

Urbanco Group Pty Limited
PO Box 546
PYRMONT NSW 2009Project 94525.04
27 June 2019
R.001.Rev0
GAR

Attention: Mr Guy Evans

Email: guy.evans@urbancogroup.com.au**Further Asbestos 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 a Further Asbestos Investigation (FAI) of the far northern portion of the proposed St Marys Intermodal Freight Terminal, Lot 2 Forrester Road, St Marys (the investigation site - as shown on Drawing 1, Attachment A). 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 supplementary contamination assessment (SCA, DP ref. 94525.02.R.002.Rev1) of the larger site completed in April 2019 identified bonded asbestos containing material (ACM) impacted fill within two test pits (TP205 and TP208) completed within the site (referred to as PAEC1 in the SCA) at concentrations exceeding commercial / industrial land use health screening levels. The SCA test pit locations within the site are shown on Drawing 2, Appendix A.

The ACM impacted fill requires remediation for the site to be considered suitable for the proposed industrial redevelopment. Whilst the limited sampling completed during the SCA estimated the extent of impact across an approximate area of 320 m² the additional investigation was required to potentially further define the impacted fill and reduce volumes subject to remediation. In addition the investigation was to provide additional data across the site that may reduce the risk of unexpected finds being encountered during development of the northern portion of the site.

3. Scope of Works

The scope of work for the investigation was as follows:

- Inspection of the site to assess the potential for contamination, particularly remnant surficial material;
- Photographing of the site for record purposes;
- Excavation of delineation and additional grid based test pits across the site through fill material into natural soils;
- Collection of soil samples at varied depths from within the fill material;
- Dispatch of samples to NATA accredited laboratories (DP Macarthur Laboratory and Envirolab Services Pty Ltd) for quantitative analysis for asbestos;
- Interpretation of 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 the northern portion of the larger site which comprises:

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

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

5. Rationale and Methodology

The field work for the investigation was undertaken by a DP environmental consultant at the site on 13 June 2019. Photographical plates from the fieldwork are presented in Attachment B.

The SCA and FAD test pit sample locations are presented on Drawing 3, attached.

The following works were completed as part of the investigation:

- Excavation of eight test pits (TP223 to TP230) with a backhoe/excavator in the immediate vicinity of the location (TP205) where the bulk of the ACM has been identified at the site to further delineate ACM impact to fill. Four test pits (TP223 to TP226) were completed approximately 2 m from TP205 at the four cardinal points (north, east, south and west) and then four more test pits (TP227 to TP230) completed another 4 m step out from TP205;
- Excavation of two test pits (TP245 and TP246) approximately 2 m north and northeast of TP208 where a small amount of ACM was previously identified to further delineate the lateral extent to the north;

- Each test pit excavation was completed through fill soils to a depth of approximately 0.3 m into underlying native soils;
- At each test pit location 10 L bulk soil samples were collected from each metre of fill encountered and inspected in accordance with Western Australia Department of Health (2009) *Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia* (WA DoH, 2009) gravimetric method. In addition a 500 ml sample of soil was collected from each metre of fill soil encountered for asbestos identification and quantification in the soil sample; and
- Excavation of an additional 10 - 15 test pits (TP230 to TP244) in other areas of the site to visually assess the absence of ACM impacted fill and reduce the risk of unexpected finds. A visual inspection was completed initially of the strata within the excavated test pits to confirm absence of ACM with no sampling completed initially. In the event that any ACM and/or significant construction and demolition waste was observed in fill, screening of 10 L asbestos assessment samples was completed (which occurred in test pit location TP239).

5.1 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. Samples were collected from the excavated walls of the test pits;
- 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 samples requiring analysis of asbestos;
- 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.

6. 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)	

7. Results

7.1 Field Work Observations

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

In summary the strata encountered across the majority of the site was as follows:

- Filling – brown silty clay with gravel encountered from the surface up to 1.5 metres below ground level (m bgl) in all locations; overlying
- Silty clay - encountered from depths of 1.0 to 1.5 m bgl until termination in all locations.

Anthropogenic material including brick fragments, ceramics, plastic and concrete were variously encountered in filling at most locations across the site. Fragments of bonded ACM were also encountered within filling material in test pits TP205, TP208, TP224, TP225, TP230, TP234 and TP246 and are further discussed in Sections 6.2 and 7.

7.2 Laboratory Analytical Results

The sample/test pit identification, sample depths and analytical results for the soil samples collected from test pits 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 at concentrations exceeding the SAC (0.05% w/w) in 10 L bulk samples collected from fill in the following test pits:

- Test pit TP224 at depths of 0.0 to 1.0 m bgl at a concentration of 0.085% w/w; and
- Test pit TP225 at depths of 0.0 to 1.3 m bgl at a concentration of 0.63% w/w.

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

- Test pit TP230 at depths of 0.0 to 1.1 m bgl at a concentration of 0.005% w/w; and
- Test pit TP245 at depths of 0.0 to 0.6 m bgl at a concentration of 0.03% w/w.

Asbestos (in the form of FA and AF) was detected at concentrations exceeding the SAC (0.001% w/w) in 500 mL samples collected from fill in the following test pits:

- Test pit TP227 at depths of 0.0 to 0.9 m bgl at a concentration of 0.004% w/w.

Asbestos (in the form of bonded ACM) was detected in 500 mL samples collected from fill in the following test pits:

- Test pit TP224 at depths of 0.0 to 1.0 m bgl at a mass of 4.269 g which equates to 0.11% w/w of the 500 mL sample; and
- Test pit TP225 at depths of 0.0 to 1.3 m bgl at a mass of 24.136 g which equates to 0.62% w/w of the 500 mL sample.

8. Discussion and Conclusions

Asbestos within bonded ACM in fill was detected at concentrations exceeding commercial/industrial (0.05% w/w) criteria in the following locations:

- During the SCA at test pit locations TP205 and TP208; and
- During this investigation at test pit locations TP224 and TP225 completed approximately 2 m to the east and south, respectively of TP205.

The approximate lateral extent of known fill (and fill depths encountered) requiring remediation based on the test pit data to date is presented on Drawing 4, attached.

In addition, friable asbestos (FA/AF) was also identified within fill in one test pit TP227 during this investigation at a concentration exceeding SAC. Therefore all fill within the known area requiring remediation should now be treated as impacted with both friable and bonded forms of asbestos.

Whilst investigations to date have involved a significant sampling density across the area there is still potential for other pockets of asbestos impacted fill across the site and immediate surrounds that may require remediation given:

- Anthropogenic material in the form of building waste has been identified in the majority of test pits across the site. Building waste is commonly an indicator for the potential presence of collocated ACM; and
- One small fragment of ACM was also identified in a test pit (TP239) outside of the known remediation area at a concentration below commercial/industrial criteria (0.05% w/w).

In May 2019, DP produced a Remediation Action Plan (RAP, DP ref. 94525.03.R.001.Rev0) to establish appropriate remediation objectives, strategies, methodologies and validation processes to enable remediation of the site (PAEC 1) defined by the SCA in accordance with EPA requirements. A number of options were discussed in the RAP to remediate the fill including excavation/offsite disposal and/or emu-picking, validation and burial or containment of the fill within a dedicated containment cell.

Given that friable asbestos has now been identified within the area requiring remediation emu-picking is no longer considered an appropriate remedial option. Adherence to the RAP should enable appropriate management of any potential impacts on the environment which may occur during the course of the remediation works.

9. Limitations

Douglas Partners Pty Ltd (DP) has prepared this report for this project at Lot 2 Forrester Road, St Marys NSW in accordance with DP's proposal MAC190124.P.001.Rev0 dated 10 May 2019 and acceptance received from Mr Guy Evans on behalf of Pacific National Pty Ltd dated 18 June 2019. The work was carried out under DP's Conditions of Engagement. This report is provided for the exclusive use of Pacific National Pty Ltd for this project only and for the purposes as described in the report. It should not be used by or relied upon for other projects or purposes on the same or other site or by a third party. Any party so relying upon this report beyond its exclusive use and purpose as stated above, and without the express written consent of DP, does so entirely at its own risk and without recourse to DP for any loss or damage. In preparing this report DP has necessarily relied upon information provided by the client and/or their agents.

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

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

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

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

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

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



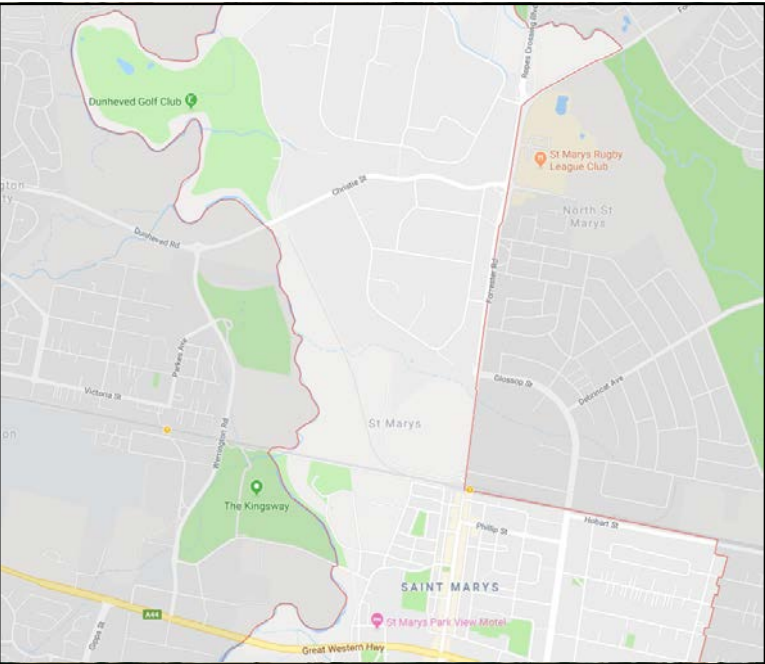
Christopher C Kline

Principal

Attachment A:	Drawings 1 to 4
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 4

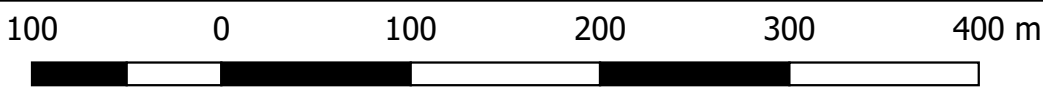


Site Locality



Legend

- Site boundary (PAEC1)
- Larger Site Boundary



TITLE: Further Asbestos Delineation Investigation
Lot 2 Forrester Road, St Marys NSW



OFFICE: Macarthur

DRAWN GAR

DATE: 25.06.2019

CLIENT:

PROJ. 94525.04




DRAWING No: 1

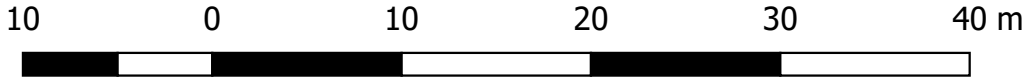
REVISION: 0

SCALE: As Shown



Legend

-  Approx. Site boundary (PAEC1)
-  Larger Site Boundary
-  SCA Test Pit Locations



TITLE: **SCA Test Pit Locations**
Further Asbestos Delineation Investigation
Lot 2 Forrester Road, St Marys NSW



OFFICE: Macarthur
DRAWN: GAR
DATE: 25.06.2019
SCALE: As Shown

CLIENT: PROJ. 94525.04 DRAWING No: 2 REVISION: 0

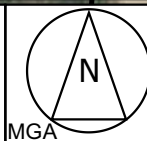


Legend

- Approx. Site boundary (PAEC1)
- Larger Site Boundary
- SCA Test Pit Locations
- FAI test pits

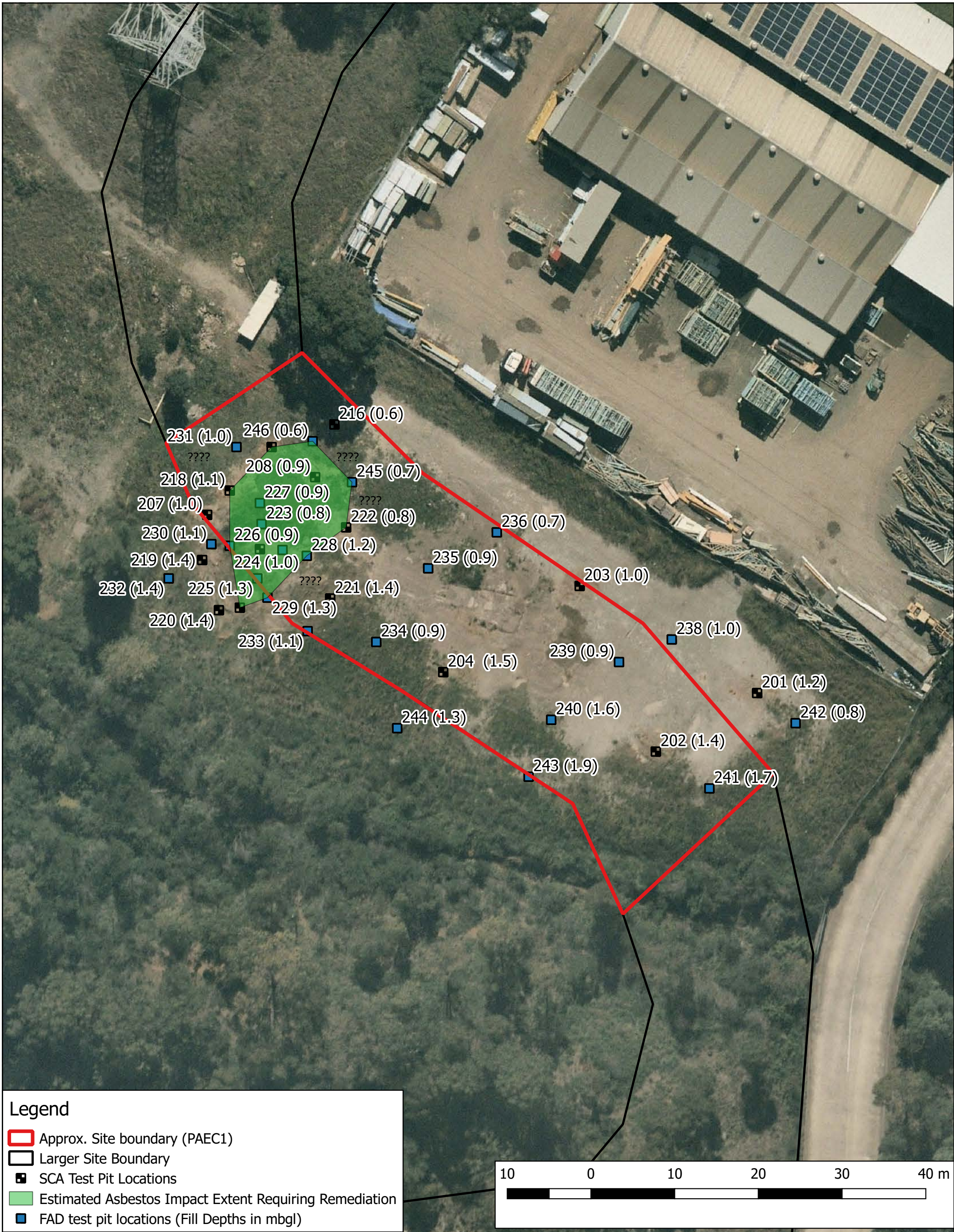


TITLE: **FAD Test Pit Locations**
Further Asbestos Investigation
Lot 2 Forrester Road, St Marys NSW



OFFICE: Macarthur	
DRAWN	GAR
DATE: 25.06.2019	
SCALE: As Shown	

CLIENT:	PROJ. 94525.04	DRAWING No: 3	REVISION: 0	
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Attachment B

Photographic Plates



Photo 1 - Test Pit TP225



Photo 2 - Fragments of ACM in fill at test pit TP225



Site Photographs

Further Asbestos Delineation Investigation

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

CLIENT: Pacific National

PROJ: 94525.04

PLATE: 1

REV: A

DATE: 25-Jun-19



Photo 3 - Test Pit 224



Photo 4 - ACM in test pit TP224



	Site Photographs	PROJ:	94525.04
	Further Asbestos Delineation Investigation	PLATE:	2
	Proposed St Marys Freight Hub - Stage 1, 2 Forrester Road, St Marys, NSW	REV:	A
	CLIENT: Pacific National	DATE:	25-Jun-19



Photo 5 - Test Pit 226



Photo 6 - Test Pit 227

	Site Photographs	PROJ:	94525.04
	Further Asbestos Delineation Investigation	PLATE:	3
	Proposed St Marys Freight Hub - Stage 1, 2 Forrester Road, St Marys, NSW	REV:	A
	CLIENT: Pacific National	DATE:	25-Jun-19

Attachment C

Test Pit Logs

TEST PIT LOG

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

SURFACE LEVEL: 24.4 mAHD
EASTING: 293525
NORTHING: 6262758

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

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
24.0		FILL - brown silty clay with fine to coarse gravel and a trace of brick fragments, plastic, metal wire and rootlets, dry		D/E	0.1							
				B	0.2							
				D/E	0.5							
					0.6							
23.0	1.2	SILTY CLAY - very stiff, brown silty clay with a trace of rootlets, damp Pit discontinued at 1.4m - target depth reached										
22.0	1.4											
21.0	2.0											
20.0	3.0											
19.0	4.0											
18.0	5.0											
17.0	6.0											
	7.0											

RIG: 8 tonne backhoe fitted - 450mm bucket

LOGGED: JY

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

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

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

TEST PIT LOG

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

SURFACE LEVEL: 24.3 mAHD
EASTING: 293513
NORTHING: 6262751

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

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

RIG: 8 tonne backhoe fitted - 450mm bucket

LOGGED: JY

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

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



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

TEST PIT LOG

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

SURFACE LEVEL: 24.2 mAH
EASTING: 293503
NORTHING: 6262771

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

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

RIG: 8 tonne backhoe fitted - 450mm bucket

LOGGED: JY

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

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

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

TEST PIT LOG

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

SURFACE LEVEL: 23.8 mAHD
EASTING: 293487
NORTHING: 6262760

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

[illegible]

RIG: 8 tonne backhoe fitted - 450mm bucket

LOGGED: JY

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

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

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



Douglas Partners
Geotechnics | Environment | Groundwater

TEST PIT LOG

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

SURFACE LEVEL: 23.6 mAHD
EASTING: 293465
NORTHING: 6262775

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

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

RIG: 8 tonne backhoe fitted - 450mm bucket

LOGGED: JY

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

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

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

TEST PIT LOG

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

SURFACE LEVEL: 23.6 mAHD
EASTING: 293463
NORTHING: 6262768

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

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

RIG: 8 tonne backhoe fitted - 450mm bucket

LOGGED: JY

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

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

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

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

TEST PIT LOG

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

SURFACE LEVEL: 23.7 mAH
EASTING: 293459
NORTHING: 6262779

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

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

RIG: 8 tonne backhoe fitted - 450mm bucket

LOGGED: JY

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

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

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

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

TEST PIT LOG

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

SURFACE LEVEL: 23.7 mAHD
EASTING: 293472
NORTHING: 6262784

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

[illegible]

RIG: 8 tonne backhoe fitted - 450mm bucket

LOGGED: JY

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

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

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

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



TEST PIT LOG

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

SURFACE LEVEL: 23.8 mAHD
EASTING: 293474
NORTHING: 6262790

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

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

RIG: 8 tonne backhoe fitted - 450mm bucket

LOGGED: JY

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

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

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

TEST PIT LOG

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

SURFACE LEVEL: 23.7 mAHD
EASTING: 293467
NORTHING: 6262787

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

[illegible]

RIG: 8 tonne backhoe fitted - 450mm bucket

LOGGED: JY

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

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

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



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TEST PIT LOG

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

SURFACE LEVEL: 23.6 mAHD
EASTING: 293462
NORTHING: 6262782

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

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

RIG: 8 tonne backhoe fitted - 450mm bucket

LOGGED: JY

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

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



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

TEST PIT LOG

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

SURFACE LEVEL: 23.5 mAH
EASTING: 293458
NORTHING: 6262774

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

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

RIG: 8 tonne backhoe fitted - 450mm bucket

LOGGED: JY

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

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

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

TEST PIT LOG

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

SURFACE LEVEL: 23.5 mAHD
EASTING: 293460
NORTHING: 6262768

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

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

RIG: 8 tonne backhoe fitted - 450mm bucket

LOGGED: JY

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

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

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

TEST PIT LOG

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

SURFACE LEVEL: 23.7 mAHD
EASTING: 293474
NORTHING: 6262769

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

[illegible]

RIG: 8 tonne backhoe fitted - 450mm bucket

LOGGED: JY

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

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

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



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TEST PIT LOG

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

SURFACE LEVEL: 23.7 mAHD
EASTING: 293476
NORTHING: 6262778

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

[illegible]

RIG: 8 tonne backhoe fitted - 450mm bucket

LOGGED: JY

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

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

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





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TEST PIT LOG

CLIENT: Urbanco Group Pty Limited
PROJECT: Proposed St Marys Intermodal Freight Terminal
LOCATION: Lot 2, Forrester Road, St Marys, NSW

SURFACE LEVEL: 23.6 mAHD
EASTING: 293465
NORTHING: 6262778

PIT No: 223
PROJECT No: 94525.04
DATE: 17/6/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
	0.08	TOPSOIL FILLING - brown silty clay with fine to coarse grained gravel and a trace of rootlets, moist FILL - brown silty clay with gravel and a trace of brick fragments, plastic, bitumen, ripped sandstone, ripped shale and rootlets, moist		B/D	0.0							
	0.8	SILTY CLAY - very stiff, pale brown silty clay, damp			0.8							
1	1.0	Pit discontinued at 1.0m - limit of investigation										

RIG: 8 Tonne excavator - 400mm bucket

LOGGED: JY

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

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

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

TEST PIT LOG

CLIENT: Urbanco Group Pty Limited
PROJECT: Proposed St Marys Intermodal Freight Terminal
LOCATION: Lot 2, Forrester Road, St Marys, NSW

SURFACE LEVEL: 23.7 mAHD
EASTING: 293468
NORTHING: 6262775

PIT No: 224
PROJECT No: 94525.04
DATE: 17/6/2019
SHEET 1 OF 1

[illegible]

RIG: 8 Tonne excavator - 400mm bucket

LOGGED: JY

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

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

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



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TEST PIT LOG

CLIENT: Urbanco Group Pty Limited
PROJECT: Proposed St Marys Intermodal Freight Terminal
LOCATION: Lot 2, Forrester Road, St Marys, NSW

SURFACE LEVEL: 23.6 mAHD
EASTING: 293465
NORTHING: 6262771

PIT No: 225
PROJECT No: 94525.04
DATE: 17/6/2019
SHEET 1 OF 1

[illegible]

RIG: 8 Tonne excavator - 400mm bucket

LOGGED: JY

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

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

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



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TEST PIT LOG

CLIENT: Urbanco Group Pty Limited
PROJECT: Proposed St Marys Intermodal Freight Terminal
LOCATION: Lot 2, Forrester Road, St Marys, NSW

SURFACE LEVEL: 23.6 mAHD
EASTING: 293462
NORTHING: 6262775

PIT No: 226
PROJECT No: 94525.04
DATE: 17/6/2019
SHEET 1 OF 1

[illegible]

RIG: 8 Tonne excavator - 400mm bucket

LOGGED: JY

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

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

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



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TEST PIT LOG

CLIENT: Urbanco Group Pty Limited
PROJECT: Proposed St Marys Intermodal Freight Terminal
LOCATION: Lot 2, Forrester Road, St Marys, NSW

SURFACE LEVEL: 23.7 mAHD
EASTING: 293465
NORTHING: 6262780

PIT No: 227
PROJECT No: 94525.04
DATE: 17/6/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
	0.08	TOPSOIL FILLING - brown silty clay with fine to coarse grained gravel and a trace of rootlets, moist FILL - brown silty clay with gravel and a trace of brick fragments, metal, plastic pipe, concrete, bitumen, ripped sandstone and ripped shale, moist		B/D	0.0							
	0.9	SILTY CLAY - very stiff, pale brown silty clay, damp			0.9							
	1.1	Pit discontinued at 1.1m - limit of investigation										
	2.3											
	2.2											
	2.0											
	2.1											
	3.0											
	2.0											

RIG: 8 Tonne excavator - 400mm bucket

LOGGED: JY

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

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

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

TEST PIT LOG

CLIENT: Urbanco Group Pty Limited
PROJECT: Proposed St Marys Intermodal Freight Terminal
LOCATION: Lot 2, Forrester Road, St Marys, NSW

SURFACE LEVEL: 23.7 mAHD
EASTING: 293471
NORTHING: 6262774

PIT No: 228
PROJECT No: 94525.04
DATE: 17/6/2019
SHEET 1 OF 1

[illegible]

RIG: 8 Tonne excavator - 400mm bucket

LOGGED: JY

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

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

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



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TEST PIT LOG

CLIENT: Urbanco Group Pty Limited
PROJECT: Proposed St Marys Intermodal Freight Terminal
LOCATION: Lot 2, Forrester Road, St Marys, NSW

SURFACE LEVEL: 23.6 mAHD
EASTING: 293466
NORTHING: 6262769

PIT No: 229
PROJECT No: 94525.04
DATE: 17/6/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
	0.1	TOPSOIL FILLING - brown silty clay with fine to coarse grained gravel and a trace of rootlets, moist		B/D	0.0							
		FILL - brown silty clay with gravel and a trace of bitumen, metal wires, wood and rootlets, damp			0.3							
23												
1												
	1.3	CLAYEY SILT - grey clayey silt, damp (possibly old topsoil)										
22												
	1.6	GRAVELLY CLAY - very stiff, red brown mottled grey										
	1.7	gravelly clay, moist										
		Pit discontinued at 1.7m - limit of investigation										
2												
21												
3												
20												

RIG: 8 Tonne excavator - 400mm bucket

LOGGED: JY

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

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

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

TEST PIT LOG

CLIENT: Urbanco Group Pty Limited
PROJECT: Proposed St Marys Intermodal Freight Terminal
LOCATION: Lot 2, Forrester Road, St Marys, NSW

SURFACE LEVEL: 23.6 mAHD
EASTING: 293459
NORTHING: 6262776

PIT No: 230
PROJECT No: 94525.04
DATE: 17/6/2019
SHEET 1 OF 1

[illegible]

RIG: 8 Tonne excavator - 400mm bucket

LOGGED: JY

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

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

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




TEST PIT LOG

CLIENT: Urbanco Group Pty Limited
PROJECT: Proposed St Marys Intermodal Freight Terminal
LOCATION: Lot 2, Forrester Road, St Marys, NSW

SURFACE LEVEL: 23.6 mAHD
EASTING: 293462
NORTHING: 6262787

PIT No: 231
PROJECT No: 94525.04
DATE: 17/6/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
	0.08	TOPSOIL FILLING - brown silty clay with sand and gravel, damp										
		FILL - grey brown gravelly clay with a trace of brick fragments and bitumen, damp										
	1.0	SILTY SAND - pale brown silty sand, damp										
	1.1	Pit discontinued at 1.1m - limit of investigation										

RIG: 8 Tonne excavator - 400mm bucket

LOGGED: JY

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

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





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

TEST PIT LOG

CLIENT: Urbanco Group Pty Limited
PROJECT: Proposed St Marys Intermodal Freight Terminal
LOCATION: Lot 2, Forrester Road, St Marys, NSW

SURFACE LEVEL: 23.5 mAHD
EASTING: 293454
NORTHING: 6262771

PIT No: 232
PROJECT No: 94525.04
DATE: 17/6/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
	0.1	TOPSOIL FILLING - brown gravelly clay, damp										
		FILL - brown silty clay with gravel and a trace of brick fragments, tile fragments, plastic bag, plastic and large concrete slab fragment										
		- becoming grey brown speckled red, pale grey and brown below 0.7m										
	1.4	SILTY SAND - pale brown silty sand, damp										
	1.5	Pit discontinued at 1.5m - limit of investigation										
	2											
	3											
	20											

RIG: 8 Tonne excavator - 400mm bucket

LOGGED: JY

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

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




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

TEST PIT LOG

CLIENT: Urbanco Group Pty Limited
PROJECT: Proposed St Marys Intermodal Freight Terminal
LOCATION: Lot 2, Forrester Road, St Marys, NSW

SURFACE LEVEL: 23.6 mAHD
EASTING: 293471
NORTHING: 6262765

PIT No: 233
PROJECT No: 94525.04
DATE: 17/6/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
	0.15	TOPSOIL FILLING - brown clayey gravel with some rootlets, damp										
		FILL - brown silty clay with gravel and a trace of tile and brick fragments, damp										
	1.1	SILTY CLAY - stiff, grey silty clay with sand, damp										
	1.2	Pit discontinued at 1.2m - limit of investigation										
	2											
	3											
	20											

RIG: 8 Tonne excavator - 400mm bucket

LOGGED: JY

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

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

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

TEST PIT LOG

CLIENT: Urbanco Group Pty Limited
PROJECT: Proposed St Marys Intermodal Freight Terminal
LOCATION: Lot 2, Forrester Road, St Marys, NSW

SURFACE LEVEL: 23.7 mAHD
EASTING: 293479
NORTHING: 6262764

PIT No: 234
PROJECT No: 94525.04
DATE: 17/6/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
	0.2	FILLING - grey sandy gravel with a trace of bitumen fragments, dry		B/D	0.0							
		FILLING - brown gravelly clay with a trace of brick fragments, bitumen, soft plastic and one small fragment of asbestos										
23	0.9	SANDY SILT - dark grey sandy silt, damp (possibly old topsoil layer)			0.9							
1	1.1	SILTY CLAY - very stiff, silty clay with sand, damp										
	1.2	Pit discontinued at 1.0m - limit of investigation										
22												
2												
21												
3												
20												

RIG: 8 Tonne excavator - 400mm bucket

LOGGED: JY

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

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

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

TEST PIT LOG

CLIENT: Urbanco Group Pty Limited
PROJECT: Proposed St Marys Intermodal Freight Terminal
LOCATION: Lot 2, Forrester Road, St Marys, NSW

SURFACE LEVEL: 24 mAHD
EASTING: 293485
NORTHING: 6262773

PIT No: 235
PROJECT No: 94525.04
DATE: 17/6/2019
SHEET 1 OF 1

[illegible]

RIG: 8 Tonne excavator - 400mm bucket

LOGGED: JY

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

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

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





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TEST PIT LOG

CLIENT: Urbanco Group Pty Limited
PROJECT: Proposed St Marys Intermodal Freight Terminal
LOCATION: Lot 2, Forrester Road, St Marys, NSW

SURFACE LEVEL: 24.2 mAHD
EASTING: 293494
NORTHING: 6262777

PIT No: 236
PROJECT No: 94525.04
DATE: 17/6/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
24.2	0.08	FILL - grey sand gravel, dry										
		FILL - grey brown sandy gravel with clay and a trace of tile and brick fragments, dry										
	0.7	SANDY SILT - pale brown sandy silt with clay, damp										
23.1	0.8	Pit discontinued at 0.8m - limit of investigation										
22.1	1											
21.1	2											
20.1	3											

RIG: 8 Tonne excavator - 400mm bucket

LOGGED: JY

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

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

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

TEST PIT LOG

CLIENT: Urbanco Group Pty Limited
PROJECT: Proposed St Marys Intermodal Freight Terminal
LOCATION: Lot 2, Forrester Road, St Marys, NSW

SURFACE LEVEL: 24.3 mAHD
EASTING: 293514
NORTHING: 6262764

PIT No: 238
PROJECT No: 94525.04
DATE: 17/6/2019
SHEET 1 OF 1

[illegible]

RIG: 8 Tonne excavator - 400mm bucket

LOGGED: JY

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

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

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



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TEST PIT LOG

CLIENT: Urbanco Group Pty Limited
PROJECT: Proposed St Marys Intermodal Freight Terminal
LOCATION: Lot 2, Forrester Road, St Marys, NSW

SURFACE LEVEL: 24.2 mAH
EASTING: 293500
NORTHING: 6262754

PIT No: 240
PROJECT No: 94525.04
DATE: 17/6/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
24.0 23.5 23.0 22.5 22.0 21.5 21.0	0.04	FILL - grey sandy gravel, dry										
		FILL - grey brown sandy gravel with a trace of bitumen and soft plastic, dry										
		- metal pole at 0.2m										
1 23.5 23.0 22.5 22.0 21.5 21.0	0.9	FILL - grey mottled brown silty clay with gravel and a trace of concrete fragments, brick fragments and soft plastic, damp										
		- thin metal rod at 1.0m										
1.6 1.7 2 2.5 3 3.5 4 4.5 5 5.5 6 6.5 7 7.5 8 8.5 9 9.5 10 10.5 11 11.5 12 12.5 13 13.5 14 14.5 15 15.5 16 16.5 17 17.5 18 18.5 19 19.5 20 20.5 21 21.5 22 22.5 23 23.5 24	1.6	SILTY SAND - pale brown silty sand with a trace of carbonaceous material, damp										
	1.7	Pit discontinued at 1.7m - limit of investigation										

RIG: 8 Tonne excavator - 400mm bucket

LOGGED: JY

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

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

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

TEST PIT LOG

CLIENT: Urbanco Group Pty Limited
PROJECT: Proposed St Marys Intermodal Freight Terminal
LOCATION: Lot 2, Forrester Road, St Marys, NSW

SURFACE LEVEL: 24.3 mAHD
EASTING: 293519
NORTHING: 6262746

PIT No: 241
PROJECT No: 94525.04
DATE: 17/6/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
24	0.15	TOPSOIL FILLING - brown silty clay with fine to coarse grained gravel and a trace of rootlets, moist										
		FILL - brown silty clay with sand and gravel and a trace of plastic cover wire and brick fragments, damp										
	0.6	FILL - grey brown silty clay with gravel and some ripped shale and timber, damp										
1												
23												
	1.7	SANDY SILT - brown sandy silt, damp										
	1.8	Pit discontinued at 1.8m - limit of investigation										
2												
22												
3												
21												

RIG: 8 Tonne excavator - 400mm bucket

LOGGED: JY

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

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



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

TEST PIT LOG

CLIENT: Urbanco Group Pty Limited
PROJECT: Proposed St Marys Intermodal Freight Terminal
LOCATION: Lot 2, Forrester Road, St Marys, NSW

SURFACE LEVEL: 24.4 mAHD
EASTING: 293529
NORTHING: 6262754

PIT No: 242
PROJECT No: 94525.04
DATE: 17/6/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
		FILL - brown silty clay with sand and gravel and a trace of ripped siltstone, brick fragments, ripped sandstone, bathroom tile and small red hard plastic pipe fragment, damp										
	0.8	SANDY SILT - brown sandy silt, damp										
	0.9	Pit discontinued at 0.9m - limit of investigation										
	1											
	2											
	3											
	4											
	5											
	6											
	7											
	8											
	9											
	10											
	11											
	12											
	13											
	14											
	15											
	16											
	17											
	18											
	19											
	20											
	21											
	22											
	23											
	24											

RIG: 8 Tonne excavator - 400mm bucket

LOGGED: JY

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

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



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

TEST PIT LOG

CLIENT: Urbanco Group Pty Limited
PROJECT: Proposed St Marys Intermodal Freight Terminal
LOCATION: Lot 2, Forrester Road, St Marys, NSW

SURFACE LEVEL: 24 mAHD
EASTING: 293497
NORTHING: 6262748

PIT No: 243
PROJECT No: 94525.04
DATE: 17/6/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
24	0.05	FILLING - grey sandy gravel, dry FILL - brown silty clay with gravel and a trace of hard and soft plastic, fabric and brick fragments, damp										
23	1											
22	1.9	SILTY CLAY - stiff, pale brown silty clay with some sand, damp										
21	2.0	Pit discontinued at 2.0m - limit of investigation										
20	2											
19	3											

RIG: 8 Tonne excavator - 400mm bucket

LOGGED: JY

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

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



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

TEST PIT LOG

CLIENT: Urbanco Group Pty Limited
PROJECT: Proposed St Marys Intermodal Freight Terminal
LOCATION: Lot 2, Forrester Road, St Marys, NSW

SURFACE LEVEL: 23.8 mAHD
EASTING: 293482
NORTHING: 6262754

PIT No: 244
PROJECT No: 94525.04
DATE: 17/6/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
	0.1	TOPSOIL FILLING - brown silty clay with fine to coarse grained gravel and a trace of rootlets, moist FILL - brown silty clay with gravel and a trace of fabric, brick fragments and bathroom tile, damp										
	1.3	SANDY SILT - grey sandy silt with clay, damp										
	1.4	Pit discontinued at 1.4m - limit of investigation										
	2.0											
	2.1											
	2.2											
	2.3											

RIG: 8 Tonne excavator - 400mm bucket

LOGGED: JY

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

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

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

TEST PIT LOG

CLIENT: Urbanco Group Pty Limited
PROJECT: Proposed St Marys Intermodal Freight Terminal
LOCATION: Lot 2, Forrester Road, St Marys, NSW

SURFACE LEVEL: 23.8 mAHD
EASTING: 293476
NORTHING: 6262783

PIT No: 245
PROJECT No: 94525.04
DATE: 17/6/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
	0.1	TOPSOIL FILLING - brown silty clay with fine to coarse grained gravel and a trace of rootlets, moist		B/D	0.0							
		FILL - grey brown gravelly clay with concrete fragments and a trace of glass, brick, bathroom tile and rootlets, damp										
	0.7	SANDY SILT - pale brown sandy silt with some clay, damp			0.7							
	0.8	Pit discontinued at 0.8m - limit of investigation										
23												
22												
21												
20												

RIG: 8 Tonne excavator - 400mm bucket

LOGGED: JY

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

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

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

TEST PIT LOG

CLIENT: Urbanco Group Pty Limited
PROJECT: Proposed St Marys Intermodal Freight Terminal
LOCATION: Lot 2, Forrester Road, St Marys, NSW

SURFACE LEVEL: 23.7 mAHD
EASTING: 293471
NORTHING: 6262788

PIT No: 246
PROJECT No: 94525.04
DATE: 17/6/2019
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
	0.08	TOPSOIL FILLING - brown gravelly clay with rootlets and surficial vegetation, damp FILL - brown gravelly clay with a trace of ripped shale, brick fragments, bathroom tile, wood and rootlets, moist		B/D	0.0							
	0.6	SILTY SAND - pale brown silty sand with a trace of clay, moist			0.6							
	0.7	Pit discontinued at 0.7m - limit of investigation										
	1											
	2											
	3											
	20											

RIG: 8 Tonne excavator - 400mm bucket

LOGGED: JY

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

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

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

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
TP223 / 0.0 - 0.8	16.023	-	-	-	-	-	795.3	-	-
TP224 / 0.0 - 1.0	13.989	10	good	30 × 20	80	0.085	566	-	-
TP225 / 0.0 - 1.3	14.280	41	good	70 × 2	597	0.630	581.5	-	-
TP226 / 0.0 - 0.9	14.263	-	-	-	-	-	610.3	-	-
TP227 / 0.0 - 0.9	16.127	-	-	-	-	-	612.9	0.029	0.0047
TP228 / 0.0 - 1.2	15.016	-	-	-	-	-	796	-	-
TP229 / 0.0 - 1.3	14.019	-	-	-	-	-	743.5	-	-
TP230 / 0.0 - 1.1	14.293	2	good	10 × 10	5	0.005	748.9	-	-
TP245 / 0.0 - 0.7	14.892	-	-	-	-	-	780.4	-	-
TP246 / 0.0 - 0.6	14.561	3	good	30 × 10	28	0.03	704.8	-	-
TP239 / 0.0 - 0.9	14.392	1	good	28 × 34	7.5	0.008	-	-	-
								-	
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								-	
								-	

HSL D for Asbestos in soil

*

**

-

Bold

Table 7 of Schedule B(1), NEPC (2013) for Commercial / Industrial use

Based on % w/w asbestos in soil assuming 15% asbestos in ACM

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

Concentration exceeds SAC

Attachment E

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

CERTIFICATE OF ANALYSIS 219567

Client Details

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

Sample Details

Your Reference	<u>94525.04, St Marys</u>
Number of Samples	7 SOIL, 3 SOIL/MATERIAL
Date samples received	13/06/2019
Date completed instructions received	13/06/2019

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	21/06/2019
Date of Issue	17/06/2019
NATA Accreditation Number 2901. This document shall not be reproduced except in full.	
Accredited for compliance with ISO/IEC 17025 - Testing. Tests not covered by NATA are denoted with *	

Asbestos Approved By

Analysed by Asbestos Approved Identifier: Aida Marner
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		219567-1	219567-2	219567-3	219567-4	219567-5
Your Reference	UNITS	TP223	TP224	TP225	TP226	TP227
Depth		0.0-0.8	0.0-1.0	0.0-1.3	0.0-0.9	0.0-0.9
Date Sampled		13/06/2019	13/06/2019	13/06/2019	13/06/2019	13/06/2019
Type of sample		SOIL	SOIL/MATERIAL	SOIL/MATERIAL	SOIL/MATERIAL	SOIL
Date analysed	-	17/06/2019	17/06/2019	17/06/2019	17/06/2019	17/06/2019
Sample mass tested	g	795.3	565.97	581.56	610.3	612.86
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	Chrysotile asbestos detected Organic fibres detected Synthetic mineral fibres detected	Chrysotile asbestos detected Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected Synthetic mineral 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	7.5426	41.5020	<0.1	<0.1
Asbestos ID in soil <0.1g/kg*	-	No visible asbestos detected	See Above	See Above	No visible asbestos detected	Chrysotile
ACM >7mm Estimation*	g	—	4.2689	24.1359	—	—
FA and AF Estimation*	g	—	—	—	—	0.0290
FA and AF Estimation*#2	%(w/w)	<0.001	<0.001	<0.001	<0.001	0.0047

Asbestos ID - soils NEPM						
Our Reference		219567-6	219567-7	219567-8	219567-9	219567-10
Your Reference	UNITS	TP228	TP229	TP230	TP245	TP246
Depth		0.0-1.2	0.0-1.3	0.0-1.1	0.0-0.7	0.0-0.6
Date Sampled		13/06/2019	13/06/2019	13/06/2019	13/06/2019	13/06/2019
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date analysed	-	17/06/2019	17/06/2019	17/06/2019	17/06/2019	17/06/2019
Sample mass tested	g	795.99	743.45	748.91	780.37	704.8
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

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	<p>Asbestos ID - Identification of asbestos in soil samples using Polarised Light Microscopy and Dispersion Staining Techniques. Minimum 500mL soil sample was analysed as recommended by "National Environment Protection (Assessment of site contamination) Measure, Schedule B1 and "The Guidelines from the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia - May 2009" with a reporting limit of 0.1g/kg (0.01% w/w) as per Australian Standard AS4964-2004.</p> <p>Results reported denoted with * are outside our scope of NATA accreditation.</p> <p>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)</p> <p>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.</p> <p>Estimation = Estimated asbestos weight</p> <p>Results reported with "--" is equivalent to no visible asbestos identified using Polarised Light microscopy and Dispersion Staining Techniques.</p>

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.

Rev4/October2016

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

This report is the property of Douglas Partners Pty Ltd. The report may only be used for the purpose for which it was commissioned and in accordance with the Conditions of Engagement for the commission supplied at the time of proposal. Unauthorised use of this report in any form whatsoever is prohibited.

Borehole and Test Pit Logs

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

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

Groundwater

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

- In low permeability soils groundwater may enter the hole very slowly or perhaps not at all during the time the hole is left open;

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

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

Reports

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

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

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

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

About this Report

Site Anomalies

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

Information for Contractual Purposes

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

Site Inspection

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