/2019	19/03/2019	19/03/2019	19/03/2019	19/03/2019
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
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	%	95	96	96	95	96

**Organophosphorus Pesticides**

Our Reference		214004-16	214004-19	214004-20	214004-21	214004-22
Your Reference	UNITS	211	212	212	213	214
Depth		0.1-0.2	0.4-0.5	0.7-0.8	0.4-0.5	0.2-0.3
Date Sampled		19/03/2019	19/03/2019	19/03/2019	19/03/2019	19/03/2019
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
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	%	96	96	101	96	95

**Organophosphorus Pesticides**

Our Reference		214004-24
Your Reference	UNITS	215
Depth		0.2-0.3
Date Sampled		19/03/2019
Type of sample		soil
Date extracted	-	01/04/2019
Date analysed	-	01/04/2019
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	%	96



PCBs in Soil						
Our Reference	UNITS	214004-1	214004-3	214004-6	214004-8	214004-10
Your Reference		201	202	203	204	205
Depth		0.1-0.2	0.1-0.2	0.5-0.6	0.5-0.6	0.9-1.0
Date Sampled		19/03/2019	19/03/2019	19/03/2019	19/03/2019	19/03/2019
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
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	%	95	98	99	100	95

PCBs in Soil						
Our Reference	UNITS	214004-11	214004-12	214004-13	214004-14	214004-15
Your Reference		206	207	208	209	210
Depth		0.1-0.2	0.5-0.6	0.5-0.6	0.1-0.2	0.4-0.5
Date Sampled		19/03/2019	19/03/2019	19/03/2019	19/03/2019	19/03/2019
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
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	%	95	96	96	95	96

PCBs in Soil						
Our Reference		214004-16	214004-19	214004-20	214004-21	214004-22
Your Reference	UNITS	211	212	212	213	214
Depth		0.1-0.2	0.4-0.5	0.7-0.8	0.4-0.5	0.2-0.3
Date Sampled		19/03/2019	19/03/2019	19/03/2019	19/03/2019	19/03/2019
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
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	%	96	96	101	96	95

PCBs in Soil		
Our Reference		214004-24
Your Reference	UNITS	215
Depth		0.2-0.3
Date Sampled		19/03/2019
Type of sample		soil
Date extracted	-	01/04/2019
Date analysed	-	01/04/2019
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	%	96

## Acid Extractable metals in soil

Our Reference		214004-1	214004-3	214004-6	214004-8	214004-10
Your Reference	UNITS	201	202	203	204	205
Depth		0.1-0.2	0.1-0.2	0.5-0.6	0.5-0.6	0.9-1.0
Date Sampled		19/03/2019	19/03/2019	19/03/2019	19/03/2019	19/03/2019
Type of sample		soil	soil	soil	soil	soil
Date prepared	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	02/04/2019	02/04/2019	02/04/2019	02/04/2019	02/04/2019
Arsenic	mg/kg	<4	5	5	4	7
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	22	28	22	16	24
Copper	mg/kg	60	60	48	45	50
Lead	mg/kg	33	34	27	30	40
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	13	22	23	18	18
Zinc	mg/kg	360	190	80	72	91

## Acid Extractable metals in soil

Our Reference		214004-11	214004-12	214004-13	214004-14	214004-15
Your Reference	UNITS	206	207	208	209	210
Depth		0.1-0.2	0.5-0.6	0.5-0.6	0.1-0.2	0.4-0.5
Date Sampled		19/03/2019	19/03/2019	19/03/2019	19/03/2019	19/03/2019
Type of sample		soil	soil	soil	soil	soil
Date prepared	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	02/04/2019	02/04/2019	02/04/2019	02/04/2019	02/04/2019
Arsenic	mg/kg	6	8	<4	9	8
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	32	23	13	23	34
Copper	mg/kg	110	49	7	50	36
Lead	mg/kg	34	25	7	19	76
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	26	14	3	20	33
Zinc	mg/kg	150	91	8	42	70

Acid Extractable metals in soil						
Our Reference		214004-16	214004-19	214004-20	214004-21	214004-22
Your Reference	UNITS	211	212	212	213	214
Depth		0.1-0.2	0.4-0.5	0.7-0.8	0.4-0.5	0.2-0.3
Date Sampled		19/03/2019	19/03/2019	19/03/2019	19/03/2019	19/03/2019
Type of sample		soil	soil	soil	soil	soil
Date prepared	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	02/04/2019	02/04/2019	02/04/2019	02/04/2019	02/04/2019
Arsenic	mg/kg	<4	<4	5	<4	15
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	70	9	19	8	13
Copper	mg/kg	25	8	11	7	73
Lead	mg/kg	7	14	18	11	37
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	68	6	6	7	21
Zinc	mg/kg	29	24	20	25	64

Acid Extractable metals in soil			
Our Reference		214004-24	214004-26
Your Reference	UNITS	215	201 - [TRIPLICATE]
Depth		0.2-0.3	0.1-0.2
Date Sampled		19/03/2019	19/03/2019
Type of sample		soil	soil
Date prepared	-	01/04/2019	01/04/2019
Date analysed	-	02/04/2019	02/04/2019
Arsenic	mg/kg	7	4
Cadmium	mg/kg	<0.4	<0.4
Chromium	mg/kg	21	25
Copper	mg/kg	2	65
Lead	mg/kg	32	31
Mercury	mg/kg	<0.1	<0.1
Nickel	mg/kg	3	16
Zinc	mg/kg	6	240

Moisture						
Our Reference	UNITS	214004-1	214004-3	214004-6	214004-8	214004-10
Your Reference		201	202	203	204	205
Depth		0.1-0.2	0.1-0.2	0.5-0.6	0.5-0.6	0.9-1.0
Date Sampled		19/03/2019	19/03/2019	19/03/2019	19/03/2019	19/03/2019
Type of sample		soil	soil	soil	soil	soil
Date prepared	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	02/04/2019	02/04/2019	02/04/2019	02/04/2019	02/04/2019
Moisture	%	12	14	8.4	8.6	17

Moisture						
Our Reference	UNITS	214004-11	214004-12	214004-13	214004-14	214004-15
Your Reference		206	207	208	209	210
Depth		0.1-0.2	0.5-0.6	0.5-0.6	0.1-0.2	0.4-0.5
Date Sampled		19/03/2019	19/03/2019	19/03/2019	19/03/2019	19/03/2019
Type of sample		soil	soil	soil	soil	soil
Date prepared	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	02/04/2019	02/04/2019	02/04/2019	02/04/2019	02/04/2019
Moisture	%	16	18	15	8.5	11

Moisture						
Our Reference	UNITS	214004-16	214004-19	214004-20	214004-21	214004-22
Your Reference		211	212	212	213	214
Depth		0.1-0.2	0.4-0.5	0.7-0.8	0.4-0.5	0.2-0.3
Date Sampled		19/03/2019	19/03/2019	19/03/2019	19/03/2019	19/03/2019
Type of sample		soil	soil	soil	soil	soil
Date prepared	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	02/04/2019	02/04/2019	02/04/2019	02/04/2019	02/04/2019
Moisture	%	6.0	5.1	10	6.6	13

Moisture		
Our Reference	UNITS	214004-24
Your Reference		215
Depth		0.2-0.3
Date Sampled		19/03/2019
Type of sample		soil
Date prepared	-	01/04/2019
Date analysed	-	02/04/2019
Moisture	%	10



Asbestos ID - soils NEPM						
Our Reference	UNITS	214004-1	214004-3	214004-6	214004-8	214004-10
Your Reference		201	202	203	204	205
Depth		0.1-0.2	0.1-0.2	0.5-0.6	0.5-0.6	0.9-1.0
Date Sampled		19/03/2019	19/03/2019	19/03/2019	19/03/2019	19/03/2019
Type of sample		soil	soil	soil	soil	soil
Date analysed	-	28-29/03/2019	28-29/03/2019	28-29/03/2019	28-29/03/2019	28-29/03/2019
Sample mass tested	g	1,171.2	1,075.24	1,013.18	992.51	770.9
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 (AS4964) >0.1g/kg	-	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	Chrysotile asbestos detected  Amosite asbestos detected  Crocidolite asbestos detected  Organic fibres detected  Synthetic mineral fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

Asbestos ID - soils NEPM						
Our Reference		214004-1	214004-3	214004-6	214004-8	214004-10
Your Reference	UNITS	201	202	203	204	205
Depth		0.1-0.2	0.1-0.2	0.5-0.6	0.5-0.6	0.9-1.0
Date Sampled		19/03/2019	19/03/2019	19/03/2019	19/03/2019	19/03/2019
Type of sample		soil	soil	soil	soil	soil
Total Asbestos <sup>#1</sup>	g/kg	<0.1	<0.1	<0.1	<0.1	24.8482
Asbestos ID in soil <0.1g/kg*	-	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	See Above
ACM >7mm Estimation*	g	–	–	–	–	19.1555
FA and AF Estimation*	g	–	–	–	–	–
FA and AF Estimation*#2	%(w/w)	<0.001	<0.001	<0.001	<0.001	<0.001

Asbestos ID - soils NEPM						
Our Reference		214004-12	214004-13	214004-14	214004-15	214004-16
Your Reference	UNITS	207	208	209	210	211
Depth		0.5-0.6	0.5-0.6	0.1-0.2	0.4-0.5	0.1-0.2
Date Sampled		19/03/2019	19/03/2019	19/03/2019	19/03/2019	19/03/2019
Type of sample		soil	soil	soil	soil	soil
Date analysed	-	28-29/03/2019	28-29/03/2019	28-29/03/2019	28-29/03/2019	28-29/03/2019
Sample mass tested	g	1,030.87	947.73	1,301.28	939.45	1,079
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 (AS4964) >0.1g/kg	-	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
Total Asbestos <sup>#1</sup>	g/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Asbestos ID in soil <0.1g/kg*	-	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected
ACM >7mm Estimation*	g	—	—	—	—	—
FA and AF Estimation*	g	—	—	—	—	—
FA and AF Estimation*#2	%(w/w)	<0.001	<0.001	<0.001	<0.001	<0.001

Asbestos ID - soils NEPM						
Our Reference	UNITS	214004-19	214004-20	214004-21	214004-22	214004-24
Your Reference		212	212	213	214	215
Depth		0.4-0.5	0.7-0.8	0.4-0.5	0.2-0.3	0.2-0.3
Date Sampled		19/03/2019	19/03/2019	19/03/2019	19/03/2019	19/03/2019
Type of sample		soil	soil	soil	soil	soil
Date analysed	-	28-29/03/2019	28-29/03/2019	28-29/03/2019	28-29/03/2019	28-29/03/2019
Sample mass tested	g	1,230.63	1,023.29	1,076.95	1,121.27	1,159.82
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 (AS4964) >0.1g/kg	-	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
Total Asbestos <sup>#1</sup>	g/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Asbestos ID in soil <0.1g/kg*	-	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected
ACM >7mm Estimation*	g	—	—	—	—	—
FA and AF Estimation*	g	—	—	—	—	—
FA and AF Estimation*#2	%(w/w)	<0.001	<0.001	<0.001	<0.001	<0.001

Asbestos ID - soils		
Our Reference		214004-11
Your Reference	UNITS	206
Depth		0.1-0.2
Date Sampled		19/03/2019
Type of sample		soil
Date analysed	-	01/04/2019
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
Asbestos comments	-	NO
Trace Analysis	-	No asbestos detected



Method ID	Methodology Summary
<b>ASB-001</b>	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.
<b>ASB-001</b>	<p>Asbestos ID - Identification of asbestos in soil samples using Polarised Light Microscopy and Dispersion Staining Techniques. Minimum 500mL soil sample was analysed as recommended by "National Environment Protection (Assessment of site contamination) Measure, Schedule B1 and "The Guidelines from the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia - May 2009" with a reporting limit of 0.1g/kg (0.01% w/w) as per Australian Standard AS4964-2004.</p> <p>Results reported denoted with * are outside our scope of NATA accreditation.</p> <p><b>NOTE #1</b> Total Asbestos g/kg was analysed and reported as per Australian Standard AS4964 (This is the sum of ACM &gt;7mm, &lt;7mm and FA/AF)</p> <p><b>NOTE #2</b> The screening level of 0.001% w/w asbestos in soil for FA and AF only applies where the FA and AF are able to be quantified by gravimetric procedures. This screening level is not applicable to free fibres.</p> <p>Estimation = Estimated asbestos weight</p> <p>Results reported with "--" is equivalent to no visible asbestos identified using Polarised Light microscopy and Dispersion Staining Techniques.</p>
<b>Inorg-008</b>	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
<b>Metals-020</b>	Determination of various metals by ICP-AES.
<b>Metals-021</b>	Determination of Mercury by Cold Vapour AAS.
<b>Org-003</b>	<p>Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID.</p> <p>F2 = (&gt;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.</p>
<b>Org-003</b>	<p>Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID.</p> <p>F2 = (&gt;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.</p> <p>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 (&gt;C10-C40).</p>
<b>Org-005</b>	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.

Method ID	Methodology Summary
<b>Org-005</b>	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.
<b>Org-006</b>	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
<b>Org-006</b>	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.
<b>Org-008</b>	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
<b>Org-012</b>	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.
<b>Org-014</b>	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
<b>Org-016</b>	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.
<b>Org-016</b>	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. 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-9	214004-3
Date extracted	-			01/04/2019	1	01/04/2019	01/04/2019		01/04/2019	01/04/2019
Date analysed	-			03/04/2019	1	03/04/2019	03/04/2019		03/04/2019	03/04/2019
TRH C <sub>6</sub> - C <sub>9</sub>	mg/kg	25	Org-016	<25	1	<25	<25	0	99	103
TRH C <sub>6</sub> - C <sub>10</sub>	mg/kg	25	Org-016	<25	1	<25	<25	0	99	103
Benzene	mg/kg	0.2	Org-016	<0.2	1	<0.2	<0.2	0	103	109
Toluene	mg/kg	0.5	Org-016	<0.5	1	<0.5	<0.5	0	98	103
Ethylbenzene	mg/kg	1	Org-016	<1	1	<1	<1	0	97	101
m+p-xylene	mg/kg	2	Org-016	<2	1	<2	<2	0	96	100
o-Xylene	mg/kg	1	Org-016	<1	1	<1	<1	0	99	105
naphthalene	mg/kg	1	Org-014	<1	1	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	125	1	115	119	3	123	123

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]	16	01/04/2019	01/04/2019		[NT]	[NT]
Date analysed	-			[NT]	16	03/04/2019	03/04/2019		[NT]	[NT]
TRH C <sub>6</sub> - C <sub>9</sub>	mg/kg	25	Org-016	[NT]	16	<25	<25	0	[NT]	[NT]
TRH C <sub>6</sub> - C <sub>10</sub>	mg/kg	25	Org-016	[NT]	16	<25	<25	0	[NT]	[NT]
Benzene	mg/kg	0.2	Org-016	[NT]	16	<0.2	<0.2	0	[NT]	[NT]
Toluene	mg/kg	0.5	Org-016	[NT]	16	<0.5	<0.5	0	[NT]	[NT]
Ethylbenzene	mg/kg	1	Org-016	[NT]	16	<1	<1	0	[NT]	[NT]
m+p-xylene	mg/kg	2	Org-016	[NT]	16	<2	<2	0	[NT]	[NT]
o-Xylene	mg/kg	1	Org-016	[NT]	16	<1	<1	0	[NT]	[NT]
naphthalene	mg/kg	1	Org-014	[NT]	16	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	[NT]	16	117	121	3	[NT]	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-9	214004-3
Date extracted	-			01/04/2019	1	01/04/2019	01/04/2019		01/04/2019	01/04/2019
Date analysed	-			02/04/2019	1	02/04/2019	02/04/2019		02/04/2019	02/04/2019
TRH C <sub>10</sub> - C <sub>14</sub>	mg/kg	50	Org-003	<50	1	<50	<50	0	120	96
TRH C <sub>15</sub> - C <sub>28</sub>	mg/kg	100	Org-003	<100	1	<100	<100	0	121	99
TRH C <sub>29</sub> - C <sub>36</sub>	mg/kg	100	Org-003	<100	1	<100	<100	0	114	92
TRH >C <sub>10</sub> -C <sub>16</sub>	mg/kg	50	Org-003	<50	1	<50	<50	0	120	96
TRH >C <sub>16</sub> -C <sub>34</sub>	mg/kg	100	Org-003	<100	1	<100	<100	0	121	99
TRH >C <sub>34</sub> -C <sub>40</sub>	mg/kg	100	Org-003	<100	1	<100	<100	0	114	92
Surrogate o-Terphenyl	%		Org-003	108	1	88	92	4	118	99

QUALITY CONTROL: svTRH (C10-C40) in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	16	01/04/2019	01/04/2019		[NT]	[NT]
Date analysed	-			[NT]	16	02/04/2019	02/04/2019		[NT]	[NT]
TRH C <sub>10</sub> - C <sub>14</sub>	mg/kg	50	Org-003	[NT]	16	<50	<50	0	[NT]	[NT]
TRH C <sub>15</sub> - C <sub>28</sub>	mg/kg	100	Org-003	[NT]	16	<100	<100	0	[NT]	[NT]
TRH C <sub>29</sub> - C <sub>36</sub>	mg/kg	100	Org-003	[NT]	16	<100	<100	0	[NT]	[NT]
TRH >C <sub>10</sub> -C <sub>16</sub>	mg/kg	50	Org-003	[NT]	16	<50	<50	0	[NT]	[NT]
TRH >C <sub>16</sub> -C <sub>34</sub>	mg/kg	100	Org-003	[NT]	16	<100	<100	0	[NT]	[NT]
TRH >C <sub>34</sub> -C <sub>40</sub>	mg/kg	100	Org-003	[NT]	16	<100	<100	0	[NT]	[NT]
Surrogate o-Terphenyl	%		Org-003	[NT]	16	96	97	1	[NT]	[NT]

QUALITY CONTROL: PAHs in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-11	214004-3
Date extracted	-			01/04/2019	1	01/04/2019	01/04/2019		01/04/2019	01/04/2019
Date analysed	-			03/04/2019	1	03/04/2019	03/04/2019		03/04/2019	03/04/2019
Naphthalene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	95	92
Acenaphthylene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	100	97
Phenanthrene	mg/kg	0.1	Org-012	<0.1	1	<0.1	0.2	67	108	106
Anthracene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-012	<0.1	1	0.2	0.3	40	94	94
Pyrene	mg/kg	0.1	Org-012	<0.1	1	0.2	0.4	67	90	89
Benzo(a)anthracene	mg/kg	0.1	Org-012	<0.1	1	<0.1	0.2	67	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-012	<0.1	1	0.1	0.2	67	110	109
Benzo(b,j,k)fluoranthene	mg/kg	0.2	Org-012	<0.2	1	<0.2	0.3	40	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-012	<0.05	1	0.1	0.2	67	107	105
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012	<0.1	1	<0.1	0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012	<0.1	1	0.1	0.2	67	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012	110	1	104	110	6	94	94

QUALITY CONTROL: PAHs in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	16	01/04/2019	01/04/2019		[NT]	[NT]
Date analysed	-			[NT]	16	03/04/2019	03/04/2019		[NT]	[NT]
Naphthalene	mg/kg	0.1	Org-012	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
Acenaphthylene	mg/kg	0.1	Org-012	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-012	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-012	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
Phenanthrene	mg/kg	0.1	Org-012	[NT]	16	<0.1	0.1	0	[NT]	[NT]
Anthracene	mg/kg	0.1	Org-012	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-012	[NT]	16	0.1	0.2	67	[NT]	[NT]
Pyrene	mg/kg	0.1	Org-012	[NT]	16	0.1	0.2	67	[NT]	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-012	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-012	[NT]	16	<0.1	0.1	0	[NT]	[NT]
Benzo(b,j,k)fluoranthene	mg/kg	0.2	Org-012	[NT]	16	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-012	[NT]	16	<0.05	0.1	67	[NT]	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012	[NT]	16	112	107	5	[NT]	[NT]



QUALITY CONTROL: Organochlorine Pesticides in soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-10	214004-3
Date extracted	-			01/04/2019	1	01/04/2019	01/04/2019		01/04/2019	01/04/2019
Date analysed	-			01/04/2019	1	01/04/2019	01/04/2019		01/04/2019	01/04/2019
HCB	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	94	93
gamma-BHC	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	88	87
Heptachlor	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	92	92
delta-BHC	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	91	89
Heptachlor Epoxide	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	98	97
gamma-Chlordane	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	95	94
Dieldrin	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	116	114
Endrin	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	99	98
pp-DDD	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	76	75
Endosulfan II	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	94	92
Methoxychlor	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-005	89	1	95	95	0	87	85

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	16	01/04/2019	01/04/2019		[NT]	[NT]
Date analysed	-			[NT]	16	01/04/2019	01/04/2019		[NT]	[NT]
HCB	mg/kg	0.1	Org-005	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-005	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
gamma-BHC	mg/kg	0.1	Org-005	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-005	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-005	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
delta-BHC	mg/kg	0.1	Org-005	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-005	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-005	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
gamma-Chlordane	mg/kg	0.1	Org-005	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-005	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-005	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-005	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
Dieldrin	mg/kg	0.1	Org-005	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
Endrin	mg/kg	0.1	Org-005	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-005	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
Endosulfan II	mg/kg	0.1	Org-005	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-005	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-005	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-005	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
Methoxychlor	mg/kg	0.1	Org-005	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-005	[NT]	16	96	98	2	[NT]	[NT]

QUALITY CONTROL: Organophosphorus Pesticides					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-10	214004-3
Date extracted	-			01/04/2019	1	01/04/2019	01/04/2019		01/04/2019	01/04/2019
Date analysed	-			01/04/2019	1	01/04/2019	01/04/2019		01/04/2019	01/04/2019
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Chlorpyrifos	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	102	91
Chlorpyrifos-methyl	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Dichlorvos	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	86	92
Dimethoate	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	105	96
Fenitrothion	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	109	92
Malathion	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	86	76
Parathion	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	115	96
Ronnel	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	99	91
Surrogate TCMX	%		Org-008	89	1	95	95	0	100	91

QUALITY CONTROL: Organophosphorus Pesticides					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	16	01/04/2019	01/04/2019		[NT]	[NT]
Date analysed	-			[NT]	16	01/04/2019	01/04/2019		[NT]	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-008	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-008	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
Chlorpyrifos	mg/kg	0.1	Org-008	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
Chlorpyrifos-methyl	mg/kg	0.1	Org-008	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-008	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
Dichlorvos	mg/kg	0.1	Org-008	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
Dimethoate	mg/kg	0.1	Org-008	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-008	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
Fenitrothion	mg/kg	0.1	Org-008	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
Malathion	mg/kg	0.1	Org-008	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
Parathion	mg/kg	0.1	Org-008	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-008	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-008	[NT]	16	96	98	2	[NT]	[NT]

QUALITY CONTROL: PCBs in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-10	214004-3
Date extracted	-			01/04/2019	1	01/04/2019	01/04/2019		01/04/2019	01/04/2019
Date analysed	-			01/04/2019	1	01/04/2019	01/04/2019		01/04/2019	01/04/2019
Aroclor 1016	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	100	104
Aroclor 1260	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCLMX	%		Org-006	89	1	95	95	0	100	91

QUALITY CONTROL: PCBs in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	16	01/04/2019	01/04/2019		[NT]	[NT]
Date analysed	-			[NT]	16	01/04/2019	01/04/2019		[NT]	[NT]
Aroclor 1016	mg/kg	0.1	Org-006	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-006	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-006	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-006	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-006	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-006	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1260	mg/kg	0.1	Org-006	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCLMX	%		Org-006	[NT]	16	96	98	2	[NT]	[NT]

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-11	214004-3
Date prepared	-			01/04/2019	1	01/04/2019	01/04/2019		01/04/2019	01/04/2019
Date analysed	-			02/04/2019	1	02/04/2019	02/04/2019		02/04/2019	02/04/2019
Arsenic	mg/kg	4	Metals-020	<4	1	<4	6	40	103	90
Cadmium	mg/kg	0.4	Metals-020	<0.4	1	<0.4	<0.4	0	105	84
Chromium	mg/kg	1	Metals-020	<1	1	22	25	13	107	85
Copper	mg/kg	1	Metals-020	<1	1	60	67	11	114	128
Lead	mg/kg	1	Metals-020	<1	1	33	29	13	112	107
Mercury	mg/kg	0.1	Metals-021	<0.1	1	<0.1	<0.1	0	103	99
Nickel	mg/kg	1	Metals-020	<1	1	13	18	32	112	89
Zinc	mg/kg	1	Metals-020	<1	1	360	210	53	103	#

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	16	01/04/2019	01/04/2019		[NT]	[NT]
Date analysed	-			[NT]	16	02/04/2019	02/04/2019		[NT]	[NT]
Arsenic	mg/kg	4	Metals-020	[NT]	16	<4	<4	0	[NT]	[NT]
Cadmium	mg/kg	0.4	Metals-020	[NT]	16	<0.4	<0.4	0	[NT]	[NT]
Chromium	mg/kg	1	Metals-020	[NT]	16	70	53	28	[NT]	[NT]
Copper	mg/kg	1	Metals-020	[NT]	16	25	25	0	[NT]	[NT]
Lead	mg/kg	1	Metals-020	[NT]	16	7	7	0	[NT]	[NT]
Mercury	mg/kg	0.1	Metals-021	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
Nickel	mg/kg	1	Metals-020	[NT]	16	68	56	19	[NT]	[NT]
Zinc	mg/kg	1	Metals-020	[NT]	16	29	35	19	[NT]	[NT]



## Result Definitions

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

## Quality Control Definitions

<b>Blank</b>	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.
<b>Duplicate</b>	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.
<b>Matrix Spike</b>	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.
<b>LCS (Laboratory Control Sample)</b>	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.
<b>Surrogate Spike</b>	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-ID in soil: NEPM

This report is consistent with the reporting recommendations in the National Environment Protection (Assessment of Site Contamination) Measure, Schedule B1, May 2013. This is reported outside our scope of NATA accreditation.

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 214004-11 was sub-sampled from a jar provided by the client.

8 metals in soil - # 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.

Acid Extractable Metals in Soil: The laboratory RPD acceptance criteria has been exceeded for 214004-1 for Zn. Therefore a triplicate result has been issued as laboratory sample number 214004-26.

Project No: 94525.02			Suburb: St Marys			To: Envirolab Services								
Project Name: St Mary's			Order Number											
Project Manager: Grant Russell			Sampler: JY			Attn: Aileen Hie								
Emails: Grant.Russell@douglaspartners.com.au						Phone: 9910 6200								
Date Required: Same day <input type="checkbox"/> 24 hours <input type="checkbox"/> 48 hours <input type="checkbox"/> 72 hours <input type="checkbox"/> Standard <input type="checkbox"/>						Email:								
Prior Storage: <input type="checkbox"/> Esky <input type="checkbox"/> Fridge <input type="checkbox"/> Shelved			Do samples contain 'potential' HBM? Yes <input type="checkbox"/> No <input type="checkbox"/> (If YES, then handle, transport and store in accordance with FPM HAZID)											
Sample ID	Lab ID	Date Sampled	Sample Type	Container Type	Analytes								Notes/preservation	
			S - soil W - water	G - glass P - plastic	Heavy Metals	OCP/OPP PCB	TRH and BTEX	PAH	Total Phenols	Asbestos 500 ml	COMB 6	VOCs		Hold
201 / 0.1-0.2	1	19/03/19	S	G						X	X			
201 / 0.5-0.6	2	19/03/19	S	G									X	
202 / 0.1-0.2	3	19/03/19	S	G						X	X			
202 / 0.5-0.6	4	19/03/19	S	G									X	
203 / 0.1-0.2	5	19/03/19	S	G									X	
203 / 0.5-0.6	6	19/03/19	S	G						X	X			
204 / 0.1-0.2	7	19/03/19	S	G									X	
204 / 0.5-0.6	8	19/03/19	S	G						X	X			
205 / 0.1-0.2	9	19/03/19	S	G									X	
205 / 0.9-1.0	10	19/03/19	S	G						X	X			
206 / 0.1-0.2	11	19/03/19	S	G						X	X			
207 / 0.5-0.6	12	19/03/19	S	G						X	X			
208 / 0.5-0.6	13	19/03/19	S	G						X	X			
209 / 0.1-0.2	14	19/03/19	S	G						X	X			
PQL (S) mg/kg														ANZECC PQLs req'd for all water analytes <input type="checkbox"/>
PQL = practical quantitation limit. If none given, default to Laboratory Method Detection Limit										Lab Report/Reference No: 214004				
Metals to Analyse: 8HM unless specified here:														
Total number of samples in container:					Relinquished by: SJS					Transported to laboratory by:				
Send Results to: Douglas Partners Pty Ltd					Address					Phone: Fax:				
Signed: GAR					Received by: Ming Yan To					Date & Time: 21/03/19 16:45				

Project No: 94525.02		Suburb: St Marys		To: Envirolab Services											
Project Name: St Marys		Order Number													
Project Manager: Grant Russell		Sampler: JY		Attn: Aileen Hie											
Emails: Grant.Russell@douglaspartners.com.au				Phone: 9910 6200											
Date Required: Same day <input type="checkbox"/> 24 hours <input type="checkbox"/> 48 hours <input type="checkbox"/> 72 hours <input type="checkbox"/> Standard <input type="checkbox"/>				Email:											
Prior Storage: <input type="checkbox"/> Esky <input type="checkbox"/> Fridge <input type="checkbox"/> Shelved		Do samples contain 'potential' HBM? Yes <input type="checkbox"/> No <input type="checkbox"/> (If YES, then handle, transport and store in accordance with FPM HAZID)													
Sample ID	Lab ID	Date Sampled	Sample Type	Container Type	Analytes									Notes/preservation	
			S - soil W - water	G - glass P - plastic	Heavy Metals	OCP/OPP PCB	TRH and BTEX	PAH	Total Phenols	Asbestos 500 ml	COMB 6	VOCs	Hold		
210 / 0.4-0.5	15	19/03/19	S	G							X	X			
211 / 0.1-0.2	16	19/03/19	S	G							X	X			
211 / 0.4-0.5	17	19/03/19	S	G										X	
212 / 0.1-0.2	18	19/03/19	S	G										X	
212 / 0.4-0.5	19	19/03/19	S	G							X	X			
212 / 0.7-0.8	20	19/03/19	S	G							X	X			
213 / 0.4-0.5	21	19/03/19	S	G							X	X			
214 / 0.2-0.3	22	19/03/19	S	G										X	
214 / 0.9-1.0	23	19/03/19	S	G											
215	24	19/03/19	S	G							X	X			
215 / 1.4-1.5	25	19/03/19	S	G										X	
PQL (S) mg/kg															
PQL = practical quantitation limit. If none given, default to Laboratory Method Detection Limit										Lab Report/Reference No: 214004					
Metals to Analyse: 8HM unless specified here:															
Total number of samples in container:				Relinquished by: SJS				Transported to laboratory by:							
Send Results to: Douglas Partners Pty Ltd				Address				Phone:				Fax:			
Signed: GAR				Received by:				Date & Time:							



## CERTIFICATE OF ANALYSIS 214380

### Client Details

<b>Client</b>	Douglas Partners Pty Ltd Smeaton Grange
<b>Attention</b>	Grant Russell
<b>Address</b>	18 Waler Crescent, Smeaton Grange, NSW, 2567

### Sample Details

<b>Your Reference</b>	<b><u>94525.02, St Marys</u></b>
<b>Number of Samples</b>	107 soil
<b>Date samples received</b>	26/03/2019
<b>Date completed instructions received</b>	27/03/2019

### 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

<b>Date results requested by</b>	03/04/2019
<b>Date of Issue</b>	03/04/2019
NATA Accreditation Number 2901. This document shall not be reproduced except in full.	
Accredited for compliance with ISO/IEC 17025 - Testing. <b>Tests not covered by NATA are denoted with *</b>	

#### Asbestos Approved By

Analysed by Asbestos Approved Identifier: Aida Marner, Lucy Zhu, Matt Tang

Authorised by Asbestos Approved Signatory: Lucy Zhu

#### Results Approved By

Jeremy Faircloth, Operations Manager, Sydney  
 Ken Nguyen, Reporting Supervisor  
 Lucy Zhu, Senior Asbestos Analyst  
 Steven Luong, Organics Supervisor

#### Authorised By



Jacinta Hurst, Laboratory Manager

## vTRH(C6-C10)/BTEXN in Soil

Our Reference		214380-32	214380-35	214380-39	214380-41	214380-42
Your Reference	UNITS	SP2-TP1	SP2-TP4	SP2-TP8	SP2-TP10	SP4-TP1
Depth		0.7-0.8	0.4-0.5	1.9-2.0	0.1-0.2	0.4-0.5
Date Sampled		22/03/2019	22/03/2019	22/03/2019	22/03/2019	22/03/2019
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	03/04/2019	03/04/2019	03/04/2019	03/04/2019	03/04/2019
TRH C <sub>6</sub> - C <sub>9</sub>	mg/kg	<25	<25	<25	<25	<25
TRH C <sub>6</sub> - C <sub>10</sub>	mg/kg	<25	<25	<25	<25	<25
vTPH C <sub>6</sub> - C <sub>10</sub> 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	%	96	94	94	80	99

## vTRH(C6-C10)/BTEXN in Soil

Our Reference		214380-46	214380-49	214380-51	214380-52	214380-54
Your Reference	UNITS	SP4-TP5	SP4-TP8	SP4-TP10	SP5-TP1	SP5-TP3
Depth		0.4-0.5	0.4-0.5	0.5-0.6	1.9-2.0	0.9-1.0
Date Sampled		22/03/2019	22/03/2019	22/03/2019	22/03/2019	22/03/2019
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	03/04/2019	03/04/2019	03/04/2019	03/04/2019	03/04/2019
TRH C <sub>6</sub> - C <sub>9</sub>	mg/kg	<25	<25	<25	<25	<25
TRH C <sub>6</sub> - C <sub>10</sub>	mg/kg	<25	<25	<25	<25	<25
vTPH C <sub>6</sub> - C <sub>10</sub> 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	%	93	91	91	95	94

## vTRH(C6-C10)/BTEXN in Soil

Our Reference		214380-55	214380-57	214380-58	214380-60	214380-63
Your Reference	UNITS	SP5-TP6	SP5-TP8	SP10-TP1	SP10-TP3	SP10-TP6
Depth		1.4-1.5	1.9-2.0	3.4-3.5	1.9-2.0	0.6-0.7
Date Sampled		22/03/2019	22/03/2019	22/03/2019	22/03/2019	22/03/2019
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	03/04/2019	03/04/2019	03/04/2019	03/04/2019	03/04/2019
TRH C <sub>6</sub> - C <sub>9</sub>	mg/kg	<25	<25	<25	<25	<25
TRH C <sub>6</sub> - C <sub>10</sub>	mg/kg	<25	<25	<25	<25	<25
vTPH C <sub>6</sub> - C <sub>10</sub> 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	%	100	79	97	95	95

## vTRH(C6-C10)/BTEXN in Soil

Our Reference		214380-67	214380-82	214380-83	214380-85
Your Reference	UNITS	SP10-TP10	SP3-TP17	SP3-TP18	SP3-TP20
Depth		0.4-0.5	1.4-1.5	0.9-1.0	1.9-2.0
Date Sampled		22/03/2019	22/03/2019	22/03/2019	22/03/2019
Type of sample		soil	soil	soil	soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	03/04/2019	03/04/2019	03/04/2019	03/04/2019
TRH C <sub>6</sub> - C <sub>9</sub>	mg/kg	<25	<25	<25	<25
TRH C <sub>6</sub> - C <sub>10</sub>	mg/kg	<25	<25	<25	<25
vTPH C <sub>6</sub> - C <sub>10</sub> less BTEX (F1)	mg/kg	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	99	99	95	98

## svTRH (C10-C40) in Soil

Our Reference		214380-32	214380-35	214380-39	214380-41	214380-42
Your Reference	UNITS	SP2-TP1	SP2-TP4	SP2-TP8	SP2-TP10	SP4-TP1
Depth		0.7-0.8	0.4-0.5	1.9-2.0	0.1-0.2	0.4-0.5
Date Sampled		22/03/2019	22/03/2019	22/03/2019	22/03/2019	22/03/2019
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	02/04/2019	02/04/2019	02/04/2019	02/04/2019	02/04/2019
TRH C <sub>10</sub> - C <sub>14</sub>	mg/kg	<50	<50	<50	<50	<50
TRH C <sub>15</sub> - C <sub>28</sub>	mg/kg	<100	<100	<100	<100	<100
TRH C <sub>29</sub> - C <sub>36</sub>	mg/kg	<100	<100	<100	<100	<100
TRH >C <sub>10</sub> -C <sub>16</sub>	mg/kg	<50	<50	<50	<50	<50
TRH >C <sub>10</sub> - C <sub>16</sub> less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C <sub>16</sub> -C <sub>34</sub>	mg/kg	<100	<100	<100	<100	<100
TRH >C <sub>34</sub> -C <sub>40</sub>	mg/kg	<100	<100	<100	130	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	130	<50
Surrogate o-Terphenyl	%	88	91	88	89	88

## svTRH (C10-C40) in Soil

Our Reference		214380-46	214380-49	214380-51	214380-52	214380-54
Your Reference	UNITS	SP4-TP5	SP4-TP8	SP4-TP10	SP5-TP1	SP5-TP3
Depth		0.4-0.5	0.4-0.5	0.5-0.6	1.9-2.0	0.9-1.0
Date Sampled		22/03/2019	22/03/2019	22/03/2019	22/03/2019	22/03/2019
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	02/04/2019	02/04/2019	02/04/2019	02/04/2019	02/04/2019
TRH C <sub>10</sub> - C <sub>14</sub>	mg/kg	<50	<50	<50	<50	<50
TRH C <sub>15</sub> - C <sub>28</sub>	mg/kg	170	100	160	<100	<100
TRH C <sub>29</sub> - C <sub>36</sub>	mg/kg	230	160	210	<100	<100
TRH >C <sub>10</sub> -C <sub>16</sub>	mg/kg	<50	<50	<50	<50	<50
TRH >C <sub>10</sub> - C <sub>16</sub> less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C <sub>16</sub> -C <sub>34</sub>	mg/kg	340	220	320	<100	<100
TRH >C <sub>34</sub> -C <sub>40</sub>	mg/kg	130	<100	120	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	470	220	440	<50	<50
Surrogate o-Terphenyl	%	90	91	96	90	88

## svTRH (C10-C40) in Soil

Our Reference		214380-55	214380-57	214380-58	214380-60	214380-63
Your Reference	UNITS	SP5-TP6	SP5-TP8	SP10-TP1	SP10-TP3	SP10-TP6
Depth		1.4-1.5	1.9-2.0	3.4-3.5	1.9-2.0	0.6-0.7
Date Sampled		22/03/2019	22/03/2019	22/03/2019	22/03/2019	22/03/2019
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	02/04/2019	02/04/2019	02/04/2019	02/04/2019	02/04/2019
TRH C <sub>10</sub> - C <sub>14</sub>	mg/kg	<50	<50	<50	<50	<50
TRH C <sub>15</sub> - C <sub>28</sub>	mg/kg	<100	<100	<100	<100	<100
TRH C <sub>29</sub> - C <sub>36</sub>	mg/kg	<100	<100	<100	110	<100
TRH >C <sub>10</sub> -C <sub>16</sub>	mg/kg	<50	<50	<50	<50	<50
TRH >C <sub>10</sub> - C <sub>16</sub> less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C <sub>16</sub> -C <sub>34</sub>	mg/kg	<100	<100	<100	130	<100
TRH >C <sub>34</sub> -C <sub>40</sub>	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	130	<50
Surrogate o-Terphenyl	%	91	92	87	90	88

## svTRH (C10-C40) in Soil

Our Reference		214380-67	214380-82	214380-83	214380-85
Your Reference	UNITS	SP10-TP10	SP3-TP17	SP3-TP18	SP3-TP20
Depth		0.4-0.5	1.4-1.5	0.9-1.0	1.9-2.0
Date Sampled		22/03/2019	22/03/2019	22/03/2019	22/03/2019
Type of sample		soil	soil	soil	soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	02/04/2019	02/04/2019	03/04/2019	03/04/2019
TRH C <sub>10</sub> - C <sub>14</sub>	mg/kg	<50	<50	<50	<50
TRH C <sub>15</sub> - C <sub>28</sub>	mg/kg	<100	<100	<100	<100
TRH C <sub>29</sub> - C <sub>36</sub>	mg/kg	<100	<100	<100	<100
TRH >C <sub>10</sub> -C <sub>16</sub>	mg/kg	<50	<50	<50	<50
TRH >C <sub>10</sub> - C <sub>16</sub> less Naphthalene (F2)	mg/kg	<50	<50	<50	<50
TRH >C <sub>16</sub> -C <sub>34</sub>	mg/kg	<100	<100	<100	<100
TRH >C <sub>34</sub> -C <sub>40</sub>	mg/kg	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50
Surrogate o-Terphenyl	%	92	90	90	91



PAHs in Soil						
Our Reference		214380-32	214380-35	214380-39	214380-41	214380-42
Your Reference	UNITS	SP2-TP1	SP2-TP4	SP2-TP8	SP2-TP10	SP4-TP1
Depth		0.7-0.8	0.4-0.5	1.9-2.0	0.1-0.2	0.4-0.5
Date Sampled		22/03/2019	22/03/2019	22/03/2019	22/03/2019	22/03/2019
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	02/04/2019	02/04/2019	02/04/2019	02/04/2019	02/04/2019
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	0.2
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	0.1	0.2
Pyrene	mg/kg	<0.1	<0.1	<0.1	0.2	0.2
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	0.2	0.2
Chrysene	mg/kg	<0.1	<0.1	<0.1	0.2	0.2
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	0.1
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	0.3	<0.1
Total +ve PAH's	mg/kg	<0.05	<0.05	<0.05	1.7	1.3
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	%	110	102	101	106	91

PAHs in Soil						
Our Reference		214380-46	214380-49	214380-51	214380-52	214380-54
Your Reference	UNITS	SP4-TP5	SP4-TP8	SP4-TP10	SP5-TP1	SP5-TP3
Depth		0.4-0.5	0.4-0.5	0.5-0.6	1.9-2.0	0.9-1.0
Date Sampled		22/03/2019	22/03/2019	22/03/2019	22/03/2019	22/03/2019
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	02/04/2019	02/04/2019	02/04/2019	02/04/2019	02/04/2019
Naphthalene	mg/kg	0.2	0.2	0.3	<0.1	<0.1
Acenaphthylene	mg/kg	0.2	<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	1.5	0.8	1.2	<0.1	<0.1
Anthracene	mg/kg	0.2	<0.1	0.2	<0.1	<0.1
Fluoranthene	mg/kg	2.8	0.9	2.6	<0.1	<0.1
Pyrene	mg/kg	2.6	1.0	2.8	<0.1	<0.1
Benzo(a)anthracene	mg/kg	1.7	0.6	2.4	<0.1	<0.1
Chrysene	mg/kg	2.0	0.8	2.0	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	2.4	1	2.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	1.4	0.5	1.2	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	0.7	0.3	0.7	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	0.2	<0.1	0.2	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	0.9	0.4	0.8	<0.1	<0.1
Total +ve PAH's	mg/kg	17	6.5	17	<0.05	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	2.1	0.7	2.0	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	2.1	0.8	2.0	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	2.1	0.8	2.0	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	90	100	126	92	118

PAHs in Soil						
Our Reference		214380-55	214380-57	214380-58	214380-60	214380-63
Your Reference	UNITS	SP5-TP6	SP5-TP8	SP10-TP1	SP10-TP3	SP10-TP6
Depth		1.4-1.5	1.9-2.0	3.4-3.5	1.9-2.0	0.6-0.7
Date Sampled		22/03/2019	22/03/2019	22/03/2019	22/03/2019	22/03/2019
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	02/04/2019	02/04/2019	02/04/2019	02/04/2019	02/04/2019
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	0.3	0.4	0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	0.2	0.3	0.4
Pyrene	mg/kg	<0.1	<0.1	0.2	0.3	0.4
Benzo(a)anthracene	mg/kg	<0.1	<0.1	0.1	0.2	0.2
Chrysene	mg/kg	<0.1	<0.1	0.2	0.3	0.2
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	0.2	0.3	0.4
Benzo(a)pyrene	mg/kg	<0.05	<0.05	0.09	0.1	0.2
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.2
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	0.2
Total +ve PAH's	mg/kg	<0.05	<0.05	1.4	1.7	2.3
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 p-Terphenyl-d14	%	109	105	100	100	89

PAHs in Soil					
Our Reference		214380-67	214380-82	214380-83	214380-85
Your Reference	UNITS	SP10-TP10	SP3-TP17	SP3-TP18	SP3-TP20
Depth		0.4-0.5	1.4-1.5	0.9-1.0	1.9-2.0
Date Sampled		22/03/2019	22/03/2019	22/03/2019	22/03/2019
Type of sample		soil	soil	soil	soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	02/04/2019	02/04/2019	02/04/2019	02/04/2019
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	0.2	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	0.2	0.4	<0.1
Pyrene	mg/kg	<0.1	0.2	0.4	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	0.2	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	0.4	<0.2
Benzo(a)pyrene	mg/kg	<0.05	0.1	0.2	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	0.2	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	0.1	0.2	<0.1
Total +ve PAH's	mg/kg	<0.05	0.58	2.3	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5
Surrogate <i>p</i> -Terphenyl-d14	%	88	105	86	84

Organochlorine Pesticides in soil						
Our Reference		214380-32	214380-35	214380-39	214380-41	214380-42
Your Reference	UNITS	SP2-TP1	SP2-TP4	SP2-TP8	SP2-TP10	SP4-TP1
Depth		0.7-0.8	0.4-0.5	1.9-2.0	0.1-0.2	0.4-0.5
Date Sampled		22/03/2019	22/03/2019	22/03/2019	22/03/2019	22/03/2019
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
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	%	91	92	90	89	88



Organochlorine Pesticides in soil						
Our Reference		214380-46	214380-49	214380-51	214380-52	214380-54
Your Reference	UNITS	SP4-TP5	SP4-TP8	SP4-TP10	SP5-TP1	SP5-TP3
Depth		0.4-0.5	0.4-0.5	0.5-0.6	1.9-2.0	0.9-1.0
Date Sampled		22/03/2019	22/03/2019	22/03/2019	22/03/2019	22/03/2019
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
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	0.2	<0.1	0.3	<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	1.1	<0.1	2.5	<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	1.3	<0.1	2.8	<0.1	<0.1
Surrogate TCMX	%	84	85	86	92	90

Organochlorine Pesticides in soil						
Our Reference		214380-55	214380-57	214380-58	214380-60	214380-63
Your Reference	UNITS	SP5-TP6	SP5-TP8	SP10-TP1	SP10-TP3	SP10-TP6
Depth		1.4-1.5	1.9-2.0	3.4-3.5	1.9-2.0	0.6-0.7
Date Sampled		22/03/2019	22/03/2019	22/03/2019	22/03/2019	22/03/2019
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
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	91	87	86	88

Organochlorine Pesticides in soil					
Our Reference		214380-67	214380-82	214380-83	214380-85
Your Reference	UNITS	SP10-TP10	SP3-TP17	SP3-TP18	SP3-TP20
Depth		0.4-0.5	1.4-1.5	0.9-1.0	1.9-2.0
Date Sampled		22/03/2019	22/03/2019	22/03/2019	22/03/2019
Type of sample		soil	soil	soil	soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	91	91	89	89

## Organophosphorus Pesticides

Our Reference		214380-32	214380-35	214380-39	214380-41	214380-42
Your Reference	UNITS	SP2-TP1	SP2-TP4	SP2-TP8	SP2-TP10	SP4-TP1
Depth		0.7-0.8	0.4-0.5	1.9-2.0	0.1-0.2	0.4-0.5
Date Sampled		22/03/2019	22/03/2019	22/03/2019	22/03/2019	22/03/2019
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
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	%	91	92	90	89	88

## Organophosphorus Pesticides

Our Reference		214380-46	214380-49	214380-51	214380-52	214380-54
Your Reference	UNITS	SP4-TP5	SP4-TP8	SP4-TP10	SP5-TP1	SP5-TP3
Depth		0.4-0.5	0.4-0.5	0.5-0.6	1.9-2.0	0.9-1.0
Date Sampled		22/03/2019	22/03/2019	22/03/2019	22/03/2019	22/03/2019
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
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	%	84	85	86	92	90

## Organophosphorus Pesticides

Our Reference		214380-55	214380-57	214380-58	214380-60	214380-63
Your Reference	UNITS	SP5-TP6	SP5-TP8	SP10-TP1	SP10-TP3	SP10-TP6
Depth		1.4-1.5	1.9-2.0	3.4-3.5	1.9-2.0	0.6-0.7
Date Sampled		22/03/2019	22/03/2019	22/03/2019	22/03/2019	22/03/2019
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
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	91	87	86	88

## Organophosphorus Pesticides

Our Reference		214380-67	214380-82	214380-83	214380-85
Your Reference	UNITS	SP10-TP10	SP3-TP17	SP3-TP18	SP3-TP20
Depth		0.4-0.5	1.4-1.5	0.9-1.0	1.9-2.0
Date Sampled		22/03/2019	22/03/2019	22/03/2019	22/03/2019
Type of sample		soil	soil	soil	soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1
Chlorpyrifos	mg/kg	<0.1	<0.1	<0.1	<0.1
Chlorpyrifos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	91	91	89	89

PCBs in Soil						
Our Reference	UNITS	214380-32	214380-35	214380-39	214380-41	214380-42
Your Reference		SP2-TP1	SP2-TP4	SP2-TP8	SP2-TP10	SP4-TP1
Depth		0.7-0.8	0.4-0.5	1.9-2.0	0.1-0.2	0.4-0.5
Date Sampled		22/03/2019	22/03/2019	22/03/2019	22/03/2019	22/03/2019
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
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	%	91	92	90	89	88

PCBs in Soil						
Our Reference	UNITS	214380-46	214380-49	214380-51	214380-52	214380-54
Your Reference		SP4-TP5	SP4-TP8	SP4-TP10	SP5-TP1	SP5-TP3
Depth		0.4-0.5	0.4-0.5	0.5-0.6	1.9-2.0	0.9-1.0
Date Sampled		22/03/2019	22/03/2019	22/03/2019	22/03/2019	22/03/2019
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Aroclor 1016	mg/kg	<0.2	<0.1	<0.2	<0.1	<0.1
Aroclor 1221	mg/kg	<0.2	<0.1	<0.2	<0.1	<0.1
Aroclor 1232	mg/kg	<0.2	<0.1	<0.2	<0.1	<0.1
Aroclor 1242	mg/kg	<0.2	<0.1	<0.2	<0.1	<0.1
Aroclor 1248	mg/kg	<0.2	<0.1	<0.2	<0.1	<0.1
Aroclor 1254	mg/kg	<0.2	<0.1	<0.2	<0.1	<0.1
Aroclor 1260	mg/kg	<0.2	<0.1	<0.2	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.2	<0.1	<0.2	<0.1	<0.1
Surrogate TCLMX	%	84	85	86	92	90



PCBs in Soil						
Our Reference		214380-55	214380-57	214380-58	214380-60	214380-63
Your Reference	UNITS	SP5-TP6	SP5-TP8	SP10-TP1	SP10-TP3	SP10-TP6
Depth		1.4-1.5	1.9-2.0	3.4-3.5	1.9-2.0	0.6-0.7
Date Sampled		22/03/2019	22/03/2019	22/03/2019	22/03/2019	22/03/2019
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
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	91	87	86	88

PCBs in Soil					
Our Reference		214380-67	214380-82	214380-83	214380-85
Your Reference	UNITS	SP10-TP10	SP3-TP17	SP3-TP18	SP3-TP20
Depth		0.4-0.5	1.4-1.5	0.9-1.0	1.9-2.0
Date Sampled		22/03/2019	22/03/2019	22/03/2019	22/03/2019
Type of sample		soil	soil	soil	soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	91	91	89	89

## Acid Extractable metals in soil

Our Reference		214380-32	214380-35	214380-39	214380-41	214380-42
Your Reference	UNITS	SP2-TP1	SP2-TP4	SP2-TP8	SP2-TP10	SP4-TP1
Depth		0.7-0.8	0.4-0.5	1.9-2.0	0.1-0.2	0.4-0.5
Date Sampled		22/03/2019	22/03/2019	22/03/2019	22/03/2019	22/03/2019
Type of sample		soil	soil	soil	soil	soil
Date prepared	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Arsenic	mg/kg	<4	13	<4	<4	24
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	0.7
Chromium	mg/kg	10	9	11	7	9
Copper	mg/kg	77	61	54	38	150
Lead	mg/kg	22	16	16	9	80
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	0.2
Nickel	mg/kg	7	10	18	6	13
Zinc	mg/kg	120	33	43	32	130

## Acid Extractable metals in soil

Our Reference		214380-46	214380-49	214380-51	214380-52	214380-54
Your Reference	UNITS	SP4-TP5	SP4-TP8	SP4-TP10	SP5-TP1	SP5-TP3
Depth		0.4-0.5	0.4-0.5	0.5-0.6	1.9-2.0	0.9-1.0
Date Sampled		22/03/2019	22/03/2019	22/03/2019	22/03/2019	22/03/2019
Type of sample		soil	soil	soil	soil	soil
Date prepared	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Arsenic	mg/kg	130	150	130	<4	6
Cadmium	mg/kg	5.4	5.2	4.0	<0.4	<0.4
Chromium	mg/kg	36	19	24	13	22
Copper	mg/kg	350	270	280	11	11
Lead	mg/kg	480	400	690	17	19
Mercury	mg/kg	0.2	0.2	0.2	<0.1	<0.1
Nickel	mg/kg	33	23	29	8	7
Zinc	mg/kg	590	490	490	27	33

## Acid Extractable metals in soil

Our Reference		214380-55	214380-57	214380-58	214380-60	214380-63
Your Reference	UNITS	SP5-TP6	SP5-TP8	SP10-TP1	SP10-TP3	SP10-TP6
Depth		1.4-1.5	1.9-2.0	3.4-3.5	1.9-2.0	0.6-0.7
Date Sampled		22/03/2019	22/03/2019	22/03/2019	22/03/2019	22/03/2019
Type of sample		soil	soil	soil	soil	soil
Date prepared	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Arsenic	mg/kg	4	4	120	170	6
Cadmium	mg/kg	<0.4	<0.4	0.6	0.8	<0.4
Chromium	mg/kg	15	11	9	10	18
Copper	mg/kg	12	10	170	420	23
Lead	mg/kg	18	16	240	290	18
Mercury	mg/kg	<0.1	<0.1	0.1	0.2	<0.1
Nickel	mg/kg	8	9	18	21	20
Zinc	mg/kg	29	30	130	190	39

## Acid Extractable metals in soil

Our Reference		214380-67	214380-82	214380-83	214380-85
Your Reference	UNITS	SP10-TP10	SP3-TP17	SP3-TP18	SP3-TP20
Depth		0.4-0.5	1.4-1.5	0.9-1.0	1.9-2.0
Date Sampled		22/03/2019	22/03/2019	22/03/2019	22/03/2019
Type of sample		soil	soil	soil	soil
Date prepared	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Arsenic	mg/kg	<4	5	6	6
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	8	19	21	20
Copper	mg/kg	8	6	7	16
Lead	mg/kg	11	15	17	21
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	3	4	5	10
Zinc	mg/kg	9	11	13	35

Moisture						
Our Reference	UNITS	214380-32	214380-35	214380-39	214380-41	214380-42
Your Reference		SP2-TP1	SP2-TP4	SP2-TP8	SP2-TP10	SP4-TP1
Depth		0.7-0.8	0.4-0.5	1.9-2.0	0.1-0.2	0.4-0.5
Date Sampled		22/03/2019	22/03/2019	22/03/2019	22/03/2019	22/03/2019
Type of sample		soil	soil	soil	soil	soil
Date prepared	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	02/04/2019	02/04/2019	02/04/2019	02/04/2019	02/04/2019
Moisture	%	11	12	13	7.1	9.9

Moisture						
Our Reference	UNITS	214380-46	214380-49	214380-51	214380-52	214380-54
Your Reference		SP4-TP5	SP4-TP8	SP4-TP10	SP5-TP1	SP5-TP3
Depth		0.4-0.5	0.4-0.5	0.5-0.6	1.9-2.0	0.9-1.0
Date Sampled		22/03/2019	22/03/2019	22/03/2019	22/03/2019	22/03/2019
Type of sample		soil	soil	soil	soil	soil
Date prepared	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	02/04/2019	02/04/2019	02/04/2019	02/04/2019	02/04/2019
Moisture	%	14	12	8.3	6.0	8.9

Moisture						
Our Reference	UNITS	214380-55	214380-57	214380-58	214380-60	214380-63
Your Reference		SP5-TP6	SP5-TP8	SP10-TP1	SP10-TP3	SP10-TP6
Depth		1.4-1.5	1.9-2.0	3.4-3.5	1.9-2.0	0.6-0.7
Date Sampled		22/03/2019	22/03/2019	22/03/2019	22/03/2019	22/03/2019
Type of sample		soil	soil	soil	soil	soil
Date prepared	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	02/04/2019	02/04/2019	02/04/2019	02/04/2019	02/04/2019
Moisture	%	5.9	5.1	15	6.3	9.3

Moisture					
Our Reference	UNITS	214380-67	214380-82	214380-83	214380-85
Your Reference		SP10-TP10	SP3-TP17	SP3-TP18	SP3-TP20
Depth		0.4-0.5	1.4-1.5	0.9-1.0	1.9-2.0
Date Sampled		22/03/2019	22/03/2019	22/03/2019	22/03/2019
Type of sample		soil	soil	soil	soil
Date prepared	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	02/04/2019	02/04/2019	02/04/2019	02/04/2019
Moisture	%	6.6	5.6	6.4	7.3

Asbestos ID - soils NEPM						
Our Reference	UNITS	214380-25	214380-26	214380-27	214380-28	214380-29
Your Reference		TP216	TP217	TP218	TP219	TP220
Depth		0-0.5	0-0.5	0-0.7	0-1.1	0-1.4
Date Sampled		22/03/2019	22/03/2019	22/03/2019	22/03/2019	22/03/2019
Type of sample		soil	soil	soil	soil	soil
Date analysed	-	29/03/2019	29/03/2019	29/03/2019	29/03/2019	29/03/2019
Sample mass tested	g	1,056.54	859.46	822.52	986.74	834.27
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 (AS4964) >0.1g/kg	-	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
Total Asbestos <sup>#1</sup>	g/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Asbestos ID in soil <0.1g/kg*	-	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected
ACM >7mm Estimation*	g	—	—	—	—	—
FA and AF Estimation*	g	—	—	—	—	—
FA and AF Estimation*#2	%(w/w)	<0.001	<0.001	<0.001	<0.001	<0.001

Asbestos ID - soils NEPM						
Our Reference		214380-30	214380-31	214380-32	214380-35	214380-39
Your Reference	UNITS	TP221	TP222	SP2-TP1	SP2-TP4	SP2-TP8
Depth		0-1.4	0-0.8	0.7-0.8	0.4-0.5	1.9-2.0
Date Sampled		22/03/2019	22/03/2019	22/03/2019	22/03/2019	22/03/2019
Type of sample		soil	soil	soil	soil	soil
Date analysed	-	29/03/2019	29/03/2019	29/03/2019	29/03/2019	29/03/2019
Sample mass tested	g	929.28	1,175.01	1,113.09	1,063.75	1,165.62
Sample Description	-	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Grey coarse-grained soil & rocks	Brown coarse-grained soil & rocks
Asbestos ID in soil (AS4964) >0.1g/kg	-	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
Total Asbestos <sup>#1</sup>	g/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Asbestos ID in soil <0.1g/kg*	-	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected
ACM >7mm Estimation*	g	—	—	—	—	—
FA and AF Estimation*	g	—	—	—	—	—
FA and AF Estimation*#2	%(w/w)	<0.001	<0.001	<0.001	<0.001	<0.001



Asbestos ID - soils NEPM						
Our Reference	UNITS	214380-41	214380-42	214380-46	214380-49	214380-51
Your Reference		SP2-TP10	SP4-TP1	SP4-TP5	SP4-TP8	SP4-TP10
Depth		0.1-0.2	0.4-0.5	0.4-0.5	0.4-0.5	0.5-0.6
Date Sampled		22/03/2019	22/03/2019	22/03/2019	22/03/2019	22/03/2019
Type of sample		soil	soil	soil	soil	soil
Date analysed	-	29/03/2019	29/03/2019	29/03/2019	29/03/2019	29/03/2019
Sample mass tested	g	1,099.17	1,088.13	872.31	879.26	927.47
Sample Description	-	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Grey coarse-grained soil & rocks
Asbestos ID in soil (AS4964) >0.1g/kg	-	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
Total Asbestos <sup>#1</sup>	g/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Asbestos ID in soil <0.1g/kg*	-	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected
ACM >7mm Estimation*	g	—	—	—	—	—
FA and AF Estimation*	g	—	—	—	—	—
FA and AF Estimation*#2	%(w/w)	<0.001	<0.001	<0.001	<0.001	<0.001

Asbestos ID - soils NEPM						
Our Reference		214380-52	214380-54	214380-55	214380-57	214380-58
Your Reference	UNITS	SP5-TP1	SP5-TP3	SP5-TP6	SP5-TP8	SP10-TP1
Depth		1.9-2.0	0.9-1.0	1.4-1.5	1.9-2.0	3.4-3.5
Date Sampled		22/03/2019	22/03/2019	22/03/2019	22/03/2019	22/03/2019
Type of sample		soil	soil	soil	soil	soil
Date analysed	-	29/03/2019	29/03/2019	29/03/2019	29/03/2019	29/03/2019
Sample mass tested	g	1,022.21	928.04	956.83	943.56	742.56
Sample Description	-	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Grey coarse-grained soil & rocks
Asbestos ID in soil (AS4964) >0.1g/kg	-	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
Total Asbestos <sup>#1</sup>	g/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Asbestos ID in soil <0.1g/kg*	-	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected
ACM >7mm Estimation*	g	—	—	—	—	—
FA and AF Estimation*	g	—	—	—	—	—
FA and AF Estimation*#2	%(w/w)	<0.001	<0.001	<0.001	<0.001	<0.001

Asbestos ID - soils NEPM						
Our Reference		214380-60	214380-63	214380-67	214380-75	214380-76
Your Reference	UNITS	SP10-TP3	SP10-TP6	SP10-TP10	RC1	RC2
Depth		1.9-2.0	0.6-0.7	0.4-0.5	-	-
Date Sampled		22/03/2019	22/03/2019	22/03/2019	19/03/2019	19/03/2019
Type of sample		soil	soil	soil	soil	soil
Date analysed	-	29/03/2019	29/03/2019	29/03/2019	29/03/2019	29/03/2019
Sample mass tested	g	860.65	998.95	1,025.67	1,002.34	943.13
Sample Description	-	Grey 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 (AS4964) >0.1g/kg	-	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
Total Asbestos <sup>#1</sup>	g/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Asbestos ID in soil <0.1g/kg*	-	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected
ACM >7mm Estimation*	g	—	—	—	—	—
FA and AF Estimation*	g	—	—	—	—	—
FA and AF Estimation*#2	%(w/w)	<0.001	<0.001	<0.001	<0.001	<0.001

Asbestos ID - soils NEPM						
Our Reference		214380-77	214380-78	214380-79	214380-80	214380-81
Your Reference	UNITS	RC3	SP3-TP3	SP3-TP14	SP3-TP15	SP3-TP16
Depth		-	2.9-3.0	0.3-0.4	0.5-0.6	0.7-0.8
Date Sampled		19/03/2019	22/03/2019	22/03/2019	22/03/2019	22/03/2019
Type of sample		soil	soil	soil	soil	soil
Date analysed	-	29/03/2019	29/03/2019	29/03/2019	29/03/2019	29/03/2019
Sample mass tested	g	843.26	1,170.04	929.19	1,058.45	1,026.32
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 (AS4964) >0.1g/kg	-	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
Total Asbestos <sup>#1</sup>	g/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Asbestos ID in soil <0.1g/kg*	-	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected
ACM >7mm Estimation*	g	—	—	—	—	—
FA and AF Estimation*	g	—	—	—	—	—
FA and AF Estimation*#2	%(w/w)	<0.001	<0.001	<0.001	<0.001	<0.001

Asbestos ID - soils NEPM						
Our Reference		214380-82	214380-83	214380-84	214380-85	214380-86
Your Reference	UNITS	SP3-TP17	SP3-TP18	SP3-TP19	SP3-TP20	SP3-TP21
Depth		1.4-1.5	0.9-1.0	2.4-2.5	1.9-2.0	0.4-0.5
Date Sampled		22/03/2019	22/03/2019	22/03/2019	22/03/2019	22/03/2019
Type of sample		soil	soil	soil	soil	soil
Date analysed	-	29/03/2019	29/03/2019	29/03/2019	29/03/2019	29/03/2019
Sample mass tested	g	1,231.49	1,060.51	1,129.73	920.91	883.13
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 (AS4964) >0.1g/kg	-	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
Total Asbestos <sup>#1</sup>	g/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Asbestos ID in soil <0.1g/kg*	-	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected
ACM >7mm Estimation*	g	—	—	—	—	—
FA and AF Estimation*	g	—	—	—	—	—
FA and AF Estimation*#2	%(w/w)	<0.001	<0.001	<0.001	<0.001	<0.001

## Asbestos ID - soils NEPM

Our Reference		214380-87	214380-88	214380-89	214380-90	214380-91
Your Reference	UNITS	SP3-TP22	SP3-TP23	SP3-TP24	SP3-TP25	SP3-TP26
Depth		0.9-1.0	1.4-1.5	0.9-1.0	1.4-1.5	0.9-1.0
Date Sampled		22/03/2019	22/03/2019	22/03/2019	22/03/2019	22/03/2019
Type of sample		soil	soil	soil	soil	soil
Date analysed	-	29/03/2019	29/03/2019	29/03/2019	29/03/2019	29/03/2019
Sample mass tested	g	1,040.87	1,008.73	1,135.62	990.97	1,047.16
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 (AS4964) >0.1g/kg	-	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
Total Asbestos <sup>#1</sup>	g/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Asbestos ID in soil <0.1g/kg*	-	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected
ACM >7mm Estimation*	g	—	—	—	—	—
FA and AF Estimation*	g	—	—	—	—	—
FA and AF Estimation*#2	%(w/w)	<0.001	<0.001	<0.001	<0.001	<0.001



Asbestos ID - soils NEPM					
Our Reference		214380-92	214380-93	214380-94	214380-95
Your Reference	UNITS	SP3-TP27	SP3-TP28	SP3-TP29	SP3-TP30
Depth		0.4-0.5	1.9-2.0	2.4-2.5	0.2-0.3
Date Sampled		22/03/2019	22/03/2019	22/03/2019	22/03/2019
Type of sample		soil	soil	soil	soil
Date analysed	-	29/03/2019	29/03/2019	29/03/2019	29/03/2019
Sample mass tested	g	1,010.49	1,308.18	1,135.21	1,080.51
Sample Description	-	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks
Asbestos ID in soil (AS4964) >0.1g/kg	-	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
Total Asbestos <sup>#1</sup>	g/kg	<0.1	<0.1	<0.1	<0.1
Asbestos ID in soil <0.1g/kg*	-	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected
ACM >7mm Estimation*	g	—	—	—	—
FA and AF Estimation*	g	—	—	—	—
FA and AF Estimation*#2	%(w/w)	<0.001	<0.001	<0.001	<0.001

Method ID	Methodology Summary
<b>ASB-001</b>	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.
<b>ASB-001</b>	<p>Asbestos ID - Identification of asbestos in soil samples using Polarised Light Microscopy and Dispersion Staining Techniques. Minimum 500mL soil sample was analysed as recommended by "National Environment Protection (Assessment of site contamination) Measure, Schedule B1 and "The Guidelines from the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia - May 2009" with a reporting limit of 0.1g/kg (0.01% w/w) as per Australian Standard AS4964-2004.</p> <p>Results reported denoted with * are outside our scope of NATA accreditation.</p> <p><b>NOTE #1</b> Total Asbestos g/kg was analysed and reported as per Australian Standard AS4964 (This is the sum of ACM &gt;7mm, &lt;7mm and FA/AF)</p> <p><b>NOTE #2</b> The screening level of 0.001% w/w asbestos in soil for FA and AF only applies where the FA and AF are able to be quantified by gravimetric procedures. This screening level is not applicable to free fibres.</p> <p>Estimation = Estimated asbestos weight</p> <p>Results reported with "--" is equivalent to no visible asbestos identified using Polarised Light microscopy and Dispersion Staining Techniques.</p>
<b>Inorg-008</b>	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
<b>Metals-020</b>	Determination of various metals by ICP-AES.
<b>Metals-021</b>	Determination of Mercury by Cold Vapour AAS.
<b>Org-003</b>	<p>Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID.</p> <p>F2 = (&gt;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.</p>
<b>Org-003</b>	<p>Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID.</p> <p>F2 = (&gt;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.</p> <p>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 (&gt;C10-C40).</p>
<b>Org-005</b>	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.

Method ID	Methodology Summary
<b>Org-005</b>	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.
<b>Org-006</b>	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
<b>Org-006</b>	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.
<b>Org-008</b>	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
<b>Org-012</b>	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.
<b>Org-014</b>	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
<b>Org-016</b>	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.
<b>Org-016</b>	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. 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-7	214380-35
Date extracted	-			01/04/2019	32	01/04/2019	01/04/2019		01/04/2019	01/04/2019
Date analysed	-			03/04/2019	32	03/04/2019	03/04/2019		03/04/2019	03/04/2019
TRH C <sub>6</sub> - C <sub>9</sub>	mg/kg	25	Org-016	<25	32	<25	<25	0	84	82
TRH C <sub>6</sub> - C <sub>10</sub>	mg/kg	25	Org-016	<25	32	<25	<25	0	84	82
Benzene	mg/kg	0.2	Org-016	<0.2	32	<0.2	<0.2	0	85	83
Toluene	mg/kg	0.5	Org-016	<0.5	32	<0.5	<0.5	0	89	88
Ethylbenzene	mg/kg	1	Org-016	<1	32	<1	<1	0	83	81
m+p-xylene	mg/kg	2	Org-016	<2	32	<2	<2	0	81	79
o-Xylene	mg/kg	1	Org-016	<1	32	<1	<1	0	84	78
naphthalene	mg/kg	1	Org-014	<1	32	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	83	32	96	74	26	96	91

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]	55	01/04/2019	01/04/2019		[NT]	[NT]
Date analysed	-			[NT]	55	03/04/2019	03/04/2019		[NT]	[NT]
TRH C <sub>6</sub> - C <sub>9</sub>	mg/kg	25	Org-016	[NT]	55	<25	<25	0	[NT]	[NT]
TRH C <sub>6</sub> - C <sub>10</sub>	mg/kg	25	Org-016	[NT]	55	<25	<25	0	[NT]	[NT]
Benzene	mg/kg	0.2	Org-016	[NT]	55	<0.2	<0.2	0	[NT]	[NT]
Toluene	mg/kg	0.5	Org-016	[NT]	55	<0.5	<0.5	0	[NT]	[NT]
Ethylbenzene	mg/kg	1	Org-016	[NT]	55	<1	<1	0	[NT]	[NT]
m+p-xylene	mg/kg	2	Org-016	[NT]	55	<2	<2	0	[NT]	[NT]
o-Xylene	mg/kg	1	Org-016	[NT]	55	<1	<1	0	[NT]	[NT]
naphthalene	mg/kg	1	Org-014	[NT]	55	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	[NT]	55	100	96	4	[NT]	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-7	214380-35
Date extracted	-			01/04/2019	32	01/04/2019	01/04/2019		01/04/2019	01/04/2019
Date analysed	-			02/04/2019	32	02/04/2019	02/04/2019		02/04/2019	02/04/2019
TRH C <sub>10</sub> - C <sub>14</sub>	mg/kg	50	Org-003	<50	32	<50	<50	0	106	104
TRH C <sub>15</sub> - C <sub>28</sub>	mg/kg	100	Org-003	<100	32	<100	<100	0	101	98
TRH C <sub>29</sub> - C <sub>36</sub>	mg/kg	100	Org-003	<100	32	<100	<100	0	100	107
TRH >C <sub>10</sub> -C <sub>16</sub>	mg/kg	50	Org-003	<50	32	<50	<50	0	106	104
TRH >C <sub>16</sub> -C <sub>34</sub>	mg/kg	100	Org-003	<100	32	<100	<100	0	101	98
TRH >C <sub>34</sub> -C <sub>40</sub>	mg/kg	100	Org-003	<100	32	<100	<100	0	100	107
Surrogate o-Terphenyl	%		Org-003	130	32	88	90	2	98	97

QUALITY CONTROL: svTRH (C10-C40) in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	55	01/04/2019	01/04/2019		[NT]	[NT]
Date analysed	-			[NT]	55	02/04/2019	02/04/2019		[NT]	[NT]
TRH C <sub>10</sub> - C <sub>14</sub>	mg/kg	50	Org-003	[NT]	55	<50	<50	0	[NT]	[NT]
TRH C <sub>15</sub> - C <sub>28</sub>	mg/kg	100	Org-003	[NT]	55	<100	<100	0	[NT]	[NT]
TRH C <sub>29</sub> - C <sub>36</sub>	mg/kg	100	Org-003	[NT]	55	<100	<100	0	[NT]	[NT]
TRH >C <sub>10</sub> -C <sub>16</sub>	mg/kg	50	Org-003	[NT]	55	<50	<50	0	[NT]	[NT]
TRH >C <sub>16</sub> -C <sub>34</sub>	mg/kg	100	Org-003	[NT]	55	<100	<100	0	[NT]	[NT]
TRH >C <sub>34</sub> -C <sub>40</sub>	mg/kg	100	Org-003	[NT]	55	<100	<100	0	[NT]	[NT]
Surrogate o-Terphenyl	%		Org-003	[NT]	55	91	91	0	[NT]	[NT]

QUALITY CONTROL: PAHs in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-7	214380-35
Date extracted	-			01/04/2019	32	01/04/2019	01/04/2019		01/04/2019	01/04/2019
Date analysed	-			02/04/2019	32	02/04/2019	02/04/2019		02/04/2019	02/04/2019
Naphthalene	mg/kg	0.1	Org-012	<0.1	32	<0.1	<0.1	0	95	91
Acenaphthylene	mg/kg	0.1	Org-012	<0.1	32	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-012	<0.1	32	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-012	<0.1	32	<0.1	<0.1	0	78	78
Phenanthrene	mg/kg	0.1	Org-012	<0.1	32	<0.1	<0.1	0	103	98
Anthracene	mg/kg	0.1	Org-012	<0.1	32	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-012	<0.1	32	<0.1	<0.1	0	93	90
Pyrene	mg/kg	0.1	Org-012	<0.1	32	<0.1	<0.1	0	100	94
Benzo(a)anthracene	mg/kg	0.1	Org-012	<0.1	32	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-012	<0.1	32	<0.1	<0.1	0	105	98
Benzo(b,j,k)fluoranthene	mg/kg	0.2	Org-012	<0.2	32	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-012	<0.05	32	<0.05	<0.05	0	104	86
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012	<0.1	32	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012	<0.1	32	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012	<0.1	32	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012	106	32	110	100	10	101	97

QUALITY CONTROL: PAHs in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	55	01/04/2019	01/04/2019		[NT]	[NT]
Date analysed	-			[NT]	55	02/04/2019	02/04/2019		[NT]	[NT]
Naphthalene	mg/kg	0.1	Org-012	[NT]	55	<0.1	<0.1	0	[NT]	[NT]
Acenaphthylene	mg/kg	0.1	Org-012	[NT]	55	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-012	[NT]	55	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-012	[NT]	55	<0.1	<0.1	0	[NT]	[NT]
Phenanthrene	mg/kg	0.1	Org-012	[NT]	55	<0.1	<0.1	0	[NT]	[NT]
Anthracene	mg/kg	0.1	Org-012	[NT]	55	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-012	[NT]	55	<0.1	<0.1	0	[NT]	[NT]
Pyrene	mg/kg	0.1	Org-012	[NT]	55	<0.1	<0.1	0	[NT]	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-012	[NT]	55	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-012	[NT]	55	<0.1	0.1	0	[NT]	[NT]
Benzo(b,j,k)fluoranthene	mg/kg	0.2	Org-012	[NT]	55	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-012	[NT]	55	<0.05	<0.05	0	[NT]	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012	[NT]	55	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012	[NT]	55	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012	[NT]	55	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012	[NT]	55	109	94	15	[NT]	[NT]



QUALITY CONTROL: Organochlorine Pesticides in soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-7	214380-35
Date extracted	-			01/04/2019	32	01/04/2019	01/04/2019		01/04/2019	01/04/2019
Date analysed	-			01/04/2019	32	01/04/2019	01/04/2019		01/04/2019	01/04/2019
HCB	mg/kg	0.1	Org-005	<0.1	32	<0.1	<0.1	0	[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-005	<0.1	32	<0.1	<0.1	0	96	93
gamma-BHC	mg/kg	0.1	Org-005	<0.1	32	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-005	<0.1	32	<0.1	<0.1	0	83	78
Heptachlor	mg/kg	0.1	Org-005	<0.1	32	<0.1	<0.1	0	88	84
delta-BHC	mg/kg	0.1	Org-005	<0.1	32	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-005	<0.1	32	<0.1	<0.1	0	89	86
Heptachlor Epoxide	mg/kg	0.1	Org-005	<0.1	32	<0.1	<0.1	0	93	90
gamma-Chlordane	mg/kg	0.1	Org-005	<0.1	32	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-005	<0.1	32	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-005	<0.1	32	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-005	<0.1	32	<0.1	<0.1	0	87	86
Dieldrin	mg/kg	0.1	Org-005	<0.1	32	<0.1	<0.1	0	107	106
Endrin	mg/kg	0.1	Org-005	<0.1	32	<0.1	<0.1	0	96	97
pp-DDD	mg/kg	0.1	Org-005	<0.1	32	<0.1	<0.1	0	80	81
Endosulfan II	mg/kg	0.1	Org-005	<0.1	32	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-005	<0.1	32	<0.1	<0.1	0	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-005	<0.1	32	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-005	<0.1	32	<0.1	<0.1	0	86	87
Methoxychlor	mg/kg	0.1	Org-005	<0.1	32	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-005	92	32	91	92	1	84	81

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	55	01/04/2019	01/04/2019		[NT]	[NT]
Date analysed	-			[NT]	55	01/04/2019	01/04/2019		[NT]	[NT]
HCB	mg/kg	0.1	Org-005	[NT]	55	<0.1	<0.1	0	[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-005	[NT]	55	<0.1	<0.1	0	[NT]	[NT]
gamma-BHC	mg/kg	0.1	Org-005	[NT]	55	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-005	[NT]	55	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-005	[NT]	55	<0.1	<0.1	0	[NT]	[NT]
delta-BHC	mg/kg	0.1	Org-005	[NT]	55	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-005	[NT]	55	<0.1	<0.1	0	[NT]	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-005	[NT]	55	<0.1	<0.1	0	[NT]	[NT]
gamma-Chlordane	mg/kg	0.1	Org-005	[NT]	55	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-005	[NT]	55	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-005	[NT]	55	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-005	[NT]	55	<0.1	<0.1	0	[NT]	[NT]
Dieldrin	mg/kg	0.1	Org-005	[NT]	55	<0.1	<0.1	0	[NT]	[NT]
Endrin	mg/kg	0.1	Org-005	[NT]	55	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-005	[NT]	55	<0.1	<0.1	0	[NT]	[NT]
Endosulfan II	mg/kg	0.1	Org-005	[NT]	55	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-005	[NT]	55	<0.1	<0.1	0	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-005	[NT]	55	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-005	[NT]	55	<0.1	<0.1	0	[NT]	[NT]
Methoxychlor	mg/kg	0.1	Org-005	[NT]	55	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-005	[NT]	55	92	92	0	[NT]	[NT]

QUALITY CONTROL: Organophosphorus Pesticides					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-7	214380-35
Date extracted	-			01/04/2019	32	01/04/2019	01/04/2019		01/04/2019	01/04/2019
Date analysed	-			01/04/2019	32	01/04/2019	01/04/2019		01/04/2019	01/04/2019
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-008	<0.1	32	<0.1	<0.1	0	[NT]	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-008	<0.1	32	<0.1	<0.1	0	[NT]	[NT]
Chlorpyrifos	mg/kg	0.1	Org-008	<0.1	32	<0.1	<0.1	0	98	91
Chlorpyrifos-methyl	mg/kg	0.1	Org-008	<0.1	32	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-008	<0.1	32	<0.1	<0.1	0	[NT]	[NT]
Dichlorvos	mg/kg	0.1	Org-008	<0.1	32	<0.1	<0.1	0	84	84
Dimethoate	mg/kg	0.1	Org-008	<0.1	32	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-008	<0.1	32	<0.1	<0.1	0	90	98
Fenitrothion	mg/kg	0.1	Org-008	<0.1	32	<0.1	<0.1	0	105	105
Malathion	mg/kg	0.1	Org-008	<0.1	32	<0.1	<0.1	0	85	80
Parathion	mg/kg	0.1	Org-008	<0.1	32	<0.1	<0.1	0	113	113
Ronnel	mg/kg	0.1	Org-008	<0.1	32	<0.1	<0.1	0	98	93
Surrogate TCMX	%		Org-008	92	32	91	92	1	94	88

QUALITY CONTROL: Organophosphorus Pesticides					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	55	01/04/2019	01/04/2019		[NT]	[NT]
Date analysed	-			[NT]	55	01/04/2019	01/04/2019		[NT]	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-008	[NT]	55	<0.1	<0.1	0	[NT]	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-008	[NT]	55	<0.1	<0.1	0	[NT]	[NT]
Chlorpyrifos	mg/kg	0.1	Org-008	[NT]	55	<0.1	<0.1	0	[NT]	[NT]
Chlorpyrifos-methyl	mg/kg	0.1	Org-008	[NT]	55	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-008	[NT]	55	<0.1	<0.1	0	[NT]	[NT]
Dichlorvos	mg/kg	0.1	Org-008	[NT]	55	<0.1	<0.1	0	[NT]	[NT]
Dimethoate	mg/kg	0.1	Org-008	[NT]	55	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-008	[NT]	55	<0.1	<0.1	0	[NT]	[NT]
Fenitrothion	mg/kg	0.1	Org-008	[NT]	55	<0.1	<0.1	0	[NT]	[NT]
Malathion	mg/kg	0.1	Org-008	[NT]	55	<0.1	<0.1	0	[NT]	[NT]
Parathion	mg/kg	0.1	Org-008	[NT]	55	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-008	[NT]	55	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-008	[NT]	55	92	92	0	[NT]	[NT]

QUALITY CONTROL: PCBs in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-7	214380-35
Date extracted	-			01/04/2019	32	01/04/2019	01/04/2019		01/04/2019	01/04/2019
Date analysed	-			01/04/2019	32	01/04/2019	01/04/2019		01/04/2019	01/04/2019
Aroclor 1016	mg/kg	0.1	Org-006	<0.1	32	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-006	<0.1	32	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-006	<0.1	32	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-006	<0.1	32	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-006	<0.1	32	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-006	<0.1	32	<0.1	<0.1	0	101	101
Aroclor 1260	mg/kg	0.1	Org-006	<0.1	32	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCLMX	%		Org-006	92	32	91	92	1	94	88

QUALITY CONTROL: PCBs in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	55	01/04/2019	01/04/2019		[NT]	[NT]
Date analysed	-			[NT]	55	01/04/2019	01/04/2019		[NT]	[NT]
Aroclor 1016	mg/kg	0.1	Org-006	[NT]	55	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-006	[NT]	55	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-006	[NT]	55	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-006	[NT]	55	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-006	[NT]	55	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-006	[NT]	55	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1260	mg/kg	0.1	Org-006	[NT]	55	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCLMX	%		Org-006	[NT]	55	92	92	0	[NT]	[NT]

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-7	214380-35
Date prepared	-			01/04/2019	32	01/04/2019	01/04/2019		01/04/2019	01/04/2019
Date analysed	-			01/04/2019	32	01/04/2019	01/04/2019		01/04/2019	01/04/2019
Arsenic	mg/kg	4	Metals-020	<4	32	<4	<4	0	102	88
Cadmium	mg/kg	0.4	Metals-020	<0.4	32	<0.4	<0.4	0	107	88
Chromium	mg/kg	1	Metals-020	<1	32	10	9	11	102	91
Copper	mg/kg	1	Metals-020	<1	32	77	59	26	111	88
Lead	mg/kg	1	Metals-020	<1	32	22	22	0	105	87
Mercury	mg/kg	0.1	Metals-021	<0.1	32	<0.1	<0.1	0	102	100
Nickel	mg/kg	1	Metals-020	<1	32	7	7	0	107	88
Zinc	mg/kg	1	Metals-020	<1	32	120	110	9	104	75

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	55	01/04/2019	01/04/2019		[NT]	[NT]
Date analysed	-			[NT]	55	01/04/2019	01/04/2019		[NT]	[NT]
Arsenic	mg/kg	4	Metals-020	[NT]	55	4	4	0	[NT]	[NT]
Cadmium	mg/kg	0.4	Metals-020	[NT]	55	<0.4	<0.4	0	[NT]	[NT]
Chromium	mg/kg	1	Metals-020	[NT]	55	15	16	6	[NT]	[NT]
Copper	mg/kg	1	Metals-020	[NT]	55	12	11	9	[NT]	[NT]
Lead	mg/kg	1	Metals-020	[NT]	55	18	17	6	[NT]	[NT]
Mercury	mg/kg	0.1	Metals-021	[NT]	55	<0.1	<0.1	0	[NT]	[NT]
Nickel	mg/kg	1	Metals-020	[NT]	55	8	8	0	[NT]	[NT]
Zinc	mg/kg	1	Metals-020	[NT]	55	29	28	4	[NT]	[NT]

## Result Definitions

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

## Quality Control Definitions

<b>Blank</b>	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.
<b>Duplicate</b>	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.
<b>Matrix Spike</b>	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.
<b>LCS (Laboratory Control Sample)</b>	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.
<b>Surrogate Spike</b>	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-ID in soil: NEPM

This report is consistent with the reporting recommendations in the National Environment Protection (Assessment of Site Contamination) Measure, Schedule B1, May 2013. This is reported outside our scope of NATA accreditation.

PCBs in Soil - The PQL has been raised due to interferences from analytes (other than those being tested) in sample 46,51.

## **CERTIFICATE OF ANALYSIS 214380-A**

### **Client Details**

<b>Client</b>	Douglas Partners Pty Ltd Smeaton Grange
<b>Attention</b>	Grant Russell
<b>Address</b>	18 Waler Crescent, Smeaton Grange, NSW, 2567

### **Sample Details**

<b>Your Reference</b>	<b><u>94525.02, St Marys</u></b>
<b>Number of Samples</b>	107 soil
<b>Date samples received</b>	26/03/2019
<b>Date completed instructions received</b>	27/03/2019

### **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**

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

#### **Asbestos Approved By**

Analysed by Asbestos Approved Identifier: Aida Marner, Lucy Zhu, Matt Tang

Authorised by Asbestos Approved Signatory: Lucy Zhu

#### **Results Approved By**

Ken Nguyen, Reporting Supervisor  
 Nancy Zhang, Laboratory Manager, Sydney  
 Steven Luong, Organics Supervisor

#### **Authorised By**



Jacinta Hurst, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		214380-A-96	214380-A-97	214380-A-98	214380-A-99	214380-A-100
Your Reference	UNITS	PP1-N-0.3/0.1	PP2-N-0.3/0.1	PP3-N-0.3/0.1	PP4-N-0.3/0.1	PP5-N-0.3/0.1
Depth		-	-	-	-	-
Date Sampled		21/03/2019	21/03/2019	21/03/2019	21/03/2019	21/03/2019
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	04/04/2019	04/04/2019	04/04/2019	04/04/2019	04/04/2019
Date analysed	-	04/04/2019	04/04/2019	04/04/2019	04/04/2019	04/04/2019
TRH C <sub>6</sub> - C <sub>9</sub>	mg/kg	<25	<25	<25	<25	<25
TRH C <sub>6</sub> - C <sub>10</sub>	mg/kg	<25	<25	<25	<25	<25
vTPH C <sub>6</sub> - C <sub>10</sub> 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	%	117	114	121	120	115

svTRH (C10-C40) in Soil						
Our Reference		214380-A-96	214380-A-97	214380-A-98	214380-A-99	214380-A-100
Your Reference	UNITS	PP1-N-0.3/0.1	PP2-N-0.3/0.1	PP3-N-0.3/0.1	PP4-N-0.3/0.1	PP5-N-0.3/0.1
Depth		-	-	-	-	-
Date Sampled		21/03/2019	21/03/2019	21/03/2019	21/03/2019	21/03/2019
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	04/04/2019	04/04/2019	04/04/2019	04/04/2019	04/04/2019
Date analysed	-	04/04/2019	04/04/2019	04/04/2019	04/04/2019	04/04/2019
TRH C <sub>10</sub> - C <sub>14</sub>	mg/kg	<50	<50	<50	<50	<50
TRH C <sub>15</sub> - C <sub>28</sub>	mg/kg	<100	570	<100	<100	1,600
TRH C <sub>29</sub> - C <sub>36</sub>	mg/kg	<100	560	<100	<100	2,000
TRH >C <sub>10</sub> -C <sub>16</sub>	mg/kg	<50	81	<50	<50	<50
TRH >C <sub>10</sub> - C <sub>16</sub> less Naphthalene (F2)	mg/kg	<50	81	<50	<50	<50
TRH >C <sub>16</sub> -C <sub>34</sub>	mg/kg	<100	990	<100	<100	3,100
TRH >C <sub>34</sub> -C <sub>40</sub>	mg/kg	<100	240	<100	<100	1,100
Total +ve TRH (>C10-C40)	mg/kg	<50	1,300	<50	<50	4,200
Surrogate o-Terphenyl	%	94	99	74	74	106

PAHs in Soil						
Our Reference		214380-A-96	214380-A-97	214380-A-98	214380-A-99	214380-A-100
Your Reference	UNITS	PP1-N-0.3/0.1	PP2-N-0.3/0.1	PP3-N-0.3/0.1	PP4-N-0.3/0.1	PP5-N-0.3/0.1
Depth		-	-	-	-	-
Date Sampled		21/03/2019	21/03/2019	21/03/2019	21/03/2019	21/03/2019
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	04/04/2019	04/04/2019	04/04/2019	04/04/2019	04/04/2019
Date analysed	-	04/04/2019	04/04/2019	04/04/2019	04/04/2019	04/04/2019
Naphthalene	mg/kg	<0.1	0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	5.4	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	0.3	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	0.5	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	1.2	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	2.0	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.2	6.7	<0.1	<0.1	<0.1
Pyrene	mg/kg	0.2	9.9	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	0.1	3.8	<0.1	<0.1	<0.1
Chrysene	mg/kg	0.2	6.0	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	0.3	15	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	0.1	9.0	<0.05	<0.05	0.06
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	6.0	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	2.0	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	0.2	8.3	<0.1	<0.1	0.1
Total +ve PAH's	mg/kg	1.5	76	<0.05	<0.05	0.2
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	14	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	14	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	14	<0.5	<0.5	<0.5
Surrogate <i>p</i> -Terphenyl-d14	%	86	85	85	85	84



Organochlorine Pesticides in soil						
Our Reference		214380-A-96	214380-A-97	214380-A-98	214380-A-99	214380-A-100
Your Reference	UNITS	PP1-N-0.3/0.1	PP2-N-0.3/0.1	PP3-N-0.3/0.1	PP4-N-0.3/0.1	PP5-N-0.3/0.1
Depth		-	-	-	-	-
Date Sampled		21/03/2019	21/03/2019	21/03/2019	21/03/2019	21/03/2019
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	04/04/2019	04/04/2019	04/04/2019	04/04/2019	04/04/2019
Date analysed	-	04/04/2019	04/04/2019	04/04/2019	04/04/2019	04/04/2019
HCB	mg/kg	<0.1	<1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	7.7	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	7.2	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<1	<0.1	<0.1	<0.1
Surrogate TCMX	%	81	109	83	83	89

Organophosphorus Pesticides						
Our Reference		214380-A-96	214380-A-97	214380-A-98	214380-A-99	214380-A-100
Your Reference	UNITS	PP1-N-0.3/0.1	PP2-N-0.3/0.1	PP3-N-0.3/0.1	PP4-N-0.3/0.1	PP5-N-0.3/0.1
Depth		-	-	-	-	-
Date Sampled		21/03/2019	21/03/2019	21/03/2019	21/03/2019	21/03/2019
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	04/04/2019	04/04/2019	04/04/2019	04/04/2019	04/04/2019
Date analysed	-	04/04/2019	04/04/2019	04/04/2019	04/04/2019	04/04/2019
Azinphos-methyl (Guthion)	mg/kg	<0.1	<1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<1	<0.1	<0.1	<0.1
Chlorpyrifos	mg/kg	<0.1	<1	<0.1	<0.1	<0.1
Chlorpyrifos-methyl	mg/kg	<0.1	<1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<1	<0.1	<0.1	<0.1
Dichlorvos	mg/kg	<0.1	<1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<1	<0.1	<0.1	<0.1
Surrogate TCMX	%	81	109	83	83	89

PCBs in Soil						
Our Reference		214380-A-96	214380-A-97	214380-A-98	214380-A-99	214380-A-100
Your Reference	UNITS	PP1-N-0.3/0.1	PP2-N-0.3/0.1	PP3-N-0.3/0.1	PP4-N-0.3/0.1	PP5-N-0.3/0.1
Depth		-	-	-	-	-
Date Sampled		21/03/2019	21/03/2019	21/03/2019	21/03/2019	21/03/2019
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	04/04/2019	04/04/2019	04/04/2019	04/04/2019	04/04/2019
Date analysed	-	04/04/2019	04/04/2019	04/04/2019	04/04/2019	04/04/2019
Aroclor 1016	mg/kg	<0.1	<1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	81	109	83	83	89

Acid Extractable metals in soil						
Our Reference		214380-A-96	214380-A-97	214380-A-98	214380-A-99	214380-A-100
Your Reference	UNITS	PP1-N-0.3/0.1	PP2-N-0.3/0.1	PP3-N-0.3/0.1	PP4-N-0.3/0.1	PP5-N-0.3/0.1
Depth		-	-	-	-	-
Date Sampled		21/03/2019	21/03/2019	21/03/2019	21/03/2019	21/03/2019
Type of sample		soil	soil	soil	soil	soil
Date prepared	-	04/04/2019	04/04/2019	04/04/2019	04/04/2019	04/04/2019
Date analysed	-	04/04/2019	04/04/2019	04/04/2019	04/04/2019	04/04/2019
Arsenic	mg/kg	8	5	<4	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	16	11	9	10	9
Copper	mg/kg	33	12	9	8	5
Lead	mg/kg	14	13	12	11	16
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	8	8	7	6	6
Zinc	mg/kg	65	100	42	120	56

Moisture						
Our Reference		214380-A-96	214380-A-97	214380-A-98	214380-A-99	214380-A-100
Your Reference	UNITS	PP1-N-0.3/0.1	PP2-N-0.3/0.1	PP3-N-0.3/0.1	PP4-N-0.3/0.1	PP5-N-0.3/0.1
Depth		-	-	-	-	-
Date Sampled		21/03/2019	21/03/2019	21/03/2019	21/03/2019	21/03/2019
Type of sample		soil	soil	soil	soil	soil
Date prepared	-	04/04/2019	04/04/2019	04/04/2019	04/04/2019	04/04/2019
Date analysed	-	04/04/2019	04/04/2019	04/04/2019	04/04/2019	04/04/2019
Moisture	%	10	14	5.0	14	19

Method ID	Methodology Summary
<b>Inorg-008</b>	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
<b>Metals-020</b>	Determination of various metals by ICP-AES.
<b>Metals-021</b>	Determination of Mercury by Cold Vapour AAS.
<b>Org-003</b>	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.
<b>Org-003</b>	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).
<b>Org-005</b>	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
<b>Org-005</b>	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.
<b>Org-006</b>	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
<b>Org-006</b>	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.
<b>Org-008</b>	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.



Method ID	Methodology Summary
<b>Org-012</b>	<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"> <li>1. 'EQ PQL' values are assuming all contributing PAHs reported as &lt;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.</li> <li>2. 'EQ zero' values are assuming all contributing PAHs reported as &lt;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.</li> <li>3. 'EQ half PQL' values are assuming all contributing PAHs reported as &lt;PQL are half the stipulated PQL. Hence a mid-point between the most and least conservative approaches above.</li> </ol> <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>
<b>Org-014</b>	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
<b>Org-016</b>	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.
<b>Org-016</b>	<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-7	[NT]
Date extracted	-			04/04/2019	[NT]	[NT]	[NT]	[NT]	04/04/2019	[NT]
Date analysed	-			04/04/2019	[NT]	[NT]	[NT]	[NT]	04/04/2019	[NT]
TRH C <sub>6</sub> - C <sub>9</sub>	mg/kg	25	Org-016	<25	[NT]	[NT]	[NT]	[NT]	110	[NT]
TRH C <sub>6</sub> - C <sub>10</sub>	mg/kg	25	Org-016	<25	[NT]	[NT]	[NT]	[NT]	110	[NT]
Benzene	mg/kg	0.2	Org-016	<0.2	[NT]	[NT]	[NT]	[NT]	110	[NT]
Toluene	mg/kg	0.5	Org-016	<0.5	[NT]	[NT]	[NT]	[NT]	108	[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]	111	[NT]
o-Xylene	mg/kg	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	113	[NT]
naphthalene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	116	[NT]	[NT]	[NT]	[NT]	128	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-7	[NT]
Date extracted	-			04/04/2019	[NT]	[NT]	[NT]	[NT]	04/04/2019	[NT]
Date analysed	-			04/04/2019	[NT]	[NT]	[NT]	[NT]	04/04/2019	[NT]
TRH C <sub>10</sub> - C <sub>14</sub>	mg/kg	50	Org-003	<50	[NT]	[NT]	[NT]	[NT]	83	[NT]
TRH C <sub>15</sub> - C <sub>28</sub>	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	88	[NT]
TRH C <sub>29</sub> - C <sub>36</sub>	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	86	[NT]
TRH >C <sub>10</sub> -C <sub>16</sub>	mg/kg	50	Org-003	<50	[NT]	[NT]	[NT]	[NT]	83	[NT]
TRH >C <sub>16</sub> -C <sub>34</sub>	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	88	[NT]
TRH >C <sub>34</sub> -C <sub>40</sub>	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	86	[NT]
Surrogate o-Terphenyl	%		Org-003	80	[NT]	[NT]	[NT]	[NT]	99	[NT]

QUALITY CONTROL: PAHs in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-7	[NT]
Date extracted	-			04/04/2019	[NT]	[NT]	[NT]	[NT]	04/04/2019	[NT]
Date analysed	-			04/04/2019	[NT]	[NT]	[NT]	[NT]	04/04/2019	[NT]
Naphthalene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	106	[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]	84	[NT]
Phenanthrene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	84	[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]	80	[NT]
Pyrene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	82	[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]	106	[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]	88	[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	85	[NT]	[NT]	[NT]	[NT]	83	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-7	[NT]
Date extracted	-			04/04/2019	[NT]	[NT]	[NT]	[NT]	04/04/2019	[NT]
Date analysed	-			04/04/2019	[NT]	[NT]	[NT]	[NT]	04/04/2019	[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]	93	[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]	86	[NT]
Heptachlor	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	93	[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]	91	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	98	[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]	93	[NT]
Dieldrin	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	110	[NT]
Endrin	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	98	[NT]
pp-DDD	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	76	[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]	95	[NT]
Methoxychlor	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCMX	%		Org-005	91	[NT]	[NT]	[NT]	[NT]	84	[NT]

QUALITY CONTROL: Organophosphorus Pesticides					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-7	[NT]
Date extracted	-			04/04/2019	[NT]	[NT]	[NT]	[NT]	04/04/2019	[NT]
Date analysed	-			04/04/2019	[NT]	[NT]	[NT]	[NT]	04/04/2019	[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]	93	[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]	86	[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]	96	[NT]
Fenitrothion	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NT]	[NT]	106	[NT]
Malathion	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NT]	[NT]	83	[NT]
Parathion	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NT]	[NT]	113	[NT]
Ronnel	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NT]	[NT]	97	[NT]
Surrogate TCMX	%		Org-008	91	[NT]	[NT]	[NT]	[NT]	89	[NT]



QUALITY CONTROL: PCBs in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-7	[NT]
Date extracted	-			04/04/2019	[NT]	[NT]	[NT]	[NT]	04/04/2019	[NT]
Date analysed	-			04/04/2019	[NT]	[NT]	[NT]	[NT]	04/04/2019	[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]	93	[NT]
Aroclor 1260	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCLMX	%		Org-006	91	[NT]	[NT]	[NT]	[NT]	89	[NT]

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-7	[NT]
Date prepared	-			04/04/2019	[NT]	[NT]	[NT]	[NT]	04/04/2019	[NT]
Date analysed	-			04/04/2019	[NT]	[NT]	[NT]	[NT]	04/04/2019	[NT]
Arsenic	mg/kg	4	Metals-020	<4	[NT]	[NT]	[NT]	[NT]	96	[NT]
Cadmium	mg/kg	0.4	Metals-020	<0.4	[NT]	[NT]	[NT]	[NT]	100	[NT]
Chromium	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	96	[NT]
Copper	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	101	[NT]
Lead	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	101	[NT]
Mercury	mg/kg	0.1	Metals-021	<0.1	[NT]	[NT]	[NT]	[NT]	120	[NT]
Nickel	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	104	[NT]
Zinc	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	96	[NT]

## Result Definitions

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

## Quality Control Definitions

<b>Blank</b>	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.
<b>Duplicate</b>	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.
<b>Matrix Spike</b>	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.
<b>LCS (Laboratory Control Sample)</b>	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.
<b>Surrogate Spike</b>	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

OC's in Soil - The PQL for sample 97 has been raised due to the high concentration of analytes in the sample, resulting in the sample requiring a dilution.

OP's in Soil - The PQL has been raised due to interferences from analytes (other than those being tested) in sample 97.

PCBs in Soil - The PQL has been raised due to interferences from analytes (other than those being tested) in sample 97.

<b>Project No:</b> 94525.02			<b>Suburb:</b> St Marys			<b>To:</b> Envirolab		
<b>Project Name:</b> Proposed Intermodal Freight Terminal			<b>Order Number</b>			12 Ashley St, Chatswood		
<b>Project Manager:</b> GRB			<b>Sampler:</b> JY			<b>Attn:</b> Aileen Hie		
<b>Emails:</b> Grant.Russell@douglaspartners.com.au						<b>Phone:</b> 9910 6200		
<b>Date Required:</b> Same day <input type="checkbox"/> 24 hours <input type="checkbox"/> 48 hours <input type="checkbox"/> 72 hours <input type="checkbox"/> Standard <input type="checkbox"/>						<b>Email:</b>		
<b>Prior Storage:</b> <input type="checkbox"/> Esky <input type="checkbox"/> Fridge <input type="checkbox"/> Shelved Do samples contain 'potential' HBM? Yes <input type="checkbox"/> No <input type="checkbox"/> (If YES, then handle, transport and store in accordance with FPM HAZID)								

Sample ID	Lab ID	Date Sampled	Sample Type	Container Type	Analytes										Notes/preservation	
			S - soil W - water	G - glass P - plastic	Heavy Metals	OCP/OPP PCB	TRH and BTEX	PAH	Total Phenols	Asbestos 500 ml			Hold			
TP201/0.1-0.2m	1	19/03/19	S	P								X				
TP201/0.5-0.6m	2	19/03/19	S	P											X	
TP202/0.1-0.2m	3	19/03/19	S	P								X				
TP202/0.5-0.6m	4	19/03/19	S	P											X	
TP203/0.1-0.2m	5	19/03/19	S	P											X	
TP203/0.5-0.6m	6	19/03/19	S	P								X				
TP204/0.1-0.2m	7	19/03/19	S	P											X	
TP204/0.5-0.6m	8	19/03/19	S	P								X				
TP205/0.1-0.2m	9	19/03/19	S	P											X	
TP205/0.9-1.0m	10	19/03/19	S	P								X				
TP207/0.5-0.6m	11	19/03/19	S	P								X				
TP208/0.5-0.6m	12	19/03/19	S	P								X				
TP209/0.1-0.2m	13	19/03/19	S	P								X				
TP210/0.4-0.5m	14	19/03/19	S	P								X				
<b>PQL (S) mg/kg</b>															ANZECC PQLs req'd for all water analytes <input type="checkbox"/>	
PQL = practical quantitation limit. If none given, default to Laboratory Method Detection Limit															<b>Lab Report/Reference No:</b> 214380	
Metals to Analyse: 8HM unless specified here:																
Total number of samples in container:					Relinquished by: SJS					Transported to laboratory by:						
Send Results to: Douglas Partners Pty Ltd					Address					Phone:					Fax:	
Signed:					Received by: K. Gore					Date & Time: 26.3.19 1500						

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

**ENVIROLAB**  
Date Received: 26.3.19  
Time Received: 1500  
Received by: KG  
Temp: Cool/Ambient  
Cooling: Ice/Icepack  
Security: Intact/Broken/None  
COC: 27.3.19



<b>Project No:</b> 94525.02			<b>Suburb:</b> St Marys			<b>To:</b> Envirolab		
<b>Project Name:</b> Proposed Intermodal Freight Terminal			<b>Order Number</b>			12 Ashley St, Chatswood		
<b>Project Manager:</b> GAR			<b>Sampler:</b> JY			<b>Attn:</b>		
<b>Emails:</b> Grant.Russell@douglaspartners.com.au						<b>Phone:</b>		
<b>Date Required:</b> Same day <input type="checkbox"/> 24 hours <input type="checkbox"/> 48 hours <input type="checkbox"/> 72 hours <input type="checkbox"/> Standard <input type="checkbox"/>						<b>Email:</b>		
<b>Prior Storage:</b> <input type="checkbox"/> Esky <input type="checkbox"/> Fridge <input type="checkbox"/> Shelved			Do samples contain 'potential' HBM? Yes <input type="checkbox"/> No <input type="checkbox"/> (If YES, then handle, transport and store in accordance with FPM HAZID)					

Sample ID	Lab ID	Date Sampled	Sample Type	Container Type	Analytes								Notes/preservation
			S - soil W - water	G - glass P - plastic	Heavy Metals	OCP/OPP PCB	TRH and BTEX	PAH	Total Phenols	Asbestos 500 ml	Combo 6	HOLD	
TP211/0.1-0.2m	15		S	P						X			
TP211/0.4-0.5m	16		S	P								X	
TP212/0.1-0.2m	17		S	P								X	
TP212/0.4-0.5m	18		S	P						X			
TP212/0.7-0.8m	19		S	P						X			
TP213/0.4-0.5m	20		S	P						X			
TP214/0.2-0.3m	21		S	P						X			
TP214/0.9-1.0m	22		S	P								X	
TP215/0.2-0.3m	23		S	P						X			
TP215/1.4-1.5m	24		S	P								X	
TP216/0-0.5m	25	22.3.19	S	P						X			
TP217/0-0.5m	26	22.3.19	S	P						X			
TP218/0-0.7m	27	22.3.19	S	P						X			
TP219/0-1.1m	28	22.3.19	S	P						X			
TP220/0-1.4m	29	22.3.19	S	P						X			
<b>PQL (S) mg/kg</b>												ANZECC PQLs req'd for all water analytes <input type="checkbox"/>	
<b>PQL = practical quantitation limit.</b> If none given, default to Laboratory Method Detection Limit										<b>Lab Report/Reference No:</b> 214380			
<b>Metals to Analyse:</b> 8HM unless specified here:													
<b>Total number of samples in container:</b>			<b>Relinquished by:</b> SJS		<b>Transported to laboratory by:</b>								
<b>Send Results to:</b> Douglas Partners Pty Ltd			<b>Address</b>		<b>Phone:</b>			<b>Fax:</b>					
<b>Signed:</b>			<b>Received by:</b> K. Gore			<b>Date &amp; Time:</b> 26.3.19			1500		COC: 29.3.19		

214380

<b>Project No:</b> 94525.02			<b>Suburb:</b> St Marys			<b>To:</b> Envirolab		
<b>Project Name:</b> Proposed Intermodal Freight Terminal			<b>Order Number</b>			12 Ashley St, Chatswood		
<b>Project Manager:</b> GAR			<b>Sampler:</b> JY			<b>Attn:</b> Aileen Hie		
<b>Emails:</b> Grant.Russell@douglaspartners.com.au						<b>Phone:</b> 9910 6200		
<b>Date Required:</b> Same day <input type="checkbox"/> 24 hours <input type="checkbox"/> 48 hours <input type="checkbox"/> 72 hours <input type="checkbox"/> Standard <input type="checkbox"/>						<b>Email:</b>		
<b>Prior Storage:</b> <input type="checkbox"/> Esky <input type="checkbox"/> Fridge <input type="checkbox"/> Shelved						Do samples contain 'potential' HBM? Yes <input type="checkbox"/> No <input type="checkbox"/> (If YES, then handle, transport and store in accordance with FPM HAZID)		

Sample ID	Lab ID	Date Sampled	Sample Type	Container Type	Analytes								Notes/preservation	
			S - soil W - water	G - glass P - plastic	Heavy Metals	OCP/OPP PCB	TRH and BTEX	PAH	Total Phenols	Asbestos 500 ml	Combo 6			
TP221/0-1.4m	30		S	P							X			
TP222/0-0.8m	31		S	P							X			
SP2-TP1/0.7-0.8m	32		S	P+G							X	X		
SP2-TP2/0.2-0.3m	33		S	P+G										HOLD
SP2-TP3/0.9-1.0m	34		S	P+G										HOLD
SP2-TP4/0.4-0.5m	35		S	P+G							X	X		
SP2-TP5/0.9-1.0m	36		S	P+G										HOLD
SP2-TP6/0.9-1.0m	37		S	P+G										HOLD
SP2-TP7/1.3-1.4m	38		S	P+G										HOLD
SP2-TP8/1.9-2.0m	39		S	P+G							X	X		
SP2-TP9/0.4-0.5m	40		S	P+G										HOLD
SP2-TP10/0.1-0.2m	41		S	P+G							X	X		
<b>PQL (S) mg/kg</b>														ANZECC PQLs req'd for all water analytes <input type="checkbox"/>
<b>PQL = practical quantitation limit.</b> If none given, default to Laboratory Method Detection Limit <b>Metals to Analyse: 8HM unless specified here:</b>											<b>Lab Report/Reference No:</b> 214380			
<b>Total number of samples in container:</b>			<b>Relinquished by:</b> SJS			<b>Transported to laboratory by:</b>								
<b>Send Results to:</b> Douglas Partners Pty Ltd			<b>Address</b>			<b>Phone:</b>			<b>Fax:</b>					
<b>Signed:</b>			<b>Received by:</b> K. Gore			<b>Date &amp; Time:</b> 26.3.19			1506 Coc! 27.3.19					

<b>Project No:</b> 94525.02			<b>Suburb:</b> St Marys			<b>To:</b> Envirolab		
<b>Project Name:</b> Proposed Intermodal Freight Terminal			<b>Order Number</b>			12 Ashley St, Chatswood		
<b>Project Manager:</b> GRB			<b>Sampler:</b> JY			<b>Attn:</b> Aileen Hie		
<b>Emails:</b> Grant.Russell@douglaspartners.com.au						<b>Phone:</b> 9910 6200		
<b>Date Required:</b> Same day <input type="checkbox"/> 24 hours <input type="checkbox"/> 48 hours <input type="checkbox"/> 72 hours <input type="checkbox"/> Standard <input type="checkbox"/>						<b>Email:</b>		
<b>Prior Storage:</b> <input type="checkbox"/> Esky <input type="checkbox"/> Fridge <input type="checkbox"/> Shelved Do samples contain 'potential' HBM? Yes <input type="checkbox"/> No <input type="checkbox"/> (If YES, then handle, transport and store in accordance with FPM HAZID)								

Sample ID	Lab ID	Date Sampled	Sample Type	Container Type	Analytes								Notes/preservation	
			S - soil W - water	G - glass P - plastic	Heavy Metals	OCP/OPP PCB	TRH and BTEX	PAH	Total Phenols	Asbestos 500 ml	Combo 6			
SP4-TP1/0.4-0.5m	42		S	G+P							X	X		
SP4-TP2/0.9-1.0m	43		S	G+P										HOLD
SP4-TP3/2.4-2.5m	44		S	G+P										HOLD
SP4-TP4/0.2-0.3m	45		S	G+P										HOLD
SP4-TP5/0.4-0.5m	46		S	G+P							X	X		
SP4-TP6/0.7-0.8m	47		S	G+P										HOLD
SP4-TP7/0.3-0.4m	48		S	G+P										HOLD
SP4-TP8/0.4-0.5m	49		S	G+P							X	X		
SP4-TP9/0.6-0.7m	50		S	G+P										HOLD
SP4-TP10/0.5-0.6m	51		S	G+P							X	X		
SP5-TP1/1.9-2.0m	52		S	G+P							X	X		
SP5-TP2/4.0-4.1m	53		S	G+P										HOLD
SP5-TP3/0.9-1.0m	54		S	G+P							X	X		
SP5-TP5/2.9-3.0m	107		S	G+P										HOLD
<b>PQL (S) mg/kg</b>														ANZECC PQLs req'd for all water analytes <input type="checkbox"/>
<b>PQL = practical quantitation limit.</b> If none given, default to Laboratory Method Detection Limit <b>Metals to Analyse: 8HM unless specified here:</b>										<b>Lab Report/Reference No:</b> 214 380				
<b>Total number of samples in container:</b>					<b>Relinquished by:</b> SJS		<b>Transported to laboratory by:</b>							
<b>Send Results to:</b> Douglas Partners Pty Ltd			<b>Address</b>			<b>Phone:</b>			<b>Fax:</b>					
<b>Signed:</b>			<b>Received by:</b> F. Gore EWS			<b>Date &amp; Time:</b> 26.2.19 1500			<b>COL:</b> 27.3.19					

<b>Project No:</b> 94525.02				<b>Suburb:</b> St Marys				<b>To:</b> Envirolab			
<b>Project Name:</b> Proposed Intermodal Freight Terminal				<b>Order Number</b>				12 Ashley St, Chatswood			
<b>Project Manager:</b> GAR				<b>Sampler:</b> JY				<b>Attn:</b> Aileen Hie			
<b>Emails:</b> Grant.Russell@douglaspartners.com.au								<b>Phone:</b> 9910 6200			
<b>Date Required:</b> Same day <input type="checkbox"/> 24 hours <input type="checkbox"/> 48 hours <input type="checkbox"/> 72 hours <input type="checkbox"/> Standard <input type="checkbox"/>								<b>Email:</b>			
<b>Prior Storage:</b> <input type="checkbox"/> Esky <input type="checkbox"/> Fridge <input type="checkbox"/> Shelved								Do samples contain 'potential' HBM? Yes <input type="checkbox"/> No <input type="checkbox"/> (If YES, then handle, transport and store in accordance with FPM HAZID)			

Sample ID	Lab ID	Date Sampled	Sample Type	Container Type	Analytes										Notes/preservation
			S - soil W - water	G - glass P - plastic	Heavy Metals	OCP/OPP PCB	TRH and BTEX	PAH	Total Phenols	Asbestos 500 ml	Combo 6				
SP5-TP6/1.4-1.5m	55		S	G+P								X	X		
SP5-TP7/0.5-0.6m	56		S	G+P											HOLD
SP5-TP8/1.9-2.0m	57		S	G+P								X	X		
SP7-TP1/0.2-0.3m	—		S	G+P								X	X		
SP7-TP2/0.4-0.5m	—		S	G+P								X	X		
SP8-TP1/0.5-0.6m	—		S	G+P								X	X		
SP8-TP2/0.5-0.6m	—		S	G+P								X	X		
SP9-TP1/0.5-0.6m	—		S	G+P								X	X		
SP9-TP2/0.5-0.6m	—		S	G+P								X	X		
SP10-TP1/3.4-3.5m	58		S	G+P								X	X		
SP10-TP2/2.9-3.0m	59		S	G+P											HOLD
SP10-TP3/1.9-2.0m	60		S	G+P								X	X		HOLD
SP10-TP4/3.9-4.0m	61		S	G+P											
SP10-TP5/0.2-0.3m	62		S	G+P											HOLD
SP10-TP6/0.6-0.7m	63		S	G+P								X	X		
<b>PQL (S) mg/kg</b>															ANZECC PQLs req'd for all water analytes <input type="checkbox"/>

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

**Metals to Analyse:** 8HM unless specified here:

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

**Send Results to:** Douglas Partners Pty Ltd **Address** **Phone:** **Fax:**

**Signed:** **Received by:** K. Gore ELS **Date & Time:** 26.3.17 1500 **COC:** 29-319

<b>Project No:</b> 94525.02			<b>Suburb:</b> St Marys			<b>To:</b> Envirolab		
<b>Project Name:</b> Proposed Intermodal Freight Terminal			<b>Order Number</b>			12 Ashley St, Chatswood		
<b>Project Manager:</b> GAR			<b>Sampler:</b> JY			<b>Attn:</b> Aileen Hie		
<b>Emails:</b> Grant.Russell@douglaspartners.com.au						<b>Phone:</b> 9910 6200		
<b>Date Required:</b> Same day <input type="checkbox"/> 24 hours <input type="checkbox"/> 48 hours <input type="checkbox"/> 72 hours <input type="checkbox"/> Standard <input type="checkbox"/>						<b>Email:</b>		
<b>Prior Storage:</b> <input type="checkbox"/> Esky <input type="checkbox"/> Fridge <input type="checkbox"/> Shelved			Do samples contain 'potential' HBM? Yes <input type="checkbox"/> No <input type="checkbox"/> (If YES, then handle, transport and store in accordance with FPM HAZID)					

Sample ID	Lab ID	Date Sampled	Sample Type	Container Type	Analytes								Notes/preservation	
			S - soil W - water	G - glass P - plastic	Heavy Metals	OCP/OPP PCB	TRH and BTEX	PAH	Total Phenols	Asbestos 500 ml	Combo 6			
SP10-TP7/0.2-0.3m	64		S	G+P										HOLD
SP10-TP8/0.3-0.4m	65		S	G+P										HOLD
SP10-TP9/0.9-1.0m	66		S	G+P										HOLD
SP10-TP10/0.4-0.5m	67		S	G+P							X	X		
BD2/20190319	68	19.03.19	S	G										HOLD
BD3/20190319	69	19.03.19	S	G										HOLD
BD4/20190320	70	20.03.19	S	G										HOLD
BD5/20190320	71	20.03.19	S	G										HOLD
BD6/20190320	72	20.03.19	S	G										HOLD
BD8/20190321	73	21.03.19	S	G										HOLD
BD9/0190.321	74	21.03.19	S	G										HOLD
RC1	75	19.03.19	S	P							X			
RC2	76	19.03.19	S	P							X			
RC3	77	19.03.19	S	P							X			
<b>PQL (S) mg/kg</b>														ANZECC PQLs req'd for all water analytes <input type="checkbox"/>
<b>PQL = practical quantitation limit.</b> If none given, default to Laboratory Method Detection Limit <b>Metals to Analyse: 8HM unless specified here:</b>											<b>Lab Report/Reference No:</b> 214380			
<b>Total number of samples in container:</b>			<b>Relinquished by:</b> SJS			<b>Transported to laboratory by:</b>								
<b>Send Results to:</b> Douglas Partners Pty Ltd			<b>Address</b>			<b>Phone:</b>			<b>Fax:</b>					
<b>Signed:</b>			<b>Received by:</b> K. Gore EW			<b>Date &amp; Time:</b> 26.3.19 1500			<b>COC:</b> 27.3.19					

<b>Project No:</b> 94525.02				<b>Suburb:</b> St Marys				<b>To:</b> Envirolab			
<b>Project Name:</b> Proposed Intermodal Freight Terminal				<b>Order Number</b>				12 Ashley St, Chatswood			
<b>Project Manager:</b> GRB				<b>Sampler:</b> JY				<b>Attn:</b> Aileen Hie			
<b>Emails:</b> Grant.Russell@douglaspartners.com.au				<b>Phone:</b> 9910 6200				<b>Email:</b>			
<b>Date Required:</b> Same day <input type="checkbox"/> 24 hours <input type="checkbox"/> 48 hours <input type="checkbox"/> 72 hours <input type="checkbox"/> Standard <input type="checkbox"/>											
<b>Prior Storage:</b> <input type="checkbox"/> Esky <input type="checkbox"/> Fridge <input type="checkbox"/> Shelved Do samples contain 'potential' HBM? Yes <input type="checkbox"/> No <input type="checkbox"/> (If YES, then handle, transport and store in accordance with FPM HAZID)											

Sample ID	Lab ID	Date Sampled	Sample Type	Container Type	Analytes								Notes/preservation		
			S - soil W - water	G - glass P - plastic	Heavy Metals	OCP/OPP PCB	TRH and BTEX	PAH	Total Phenols	Asbestos 500 ml					
SP3-TP1/0.4-0.5m	—		S	G+P							X				
SP3-TP2/2.9-3.0m	NR		S	G+P							X				
SP3-TP3/1.9-2.0m	78		S	G+P							X				
SP3-TP4/0.4-0.5m	—		S	G+P							X				
SP3-TP5/2.9-3.0m	—		S	G+P							X				
SP3-TP6/0.2-0.3m	—		S	G+P							X				
SP3-TP7/0.3-0.4m	—		S	G+P							X				
SP3-TP8/0.6-0.7m	—		S	G+P							X				
SP3-TP9/0.5-0.6m	—		S	G+P							X				
SP3-TP10/0.9-1.0m	—		S	G+P							X				
SP3/TP11/0.6-0.7m	—		S	G+P							X				
SP3-TP12/0.4-0.5m	—		S	G+P							X				
SP3-TP13/0.9-1.0m	—		S	G+P							X				
SP3-TP14/0.3-0.4m	79		S	G+P							X				
SP3-TP15/0.5-0.6m	80		S	G+P							X				
<b>PQL (S) mg/kg</b>												ANZECC PQLs req'd for all water analytes <input type="checkbox"/>			
<b>PQL = practical quantitation limit.</b> If none given, default to Laboratory Method Detection Limit										<b>Lab Report/Reference No:</b> 214380					
<b>Metals to Analyse:</b> 8HM unless specified here:															
<b>Total number of samples in container:</b>					<b>Relinquished by:</b> SJS		<b>Transported to laboratory by:</b>								
<b>Send Results to:</b> Douglas Partners Pty Ltd					<b>Address</b>					<b>Phone:</b>			<b>Fax:</b>		
<b>Signed:</b>					<b>Received by:</b> K. Gore					<b>FLS</b>			<b>Date &amp; Time:</b> 26.3.19 1500		
													<b>COC: 27.3.19</b>		



<b>Project No:</b> 94525.02		<b>Suburb:</b> St Marys		<b>To:</b> Envirolab	
<b>Project Name:</b> Proposed Intermodal Freight Terminal		<b>Order Number</b>		12 Ashley St, Chatswood	
<b>Project Manager:</b> GRB		<b>Sampler:</b> JY		<b>Attn:</b> Aileen Hie	
<b>Emails:</b> Grant.Russell@douglaspartners.com.au				<b>Phone:</b> 9910 6200	
<b>Date Required:</b> Same day <input type="checkbox"/> 24 hours <input type="checkbox"/> 48 hours <input type="checkbox"/> 72 hours <input type="checkbox"/> Standard <input type="checkbox"/>		<b>Email:</b>			
<b>Prior Storage:</b> <input type="checkbox"/> Esky <input type="checkbox"/> Fridge <input type="checkbox"/> Shelved      Do samples contain 'potential' HBM? Yes <input type="checkbox"/> No <input type="checkbox"/> (If YES, then handle, transport and store in accordance with FPM HAZID)					

Sample ID	Lab ID	Date Sampled	Sample Type	Container Type	Analytes										Notes/preservation
			S - soil W - water	G - glass P - plastic	Heavy Metals	OCP/OPP PCB	TRH and BTEX	PAH	Total Phenols	Asbestos 500 ml	Combo 6				
SP3-TP16/0.7-0.8m	81		S	G+P							X	X			
SP3-TP17/1.4-1.5m	82		S	G+P							X	X			
SP3-TP18/0.9-1.0m	83		S	G+P							X	X			
SP3-TP19/2.4-2.5m	84		S	G+P							X	X			
SP3-TP20/1.9-2.0m	85		S	G+P							X	X			
SP3-TP21/0.4-0.5m	86		S	G+P							X				
SP3-TP22/0.9-1.0m	87		S	G+P							X				
SP3-TP23/1.4-1.5m	88		S	G+P							X				
SP3-TP24/0.9-1.0m	89		S	G+P							X				
SP3-TP25/1.4-1.5m	90		S	G+P							X				
SP3-TP26/0.9-1.0m	91		S	G+P							X				
SP3-TP27/0.4-0.5m	92		S	G+P							X				
SP3-TP28/1.9-2.0m	93		S	G+P							X				
SP3-TP29/2.4-2.5m	94		S	G+P							X				
SP3-TP30/0.2-0.3m	95		S	G+P							X				
<b>PQL (S) mg/kg</b>														ANZECC PQLs req'd for all water analytes <input type="checkbox"/>	
<b>PQL = practical quantitation limit.</b> If none given, default to Laboratory Method Detection Limit <b>Metals to Analyse: 8HM unless specified here:</b>										<b>Lab Report/Reference No:</b> 214 380					
<b>Total number of samples in container:</b>					<b>Relinquished by:</b> SJS		<b>Transported to laboratory by:</b>								
<b>Send Results to:</b> Douglas Partners Pty Ltd			<b>Address</b>			<b>Phone:</b>			<b>Fax:</b>						
<b>Signed:</b>			<b>Received by:</b> K. Gore			<b>ELS</b>			<b>Date &amp; Time:</b> 26.3.19			1500 <b>COC:</b> 27.3.19			

Project No: 94525.02		Suburb: St Marys		To: Envirolab	
Project Name: Proposed Intermodal Freight Terminal		Order Number		12 Ashley St, Chatswood	
Project Manager: GRB		Sampler: JY		Attn: Aileen Hie	
Emails: grant.russell@douglaspartners.com.au		Phone: 9910 6200		Email:	
Date Required: Same day <input type="checkbox"/> 24 hours <input type="checkbox"/> 48 hours <input type="checkbox"/> 72 hours <input type="checkbox"/> Standard <input type="checkbox"/>					
Prior Storage: <input type="checkbox"/> Eskey <input type="checkbox"/> Fridge <input type="checkbox"/> Shelved Do samples contain 'potential' HBM? Yes <input type="checkbox"/> No <input type="checkbox"/> (If YES, then handle, transport and store in accordance with FPM HAZID)					

Sample ID	Lab ID	Date Sampled	Sample Type	Container Type	Analytes										Notes/preservation	
			S - soil W - water	G - glass P - plastic	Heavy Metals	OCP/OPP PCB	TRH and BTEX	PAH	Total Phenols	Asbestos 500 ml	Combo 6					
SP5-TP6/1.4-1.5m	<del>54</del>	22.03.19	S	G+P								X	X			
SP5-TP7/0.5-0.6m	<del>54</del>	22.03.19	S	G+P												ON HOLD
SP5-TP8/1.9-2.0m	<del>54</del>	22.03.19	S	G+P												ON HOLD
PP1-N-0.3/0.1	98	21.03.19	S	G									X			
PP2-N-0.3/0.1	99	21.03.20	S	G									X			
PP3-N-0.3/0.1	<del>100</del> 98	21.03.21	S	G									X			
PP4-N-0.3/0.1	<del>100</del> 99	21.03.22	S	G									X			
PP5-N-0.3/0.1	<del>100</del> 100	21.03.23	S	G									X			
TS	<del>101</del> 101		S	G												ON HOLD
TB	<del>102</del> 102		S	G												ON HOLD
BD7/20190321	<del>103</del> 103	21.03.23	S	G												ON HOLD
BD8/20190321	<del>105</del> 105	21.03.23	S	G												ON HOLD
BD9/20190321	<del>105</del> 106	21.03.23	S	G												ON HOLD
extra SP5-TP4/2.4-2.5	<del>107</del> 107															
extra SP5-TP5/2.9-3.0	<del>108</del> 108															
PQL (S) mg/kg														ANZECC PQLs req'd for all water analytes <input type="checkbox"/>		
PQL = practical quantitation limit. If none given, default to Laboratory Method Detection Limit												Lab Report/Reference No: 217380				
Metals to Analyse: 8HM unless specified here:																
Total number of samples in container:					Relinquished by: SJS					Transported to laboratory by:						
Send Results to: Douglas Partners Pty Ltd					Address					Phone:					Fax:	
Signed:					Received by: K-Gore ELS					Date & Time: 26.3.19 1500					COC: 27.3.19	

## CERTIFICATE OF ANALYSIS 214714

### Client Details

<b>Client</b>	Douglas Partners Pty Ltd (Riverstone)
<b>Attention</b>	Grant Russell, Jeremie Young
<b>Address</b>	43 Hobart St, Riverstone, NSW, 2765

### Sample Details

<b>Your Reference</b>	<b><u>94525.02, St Marys</u></b>
<b>Number of Samples</b>	1 Material
<b>Date samples received</b>	01/04/2019
<b>Date completed instructions received</b>	01/04/2019

### 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

<b>Date results requested by</b>	08/04/2019
<b>Date of Issue</b>	02/04/2019
NATA Accreditation Number 2901. This document shall not be reproduced except in full.	
Accredited for compliance with ISO/IEC 17025 - Testing. <b>Tests not covered by NATA are denoted with *</b>	

#### Asbestos Approved By

Analysed by Asbestos Approved Identifier: Panika Wongchanda  
 Authorised by Asbestos Approved Signatory: Lucy Zhu

#### Results Approved By

Lucy Zhu, Senior Asbestos Analyst

#### Authorised By



Jacinta Hurst, Laboratory Manager

Asbestos ID - materials		
Our Reference		214714-1
Your Reference	UNITS	ACM1
Type of sample		Material
Date analysed	-	02/04/2019
Mass / Dimension of Sample	-	95x30x5mm
Sample Description	-	A)Grey fibre cement material B)Fragments
Asbestos ID in materials	-	A)Chrysotile asbestos detected  B)No asbestos detected

Method ID	Methodology Summary
<b>ASB-001</b>	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**

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



## Report Comments

Sample 214714-1; The supplied sample was sub-sampled (A & B) in order to accurately report the analytical results representative of the entire sample, as per AS4964-2004.

FPM - ENVID/Form COC 02

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## Appendix J

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QA / QC

## Appendix J

### Data Quality Assurance and Quality Control Assessment

#### J1 Data Quality Indicators

Field and laboratory procedures were assessed against the following data quality indicators (DQIs):

**Table J1: 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>
	field replicates	Precision average relative percent difference (RPD) result <5 times PQL, no limit; results >5 times PQL, 0% - 30%
Laboratory considerations	laboratory duplicates	Precision average RPD result <5 times PQL, no limit; results >5 times PQL, 0% - 50%
	laboratory-prepared volatile trip spikes	Recovery of 60 - 140%
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:	
	laboratory-prepared volatile trip spikes	Recovery of 60-140%
	Laboratory-prepared trip blanks (field blanks)	<PQL
	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 D)
	SOPs appropriate and complied with	Field staff to follow SOPs in the DP <i>Field Procedures Manual</i>
	Experienced sampler	Experienced DP Environmental Engineer to conduct field work and sampling
	Documentation correct	Maintain COC documentation at all times
	Sample holding times complied with	Sample holding times complied with

DQI	Performance Indicator	Acceptable Range
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
Comparability		
Field considerations	Same SOPs used on each occasion	Field staff to follow SOPs in the DP <i>Field Procedures Manual</i>
Laboratory considerations	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	Appropriate media sampled according to DQO's (Appendix D)	Appropriate media sampled according to DQO's (Appendix D)
Laboratory considerations	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 D)

## J2 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).

### J2.1 Sampling Team

Sampling was undertaken by an experienced DP Environmental Scientist.

### J2.2 Sample Collection and Weather Conditions

Sample collection procedures and dispatch are reported in body of the report. Sampling was undertaken during sunny and hot conditions.

### J2.3 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 G.

### J2.4 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 I, prior to the laboratory certificates.

### J2.5 Sample Splitting Techniques

Replicate samples were collected in the field as a measure of precision of the results. Field replicates samples for soil were 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. Replicate samples were labelled with a DP identification number, recorded on DP logs, so as to conceal their relationship to their primary sample from the analysing laboratory.

### J2.6 Duplicate Frequency

Field sampling comprised intra-laboratory duplicate sampling, at a rate of approximately one duplicate sample for every 20 primary samples.

### J2.7 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).

#### J2.7.1 Intra-Laboratory Replicate Analysis

Replicates were tested to assess data 'precision' and the reproducibility within the primary laboratory (EnviroLab Pty Ltd) as a measure of consistency of sampling techniques. Two replicate samples were 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% is considered to be within the acceptable range.



The comparative results of analysis between primary and duplicate samples are summarised in the table below. Where one or both results were below the PQL, an RPD was not calculated.

**Table J2: RPD Results**

Sample	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc
TP206/0.1-0.2	6	<0.4	32	110	34	<0.1	26	150
BD1	4	<0.4	22	78	24	<0.1	19	130
Difference	2	-	10	32	10	-	7	20
<b>RPD (%)</b>	<b>40 %</b>	-	<b>37 %</b>	<b>34 %</b>	<b>34 %</b>	-	<b>31 %</b>	14 %
TP207/0.5-0.6	8	<0.4	23	49	25	<0.1	14	91
BD2	5	<0.4	19	37	24	<0.1	9	82
Difference	3	-	4	12	1	-	5	9
<b>RPD (%)</b>	<b>46 %</b>	-	19 %	27 %	4 %	-	<b>43 %</b>	10%
TP208/0.5-0.6	<4	<0.4	13	7	7	<0.1	3	8
BD3	4	<0.4	13	40	25	<0.1	11	45
Difference	-	-	0	33	18	-	8	37
<b>RPD (%)</b>	-	-	0	<b>140 %</b>	<b>112 %</b>	-	<b>114 %</b>	<b>139 %</b>
TP209/0.1-0.2	9	<0.4	23	50	19	<0.1	20	42
BD4	7	<0.4	27	29	26	<0.1	17	43
Difference	2	-	4	21	7	-	3	1
<b>RPD (%)</b>	25 %	-	16 %	<b>53 %</b>	31 %	-	16 %	2 %

Notes: **Bold RPD >30**  
 Concentration of either paired duplicated not greater than five times PQL

All RPD values were within the acceptable range of  $\pm 30$  with the exception of:

- Arsenic, chromium, copper, lead and nickel in intra-laboratory duplicate pair TP206/0.1-0.2 and BD1;
- Arsenic and nickel in intra-laboratory duplicate pair TP207/0.5-0.6 and BD2
- Arsenic, chromium, copper, lead and nickel in intra-laboratory duplicate pair TP208/0.5-0.6 and BD3;and
- Copper in intra-laboratory duplicate pair TP209/0.1-0.2 and BD43.

The exceedances are considered likely due to the low levels of metals detected close to the limit of report and/or the heterogeneity of the fill soil. The exceedances are not considered to affect the results of the investigation.

Overall, the intra-laboratory and inter-laboratory comparisons indicate that the sampling technique was consistent and repeatable and therefore acceptable precision was achieved.

### **J3 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).

#### **J3.1 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.

#### **J3.2 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.

#### **J3.3 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.

#### **J3.4 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.

### J3.5 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.

### J3.6 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.

### J3.7 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 J5: 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 replicates	Precision average relative percent difference (RPD) result <5 times PQL, no limit; results >5 times PQL, 0% - 30%	C
	laboratory duplicates	Precision average RPD result <5 times PQL, no limit; results >5 times PQL, 0 - 50%	C
	laboratory-prepared volatile trip spikes	Recovery of 60-140%	C

DQI	Performance Indicator	Acceptable Range	Compliance
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:		
	laboratory-prepared volatile trip spikes	Recovery of 60 - 140%	C
	laboratory-prepared trip blanks (field blanks)	<PQL	C
	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 - 30% (inorganics); 60 - 40% (organics)	C
	laboratory control samples	Recovery of 70 - 130% (inorganics); 60 - 140% (organics)	C
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 <i>DP 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 <i>DP 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

DQI	Performance Indicator	Acceptable Range	Compliance
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 a minor partial-compliance. On this basis, the sampling and laboratory methods used during the investigation were found to meet DQOs for this project.