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Pacific National (NSW) Pty Ltd
Tom Thumb Road
CONISTON NSW 2500

Project 94525.05
15 August 2019
R.001.Rev0
GAR

Attention: Mr Guy Evans

Email: guy.evans@urbancogroup.com.au

Dear Mr Guy Evans

Stockpile SP3 and Railway Corridor Investigation
Proposed St Marys Intermodal Freight Terminal
Lot 2, Forrester Road, St Marys, NSW

1. Introduction

Douglas Partners Pty Ltd (DP) was commissioned by Urbanco Group Pty Limited on behalf of Pacific National (PN) to undertake further investigation of the following environmental issues located at the proposed St Marys Intermodal Freight Terminal, Lot 2 Forrester Road, St Mary's (the investigation site - as shown on Drawing 1, Attachment A):

- The large stockpile of soil (SP3) likely created from historical topsoil stripping works; and
- The railway corridor.

The site is part of the proposed St Marys Freight Hub (the larger site) which 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.

2. Background

A preliminary site investigation (PSI, DP ref. 94525.00.R.001.Rev0) was completed at the site in February 2019 which included identification of the following Potential Areas of Environmental Concern (PAEC) which required further investigation:

- PAEC 3: Stockpiles of soil, of which stockpile SP3 was one of the largest stockpiles identified; and
- PAEC 6: Potential asbestos contamination of surface soils including the railway corridor from discarded brake shoes.

A supplementary contamination assessment (SCA, DP ref. 94525.02.R.002.Rev1) of the larger site was completed in April 2019 to further assess the identified PAEC and to determine any remediation requirements (if any) for the site.

The following scope was completed during the SCA in stockpile SP3 (PAEC 3):

- 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 competed at the site and the number of sampling locations in SP3 was based on approximately 30% of the minimum density recommended in the NSW EPA (1995) *Sampling Design Guidelines* for an eight hectare site (estimated area where topsoil stripping had occurred). The number of samples provided a sampling rate of between 1 sample per 500 to 850 m^3 of material;
- Laboratory analysis of selected stockpile soil samples for fill related and commonly encountered (including market gardening/pesticide related) COPC including:
  - Total Recoverable Hydrocarbons (TRH);
  - Benzene, toluene, ethyl benzene and xylenes (BTEX);
  - Polycyclic Aromatic Hydrocarbons (PAHs);
  - Heavy metals (Arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc);
  - Organochlorine Pesticides (OCPs);
  - Organophosphate pesticides (OPPs);
  - Polychlorinated biphenyls (PCBs); and
  - Asbestos.

The results of the SCA sampling in SP3 did not identify COPC at concentrations exceeding site assessment criteria (commercial / industrial) in all samples submitted for laboratory analysis.

The following scope was completed during the SCA in the railway corridor (PAEC 6):

- Site walkover to visually identify any ACM fragments on site surfaces nearby to the railway corridor – the site walkover was limited to areas 4 m or greater from the railway tracks due to lack of a licenced track protection officer and appropriate railway work authorisation; and
- Collection of three surface soil samples (RC1 to RC3) in the vicinity (>4 m from tracks) of the railway corridor for laboratory analysis of asbestos.

The results of SCA site walkover did not identify fragments of ACM on the site surface nearby to the railway corridor and the results of soil sampling did not identify asbestos in the three soil samples collected and submitted for laboratory analysis.

The following further investigations have been requested to be completed by PN to satisfy recent comments/concerns from the NSW EPA and Penrith City Council during their review of the Environmental Impact Statement (EIS) for the proposed redevelopment:

- Further sampling of SP3 to address comments by the NSW EPA (ref# DOC19/544951) to fully characterise the stockpile with a quantitative asbestos assessment; and
- A site walkover and further sampling of the corridor was required to address comments by Penrith City Council in the Notice of Exhibition (ref# ECM:8712576).

3. Scope of Works

The scope of work for this investigation was as follows:

- Inspection of the site to assess the potential for contamination, particularly remnant surficial material or ACM fragments within the railway corridor in the presence of a licenced track protection officer;
- Photographing of the site for record purposes;
- Excavation of an additional 60 test pits through stockpiled soils in SP3 material into natural soils and collection of soil samples at varied depths;
- Collection of six surface soil samples along the length of the railway corridor in the presence of a licenced track protection officer;
- Dispatch of samples to NATA accredited laboratories (DP Macarthur Laboratory and Envirolab Services Pty Ltd) for quantitative analysis for asbestos;
- Interpretation of asbestos results with reference to current NSW EPA endorsed guidelines; and
- Preparation of this report.

4. Site Description

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.

5. Rationale and Methodology

The field work for the investigation was undertaken by a DP environmental consultant at the site on 25 and 26 July 2019. Photographic plates from the fieldwork are presented in Attachment B.

The following works were completed as part of the further investigation:

- Excavation of an additional 60 test pits (TP101 to TP160) within SP3 with a backhoe. The SP3 test pit locations are presented on Drawing 2. Combined with the number of test pits (30 test pits – SP3 TP1 to TP30) completed previously in the SCA, a total of 90 test pits have been completed within SP3. The total number of samples is in accordance with the minimum density recommended in the NSW EPA (1995) Sampling Design Guidelines for an eight hectare site (estimated area where topsoil stripping occurred to create the stockpile);

- Each test pit excavation was completed through stockpiled soils to varied depths within the soil profile;
- At each test pit location, a 10 L bulk soil sample was collected at varied depths within the stockpile and inspected in accordance with WA DOH gravimetric method. In addition, a 500 ml sample of soil was collected for asbestos identification and quantification in the soil sample;
- Site walkover on a 2 m grid along the railway corridor, under supervision of a licenced track protection officer, for visual assessment of asbestos on the site surface; and
- Collection of an additional six surface (0.0 - 0.1 m bgl) soil samples (RC101 to RC106) along the length of the railway corridor for laboratory analysis of asbestos. The railway corridor sample locations from this investigation and the SCA (RC1 to RC3) are presented on Drawing 3.

6. Field Sampling and Laboratory Procedure

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

- Sample locations were pre-determined using GIS prior to field work and were located in the field using a handheld Garmin GPS;
- A backhoe excavator fitted with a 450 mm tooth bucket was used to excavate all test pits within stockpile SP3. Samples were collected from the excavated walls of the test pits;
- A hand-held shovel was used to collect surface soil samples within the railway corridor;
- Disposable nitrile gloves were used to collect all samples. Gloves were replaced prior to the collection of each sample in order to prevent cross-contamination;
- A bulk bag (10 L) and 500 ml bag sample were additionally collected for stockpile SP3 samples requiring analysis of asbestos;
- 500 ml bag samples were collected at the railway corridor sampling locations;
- Sample containers were labelled with individual and unique identification, including project number, sample ID, depth and date of sampling; and
- Logs were completed for all test pits indicating the geological profile observed within each test. Test pit logs included, where relevant, sample identification, coordinates, date of collection, a description of the substrate conditions encountered, visual or olfactory evidence of contamination, the depth of samples collected, the sampler and equipment used.

Asbestos sieve analysis was completed at DP Macarthur laboratory located at Smeaton Grange NSW. The 500 ml bag sample analysis for asbestos was completed at Envirolab laboratories at Chatswood NSW.

7. Site Assessment Criteria

The Site Assessment Criteria (SAC) applied in this investigation have been informed by the proposed land use (i.e. commercial/industrial) which was adopted in the previous investigations. 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 site's 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 following SAC relevant to asbestos are summarised in Table 1 below.

Table 1: SAC

Contaminant of Concern		RAC	Rationale
Asbestos	Bonded ACM	No visible ACM on surface and 0.05% (w / w)	For bonded asbestos, no visible asbestos at the surface (to a depth of 0.1 m) has been adopted to provide maximum protection at the exposure point, and due to aesthetic issues. HSL D for Asbestos Contamination in soil, percentage weight by weight (% w/w).
	Fibrous asbestos (FA) and asbestos fines (AF)	0.001 % (w / w)	

8. Results

8.1 Field Work Observations

The test pit logs for all test pits completed within SP3 during this investigation (Attachment C) should be read in conjunction with the accompanying standard notes defining classification methods and descriptive terms.

In summary, stockpile SP3 generally comprised brown silty clay with sand or clayey sand with trace gravels and organic material. Sandstone boulders were identified within several test pits. Trace anthropogenic material including fragments of ceramic, wire, plastic, brick, bitumen, concrete and glass were identified in several of the test pits. Fragments of ACM were identified in bulk samples collected during the current investigation from test pits TP116, TP123 and TP137 (laboratory results are discussed further in section 8.2).

Surface soil encountered at soil sample locations within the railway corridor generally comprised clayey sand with trace gravels. No ACM or building waste commonly indicative of ACM was observed during site walkover of railway corridor.

8.2 Laboratory Analytical Results

The sample/test pit identification, sample depths and analytical results for the soil samples collected from SP3 test pits and the railway corridor are summarised in Table D1 in Attachment D, together with the adopted SAC. The laboratory certificates of analysis are also attached in Attachment E.

Asbestos (in the form of bonded ACM) was detected, however was below the SAC (0.05% w/w), in 10 L bulk samples collected from fill in the following test pits completed in stockpile SP3:

- TP116 at a depth of 1.9 - 2.0 m within the stockpile– concentration of 0.008% w/w;
- TP123 at a depth of 0.9 - 1.0 m within the stockpile – concentration of 0.013% w/w; and
- TP137 at a depth of 1.9 - 2.0 m within the stockpile – concentration of 0.0006% w/w.

Asbestos was not detected in the remaining samples (10 L bulk or 500 mL) submitted for analysis.

9. Discussion and Conclusions

The results of the previous and current investigations have not identified asbestos at concentrations exceeding SAC (commercial/industrial land use) in all soil samples collected from stockpile SP3 and the railway corridor. From a contamination perspective, based on the findings of this and previous environmental investigations, it is concluded that no further investigations or remediation works are warranted for stockpile SP3 and the railway corridor.

Notwithstanding the above, the potential remains for isolated pockets of contamination to be present in stockpile SP3 and the railway corridor. To appropriately manage unexpected potential contamination issues encountered during development works, DP recommends the implementation of the Contingency for Unexpected Finds as described in Section 8.4 of the RAP (ref.94525.03.R.001.Rev1). Additionally, any materials requiring off-site disposal must be classified, managed and disposed in accordance with the *Protection of the Environment Operations Act 1997*. This may require further chemical and asbestos testing of the soil.

10. Limitations

Douglas Partners Pty Ltd (DP) has prepared this report for this project at Lot 2 Forrester Road, St Marys in accordance with DP's proposal MAC1901234.P.002.Rev0 dated 17 July 2019 and acceptance received from Mr Guy Evans on behalf of Pacific National dated 18 July 2019. The work was carried out under DP's Conditions of Engagement. This report is provided for the exclusive use of Pacific National 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 environmental components set out in this report and to their application by the project designers to project design, construction, maintenance and demolition.

Please contact the undersigned if you have any questions on this matter.

Yours faithfully
Douglas Partners Pty Ltd

Grant Russell
Senior Environmental Scientist

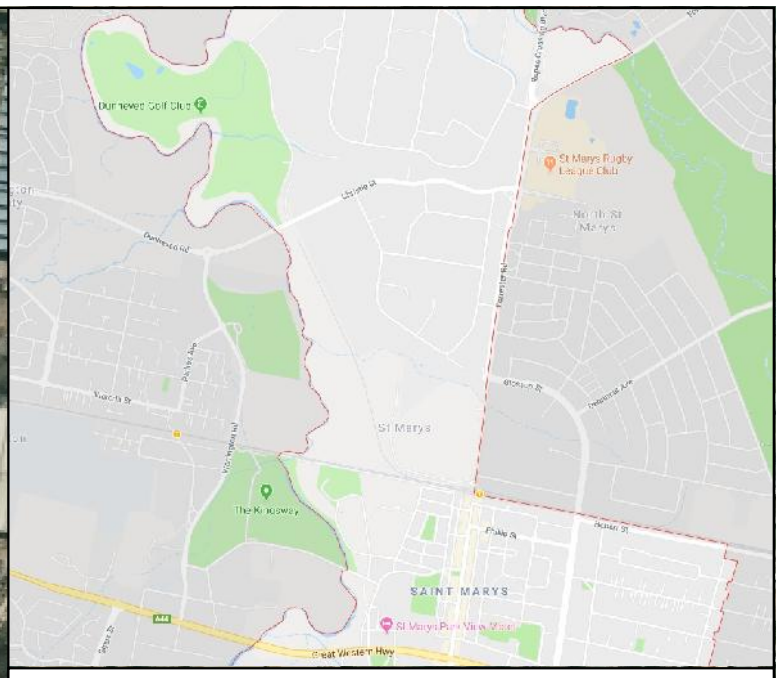
Reviewed by

pp for: **Dean Woods**
Senior Associate

Attachment A: Drawings 1 to 3
Attachment B: Photographic Plates
Attachment C: Test Pit Logs
Attachment D: Table D1: Soil Laboratory Results Summary
Attachment E: NATA Laboratory Certificates of Analysis and Chain-of-Custody documentation
Attachment F: About this Report

Attachment A

Drawings 1 to 3



Site Locality

Railway Corridor

Stockpile SP3

Legend
- Larger Site Boundary
- Railway Corridor
- Stockple SP3

100 0 100 200 300 400 m

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Geotechnics / Environment / Groundwater

TITLE: **Stockpile SP3 and Railway Corridor Investigation**
Site Location Map
Lot 2 Forrester Road, St Marys NSW

N
MGA

OFFICE: Macarthur
DRAWN BY: GAR
DATE: 25.06.2019

CLIENT: Pacific National (NSW) Pty Ltd
PROJ. #: 94525.05
DRAWING No: 1
REVISION: 0
SCALE: As Shown

Douglas Partners
Geotechnics / Environment / Groundwater

TITLE: **Stockpile SP3 and Railway Corridor Investigation**
SP3 Sample location Map
Lot 2 Forrester Road, St Marys NSW

N
MGA

OFFICE: Macarthur
DRAWN BY: GAR
DATE: 25.06.2019

CLIENT: Pacific National (NSW) Pty Ltd
PROJ. #: 94525.05
DRAWING No: 2
REVISION: 0
SCALE: As Shown

Legend

- Larger Site Boundary
- Railway Corridor
- SCA Railway Corridor Samples
- Current Investigation Railway Corridor Samples

Douglas Partners
Geotechnics / Environment / Groundwater

TITLE: **Stockpile SP3 and Railway Corridor Investigation**
Railway Corridor Sample Location
Lot 2 Forrester Road, St Marys NSW

N
MGA

OFFICE: Macarthur
DRAWN BY: GAR
DATE: 25.06.2019

CLIENT: Pcaific National (NSW) Pty Ltd
PROJ. #: 94525.05
DRAWING No: 3
REVISION: 0
SCALE: As Shown

Attachment B

Photographic Plates

Photo 1 - Stockpile SP3

Photo 2 - Test Pit TP101

Douglas Partners Geotechnics / Environment / Groundwater	Site Photographs	PROJ:	94525.00
	Stockpile SP3 and Railway Corridor Investigation	PLATE:	1
	Proposed St Marys Freight Hub - Stage 1, 2 Forrester Road, St Marys, NSW	REV:	A
	CLIENT: Pacific National	DATE:	13-Aug-19

Photo 3 - Test Pit TP119

Photo 4 - Test Pit TP137

Douglas Partners Geotechnics / Environment / Groundwater	Site Photographs	PROJ:	94525.00
	Stockpile SP3 and Railway Corridor Investigation	PLATE:	2
	Proposed St Marys Freight Hub - Stage 1, 2 Forrester Road, St Marys, NSW	REV:	A
	CLIENT: Pacific National	DATE:	13-Aug-19

Photo 5 - Test Pit TP139

Photo 6 - Test Pit TP150

Douglas Partners Geotechnics / Environment / Groundwater	Site Photographs	PROJ:	94525.00
	Stockpile SP3 and Railway Corridor Investigation	PLATE:	3
	Proposed St Marys Freight Hub - Stage 1, 2 Forrester Road, St Marys, NSW	REV:	A
	CLIENT: Pacific National	DATE:	13-Aug-19

Photo 7- Railway Corridor Sample RC101

Photo 8 - Railway Corridor Sample Location RC101

Douglas Partners Geotechnics / Environment / Groundwater	Site Photographs	PROJ:	94525.05
	Stockpile SP3 and Railway Corridor Investigation	PLATE:	4
	Proposed St Marys Freight Hub - Stage 1, 2 Forrester Road, St Marys, NSW	REV:	A
	CLIENT: Pacific National	DATE:	13-Aug-19

Photo 9 - Railway Corridor Sample RC102.

Photo 10 - Railway Corridor

Douglas Partners Geotechnics / Environment / Groundwater	Site Photographs	PROJ:	94525.00
	Stockpile SP3 and Railway Corridor Investigation	PLATE:	5
	Proposed St Marys Freight Hub - Stage 1, 2 Forrester Road, St Marys, NSW	REV:	A
	CLIENT: Pacific National	DATE:	13-Aug-19

Photo 11 - Sample Location RC101.

Photo 16 - Railway Corridor Sample Location RC106

Douglas Partners Geotechnics / Environment / Groundwater	Site Photographs	PROJ:	94525.00
	Stockpile SP3 and Railway Corridor Investigation	PLATE:	6
	Proposed St Marys Freight Hub - Stage 1, 2 Forrester Road, St Marys, NSW	REV:	A
	CLIENT: Pacific National	DATE:	13-Aug-19

Attachment C

Test Pit Logs

TEST PIT LOG

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

SURFACE LEVEL: 32.6 mAHD
EASTING: 293512
NORTHING: 6262175

PIT No: SP3-TP101
PROJECT No: 94525.05
DATE: 25/7/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
32	0	FILL - pale brown clayey sand fill with gravel and a trace of ripped sandstone, surficial vegetation, dry		D/B	1.9				
31	1								
	2				2.0				
30	2.0	Pit discontinued at 2.0m - limit of investigation							
29	3								
28	4								

RIG: 8.5T backhoe - 400mm bucket

LOGGED: JY

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Stockpile ~5.0m high

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

SAMPLING & IN SITU TESTING LEGEND

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

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TEST PIT LOG

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

SURFACE LEVEL: 32.2 mAHD
EASTING: 293512
NORTHING: 6262179

PIT No: SP3-TP102
PROJECT No: 94525.05
DATE: 25/7/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
32	0.0	FILL - brown clayey sand fill with fine to cobble sized gravel and a trace of ripped sandstone, surficial vegetation, dry		D/B	0.9				
31	1.0	Pit discontinued at 1.0m - limit of investigation			1.0				
30	2.0								
29	3.0								
28	4.0								

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

RIG: 8.5T backhoe - 400mm bucket

LOGGED: JY

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Stockpile ~5.0m high

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

SAMPLING & IN SITU TESTING LEGEND

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

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Geotechnics / Environment / Groundwater

TEST PIT LOG

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

SURFACE LEVEL: 32.3 mAHD
EASTING: 293510
NORTHING: 6262185

PIT No: SP3-TP103
PROJECT No: 94525.05
DATE: 25/7/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
32	0	FILL - brown clayey sand fill with fine to cobble sized gravel and a trace of ripped sandstone, surficial vegetation, dry							5 10 15 20
31	1								1
30	2								2
	3			D/B	2.9				3
	3.0	Pit discontinued at 3.0m - limit of investigation			3.0				
29									
28	4								4

RIG: 8.5T backhoe - 400mm bucket

LOGGED: JY

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Stockpile ~6.0m high

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

SAMPLING & IN SITU TESTING LEGEND

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

Douglas Partners
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TEST PIT LOG

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

SURFACE LEVEL: 32.1 mAHD
EASTING: 293508
NORTHING: 6262189

PIT No: SP3-TP104
PROJECT No: 94525.05
DATE: 25/7/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
32	0	FILL - pale brown sandy fine to cobble sized gravel fill with clay and some ripped sandstone boulders up to 200mm diameter, dry							
31	1								1
	2			D/B	1.9				2
	2.0	Pit discontinued at 2.0m - limit of investigation			2.0				
30									
29	3								3
28	4								4

RIG: 8.5T backhoe - 400mm bucket

LOGGED: JY

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Stockpile ~4.0m high

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

SAMPLING & IN SITU TESTING LEGEND

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

Douglas Partners
Geotechnics / Environment / Groundwater

TEST PIT LOG

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

SURFACE LEVEL: 32.0 mAHD
EASTING: 293508
NORTHING: 6262193

PIT No: SP3-TP105
PROJECT No: 94525.05
DATE: 25/7/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
32		FILL - pale brown sandy fine to cobble sized gravel fill with clay and some ripped sandstone boulders up to 200mm diameter, dry							
31	1								1
				D/B	1.9				
30	2 2.0	Pit discontinued at 2.0m - limit of investigation			2.0				2
29	3								3
28	4								4

RIG: 8.5T backhoe - 400mm bucket

LOGGED: JY

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Stockpile ~4.0m high

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

SAMPLING & IN SITU TESTING LEGEND

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

Douglas Partners
Geotechnics / Environment / Groundwater

TEST PIT LOG

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

SURFACE LEVEL: 32.1 mAHD
EASTING: 293504
NORTHING: 6262195

PIT No: SP3-TP106
PROJECT No: 94525.05
DATE: 25/7/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
32	0	FILL - brown gravelly sand fill with clay and a trace of ripped siltstone boulders up to 300mm diameter, surficial vegetation, moist							
31	1								
30	2			D/B	2.4				
	2.5				2.5				
		Pit discontinued at 2.5m - limit of investigation							
29	3								
28	4								

RIG: 8.5T backhoe - 400mm bucket

LOGGED: JY

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Stockpile ~4.0m high

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

SAMPLING & IN SITU TESTING LEGEND

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

Douglas Partners
Geotechnics / Environment / Groundwater

TEST PIT LOG

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

SURFACE LEVEL: 32.1 mAHD
EASTING: 293507
NORTHING: 6262198

PIT No: SP3-TP107
PROJECT No: 94525.05
DATE: 25/7/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
32	0	FILL - brown gravelly sand fill with clay and a trace of ripped sandstone and rootlets, surficial vegetation, moist							
				D/B	1.4				
31	1								1
	1.5	Pit discontinued at 1.5m - limit of investigation			1.5				
30	2								2
29	3								3
28	4								4

5 10 15 20

RIG: 8.5T backhoe - 400mm bucket

LOGGED: JY

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Stockpile ~3.0m high

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

SAMPLING & IN SITU TESTING LEGEND

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

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TEST PIT LOG

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

SURFACE LEVEL: 32.2 mAHD
EASTING: 293505
NORTHING: 6262201

PIT No: SP3-TP108
PROJECT No: 94525.05
DATE: 25/7/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
32	0	FILL - brown gravelly sand fill with clay and a trace of ripped sandstone and rootlets, surficial vegetation, moist							
31	1								1
	1.8	FILL - grey sandy gravel fill with ripped siltstone, ripped sandstone and a trace of brick fragments and ceramic fragments							
30	2			D/B	2.4				2
	2.5	Pit discontinued at 2.5m - limit of investigation			2.5				
29	3								3
28	4								4

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

RIG: 8.5T backhoe - 400mm bucket

LOGGED: JY

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Stockpile ~3.0m high

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

SAMPLING & IN SITU TESTING LEGEND

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

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TEST PIT LOG

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

SURFACE LEVEL: 32.2 mAHD
EASTING: 293503
NORTHING: 6262205

PIT No: SP3-TP109
PROJECT No: 94525.05
DATE: 25/7/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
32	0.2	FILL - grey-brown sandy gravel fill with ripped siltstone, ripped sandstone up to cobble size, a trace of rootlets, surficial vegetation, moist			0.2				
		FILL - grey-brown fine to cobble sized ripped siltstone and sandstone gravel fill with sand and clay, dry		D/B					
31	1								1
30	2								2
	3	3.0			3.0				3
		Pit discontinued at 3.0m - limit of investigation							
29									
	4								4
28									

5 10 15 20

RIG: 8.5T backhoe - 400mm bucket

LOGGED: JY

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Stockpile ~3.0m high

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

SAMPLING & IN SITU TESTING LEGEND

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

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TEST PIT LOG

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

SURFACE LEVEL: 32.2 mAHD
EASTING: 293505
NORTHING: 6262209

PIT No: SP3-TP110
PROJECT No: 94525.05
DATE: 25/7/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
32	0	FILL - brown gravelly sand fill with clay and a trace of ripped sandstone and rootlets, surficial vegetation, moist							
	1								
31				D/B	1.9				
	2	2.0			2.0				
		Pit discontinued at 2.0m - limit of investigation							
30									
	3								
29									
	4								
28									

RIG: 8.5T backhoe - 400mm bucket

LOGGED: JY

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Stockpile ~4.0m high

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

SAMPLING & IN SITU TESTING LEGEND

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

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TEST PIT LOG

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

SURFACE LEVEL: 32.1 mAHD
EASTING: 293502
NORTHING: 6262211

PIT No: SP3-TP111
PROJECT No: 94525.05
DATE: 25/7/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
32	0	FILL - pale brown gravelly sand fill with clay and a trace of rootlets, surficial vegetation, dry							
31	1.0	FILL - grey sandy ripped sandstone and ripped siltstone gravel fill, dry							
30	2			D/B	2.4				
	2.5	Pit discontinued at 2.5m - limit of investigation			2.5				
29	3								
28	4								

RIG: 8.5T backhoe - 400mm bucket

LOGGED: JY

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Stockpile ~4.0m high

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

SAMPLING & IN SITU TESTING LEGEND

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

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TEST PIT LOG

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

SURFACE LEVEL: 32.1 mAHD
EASTING: 293504
NORTHING: 6262215

PIT No: SP3-TP112
PROJECT No: 94525.05
DATE: 25/7/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
32		FILL - brown sandy gravel fill with surficial vegetation, dry							
		- black plastic covered wire fragment at 1.0m		D/B	0.9				
31	1.0	Pit discontinued at 1.0m - limit of investigation			1.0				
30									
29									
28									

RIG: 8.5T backhoe - 400mm bucket

LOGGED: JY

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Stockpile ~3.0m high

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

SAMPLING & IN SITU TESTING LEGEND

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

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TEST PIT LOG

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

SURFACE LEVEL: 32.1 mAHD
EASTING: 293498
NORTHING: 6262218

PIT No: SP3-TP113
PROJECT No: 94525.05
DATE: 25/7/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm) 5 10 15 20
32	0	FILL - brown gravelly sand fill with clay, surficial vegetation, dry							
31	1								1
	2			D/B	1.9				
	2.0				2.0				2
30		Pit discontinued at 2.0m - limit of investigation							
29	3								3
28	4								4

RIG: 8.5T backhoe - 400mm bucket

LOGGED: JY

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Stockpile ~3.0m high

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

SAMPLING & IN SITU TESTING LEGEND

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

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TEST PIT LOG

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

SURFACE LEVEL: 31.9 mAHD
EASTING: 293501
NORTHING: 6262223

PIT No: SP3-TP114
PROJECT No: 94525.05
DATE: 25/7/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
31	0	FILL - brown fine to cobble sized ripped sandstone and siltstone gravelly clay fill with sand, a trace of rootlets and soft plastic fragments, w<PL							
				D/B	2.4				
30	2.5	Pit discontinued at 2.5m - limit of investigation			2.5				
29									
28									
27									

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

RIG: 8.5T backhoe - 400mm bucket

LOGGED: JY

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Stockpile ~3.5m high

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

SAMPLING & IN SITU TESTING LEGEND

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

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TEST PIT LOG

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

SURFACE LEVEL: 32.1 mAHD
EASTING: 293498
NORTHING: 6262224

PIT No: SP3-TP115
PROJECT No: 94525.05
DATE: 25/7/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
32	0.0	FILL - pale brown sandy fine to cobble sized ripped sandstone and siltstone gravel fill with clay and a trace of rootlets, dry		D/B	0.9				
	1.0	Pit discontinued at 1.0m - limit of investigation			1.0				
31									
30									
29									
28									

Dynamic Penetrometer Test (blows per mm): 5, 10, 15, 20; 1, 2, 3, 4

RIG: 8.5T backhoe - 400mm bucket

LOGGED: JY

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Stockpile ~3.0m high

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

SAMPLING & IN SITU TESTING LEGEND

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

Douglas Partners
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TEST PIT LOG

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

SURFACE LEVEL: 31.9 mAHD
EASTING: 293500
NORTHING: 6262227

PIT No: SP3-TP116
PROJECT No: 94525.05
DATE: 25/7/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
31	1	FILL - pale brown sandy fine to cobble sized ripped sandstone and siltstone gravel fill with clay and a trace of rootlets, dry		D/B	1.9				
30	2 2.0	Pit discontinued at 2.0m - limit of investigation			2.0				
29	3								
28	4								
27									

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

RIG: 8.5T backhoe - 400mm bucket

LOGGED: JY

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Stockpile ~4.0m high

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

SAMPLING & IN SITU TESTING LEGEND

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

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TEST PIT LOG

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

SURFACE LEVEL: 31.8 mAHD
EASTING: 293496
NORTHING: 6262231

PIT No: SP3-TP117
PROJECT No: 94525.05
DATE: 25/7/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
31	0	FILL - brown gravelly sand fill with clay, surficial vegetation, dry		D/B	1.4 1.5				
30	2.0	Pit discontinued at 2.0m - limit of investigation							
29									
28									
27									

RIG: 8.5T backhoe - 400mm bucket

LOGGED: JY

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Stockpile ~3.5m high

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

SAMPLING & IN SITU TESTING LEGEND

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

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TEST PIT LOG

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

SURFACE LEVEL: 31.5 mAHD
EASTING: 293500
NORTHING: 6262235

PIT No: SP3-TP118
PROJECT No: 94525.05
DATE: 25/7/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
31	0	FILL - pale brown sandy fine to cobble sized ripped sandstone and siltstone gravel fill with clay and a trace of rootlets, dry		D/B	0.9 1.0				
30	1								1
29	2								2
28	2.0	Pit discontinued at 2.0m - limit of investigation							
27	3								3
	4								4

5 10 15 20

RIG: 8.5T backhoe - 400mm bucket

LOGGED: JY

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Stockpile ~3.5m high

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

SAMPLING & IN SITU TESTING LEGEND

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

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TEST PIT LOG

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

SURFACE LEVEL: 31.4 mAHD
EASTING: 293497
NORTHING: 6262237

PIT No: SP3-TP119
PROJECT No: 94525.05
DATE: 25/7/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
31	0	FILL - grey-brown sandy gravel fill with a trace of rootlets, surficial vegetation, dry							
		- green plastic mesh sheet fragment and 50mm glass fragment at 0.4m		D/B	0.4				
	0.5	Pit discontinued at 0.5m - limit of investigation			0.5				
	1								1
30									
	2								2
29									
	3								3
28									
	4								4
27									

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

RIG: 8.5T backhoe - 400mm bucket

LOGGED: JY

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Stockpile ~3.0m high

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

SAMPLING & IN SITU TESTING LEGEND

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

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Geotechnics / Environment / Groundwater

TEST PIT LOG

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

SURFACE LEVEL: 31.2 mAHD
EASTING: 293501
NORTHING: 6262247

PIT No: SP3-TP120
PROJECT No: 94525.05
DATE: 25/7/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
31	0	FILL - brown gravelly sand fill with clay and a trace of ripped sandstone and rootlets, surficial vegetation, moist							
30	1								
	2			D/B	1.9 - 2.0				
	2.0	Pit discontinued at 2.0m - limit of investigation							
29									
28	3								
27	4								

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

RIG: 8.5T backhoe - 400mm bucket

LOGGED: JY

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Stockpile ~5.0m high

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

SAMPLING & IN SITU TESTING LEGEND

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

Douglas Partners
Geotechnics / Environment / Groundwater

TEST PIT LOG

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

SURFACE LEVEL: 31.2 mAHD
EASTING: 293496
NORTHING: 6262248

PIT No: SP3-TP121
PROJECT No: 94525.05
DATE: 25/7/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
31	0.0	FILL - brown gravelly sand fill with clay and a trace of rootlets, surficial vegetation, dry		D/B	0.9				
	1.0	Pit discontinued at 1.0m - limit of investigation			1.0				
30									
29									
28									
27									

Dynamic Penetrometer Test (blows per mm): 5, 10, 15, 20; 1, 2, 3, 4

RIG: 8.5T backhoe - 400mm bucket

LOGGED: JY

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Stockpile ~3.0m high

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

SAMPLING & IN SITU TESTING LEGEND

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

Douglas Partners
Geotechnics / Environment / Groundwater

TEST PIT LOG

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

SURFACE LEVEL: 31.0 mAHD
EASTING: 293502
NORTHING: 6262252

PIT No: SP3-TP122
PROJECT No: 94525.05
DATE: 25/7/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
31		FILL - grey-brown sandy gravel fill with a trace of bitumen and brick fragments, surficial vegetation, dry							
		- metal plate (20 x 200 x 200 mm) at 0.5m							
30	1								1
				D/B	1.4				
	1.5	Pit discontinued at 1.5m			1.5				
		- limit of investigation							
29	2								2
28	3								3
27	4								4

5 10 15 20

RIG: 8.5T backhoe - 400mm bucket

LOGGED: JY

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Stockpile ~4.0m high

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

SAMPLING & IN SITU TESTING LEGEND

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

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Geotechnics / Environment / Groundwater

TEST PIT LOG

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

SURFACE LEVEL: 31.1 mAHD
EASTING: 293495
NORTHING: 6262256

PIT No: SP3-TP123
PROJECT No: 94525.05
DATE: 25/7/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
31	0	FILL - brown gravelly sand fill with clay and a trace of rootlets, surficial vegetation, dry - large concrete fragment (800mm x 300mm) at 0.2m		D/B	0.9				
	1 1.0	Pit discontinued at 1.0m - limit investigation			1.0				
30	2								
29	3								
28	4								
27									

RIG: 8.5T backhoe - 400mm bucket

LOGGED: JY

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Stockpile ~3.0m high

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

SAMPLING & IN SITU TESTING LEGEND

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

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TEST PIT LOG

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

SURFACE LEVEL: 30.9 mAHD
EASTING: 293500
NORTHING: 6262259

PIT No: SP3-TP124
PROJECT No: 94525.05
DATE: 25/7/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm) 5 10 15 20
30	0	FILL - brown gravelly clay fill with a trace of rootlets, ripped sandstone and ripped siltstone gravel, w<PL		D/B	0.6				
	0.7	Pit discontinued at 0.7m - limit of investigation			0.7				
29	1								1
28	2								2
27	3								3
26	4								4

RIG: 8.5T backhoe - 400mm bucket

LOGGED: JY

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Stockpile ~5.0m high

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

SAMPLING & IN SITU TESTING LEGEND

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

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TEST PIT LOG

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

SURFACE LEVEL: 31.0 mAHD
EASTING: 293496
NORTHING: 6262265

PIT No: SP3-TP125
PROJECT No: 94525.05
DATE: 25/7/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
31		FILL - pale brown gravelly sand fill, dry							
		- very fine plastic covered wires in large plastic cable at 0.2m							
30	1								1
29	2								2
				D/B	2.9				
28	3	3.0			3.0				3
		Pit discontinued at 3.0m - limit of investigation							
27	4								4

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

RIG: 8.5T backhoe - 400mm bucket

LOGGED: JY

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Stockpile ~4.0m high

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

SAMPLING & IN SITU TESTING LEGEND

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

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TEST PIT LOG

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

SURFACE LEVEL: 30.7 mAHD
EASTING: 293504
NORTHING: 6262268

PIT No: SP3-TP126
PROJECT No: 94525.05
DATE: 25/7/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm) 5 10 15 20
30	0.0	FILL - pale brown gravelly sand fill with clay and a trace of concrete and brick fragments, surficial vegetation, dry		D/B	0.9				1
	1.0	Pit discontinued at 1.0m - limit of investigation			1.0				
29	2								2
28	3								3
27	4								4
26									

RIG: 8.5T backhoe - 400mm bucket

LOGGED: JY

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Stockpile ~7.0m high

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

SAMPLING & IN SITU TESTING LEGEND

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

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TEST PIT LOG

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

SURFACE LEVEL: 30.7 mAHD
EASTING: 293503
NORTHING: 6262277

PIT No: SP3-TP127
PROJECT No: 94525.05
DATE: 25/7/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
30	0	FILL - brown gravelly clay fill with a trace of rootlets, ripped sandstone and ripped siltstone gravel, w<PL							5 10 15 20
	1			D/B	1.4				1
	1.5	Pit discontinued at 1.5m - limit of investigation			1.5				
29	2								2
28	3								3
27	4								4
26									

RIG: 8.5T backhoe - 400mm bucket

LOGGED: JY

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Stockpile ~3.0m high

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

SAMPLING & IN SITU TESTING LEGEND

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

Douglas Partners
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TEST PIT LOG

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

SURFACE LEVEL: 30.7 mAHD
EASTING: 293500
NORTHING: 6262283

PIT No: SP3-TP128
PROJECT No: 94525.05
DATE: 25/7/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
30	0	FILL - brown gravelly clay fill with a trace of rootlets, ripped sandstone and ripped siltstone gravel, w<PL		D/B	0.9				5 10 15 20
	1.0	Pit discontinued at 1.0m - limit of investigation			1.0				1
29	1								
	2								2
28									
	3								3
27									
	4								4
26									

RIG: 8.5T backhoe - 400mm bucket

LOGGED: JY

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Stockpile ~3.0m high

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

SAMPLING & IN SITU TESTING LEGEND

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

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Geotechnics / Environment / Groundwater

TEST PIT LOG

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

SURFACE LEVEL: 30.7 mAHD
EASTING: 293492
NORTHING: 6262284

PIT No: SP3-TP129
PROJECT No: 94525.05
DATE: 25/7/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
30	0	FILL - brown gravelly sand fill with clay and a trace of rootlets, surficial vegetation, dry							
29	1								
28	2								
	3			D/B	2.9				
	3.0	Pit discontinued at 3.0m - limit of investigation			3.0				
27	4								
26									

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

RIG: 8.5T backhoe - 400mm bucket

LOGGED: JY

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Stockpile ~4.0m high

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

SAMPLING & IN SITU TESTING LEGEND

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

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TEST PIT LOG

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

SURFACE LEVEL: 30.7 mAHD
EASTING: 293497
NORTHING: 6262287

PIT No: SP3-TP130
PROJECT No: 94525.05
DATE: 25/7/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
30	0.0	FILL - pale brown sandy gravel fill with a trace of rootlets, ripped siltstone and wood, surficial vegetation, dry		D/B	0.9				
	1.0	Pit discontinued at 1.0m - limit of investigation			1.0				
29									
28									
27									
26									

RIG: 8.5T backhoe - 400mm bucket

LOGGED: JY

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Stockpile ~3.5m high

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

SAMPLING & IN SITU TESTING LEGEND

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

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TEST PIT LOG

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

SURFACE LEVEL: 30.7 mAHD
EASTING: 293495
NORTHING: 6262316

PIT No: SP3-TP131
PROJECT No: 94525.05
DATE: 25/7/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm) 5 10 15 20
30	0	FILL - pale brown gravelly sand fill with a trace of concrete fragment, surficial vegetation, dry							
		- soft plastic bag at 0.2m							
		- metal rod (10mm diameter) at 0.3m							
	1								1
				D/B	1.4				
	1.5	Pit discontinued at 1.5m			1.5				
29		- limit of investigation							
	2								2
28									
	3								3
27									
	4								4
26									

RIG: 8.5T backhoe - 400mm bucket

LOGGED: JY

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Stockpile ~3.0m high

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

SAMPLING & IN SITU TESTING LEGEND

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

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TEST PIT LOG

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

SURFACE LEVEL: 30.5 mAHD
EASTING: 293498
NORTHING: 6262311

PIT No: SP3-TP132
PROJECT No: 94525.05
DATE: 25/7/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
30	0	FILL - pale brown sandy clay fill with gravel, surficial vegetation, w<PL							
				D/B	0.9				
	1	- bitumen and metal fragment at 1.0m			1.0				
29									
	2	2.0 Pit discontinued at 2.0m - limit of investigation							
28									
	3								
27									
	4								
26									

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

RIG: 8.5T backhoe - 400mm bucket

LOGGED: JY

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Stockpile ~3.0m high

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

SAMPLING & IN SITU TESTING LEGEND

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

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TEST PIT LOG

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

SURFACE LEVEL: 30.5 mAHD
EASTING: 293494
NORTHING: 6262306

PIT No: SP3-TP133
PROJECT No: 94525.05
DATE: 25/7/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
30	0	FILL - brown gravelly sand fill with a trace of roof tile, metal wire, metal and brick fragments, surficial vegetation, dry							
	1								1
29				D/B	1.9				
	2	2.0			2.0				2
		Pit discontinued at 2.0m - limit of investigation							
28									
	3								3
27									
	4								4
26									

RIG: 8.5T backhoe - 400mm bucket

LOGGED: JY

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Stockpile ~3.0m high

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

SAMPLING & IN SITU TESTING LEGEND

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

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TEST PIT LOG

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

SURFACE LEVEL: 30.4 mAHD
EASTING: 293498
NORTHING: 6262306

PIT No: SP3-TP134
PROJECT No: 94525.05
DATE: 25/7/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
30	1	FILL - pale brown gravelly clay fill with a trace of bitumen fragments and rootlets, surficial vegetation, one brick and metal road, moist							
29	2			D/B	1.9				
	2.0	Pit discontinued at 2.0m - limit of investigation			2.0				
28	3								
27	4								
26									

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

RIG: 8.5T backhoe - 400mm bucket

LOGGED: JY

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Stockpile ~3.5m high

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

SAMPLING & IN SITU TESTING LEGEND

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

Douglas Partners
Geotechnics / Environment / Groundwater

TEST PIT LOG

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

SURFACE LEVEL: 30.3 mAHD
EASTING: 293497
NORTHING: 6262301

PIT No: SP3-TP135
PROJECT No: 94525.05
DATE: 25/7/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
30	0.0	FILL - grey-brown gravelly clay fill with ripped siltstone and a trace of wood, brick fragments and rootlets, w<PL		D/B	0.4				
	0.5	- golf ball at 0.5m Pit discontinued at 0.5m - limit of investigation			0.5				
29	1								1
28	2								2
27	3								3
26	4								4

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

RIG: 8.5T backhoe - 400mm bucket

LOGGED: JY

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Stockpile ~2.0m high

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

SAMPLING & IN SITU TESTING LEGEND

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

Douglas Partners
Geotechnics / Environment / Groundwater

TEST PIT LOG

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

SURFACE LEVEL: 30.5 mAHD
EASTING: 293493
NORTHING: 6262295

PIT No: SP3-TP136
PROJECT No: 94525.05
DATE: 25/7/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
30	0	FILL - grey-brown gravelly sand fill with brick fragments, roof tile fragments and concrete fragments, dry							
29	1								
	2			D/B	1.9				
	2.0	Pit discontinued at 2.0m - limit of investigation			2.0				
28	3								
27	4								
26									

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

RIG: 8.5T backhoe - 400mm bucket

LOGGED: JY

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Stockpile ~2.5m high

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

SAMPLING & IN SITU TESTING LEGEND

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

Douglas Partners
Geotechnics / Environment / Groundwater

TEST PIT LOG

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

SURFACE LEVEL: 30.1 mAHD
EASTING: 293484
NORTHING: 6262297

PIT No: SP3-TP137
PROJECT No: 94525.05
DATE: 25/7/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
30		FILL - brown sandy gravel fill with clay and a trace of glass fragments and bitumen fragments, surficial vegetation, dry							
29	1								1
		- plastic drink bottle at 1.8m		D/B	1.9				
	2	2.0			2.0				2
28		Pit discontinued at 2.0m - limit of investigation							
	3								3
27									
	4								4
26									

RIG: 8.5T backhoe - 400mm bucket

LOGGED: JY

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Stockpile ~3.0m high

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

SAMPLING & IN SITU TESTING LEGEND

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

Douglas Partners
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TEST PIT LOG

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

SURFACE LEVEL: 30.3 mAHD
EASTING: 293482
NORTHING: 6262294

PIT No: SP3-TP138
PROJECT No: 94525.05
DATE: 25/7/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
30		FILL - dark brown sandy clay fill with gravel and ripped siltstone, (possibly railway ballast), surficial vegetation, w<PL		D/B	0.9				
	1.0	Pit discontinued at 1.0m - limit of investigation			1.0				
29									
28									
27									
26									

Dynamic Penetrometer Test (blows per mm): 5, 10, 15, 20; 1, 2, 3, 4

RIG: 8.5T backhoe - 400mm bucket

LOGGED: JY

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Stockpile ~3.0m high

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

SAMPLING & IN SITU TESTING LEGEND

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

Douglas Partners
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TEST PIT LOG

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

SURFACE LEVEL: 28.6 mAHD
EASTING: 293483
NORTHING: 6262310

PIT No: SP3-TP139
PROJECT No: 94525.05
DATE: 25/7/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
28	0	FILL - brown clayey sand fill with gravel, a trace of bricks, 200mm bitumen fragments and rootlets, surficial vegetation, dry							
	1			D/B	1.4				
	1.5	Pit discontinued at 1.5m - limit of investigation			1.5				
27	2								
26	3								
25	4								
24									

RIG: 8.5T backhoe - 400mm bucket

LOGGED: JY

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Stockpile ~1.5m high

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

SAMPLING & IN SITU TESTING LEGEND

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

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Geotechnics / Environment / Groundwater

TEST PIT LOG

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

SURFACE LEVEL: 28.3 mAHD
EASTING: 293482
NORTHING: 6262320

PIT No: SP3-TP140
PROJECT No: 94525.05
DATE: 25/7/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
28	0	FILL - grey-brown clayey sand fill with gravel and railway ballast, surficial vegetation, moist		D/B	0.9				
	1 1.0	Pit discontinued at 1.0m - limit of investigation			1.0				
27	2								
26	3								
25	4								
24									

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

RIG: 8.5T backhoe - 400mm bucket

LOGGED: JY

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Stockpile ~1.0m high

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

SAMPLING & IN SITU TESTING LEGEND

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

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TEST PIT LOG

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

SURFACE LEVEL: 32.6 mAHD
EASTING: 293491
NORTHING: 6262333

PIT No: SP3-TP141
PROJECT No: 94525.05
DATE: 25/7/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
32	0	FILL - pale brown clayey sand fill with a trace of gravel and one glass fragments, surficial vegetation, dry							
	1			D/B	1.4				
	1.5	Pit discontinued at 1.5m - limit of investigation			1.5				
31	2								
30	3								
29	4								
28									

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

RIG: 8.5T backhoe - 400mm bucket

LOGGED: JY

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Stockpile ~8.0m high

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

SAMPLING & IN SITU TESTING LEGEND

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

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TEST PIT LOG

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

SURFACE LEVEL: 32.1 mAHD
EASTING: 293488
NORTHING: 6262339

PIT No: SP3-TP142
PROJECT No: 94525.05
DATE: 25/7/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
32	0	FILL - pale brown clayey sand fill with a trace of gravel, surficial vegetation, dry							
31	1	- metal star picket at 1.0m							
				D/B	1.9				
30	2	Pit discontinued at 2.0m - limit of investigation			2.0				
29	3								
28	4								

RIG: 8.5T backhoe - 400mm bucket

LOGGED: JY

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Stockpile ~8.0m high

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

SAMPLING & IN SITU TESTING LEGEND

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

Douglas Partners
Geotechnics / Environment / Groundwater

TEST PIT LOG

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

SURFACE LEVEL: 32.2 mAHD
EASTING: 293491
NORTHING: 6262341

PIT No: SP3-TP143
PROJECT No: 94525.05
DATE: 25/7/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
32		FILL - orange-brown silty sand fill with clay and gravel with a trace of ripped siltstone, surficial vegetation, dry		D/B	0.4				
	0.5	Pit discontinued at 0.5m - limit of investigation			0.5				
31	1								1
30	2								2
29	3								3
28	4								4

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

RIG: 8.5T backhoe - 400mm bucket

LOGGED: JY

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Stockpile ~7.5m high

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

SAMPLING & IN SITU TESTING LEGEND

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

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Geotechnics / Environment / Groundwater

TEST PIT LOG

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

SURFACE LEVEL: 31.9 mAHD
EASTING: 293488
NORTHING: 6262343

PIT No: SP3-TP144
PROJECT No: 94525.05
DATE: 25/7/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
31	0	FILL - pale grey-brown gravelly sand fill with a trace of ripped sandstone and ripped siltstone, dry							
	1								1
30	2								2
29	3			D/B	3.4				3
	3.5	Pit discontinued at 3.5m - limit of investigation			3.5				
28	4								4
27									

RIG: 8.5T backhoe - 400mm bucket

LOGGED: JY

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Stockpile ~7.5m high

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

SAMPLING & IN SITU TESTING LEGEND

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

Douglas Partners
Geotechnics / Environment / Groundwater

TEST PIT LOG

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

SURFACE LEVEL: 32.2 mAHD
EASTING: 293493
NORTHING: 6262344

PIT No: SP3-TP145
PROJECT No: 94525.05
DATE: 25/7/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
32	0	FILL - pale brown gravelly sand fill, dry							5 10 15 20
	1								1
31									
	2								2
30									
	3			D/B	3.4				3
29	3.5	Pit discontinued at 3.5m - limit of investigation			3.5				
	4								4
28									

RIG: 8.5T backhoe - 400mm bucket

LOGGED: JY

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Stockpile ~7.5m high

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

SAMPLING & IN SITU TESTING LEGEND

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

Douglas Partners
Geotechnics / Environment / Groundwater

TEST PIT LOG

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

SURFACE LEVEL: 31.6 mAHD
EASTING: 293488
NORTHING: 6262345

PIT No: SP3-TP146
PROJECT No: 94525.05
DATE: 25/7/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm) 5 10 15 20
31	0	FILL - pale brown gravelly sand fill with a trace of cobbles up to 150mm diameter							
	1			D/B	1.4				1
	1.5	Pit discontinued at 1.5m - limit of investigation			1.5				
30	2								2
29	3								3
28	4								4
27									

RIG: 8.5T backhoe - 400mm bucket

LOGGED: JY

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Stockpile ~7.0m high

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

SAMPLING & IN SITU TESTING LEGEND

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

Douglas Partners
Geotechnics / Environment / Groundwater

TEST PIT LOG

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

SURFACE LEVEL: 32.2 mAHD
EASTING: 293492
NORTHING: 6262347

PIT No: SP3-TP147
PROJECT No: 94525.05
DATE: 25/7/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
32	0	FILL - brown clayey sand fill with gravel and a trace of ripped sandstone and rootlets, surficial vegetation, moist							5 10 15 20
31	1								1
30	2								2
29	3								3
	4			D/B	3.9-4.0				4
28	4.0	Pit discontinued at 4.0m - limit of investigation							

RIG: 8.5T backhoe - 400mm bucket

LOGGED: JY

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Stockpile ~7.0m high

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

SAMPLING & IN SITU TESTING LEGEND

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

Douglas Partners
Geotechnics / Environment / Groundwater

TEST PIT LOG

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

SURFACE LEVEL: 31.9 mAHD
EASTING: 293492
NORTHING: 6262350

PIT No: SP3-TP148
PROJECT No: 94525.05
DATE: 25/7/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
31	0	FILL - brown clayey sand fill with gravel and a trace of ripped sandstone and rootlets, surficial vegetation, moist							
	1								1
30	2								2
29	3			D/B	3.4				3
	3.5	Pit discontinued at 3.5m - limit of investigation			3.5				
28	4								4
27									

RIG: 8.5T backhoe - 400mm bucket

LOGGED: JY

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Stockpile ~4.0m high

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

SAMPLING & IN SITU TESTING LEGEND

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

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Geotechnics / Environment / Groundwater

TEST PIT LOG

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

SURFACE LEVEL: 31.7 mAHD
EASTING: 293488
NORTHING: 6262351

PIT No: SP3-TP149
PROJECT No: 94525.05
DATE: 25/7/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Sampling & In Situ Testing: Depth	Sampling & In Situ Testing: Sample	Sampling & In Situ Testing: Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
31	0	FILL - pale brown silty sand fill with clay, surficial vegetation, dry							
	1								1
30	2								2
29	3			D/B	3.4				3
	3.5	Pit discontinued at 3.5m - limit of investigation			3.5				
28	4								4
27									

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

RIG: 8.5T backhoe - 400mm bucket

LOGGED: JY

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Stockpile ~7.0m high

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

SAMPLING & IN SITU TESTING LEGEND

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

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Geotechnics / Environment / Groundwater

TEST PIT LOG

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

SURFACE LEVEL: 31.7 mAHD
EASTING: 293490
NORTHING: 6262352

PIT No: SP3-TP150
PROJECT No: 94525.05
DATE: 25/7/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
31	0.0	FILL - pale brown gravelly sand fill with a trace of wood and rubber fragments, dry		D/B	0.9				
	1.0	Pit discontinued at 1.0m - limit of investigation			1.0				
30									
29									
28									
27									

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

RIG: 8.5T backhoe - 400mm bucket

LOGGED: JY

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Stockpile ~7.0m high

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

SAMPLING & IN SITU TESTING LEGEND

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

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TEST PIT LOG

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

SURFACE LEVEL: 31.4 mAHD
EASTING: 293488
NORTHING: 6262357

PIT No: SP3-TP151
PROJECT No: 94525.05
DATE: 25/7/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
31	0	FILL - pale brown silty clay fill with sand and a trace of gravel and rootlets, surficial vegetation, dry							5 10 15 20
30	1								1
29	2								2
	3			D/B	2.9				3
	3.0	Pit discontinued at 3.0m - limit of investigation			3.0				
28									
	4								4
27									

RIG: 8.5T backhoe - 400mm bucket

LOGGED: JY

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Stockpile ~7.0m high

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

SAMPLING & IN SITU TESTING LEGEND

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

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TEST PIT LOG

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

SURFACE LEVEL: 31.1 mAHD
EASTING: 293493
NORTHING: 6262357

PIT No: SP3-TP152
PROJECT No: 94525.05
DATE: 25/7/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
31	0	FILL - pale brown silty clay fill with a trace of gravel and wood, surficial vegetation, w<PL							
30	1								
29	2			D/B	2.9				
28	3				3.0				
	3.0	Pit discontinued at 3.0m - limit of investigation							
27	4								

RIG: 8.5T backhoe - 400mm bucket

LOGGED: JY

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Stockpile ~6.0m high

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

SAMPLING & IN SITU TESTING LEGEND

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

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TEST PIT LOG

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

SURFACE LEVEL: 30.6 mAHD
EASTING: 293491
NORTHING: 6262360

PIT No: SP3-TP153
PROJECT No: 94525.05
DATE: 25/7/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
30	0	FILL - pale brown silty clay with sand and gravel, surficial vegetation, w<PL							
	1								1
29				D/B	1.9				
	2	2.0			2.0				2
		Pit discontinued at 2.0m - limit of investigation							
28									
	3								3
27									
	4								4
26									

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

RIG: 8.5T backhoe - 400mm bucket

LOGGED: JY

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Stockpile ~5.0m high

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

SAMPLING & IN SITU TESTING LEGEND

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

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TEST PIT LOG

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

SURFACE LEVEL: 29.6 mAHD
EASTING: 293490
NORTHING: 6262367

PIT No: SP3-TP154
PROJECT No: 94525.05
DATE: 25/7/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
29	0	FILL - pale grey-brown gravelly sand fill with a trace of ripped siltstone, one brick, surficial vegetation, dry							
	1								1
28				D/B	1.9				
	2	2.0			2.0				2
		Pit discontinued at 2.0m - limit of investigation							
27	3								3
26	4								4
25									

RIG: 8.5T backhoe - 400mm bucket

LOGGED: JY

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Stockpile ~4.0m high

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

SAMPLING & IN SITU TESTING LEGEND

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

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TEST PIT LOG

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

SURFACE LEVEL: 29.6 mAHD
EASTING: 293494
NORTHING: 6262366

PIT No: SP3-TP155
PROJECT No: 94525.05
DATE: 25/7/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
29	1	FILL - pale brown clayey sand fill with gravel and a trace of wood, surficial vegetation, dry		D/B	1.9				
28	2	2.0 Pit discontinued at 2.0m - limit of investigation			2.0				
27	3								
26	4								
25									

RIG: 8.5T backhoe - 400mm bucket

LOGGED: JY

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Stockpile ~4.0m high

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

SAMPLING & IN SITU TESTING LEGEND

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

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TEST PIT LOG

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

SURFACE LEVEL: 29.7 mAHD
EASTING: 293493
NORTHING: 6262370

PIT No: SP3-TP156
PROJECT No: 94525.05
DATE: 25/7/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
29	0.0	FILL - pale brown clayey sand fill with gravel and a trace of wood and ripped sandstone gravel, surficial vegetation, dry		D/B	0.9				
	1.0	Pit discontinued at 1.0m - limit of investigation			1.0				
28									
27									
26									
25									

RIG: 8.5T backhoe - 400mm bucket

LOGGED: JY

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Stockpile ~3.0m high

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

SAMPLING & IN SITU TESTING LEGEND

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

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TEST PIT LOG

CLIENT: Pacific National Services 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: 6262373

PIT No: SP3-TP157
PROJECT No: 94525.05
DATE: 25/7/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
29	0	FILL - pale brown clayey sand fill with gravel and a trace of wood and ripped sandstone gravel, surficial vegetation, dry							
	1								1
28									
	2								2
				D/B	2.4				
27	2.5	Pit discontinued at 2.5m - limit of investigation			2.5				
	3								3
26									
	4								4
25									

RIG: 8.5T backhoe - 400mm bucket

LOGGED: JY

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Stockpile ~3.5m high

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

SAMPLING & IN SITU TESTING LEGEND

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

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TEST PIT LOG

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

SURFACE LEVEL: 27.2 mAHD
EASTING: 293496
NORTHING: 6262383

PIT No: SP3-TP158
PROJECT No: 94525.05
DATE: 25/7/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm) 5 10 15 20
27		FILL - pale brown gravelly sand fill with a trace of rootlets, surficial vegetation, dry							
	1								1
26				D/B	1.4				
	1.5	Pit discontinued at 1.5m - limit of investigation			1.5				
	2								2
25									
	3								3
24									
	4								4
23									

RIG: 8.5T backhoe - 400mm bucket

LOGGED: JY

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Stockpile ~1.5m high

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

SAMPLING & IN SITU TESTING LEGEND

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

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TEST PIT LOG

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

SURFACE LEVEL: 27.2 mAHD
EASTING: 293498
NORTHING: 6262381

PIT No: SP3-TP159
PROJECT No: 94525.05
DATE: 25/7/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm) 5 10 15 20
27		FILL - pale brown gravelly fill with a trace of ripped siltstone gravel, soft plastic, wood and rootlets, surficial vegetation, dry							
	1								1
26				D/B	1.4				
	1.5	Pit discontinued at 1.5m - limit of investigation			1.5				
	2								2
25									
	3								3
24									
	4								4
23									

RIG: 8.5T backhoe - 400mm bucket

LOGGED: JY

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Stockpile ~1.5m high

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

SAMPLING & IN SITU TESTING LEGEND

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

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TEST PIT LOG

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

SURFACE LEVEL: 28.0 mAHD
EASTING: 293489
NORTHING: 6262377

PIT No: SP3-TP160
PROJECT No: 94525.05
DATE: 25/7/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
28		FILL - pale brown gravelly sand fill with a trace of ripped sandstone gravel, surficial vegetation, dry							
27	1								1
				D/B	1.9				
26	2	2.0 Pit discontinued at 2.0m - limit of investigation			2.0				2
25	3								3
24	4								4

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

RIG: 8.5T backhoe - 400mm bucket

LOGGED: JY

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Stockpile ~2.0m high

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

SAMPLING & IN SITU TESTING LEGEND

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

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Sampling

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

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

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

Test Pits

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

Large Diameter Augers

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

Continuous Spiral Flight Augers

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

Non-core Rotary Drilling

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

Continuous Core Drilling

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

Standard Penetration Tests

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

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

The test results are reported in the following form.

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

  4,6,7
  N=13

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

  15, 30/40 mm

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

Dynamic Cone Penetrometer Tests / Perth Sand Penetrometer Tests

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

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

Soil Descriptions

Douglas Partners

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

Introduction

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

Drilling or Excavation Methods

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

Water

▷	Water seep
▽	Water level

Sampling and Testing

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

Description of Defects in Rock

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

Defect Type

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

Orientation

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

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

Coating or Infilling Term

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

Coating Descriptor

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

Shape

cu	curved
ir	irregular
pl	planar
st	stepped
un	undulating

Roughness

po	polished
ro	rough
sl	slickensided
sm	smooth
vr	very rough

Other

fg	fragmented
bnd	band
qtz	quartz

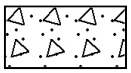
Symbols & Abbreviations

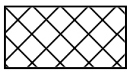
Graphic Symbols for Soil and Rock

General

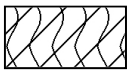

Asphalt

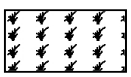

Road base

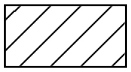

Concrete

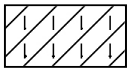

Filling

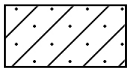
Soils


Topsoil

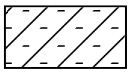

Peat

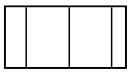

Clay

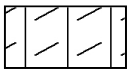

Silty clay

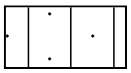

Sandy clay

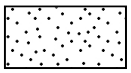

Gravelly clay

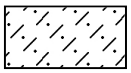

Shaly clay

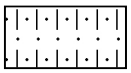

Silt


Clayey silt


Sandy silt

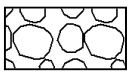

Sand

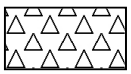

Clayey sand


Silty sand


Gravel

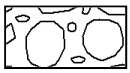

Sandy gravel


Cobbles, boulders

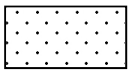

Talus

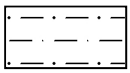
Sedimentary Rocks

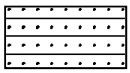

Boulder conglomerate

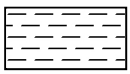

Conglomerate


Conglomeratic sandstone

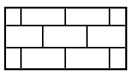

Sandstone


Siltstone

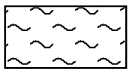

Laminite

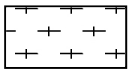

Mudstone, claystone, shale

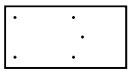

Coal


Limestone

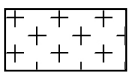
Metamorphic Rocks

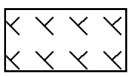

Slate, phyllite, schist

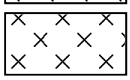

Gneiss

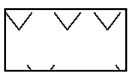

Quartzite

Igneous Rocks


Granite


Dolerite, basalt, andesite


Dacite, epidote


Tuff, breccia


Porphyry

Attachment D

Table D1: Soil Laboratory Results Summary

Table D1- Summary of Bulk Soil Sampling and Analytical Results

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)*	Weight of 500mL Sample (g)	Weight of AF or FA (g)**	Concentration of FA and AF in soil (% w/w)
HSL D for Asbestos in soil	-	-	-	-	-	0.050	-	-	0.001
TP101 / 1.9-2	16.525	-	-	-	-	-	672.62	-	-
TP102 / 0.9-1	12.965	-	-	-	-	-	642.03	-	-
TP103 / 2.9-3	17.976	-	-	-	-	-	723.53	-	-
TP104 / 1.9-2	16.376	-	-	-	-	-	772.51	-	
TP105 / 1.9-2	15.987	-	-	-	-	-	767.31	-	-
TP106 / 2.4-2.5	16.629	-	-	-	-	-	718.94	-	-
TP107 / 1.4-1.5	16.452	-	-	-	-	-	817.65	-	-
TP108 / 2.4-2.5	16.775	-	-	-	-	-	909.15	-	-
TP109 / 2.9-3	18.218	-	-	-	-	-	803.16	-	-
TP110 / 1.9-2	16.347	-	-	-	-	-	773.15	-	-
TP111 / 2.4-2.5	18.873	-	-	-	-	-	808.39	-	
TP112 / 0.9-1	18.754	-	-	-	-	-	868.73	-	
TP113 / 1.9-2	17.722	-	-	-	-	-	817.68	-	
TP114 / 2.4-2.5	17.803	-	-	-	-	-	722.26	-	
TP115 / 0.9-1	19.737	-	-	-	-	-	820.38	-	
TP116 / 1.9-2	17.311	2	good	50	9.7	0.008	732.46	-	
TP117 / 1.4-1.5	18.549	-	-	-	-	-	757.93	-	
TP118 / 0.9-1	16.902	-	-	-	-	-	773.06	-	
TP119 / 0.4-0.5	16.885	-	-	-	-	-	708.33	-	
TP120 / 1.9-2	17.346	-	-	-	-	-	770.68	-	
TP121 / 0.9-1	15.848	-	-	-	-	-	727.08	-	
TP122 / 1.4-1.5	19.074	-	-	-	-	-	793.77	-	
TP123 / 0.9-1	18.512	1	good	70	16.8	0.013	680.6	-	
TP124 / 0.6-0.7	19.652	-	-	-	-	-	710	-	
TP125 / 2.9-3	19.505	-	-	-	-	-	776.55	-	
TP126 / 0.9-1	16.828	-	-	-	-	-	770.66	-	-

HSL D for Asbestos in soil	Table 7 of Schedule B(1), NEPC (2013) for Commercial / Industrial use
*	Based on % w/w asbestos in soil assuming 15% asbestos in ACM
**	Based on the weight of asbestos in FA and AF as calculated by Envirolab. Values exclude calculated weight of bonded ACM greater than > 7mm in samples
-	Not applicable as no asbestos was detected
Bold	Concentration exceeds SAC

Table D1- Summary of Bulk Soil Sampling and Analytical Results

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)*	Weight of 500mL Sample (g)	Weight of AF or FA (g)**	Concentration of FA and AF in soil (% w/w)
HSL D for Asbestos in soil	-	-	-	-	-	0.050	-	-	0.001
TP127 / 1.4-1.5	16.858	-	-	-	-	-	782.23	-	-
TP128 / 0.9-1	18.638	-	-	-	-	-	728.83	-	-
TP129 / 2.9-3	16.752	-	-	-	-	-	742.76	-	-
TP130 / 0.9-1	16.621	-	-	-	-	-	755.09	-	
TP131 / 1.4-1.5	16.363	-	-	-	-	-	1238.9	-	-
TP132 / 0.9-1	17.373	-	-	-	-	-	1147.46	-	-
TP133 / 1.9-2	17.759	-	-	-	-	-	1293.44	-	-
TP134 / 1.9-2	18.342	-	-	-	-	-	1162.38	-	-
TP135 / 0.4-0.5	15.593	-	-	-	-	-	1047.69	-	-
TP136 / 1.9-2	16.424	-	-	-	-	-	1394.33	-	-
TP137 / 1.9-2	17.518	1	good	10	0.7	0.0006	1420.88	-	
TP138 / 0.9-1	14.606	-	-	-	-	-	1085.06	-	
TP139 / 1.4-1.5	14.218	-	-	-	-	-	1018.53	-	
TP140 / 0.9-1	14.860	-	-	-	-	-	1041.35	-	
TP141 / 1.4-1.5	13.913	-	-	-	-	-	1136.18	-	
TP142 / 1.9-2	14.796	-	-	-	-	-	1285.37	-	
TP143 / 0.4-0.5	13.817	-	-	-	-	-	1081.97	-	
TP144 / 3.4-3.5	15.067	-	-	-	-	-	1412.68	-	
TP145 / 3.4-3.5	14.485	-	-	-	-	-	1186.19	-	
TP146 / 1.4-1.5	16.098	-	-	-	-	-	1186.01	-	
TP147 / 3.9-4	14.257	-	-	-	-	-	912.26	-	
TP148 / 3.4-3.5	14.960	-	-	-	-	-	1135.54	-	
TP149 / 3.4-3.5	15.557	-	-	-	-	-	1191.4	-	
TP150 / 0.9-1	16.260	-	-	-	-	-	947.07	-	
TP151 / 2.9-3	14.595	-	-	-	-	-	979.69	-	
TP152 / 2.9-3	13.516	-	-	-	-	-	927.22	-	-

HSL D for Asbestos in soil	Table 7 of Schedule B(1), NEPC (2013) for Commercial / Industrial use
*	Based on % w/w asbestos in soil assuming 15% asbestos in ACM
**	Based on the weight of asbestos in FA and AF as calculated by Envirolab. Values exclude calculated weight of bonded ACM greater than > 7mm in samples
-	Not applicable as no asbestos was detected
Bold	Concentration exceeds SAC

Table D1- Summary of Bulk Soil Sampling and Analytical Results

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)*	Weight of 500mL Sample (g)	Weight of AF or FA (g)**	Concentration of FA and AF in soil (% w/w)
HSL D for Asbestos in soil	-	-	-	-	-	0.050	-	-	0.001
TP153 / 1.9-2	16.991	-	-	-	-	-	1281.67	-	-
TP154 / 1.9-2	14.289	-	-	-	-	-	1157.25	-	-
TP155 / 1.9-2	15.780	-	-	-	-	-	1171.44	-	-
TP156 / 0.9-1	16.694	-	-	-	-	-	1102.06	-	
TP157 / 2.4-2.5	16.012	-	-	-	-	-	1243.37	-	-
TP158 / 1.4-1.5	15.181	-	-	-	-	-	1137.75	-	-
TP159 / 1.4-1.5	15.063	-	-	-	-	-	1043.72	-	-
TP160 / 1.9-2	14.882	-	-	-	-	-	1330.33	-	-
RC101 / 0.0-0.1	--	-	-	-	-	-	1035.46	-	-
RC102 / 0.0-0.1	--	-	-	-	-	-	1185.77	-	-
RC103 / 0.0-0.1	--	-	-	-	-	-	1387.32	-	
RC104 / 0.0-0.1	--	-	-	-	-	-	1239.44	-	
RC105 / 0.0-0.1	--	-	-	-	-	-	1352.06	-	
RC106 / 0.0-0.1	--	-	-	-	-	-	1040.62	-	

HSL D for Asbestos in soil	Table 7 of Schedule B(1), NEPC (2013) for Commercial / Industrial use
*	Based on % w/w asbestos in soil assuming 15% asbestos in ACM
**	Based on the weight of asbestos in FA and AF as calculated by Envirolab. Values exclude calculated weight of bonded ACM greater than > 7mm in samples
-	Not applicable as no asbestos was detected
--	500 mL samples collected only
Bold	Concentration exceeds SAC

Attachment E

NATA Laboratory Certificates of Analysis and Chain-of-Custody documentation

Envirolab Services Pty Ltd
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CERTIFICATE OF ANALYSIS 222599

Client Details

Client	Douglas Partners Pty Ltd Smeaton Grange
Attention	Grant Russell
Address	18 Waler Crescent, Smeaton Grange, NSW, 2567

Sample Details

Your Reference	**94525.05, St Mary's**
Number of Samples	66 Soil
Date samples received	29/07/2019
Date completed instructions received	29/07/2019

Analysis Details

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

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

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

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

Report Details

Date results requested by	05/08/2019
Date of Issue	31/07/2019

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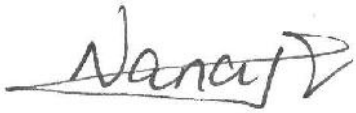
Asbestos Approved By
Analysed by Asbestos Approved Identifier: Aida Marner, Lucy Zhu
Authorised by Asbestos Approved Signatory: Lucy Zhu
Results Approved By
Lucy Zhu, Senior Asbestos Analyst

Authorised By



Nancy Zhang, Laboratory Manager

Asbestos ID - soils NEPM						
Our Reference		222599-1	222599-2	222599-3	222599-4	222599-5
Your Reference	UNITS	RC101	RC102	RC103	RC104	RC105
Depth		-	-	-	-	-
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	30-31/07/2019	30-31/07/2019	30-31/07/2019	30-31/07/2019	30-31/07/2019
Sample mass tested	g	1,035.46	1,185.77	1,387.32	1,239.44	1,352.06
Sample Description	-	Beige clayey soil & rocks	Beige clayey soil & rocks	Beige clayey soil & rocks	Beige clayey soil & rocks	Beige clayey 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[#1]	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		222599-6	222599-7	222599-8	222599-9	222599-10
Your Reference	UNITS	RC106	TP101	TP102	TP103	TP104
Depth		-	1.9-2	0.9-1	2.9-3	1.9-2
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	30-31/07/2019	30-31/07/2019	30-31/07/2019	30-31/07/2019	30-31/07/2019
Sample mass tested	g	1,040.62	672.62	642.03	723.53	772.51
Sample Description	-	Brown clayey soil & rocks	Brown clayey soil & rocks	Brown clayey soil & rocks	Brown clayey soil & rocks	Brown clayey 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[#1]	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		222599-11	222599-12	222599-13	222599-14	222599-15
Your Reference	UNITS	TP105	TP106	TP107	TP108	TP109
Depth		1.9-2	2.4-2.5	1.4-1.5	2.4-2.5	2.9-3
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	30-31/07/2019	30-31/07/2019	30-31/07/2019	30-31/07/2019	30-31/07/2019
Sample mass tested	g	767.31	718.94	817.65	909.15	803.16
Sample Description	-	Brown clayey soil & rocks	Brown clayey soil & rocks	Brown clayey soil & rocks	Brown clayey soil & rocks	Brown clayey 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[#1]	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		222599-16	222599-17	222599-18	222599-19	222599-20
Your Reference	UNITS	TP110	TP111	TP112	TP113	TP114
Depth		1.9-2	2.4-2.5	0.9-1	1.9-2	2.4-2.5
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	30-31/07/2019	30-31/07/2019	30-31/07/2019	30-31/07/2019	30-31/07/2019
Sample mass tested	g	773.15	808.39	868.73	817.68	722.26
Sample Description	-	Brown clayey soil & rocks	Brown clayey soil & rocks	Brown clayey soil & rocks	Brown clayey soil & rocks	Brown clayey 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#1	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		222599-21	222599-22	222599-23	222599-24	222599-25
Your Reference	UNITS	TP115	TP116	TP117	TP118	TP119
Depth		0.9-1	1.9-2	1.4-1.5	0.9-1	0.4-0.5
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	30-31/07/2019	30-31/07/2019	30-31/07/2019	30-31/07/2019	30-31/07/2019
Sample mass tested	g	820.38	732.46	757.93	773.06	708.33
Sample Description	-	Brown clayey soil & rocks	Brown clayey soil & rocks	Brown clayey soil & rocks	Brown clayey soil & rocks	Brown clayey 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[#1]	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		222599-26	222599-27	222599-28	222599-29	222599-30
Your Reference	UNITS	TP120	TP121	TP122	TP123	TP124
Depth		1.9-2	0.9-1	1.4-1.5	0.9-1	0.6-0.7
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	30-31/07/2019	30-31/07/2019	30-31/07/2019	30-31/07/2019	30-31/07/2019
Sample mass tested	g	770.68	727.08	793.77	680.6	710
Sample Description	-	Brown clayey soil & rocks	Brown clayey 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[#1]	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		222599-31	222599-32	222599-33	222599-34	222599-35
Your Reference	UNITS	TP125	TP126	TP127	TP128	TP129
Depth		2.9-3	0.9-1	1.4-1.5	0.9-1	2.9-3
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	30-31/07/2019	30-31/07/2019	30-31/07/2019	30-31/07/2019	30-31/07/2019
Sample mass tested	g	776.55	770.66	782.23	728.83	742.76
Sample Description	-	Brown clayey soil & rocks	Brown clayey soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown clayey 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[#1]	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		222599-36	222599-37	222599-38	222599-39	222599-40
Your Reference	UNITS	TP130	TP131	TP132	TP133	TP134
Depth		0.9-1	1.4-1.5	0.9-1	1.9-2	1.9-2
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	30-31/07/2019	30-31/07/2019	30-31/07/2019	30-31/07/2019	30-31/07/2019
Sample mass tested	g	755.09	1,238.9	1,147.46	1,293.44	1,162.38
Sample Description	-	Brown clayey soil & rocks	Brown clayey soil & rocks	Brown clayey soil & rocks	Brown clayey soil & rocks	Brown clayey 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[#1]	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		222599-41	222599-42	222599-43	222599-44	222599-45
Your Reference	UNITS	TP135	TP136	TP137	TP138	TP139
Depth		0.4-0.5	1.9-2	1.9-2	0.9-1	1.4-1.5
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	30-31/07/2019	30-31/07/2019	30-31/07/2019	30-31/07/2019	30-31/07/2019
Sample mass tested	g	1,047.69	1,394.33	1,420.88	1,085.06	1,018.53
Sample Description	-	Brown clayey soil & rocks	Brown clayey soil & rocks	Brown clayey soil & rocks	Brown clayey soil & rocks	Brown clayey 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[#1]	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		222599-46	222599-47	222599-48	222599-49	222599-50
Your Reference	UNITS	TP140	TP141	TP142	TP143	TP144
Depth		0.9-1	1.4-1.5	1.9-2	0.4-0.5	3.4-3.5
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	30-31/07/2019	30-31/07/2019	30-31/07/2019	30-31/07/2019	30-31/07/2019
Sample mass tested	g	1,041.35	1,136.18	1,285.37	1,081.97	1,412.68
Sample Description	-	Brown clayey soil & rocks	Brown clayey soil & rocks	Brown clayey soil & rocks	Brown clayey soil & rocks	Brown clayey 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[#1]	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		222599-51	222599-52	222599-53	222599-54	222599-55
Your Reference	UNITS	TP145	TP146	TP147	TP148	TP149
Depth		3.4-3.5	1.4-1.5	3.9-4	3.4-3.5	3.4-3.5
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	30-31/07/2019	30-31/07/2019	30-31/07/2019	30-31/07/2019	30-31/07/2019
Sample mass tested	g	1,186.19	1,186.01	912.26	1,135.54	1,191.4
Sample Description	-	Brown clayey soil & rocks	Brown clayey soil & rocks	Brown clayey soil & rocks	Brown clayey soil & rocks	Brown clayey 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[#1]	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		222599-56	222599-57	222599-58	222599-59	222599-60
Your Reference	UNITS	TP150	TP151	TP152	TP153	TP154
Depth		0.9-1	2.9-3	2.9-3	1.9-2	1.9-2
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	30-31/07/2019	30-31/07/2019	30-31/07/2019	30-31/07/2019	30-31/07/2019
Sample mass tested	g	947.07	979.69	927.22	1,281.67	1,157.25
Sample Description	-	Brown clayey soil & rocks	Brown clayey soil & rocks	Brown clayey soil & rocks	Brown clayey soil & rocks	Brown clayey 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[#1]	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		222599-61	222599-62	222599-63	222599-64	222599-65
Your Reference	UNITS	TP155	TP156	TP157	TP158	TP159
Depth		1.9-2	0.9-1	2.4-2.5	1.4-1.5	1.4-1.5
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	30-31/07/2019	30-31/07/2019	30-31/07/2019	30-31/07/2019	30-31/07/2019
Sample mass tested	g	1,171.44	1,102.06	1,243.37	1,137.75	1,043.72
Sample Description	-	Brown clayey soil & rocks	Brown clayey soil & rocks	Brown clayey soil & rocks	Brown clayey soil & rocks	Brown clayey 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[#1]	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		222599-66
Your Reference	UNITS	TP160
Depth		1.9-2
Type of sample		Soil
Date analysed	-	30-31/07/2019
Sample mass tested	g	1,330.33
Sample Description	-	Brown clayey soil & rocks
Asbestos ID in soil (AS4964) >0.1g/kg	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected
Total Asbestos#1	g/kg	<0.1
Asbestos ID in soil <0.1g/kg*	-	No visible asbestos detected
ACM >7mm Estimation*	g	–
FA and AF Estimation*	g	–
FA and AF Estimation*#2	%(w/w)	<0.001

Method ID	Methodology Summary
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.
ASB-001	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. Results reported denoted with * are outside our scope of NATA accreditation. **NOTE** #1 Total Asbestos g/kg was analysed and reported as per Australian Standard AS4964 (This is the sum of ACM >7mm, <7mm and FA/AF) **NOTE** #2 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. Estimation = Estimated asbestos weight Results reported with "--" is equivalent to no visible asbestos identified using Polarised Light microscopy and Dispersion Staining Techniques.

Result Definitions

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

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.

Douglas Partners
Geotechnics | Environment | Groundwater

CHAIN OF CUSTODY DESPATCH SHEET

Project No:	94525.05	**Suburb:**	St Marys	**To:**	Envirolab Services
Project Name:	St Mary's	**Order Number**			
Project Manager:	Grant Russell	**Sampler:**	GAR	**Attn:**	Aileen Hie
Emails:	Grant.Russell@douglaspartners.com.au			**Phone:**	9910 6200
Date Required:	Same day ☐ 24 hours ☐ 48 hours ☐ 72 hours ☐ Standard ☐			**Email:**	
Prior Storage:	☐ Esky ☐ Fridge ☐ Shelved	Do samples contain 'potential' HBM?	Yes ☐ No ☐	(If YES, then handle, transport and store in accordance with FPM HAZID)	

Sample ID	Lab ID	Date Sampled	Sample Type (S - soil W - water)	Container Type (G - glass P - plastic)	Analytes					Asbestos 500 ml			Hold	Notes/preservation
RC101	1	26/07/19	S	P						X				
RC102	2	26/07/19	S	P						X				
RC103	3	26/07/19	S	P						X				
RC104	4	26/07/19	S	P						X				
RC105	5	26/07/19	S	P						X				
RC106	6	26/07/19	S	P						X				
TP101 / 1.9-2	7	25/07/19	S	P						X				
TP102 / 0.9-1	8	25/07/19	S	P						X				
TP103 / 2.9-3	9	25/07/19	S	P						X				
TP104 / 1.9-2	10	25/07/19	S	P						X				
TP105 / 1.9-2	11	25/07/19	S	P						X				
TP106 / 2.4-2.5	12	25/07/19	S	P						X				
TP107 / 1.4-1.5	13	25/07/19	S	P						X				
TP108 / 2.4-2.5	14	25/07/19	S	P						X				
TP109 / 2.9-3	15	25/07/19	S	P						X				
PQL (S) mg/kg													**ANZECC PQLs req'd for all water analytes** ☐	

ENVIROLAB

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

Job No: 222599

Date Received: 29/07/19
Time Received: 15:12
Received by: SB
Temp: Cool/Ambient
Cooling: Ice/icepack
Security: ~~Intact/Broken/None~~

PQL = practical quantitation limit. If none given, default to Laboratory Method Detection Limit

Metals to Analyse: 8HM unless specified here:

Lab Report/Reference No: 222599

Total number of samples in container: | **Relinquished by:** GAR | **Transported to laboratory by:**

Send Results to: Douglas Partners Pty Ltd | **Address** | **Phone:** | **Fax:**

Signed: GAR | **Received by:** S. Bo Hon | **Date & Time:** 29/07/19 15:12

Douglas Partners
Geotechnics | Environment | Groundwater

CHAIN OF CUSTODY DESPATCH SHEET

Project No:	94525.05	**Suburb:**	St Marys	**To:**	Envirolab Services
Project Name:	St Mary's	**Order Number**			
Project Manager:	Grant Russell	**Sampler:**	GAR	**Attn:**	Aileen Hie
Emails:	Grant.Russell@douglaspartners.com.au			**Phone:**	9910 6200
Date Required:	Same day ☐ 24 hours ☐ 48 hours ☐ 72 hours ☐ Standard ☐			**Email:**	
Prior Storage:	☐ Esky ☐ Fridge ☐ Shelved	Do samples contain 'potential' HBM?	Yes ☐ No ☐ (If YES, then handle, transport and store in accordance with FPM HAZID)		

Sample ID	Lab ID	Sampling Date	Sample Type (S - soil W - water)	Container Type (G - glass P - plastic)	Analytes									Notes/preservation
										Asbestos 500 ml			Hold	
TP110 / 1.9-2	16	25/07/19	S	P						X				
TP111 / 2.4-2.5	17	25/07/19	S	P						X				
TP112 / 0.9-1	18	25/07/19	S	P						X				
TP113 / 1.9-2	19	25/07/19	S	P						X				
TP114 / 2.4-2.5	20	25/07/19	S	P						X				
TP115 / 0.9-1	21	25/07/19	S	P						X				
TP116 / 1.9-2	22	25/07/19	S	P						X				
TP117 / 1.4-1.5	23	25/07/19	S	P						X				
TP118 / 0.9 - 1	24	25/07/19	S	P						X				
TP119 / 0.4-0.5	25	25/07/19	S	P						X				
TP120 / 1.9-2	26	25/07/19	S	P						X				
TP121 / 0.9-1	27	25/07/19	S	P						X				
TP122 / 1.4-1.5	28	25/07/19	S	P						X				
TP123 / 0.9-1	29	25/07/19	S	P						X				
TP124 /0.6-0.7	30	25/07/19	S	P						X				
PQL (S) mg/kg														**ANZECC PQLs req'd for all water analytes** ☐

SB

ENVIROLAB

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

Job No:

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

PQL = practical quantitation limit. If none given, default to Laboratory Method Detection Limit

Metals to Analyse: 8HM unless specified here:

Lab Report/Reference No: 222599

Total number of samples in container:	**Relinquished by:** GAR	**Transported to laboratory by:**	
Send Results to: Douglas Partners Pty Ltd	**Address**	**Phone:**	**Fax:**
Signed:	**Received by:** S. Bolton	**Date & Time:** 29/07/19	

Douglas Partners
Geotechnics / Environment / Groundwater

CHAIN OF CUSTODY DESPATCH SHEET

Project No:	94525.05	**Suburb:**	St Marys	**To:**	Envirolab Services
Project Name:	St Mary's	**Order Number**			
Project Manager:	Grant Russell	**Sampler:**	GAR	**Attn:**	Aileen Hie
Emails:	Grant.Russell@douglaspartners.com.au			**Phone:**	9910 6200
Date Required:	Same day ☐ 24 hours ☐ 48 hours ☐ 72 hours ☐ Standard ☐			**Email:**	
Prior Storage:	☐ Esky ☐ Fridge ☐ Shelved	Do samples contain 'potential' HBM?	Yes ☐	No ☐	(If YES, then handle, transport and store in accordance with FPM HAZID)

Sample ID	Lab ID	Sampling Date	Sample Type (S - soil, W - water)	Container Type (G - glass, P - plastic)	Analytes									Notes/preservation
										Asbestos 500 ml			Hold	
TP125 / 2.9-3	31	25/07/19	S	P						X				
TP126 / 0.9-1	32	25/07/19	S	P						X				
TP127 /1.4-1.5	33	25/07/19	S	P						X				
TP128 / 0.9-1	34	25/07/19	S	P						X				
TP129 / 2.9-3	35	25/07/19	S	P						X				
TP130 / 0.9-1	36	25/07/19	S	P						X				
TP131 / 1.4-1.5	37	26/07/19	S	P						X				
TP132 / 0.9-1	38	26/07/19	S	P						X				
TP133 / 1.9-2	39	26/07/19	S	P						X				
TP134 / 1.9-2	40	26/07/19	S	P						X				
TP135 / 0.4-0.5	41	26/07/19	S	P						X				
TP136 / 1.9-2	42	26/07/19	S	P						X				
TP137 / 1.9-2	43	26/07/19	S	P						X				
TP138 / 0.9-1	44	26/07/19	S	P						X				
TP139 / 1.4-1.5	45	26/07/19	S	P						X				
PQL (S) mg/kg													**ANZECC PQLs req'd for all water analytes** ☐	

PQL = practical quantitation limit. If none given, default to Laboratory Method Detection Limit

Metals to Analyse: 8HM unless specified here:

Lab Report/Reference No: 222599

Total number of samples in container:	**Relinquished by:** GAR	**Transported to laboratory by:**	
Send Results to: Douglas Partners Pty Ltd	**Address**	**Phone:**	**Fax:**
Signed:	**Received by:** S. Bolton	**Date & Time:** 29/07/19 15:12	

Douglas Partners
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CHAIN OF CUSTODY DESPATCH SHEET

Project No:	94525.05	**Suburb:**	St Marys	**To:**	Envirolab Services
Project Name:	St Mary's	**Order Number**			
Project Manager:	Grant Russell	**Sampler:**	GAR	**Attn:**	Aileen Hie
Emails:	Grant.Russell@douglaspartners.com.au			**Phone:**	9910 6200
Date Required:	Same day ☐ 24 hours ☐ 48 hours ☐ 72 hours ☐ Standard ☐			**Email:**	
Prior Storage:	☐ Esky ☐ Fridge ☐ Shelved	Do samples contain 'potential' HBM?	Yes ☐ No ☐ (If YES, then handle, transport and store in accordance with FPM HAZID)		

Sample ID	Lab ID	Sampling Date	Sample Type (S - soil W - water)	Container Type (G - glass P - plastic)	Analytes									Notes/preservation
										Asbestos 500 ml			Hold	
TP140 / 0.9-1	46	26/07/19	S	P						X				
TP141 / 1.4-1.5	47	26/07/19	S	P						X				
TP142 / 1.9-2	48	26/07/19	S	P						X				
TP143 / 0.4-0.5	49	26/07/19	S	P						X				
TP144 / 3.4-3.5	50	26/07/19	S	P						X				
TP145 / 3.4-3.5	51	26/07/19	S	P						X				
TP146 / 1.4-1.5	52	26/07/19	S	P						X				
TP147 / 3.9-4	53	26/07/19	S	P						X				
TP148 / 3.4-3.5	54	26/07/19	S	P						X				
TP149 / 3.4-3.5	55	26/07/19	S	P						X				
TP150 / 0.9-1	56	26/07/19	S	P						X				
TP151 / 2.9-3	57	26/07/19	S	P						X				
TP152 / 2.9-3	58	26/07/19	S	P						X				
TP153 / 1.9-2	59	26/07/19	S	P						X				
TP154 / 1.9-2	60	26/07/19	S	P						X				
PQL (S) mg/kg													**ANZECC PQLs req'd for all water analytes** ☐	

PQL = practical quantitation limit. If none given, default to Laboratory Method Detection Limit

Metals to Analyse: 8HM unless specified here:

Lab Report/Reference No: 222599

Total number of samples in container:	**Relinquished by:** GAR	**Transported to laboratory by:**	
Send Results to: Douglas Partners Pty Ltd	**Address**	**Phone:**	**Fax:**
Signed:	**Received by:** S. Bolton	**Date & Time:** 29/07/19	15:12

Douglas Partners
Geotechnics / Environment / Groundwater

CHAIN OF CUSTODY DESPATCH SHEET

Project No:	94525.05	**Suburb:**	St Marys	**To:**	Envirolab Services
Project Name:	St Mary's	**Order Number**			
Project Manager:	Grant Russell	**Sampler:**	GAR	**Attn:**	Aileen Hie
Emails:	Grant.Russell@douglaspartners.com.au			**Phone:**	9910 6200
Date Required:	Same day ☐ 24 hours ☐ 48 hours ☐ 72 hours ☐ Standard ☐			**Email:**	
Prior Storage:	☐ Esky ☐ Fridge ☐ Shelved	Do samples contain 'potential' HBM?	Yes ☐ No ☐ (If YES, then handle, transport and store in accordance with FPM HAZID)		

Sample ID	Lab ID	Sampling Date	Sample Type (S - soil, W - water)	Container Type (G - glass, P - plastic)	Analytes									Notes/preservation
										Asbestos 500 ml			Hold	
TP155 / 1.9-2	61	26/07/19	S	P						X				
TP156 / 0.9-1	62	26/07/19	S	P						X				
TP157 / 2.4-2.5	63	26/07/19	S	P						X				
TP158 / 1.4-1.5	64	26/07/19	S	P						X				
TP159 / 1.4-1.5	65	26/07/19	S	P						X				
TP160 / 1.9-2	66	26/07/19	S	P						X				
PQL (S) mg/kg												ANZECC PQLs req'd for all water analytes ☐		

PQL = practical quantitation limit. If none given, default to Laboratory Method Detection Limit

Metals to Analyse: 8HM unless specified here:

Lab Report/Reference No: 222599

Total number of samples in container:	**Relinquished by:** GAR	**Transported to laboratory by:**	
Send Results to: Douglas Partners Pty Ltd	**Address**	**Phone:**	**Fax:**
Signed:	**Received by:** 29/07/19 S. Bolton	**Date & Time:** 29/07/19 15:12	

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

SAMPLE RECEIPT ADVICE

Client Details

Client	Douglas Partners Pty Ltd Smeaton Grange
Attention	Grant Russell

Sample Login Details

Your reference	94525.05, St Mary's
Envirolab Reference	222599
Date Sample Received	29/07/2019
Date Instructions Received	29/07/2019
Date Results Expected to be Reported	05/08/2019

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	66 Soil
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	18.1
Cooling Method	None
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

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

Analysis Underway, details on the following page:

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

Sample ID	Asbestos ID - soils NEPM
RC101	✓
RC102	✓
RC103	✓
RC104	✓
RC105	✓
RC106	✓
TP101-1.9-2	✓
TP102-0.9-1	✓
TP103-2.9-3	✓
TP104-1.9-2	✓
TP105-1.9-2	✓
TP106-2.4-2.5	✓
TP107-1.4-1.5	✓
TP108-2.4-2.5	✓
TP109-2.9-3	✓
TP110-1.9-2	✓
TP111-2.4-2.5	✓
TP112-0.9-1	✓
TP113-1.9-2	✓
TP114-2.4-2.5	✓
TP115-0.9-1	✓
TP116-1.9-2	✓
TP117-1.4-1.5	✓
TP118-0.9-1	✓
TP119-0.4-0.5	✓
TP120-1.9-2	✓
TP121-0.9-1	✓
TP122-1.4-1.5	✓
TP123-0.9-1	✓
TP124-0.6-0.7	✓
TP125-2.9-3	✓
TP126-0.9-1	✓

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

Sample ID	Asbestos ID - soils NEPM
TP127-1.4-1.5	✓
TP128-0.9-1	✓
TP129-2.9-3	✓
TP130-0.9-1	✓
TP131-1.4-1.5	✓
TP132-0.9-1	✓
TP133-1.9-2	✓
TP134-1.9-2	✓
TP135-0.4-0.5	✓
TP136-1.9-2	✓
TP137-1.9-2	✓
TP138-0.9-1	✓
TP139-1.4-1.5	✓
TP140-0.9-1	✓
TP141-1.4-1.5	✓
TP142-1.9-2	✓
TP143-0.4-0.5	✓
TP144-3.4-3.5	✓
TP145-3.4-3.5	✓
TP146-1.4-1.5	✓
TP147-3.9-4	✓
TP148-3.4-3.5	✓
TP149-3.4-3.5	✓
TP150-0.9-1	✓
TP151-2.9-3	✓
TP152-2.9-3	✓
TP153-1.9-2	✓
TP154-1.9-2	✓
TP155-1.9-2	✓
TP156-0.9-1	✓
TP157-2.4-2.5	✓
TP158-1.4-1.5	✓

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customerservice@envirolab.com.au
www.envirolab.com.au

Sample ID	Asbestos ID - soils NEPM
TP159-1.4-1.5	✓
TP160-1.9-2	✓

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

Additional Info

Sample storage - Waters are routinely disposed of approximately 1 month and soils approximately 2 months from receipt.
Requests for longer term sample storage must be received in writing.
Please contact the laboratory immediately if observed settled sediment present in water samples is to be included in the extraction and/or analysis (exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS analysis where solids are included by default.
TAT for Micro is dependent on incubation. This varies from 3 to 6 days.

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www.envirolab.com.au

CERTIFICATE OF ANALYSIS 223165

Client Details

Client	Douglas Partners Pty Ltd Smeaton Grange
Attention	Grant Russell
Address	18 Waler Crescent, Smeaton Grange, NSW, 2567

Sample Details

Your Reference	**94525.05, St Marys**
Number of Samples	3 Material
Date samples received	05/08/2019
Date completed instructions received	05/08/2019

Analysis Details

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

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

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

Report Details

Date results requested by	08/08/2019
Date of Issue	06/08/2019

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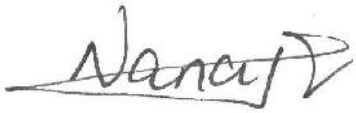
Asbestos Approved By
Analysed by Asbestos Approved Identifier: Wonnie Condos
Authorised by Asbestos Approved Signatory: Lucy Zhu
Results Approved By
Lucy Zhu, Senior Asbestos Analyst

Authorised By



Nancy Zhang, Laboratory Manager

Asbestos ID - materials				
Our Reference		223165-1	223165-2	223165-3
Your Reference	UNITS	TP116/1.9-2	TP123/0.9-1	TP137/1.9-2
Date Sampled		25/07/2019	25/07/2019	26/07/2019
Type of sample		Material	Material	Material
Date analysed	-	06/08/2019	06/08/2019	06/08/2019
Mass / Dimension of Sample	-	50x30x4mm	70x40x4mm	10x10x4mm
Sample Description	-	Grey fibre cement material	Beige fibre cement material	Beige fibre cement material
Asbestos ID in materials	-	Chrysotile asbestos detected	Chrysotile asbestos detected	Chrysotile asbestos detected Amosite asbestos detected

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

Result Definitions

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

Douglas Partners
Geotechnics | Environment | Groundwater

CHAIN OF CUSTODY DESPATCH SHEET

Project No:	94525.05	**Suburb:**	St Marys	**To:**	Envirolab Services
Project Name:	St Mary's	**Order Number**			
Project Manager:	Grant Russell	**Sampler:**	GAR	**Attn:**	Aileen Hie
Emails:	Grant.Russell@douglaspartners.com.au			**Phone:**	9910 6200
Date Required:	Same day ☐ 24 hours ☐ 48 hours ☐ 72 hours ☑ Standard ☐			**Email:**	
Prior Storage:	☐ Esky ☐ Fridge ☐ Shelved	Do samples contain 'potential' HBM?	Yes ☐ No ☐ (If YES, then handle, transport and store in accordance with FPM HAZID)		

Sample ID	Lab ID	Date Sampled	Sample Type (S - soil, W - water)	Container Type (G - glass, P - plastic)	Analytes					Asbestos ID			Hold	Notes/preservation
TP116 / 1.9-2	1	25/07/19	S	P						X				
TP123 / 0.9-1	2	25/07/19	S	P						X				
TP137 / 1.9-2	3	26/07/19	S	P						X				
PQL (S) mg/kg														

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

Job No: 223165

Date Received: 05.08.19
Time Received: 17:55
Received by: LC
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

Eileen

ANZECC PQLs req'd for all water analytes ☐

PQL = practical quantitation limit. If none given, default to Laboratory Method Detection Limit

Metals to Analyse: 8HM unless specified here:

Lab Report/Reference No:

Total number of samples in container: | **Relinquished by:** GAR | **Transported to laboratory by:**

Send Results to: Douglas Partners Pty Ltd | **Address** | **Phone:** | **Fax:**

Signed: GAR 5/8/19. | **Received by:** ELS, Intranet courier | **Date & Time:** 05.08.19 17:55

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

SAMPLE RECEIPT ADVICE

Client Details

Client	Douglas Partners Pty Ltd Smeaton Grange
Attention	Grant Russell

Sample Login Details

Your reference	94525.05, St Marys
Envirolab Reference	223165
Date Sample Received	05/08/2019
Date Instructions Received	05/08/2019
Date Results Expected to be Reported	08/08/2019

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	3 Material
Turnaround Time Requested	3 days
Temperature on Receipt (°C)	-
Cooling Method	None
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

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

Analysis Underway, details on the following page:

Envirolab Services Pty Ltd
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12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

Sample ID	Asbestos ID - materials
TP116/1.9-2	✓
TP123/0.9-1	✓
TP137/1.9-2	✓

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

Additional Info

Sample storage - Waters are routinely disposed of approximately 1 month and soils approximately 2 months from receipt.
Requests for longer term sample storage must be received in writing.
Please contact the laboratory immediately if observed settled sediment present in water samples is to be included in the extraction and/or analysis (exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS analysis where solids are included by default.
TAT for Micro is dependent on incubation. This varies from 3 to 6 days.

Attachment F

About this Report

About this Report

Douglas Partners

Introduction

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

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

Copyright

Borehole and Test Pit Logs

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

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

Groundwater

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

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

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

Reports

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

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

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

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

About this Report

Site Anomalies

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

Information for Contractual Purposes

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

Site Inspection

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