ADDITIONAL BUILDING PERMIT)

AMMENITIES BLOCK
~ INCLUDES: WATER CLOSETS, SHOWER, LUNCH & LOCKER ROOM.

NATURAL BUSHLAND TO BE MAINTAINED TO PROMOTE NATURAL SETTING FOR BUILDING

PROPOSED STORAGE BUILDINGS (3 OFF)

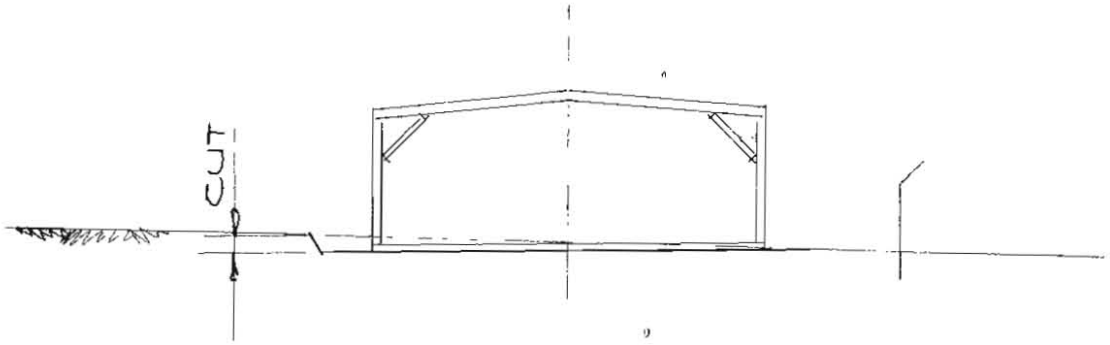
INDUSTRIAL PROTECTION FENCE (RAILESS TYPE) 2.290 HIGH
~ 3 CABLE WIRES
~ 3 ROWS OF BARBED WIRE (TOP)

406.27 M
231° 17' 20"

3.0
5.2
5.0 RAD.
90°
A
3.7 (TYP.)
5.0 (TYP.)
5.0 (TYP.)
6.0 RAD. (TYP.)
23.0 (TYP.)

N

ezyframe



GENERAL SPECIFICATION.

- ALL ROADWAYS, TURNING AREAS & CAR PARKING SPACES TO HAVE STANDARD BASE CONSTRUCTION & BE SEALED WITH HARD STANDING ALL WEATHER BITUMINOUS ASPHALT
- MINIMUM RADIUS – ROADWAYS & TURNING AREAS TO BE 6·0 METRES
- ALL BUILDINGS EXCEPT OFFICE/AMMEN. BLOCK TO BE CLAD WITH TRIMDEK HI-TEN SHEETING – COLORBOND FINISH (BRONZE OLIVE) TO BLEND WITH BUSHLAND & MEET COUNCIL REQUIREMENTS

NOTE!
ALL DIMENSION IN METRES

15·0

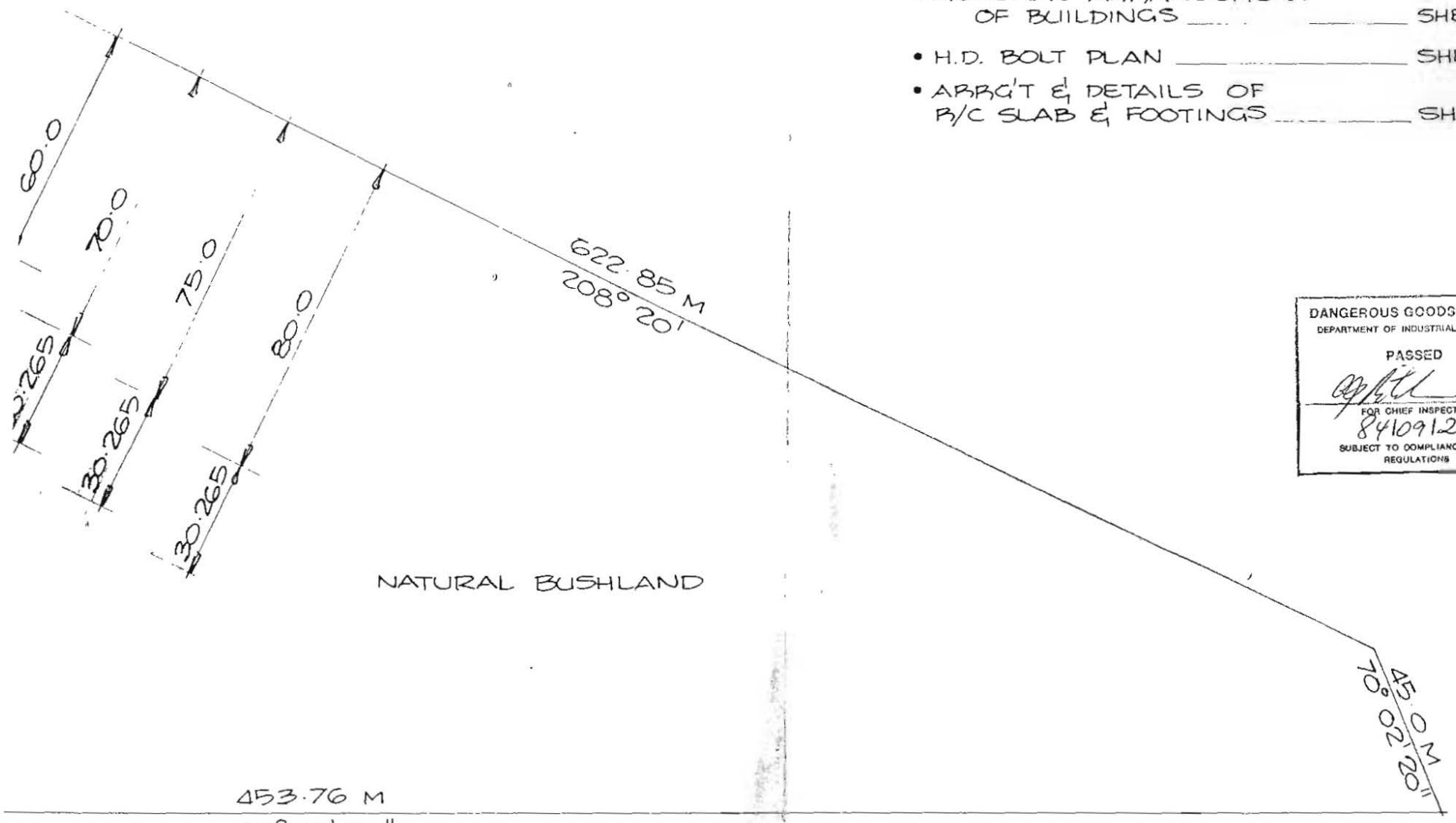
AREA 30·0 METRES
CLEAR OF ALL BUILDINGS
TO BE CLEARED FREE
OF VEGETATION FOR
FIRE PURPOSES

REFERENCE DRG'S.

OF VEGETATION FOR
FIRE PURPOSES

REFERENCE DRG'S.

- GENERAL ARRANGEMENT OF BUILDINGS ..... SHEET '2'
- H.D. BOLT PLAN ..... SHEET '3'
- ARRG'T & DETAILS OF P/C SLAB & FOOTINGS ..... SHEET '4'



DANGEROUS GOODS BRANCH
DEPARTMENT OF INDUSTRIAL RELATIONS
PASSED
FOR CHIEF INSPECTOR
84109124
SUBJECT TO COMPLIANCE WITH REGULATIONS

Lysaght Building

PROJECT
DAMILEAST PTY. LTD.
LOT 3 GLENGARRIE RD.
MARSDEN PARK

DRAWING TITLE

DATE 28/8/84	DRAWING No
DRAWN G.D.H.	4269
CHECKED T M-	
ENGINEER	SHEET No.
SCALE	1

premises described below.

(*delete whichever is not required)

FEE $10.00 per Depot

Name of Applicant in full (see over)	Surname O A. RICHARDSON Given Names PTY. LTD
Trading name or occupier's name (if any)	RICHARDSON - GROUP INDUSTRIES
Postal address	P.O. BOX 288 PENRITH Postcode 2750
Telephone number of applicant	STD Code 047 Number 31. 3255
Address of the premises in or on which the depot or depots are situated (including street number, if any)	RICHMOND RD. MARSDEN PARK Postcode 2765
Nature of premises (see over)	DEPOT.

PLEASE ATTACH SITE PLAN

Particulars of type of depots and maximum quantities of dangerous goods to be kept at any one time.

Depot number	Type of depot (see over)	Storage capacity	Dangerous goods	
			Product being stored	C & C Office use only
1	UNDERGROUND TANK	15000	MINERAL SPIRITS	
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				

Name of company supplying flammable liquid (if any) SHELL

Have premises previously been licensed? YES

If known, state name of previous occupier ABOVE Licence No. 14030

Signature of applicant O A Richardson Date 31. 1. 80.

For external explosives magazine(s), please fill in side 2.

FOR OFFICE USE ONLY

CERTIFICATE OF INSPECTION

I, RAYMOND CHARLES McGRATH being an Inspector under the Dangerous Goods Act, 1975, do hereby certify that the premises described above do comply with the requirements of the Dangerous Goods Act, 1975, and the Dangerous Goods Regulation with regard to their situation and construction for the keeping of dangerous goods of the nature and in the quantity specified.

Signature of Inspector

Date 1.2.80.

ST 618 1 0 WEST GOVERNMENT PRINTER

ame of Occupier O.A. Richardson Pty Limited
(Surname) (First Names)

rading Name (if any)

ostal Address P.O. Box 288, PENRITH Postcode 2750

ddress of the premises in which the depot or depots are situated Richmond Road, MARSDEN PARK Postcode

ccupation contractors

ature of Premises depot

articulars of construction of depots and maximum quantities of inflammable liquid and/or dangerous goods to be kept at any one time.

PLEASE SKETCH SITE ON BACK OR ATTACH PLAN

Depot No.	Construction of depots *			Inflammable Liquid		Dangerous Goods						
	Walls	Roof	Floor	Mineral spirit litres	Mineral oil litres	Class 1 litres	Class 2 litres	Class 3 kg	Class 4 m^3	Class 5A# litres	Class 5B# litres	Class 9 litres
1	underground tank			15000								
2	underground tank			15000								
3												
4												
5												
6												
7												
8												
9												
10												
TOTAL				30000								

PUBLIC REVENUE
Chq 25.00
11/4/75
Receipt No 847

* If kept in tanks describe depots as underground or aboveground tanks.

\# Insert water capacity of tanks or cylinders.

Name of Company supplying inflammable liquid Shell

Have premises previously been licensed? Yes B.14030

If known, state name of previous occupier Oswald Alfred RICHARDSON

Signature of applicant O. Richardson Date 30·7·74

CERTIFICATE OF INSPECTION

I, [signature] being an Inspector under the Inflammable Liquid Act, 1915, do hereby certify that the premises or store described above does comply with the requirements of that Act and regulations with regard to its situation and construction for the keeping of inflammable liquid and/or dangerous goods in quantity and nature specified.

Signature of Inspector [signature]

Date 30·7·74

Goods, ccordance with the provisions of the Inflammable Liquid Act, 1915 (as amended) for the ensuing year.

EXPLANATORY

10 APR 1961

No.

Inflammable Liquid—

Mineral Oil—includes kerosene, mineral turpentine and white spirit (for cleaning), and compositions containing same.
Mineral Spirit—includes petrol, benzene, benzolene, benzol and naphtha, and compositions containing same.

Dangerous Goods—

Class 1.—Acetone, amyl acetate, butyl acetate, carbon bisulphide; any combination of substances of an inflammable character suitable for use as an industrial solvent and having a true flashing point of less than 73 degrees Fahrenheit.

Class 2.—Nitro-cellulose (also known as "pyroxylin" and "collodion cotton") moistened with an alcohol, butyl alcohol (also known as "butanol"), methylated spirits, vegetable turpentine; and any liquid or solid containing methylated spirits, having a true flashing point of less than 150 degrees Fahrenheit.

Class 3.—Nitro-cellulose product.

Class 4.—Compressed or dissolved acetylene contained in a porous substance.

DIRECTIONS

1. Applications must be forwarded to the Chief Inspector of Inflammable Liquid, Explosives Department, No. 16 Grosvenor Street, Sydney (Box 48, G.P.O.), and must be accompanied by the prescribed fee, as set out hereunder:—

Registration of Premises (Fee £1 10s. 0d. p.a.).—For quantities not exceeding 300 gallons of mineral oil and 100 gallons of mineral spirit, if kept together; or 800 gallons of mineral oil and 100 gallons of mineral spirit, if kept in separate depots; or 500 gallons of mineral spirit, if kept in an underground tank depot; or 800 gallons of mineral oil and 500 gallons of mineral spirit, if mineral spirit is kept in an underground tank depot.

In addition to, or in lieu of the above, similar quantities of Dangerous Goods of Classes 1 and 2 may be kept under the like conditions; reading Dangerous Goods of Class 1 for the words Mineral Spirit and Dangerous Goods of Class 2 for the words Mineral Oil.

Store License, Div. A (Fee, £3 5s. 0d. p.a.).—For quantities in excess of those stated above, but not exceeding 4,000 gallons mineral oil and/or mineral spirit, and/or Dangerous Goods of Classes 1 and 2.

Store License, Div. B (Fees, See Regulation 7).—For quantities exceeding 4,000 gallons of mineral and/or mineral spirit, and/or dangerous goods of Classes 1 and 2, and/or dangerous goods of Class 3.
For the keeping of Dangerous Goods of Classes 3 and/or 4. (£7 10s. 0d. p.a.).

2. The certificate of inspection at foot hereof must be signed by an Inspector under the Inflammable Liquid Act, 1915 (as amended), or Police Officer, or other officer duly authorised in that behalf, and where the premises are situated outside the Metropolitan Area of Sydney, it is requested that such certificate be obtained prior to forwarding application.

P.

1. Name in full of occupier ... ... RICHARDSON. OSWALD ALFRED.

2. Occupation ... ... CONTRACTOR

3. Locality of the premises in which the depot or depots are situated ... No. or Name
Street RICHMOND ROAD
Town MARSDEN. PARK.

4. Nature of premises (Dwelling, Garage, Store, etc.) ... ... SANITARY DEPOT.

5. Will mineral spirit be kept in a prescribed underground tank depot? Yes.

6. Particulars of construction of depots and maximum quantities of inflammable liquid and/or Dangerous Goods to be kept at any one time.

Depot No.	Construction of Depots			Inflammable Liquid		Dangerous Goods			
	Walls	Roof	Floor	Mineral Spirit Gallons	Mineral Oil Gallons	Class 1 Gallons	Class 2 Gallons	Class 3 lb.	Class 4 cub. ft.
1	Underground Tank			3000					
2				3000					
3									
4					blg	150/-		[illegible]	
5					Public Revenue Account				(illegible)
6					(Date) 20.4.61			[illegible]	
7									
8					Receipt No. 8070				
9									
10									

Signature of Applicant O Richardson

Date of Application ..... 19 Postal Address 23/3/61

CERTIFICATE OF INSPECTION

I, Albert Raymond Bartlett being an Inspector under the Inflammable Liquid Act, 1915 (as amended), do hereby certify that the premises or store herein referred to and described is suitable with regard to its situation and construction for the safe keeping of inflammable liquid and/or dangerous goods in quantity and nature specified.

Place Marsden Park Signature of Inspector A.R. Bartlett

Date 10/4/61

[PLEASE TURN OVER

28-2-61

EXPLANATORY

Inflammable Liquid—

Mineral Oil—includes kerosene, mineral turpentine and white spirit (for cleaning), and compositions containing same.
Mineral Spirit—includes petrol, benzene, benzolene, benzol and naphtha, and compositions containing same.

Dangerous Goods—

Class 1.—Acetone, amyl acetate, butyl acetate, carbon bisulphide; any combination of substances of an inflammable character suitable for use as an industrial solvent and having a true flashing point of less than 73 degrees Fahrenheit.

Class 2.—Nitro-cellulose (also known as "pyroxylin" and "collodion cotton") moistened with an alcohol, butyl alcohol (also known as "butanol"), methylated spirits, vegetable turpentine; and any liquid or solid containing methylated spirits, having a true flashing point of less than 150 degrees Fahrenheit.

Class 3.—Nitro-cellulose product.

Class 4.—Compressed or dissolved acetylene contained in a porous substance.

DIRECTIONS

1. Applications must be forwarded to the Chief Inspector of Inflammable Liquid, Explosives Department, No. 16 Grosvenor Street, Sydney (Box 48, G.P.O.), and must be accompanied by the prescribed fee, as set out hereunder:—

Registration of Premises (Fee £1 10s. 0d. p.a.).—For quantities not exceeding 300 gallons of mineral oil and 100 gallons of mineral spirit, if kept together; or 800 gallons of mineral oil and 100 gallons of mineral spirit, if kept in separate depots; or 500 gallons of mineral spirit, if kept in an underground tank depot; or 800 gallons of mineral oil and 500 gallons of mineral spirit, if mineral spirit is kept in an underground tank depot.

In addition to, or in lieu of the above, similar quantities of Dangerous Goods of Classes 1 and 2 may be kept under the like conditions; reading Dangerous Goods of Class 1 for the words Mineral Spirit and Dangerous Goods of Class 2 for the words Mineral Oil.

Store License, Div. A (Fee, £3 5s. 0d. p.a.).—For quantities in excess of those stated above, but not exceeding 4,000 gallons mineral oil and/or mineral spirit, and/or Dangerous Goods of Classes 1 and 2.

Store License, Div. B (Fees, See Regulation 7).—For quantities exceeding 4,000 gallons of mineral and/or mineral spirit, and/or dangerous goods of Classes 1 and 2, and/or dangerous goods of Class 3.
For the keeping of Dangerous Goods of Classes 3 and/or 4. **(£7 10s. 0d. p.a.).**

2. The certificate of inspection at foot hereof must be signed by an Inspector under the Inflammable Liquid Act, 1915 (as amended), or Police Officer, or other officer duly authorised in that behalf, and where the premises are situated outside the Metropolitan Area of Sydney, it is requested that such certificate be obtained prior to forwarding application.

1. Name in full of occupier ... Oswald Alfred Richardson

2. Occupation ... Contractor

3. Locality of the premises in which the depot or depots are situated ... No. or Name ...
Street ... Richmond Road
Town ... Marsden Park

4. Nature of premises (Dwelling, Garage, Store, etc.) ... Depot

5. Will mineral spirit be kept in a prescribed underground tank depot? Yes

6. Particulars of construction of depots and maximum quantities of inflammable liquid and/or Dangerous Goods to be kept at any one time.

Depot No.	Construction of Depots			Inflammable Liquid		Dangerous Goods			
	Walls	Roof	Floor	Mineral Spirit Gallons	Mineral Oil Gallons	Class 1 Gallons	Class 2 Gallons	Class 3 lb.	Class 4 cub. ft.
1	Underground Tank			3000 ~~1000~~					
2									
3									
4									
5									
6									
7									
8									
9									
10									

Cash £20.
Public Revenue Account
(Date) 27.7.60
2197
Receipt No.

Signature of Applicant O. Richardson

Date of Application 18-7-1960 Postal Address 53 Moray Street Richmond

CERTIFICATE OF INSPECTION

I, Charles William Mitchell being an Inspector under the Inflammable Liquid Act, 1915 (as amended), do hereby certify that the premises or store herein referred to and described is suitable with regard to its situation and construction for the safe keeping of inflammable liquid and/or dangerous goods in quantity and nature specified.

Place Sydney Signature of Inspector C W Mitchell

Date 18-7-60

[PLEASE TURN OVER

alteration or amendment of any such Registration or License, for the keeping of Inflammable Liquid and/or Dangerous Goods, in accordance with the provisions of the Inflammable Liquid Act, 1915-53, for the ensuing year.

EXPLOSIVES DEPARTMENT 31 MAR 1959

EXPLANATORY

Inflammable Liquid—

Mineral Oil—includes kerosene, mineral turpentine and white spirit (for cleaning), and compositions containing same.
Mineral Spirit—includes petrol, benzene, benzolene, benzol and naphtha, and compositions containing same.

Dangerous Goods—

Class 1.—Acetone, amyl acetate, butyl acetate, carbon bisulphide; any combination of substances of an inflammable character suitable for use as an industrial solvent and having a true flashing point of less than 73 degrees Fahrenheit.

Class 2.—Nitro-cellulose (also known as "pyroxylin" and "collodion cotton") moistened with an alcohol, butyl alcohol (also known as "butanol"), methylated spirits, vegetable turpentine; and any liquid or solid containing methylated spirits, having a true flashing point of less than 150 degrees Fahrenheit.

Class 3.—Nitro-cellulose product.

Class 4.—Compressed or dissolved acetylene contained in a porous substance.

DIRECTIONS

1. Applications must be forwarded to the Chief Inspector of Inflammable Liquid, Explosives Department, Goldsbrough Mort Bldg., 11 Loftus Street, Circular Quay, Sydney (Box 48, G.P.O.), and must be accompanied by the prescribed fee, as set out hereunder :—

Registration of Premises (Fee £1 10s. 0d. p.a.).—For quantities not exceeding 300 gallons of mineral oil and 100 gallons of mineral spirit, if kept together; or 800 gallons of mineral oil and 100 gallons of mineral spirit, if kept in separate depots; or 500 gallons of mineral spirit, if kept in an underground tank depot; or 800 gallons of mineral oil and 500 gallons of mineral spirit, if mineral spirit is kept in an underground tank depot.

In addition to, or in lieu of the above, similar quantities of Dangerous Goods of Classes 1 and 2 may be kept under the like conditions; reading Dangerous Goods of Class 1 for the words Mineral Spirit and Dangerous Goods of Class 2 for the words Mineral Oil.

Store License, Div. A (Fee, £3 5s. 0d. p.a.).—For quantities in excess of those stated above, but not exceeding 4,000 gallons mineral oil and/or mineral spirit, and/or Dangerous Goods of Classes 1 and 2.

Store License, Div. B (Fees, See Regulation 7).—For quantities exceeding 4,000 gallons of mineral oil and/or mineral spirit, and/or dangerous goods of Classes 1 and 2, and/or dangerous goods of Class 3.
For the keeping of Dangerous Goods of Classes 3 and/or 4. **(£7 10s. 0d. p.a.).**

2. The certificate of inspection at foot hereof must be signed by an Inspector under the Inflammable Liquid Act, 1915–1953, or Police Officer, or other officer duly authorised in that behalf, and where the premises are situated outside the Metropolitan Area of Sydney, it is requested that such certificate be obtained prior to forwarding application.

EXAMINED AND PASSED Shaw 4/6/59 1/3

1. Name in full of occupier	D. E. & J. T. Goodsell
2. Occupation	Contractors
3. Locality of the premises in which the depot or depots are situated	No. or Name / Street Richmond Rd. / Town Marsden Park
4. Nature of premises (Dwelling, Garage, Store, etc.)	Dwelling
5. Will mineral spirit be kept in a prescribed underground tank depot?	

6. Particulars of construction of depots and maximum quantities of inflammable liquid and/or Dangerous Goods to be kept at any one time.

Depot No.	Construction of Depots.			Inflammable Liquid.		Dangerous Goods.			
	Walls.	Roof.	Floor.	Mineral Spirit. Gallons.	Mineral Oil. Gallons.	Class 1. Gallons.	Class 2. Gallons.	Class 3. lb.	Class 4. cub. ft.
1	Underground tank			3000					
2									
3									
4									
5									
6									
7									
8									
9									
10									

SUSPENSE A/C Chq 65/- 1.4.59 (Date) 14000 Receipt No.

65/- TRANSFERRED TO PUBLIC REVENUE ACCOUNT 23-6-59 17996

Signature of Applicant D. E. Goodsell

Date of Application 27-2 1959 Postal Address J. T. Goodsell 77 Jersey Rd Wentworthville

CERTIFICATE OF INSPECTION.

I .... being an Inspector under the Inflammable Liquid Act, 1915–53, do hereby certify that the premises or store herein referred to and described is suitable with regard to situation and construction for the safe keeping of inflammable liquid and/or dangerous goods in quantity and nature ... l.

.... Signature of Inspector ....

APPENDIX B3

OEH RECORDS

Office of Environment & Heritage

You are here: Home > Contaminated land > Record of notices

Contaminated land - record of notices

Record under section 58 of the Contaminated Land Management Act 1997

This record is maintained by OEH in accordance with Part 5 of the Contaminated Land Management Act 1997 (CLM Act).

The record **does** provide

- ✓ a record of written notices issued by OEH under the CLM Act, including preliminary investigation orders.
- ✓ the names of the sites, owners or occupiers **at the time of OEH action** in relation to the site
- ✓ copies of site audit statements (SAS) provided to OEH under section 52 of the CLM Act and relating to significantly contaminated land.

The record **does not** provide

- ✘ a record of all contaminated land in NSW. See frequently asked questions
- ✘ a list of notifications of contamination that OEH receives.
- ✘ the names of the sites, owners or occupiers if it changes **after OEH action** in relation to the site.
- ✘ full copies of agreed management
- ✘ some personal information.

... more about the CLM record of notices

From 1 July 2009 there were changes to the terminology of certain OEH actions under the CLM Act. See the list of these changes.

The record includes notices issued under sections 35 and 36 of the Environmentally Hazardous Chemicals Act 1985. These sections have been repealed. These notices are treated by the CLM Act as management orders.

Before using the record of notices see the Disclaimer and terms of use.

As at Tuesday, 6 December 2011 there are 919 notices in the record relating to 327 sites.

Show me the entire record or Search the record

6 December 2011

Search results

Your search for: LGA: Blacktown City Council Matched 3 notices relating to 2 sites.

Search Again Refine Search

Suburb	Address	Site Name	Notices related to this site
Kings Park	21 Tattersall Road	Former Dow Corning Sealants Factory	1 current
Seven Hills	27 Powers Road	Ma-Refine Oils Seven Hills	2 current

Page 1 of 1

6 December 2011

Office of Environment & Heritage

Search results

Your search for: **General Search** with the following criteria

Suburb - Marsden Park

returned 38 results

Export to excel 1 of 2 Pages Search Again

Number	Name	Location	Type	Status	Date
7680	ASSOCIATED DAIRIES PTY LTD	1270 RICHMOND ROAD, MARSDEN PARK, NSW 2765	POEO licence	Surrendered	12 Jul 2000
1009789	ASSOCIATED DAIRIES PTY LTD	1270 RICHMOND ROAD, MARSDEN PARK, NSW 2765	s.58 Licence Variation	Issued	16 Jul 2001
1010198	ASSOCIATED DAIRIES PTY LTD	1270 RICHMOND ROAD, MARSDEN PARK, NSW 2765	s.80 Approval of the Surrender of a Licence	Issued	14 Aug 2001
6653	BARTTER ENTERPRISES PTY. LIMITED	SOUTH STREET , MARSDEN PARK, NSW 2765	POEO licence	Surrendered	19 Apr 2000
140195	BARTTER ENTERPRISES PTY. LIMITED	SOUTH STREET , MARSDEN PARK, NSW 2765	POEO Licence Transfer	Approved	23 Aug 2000
1008250	BARTTER ENTERPRISES PTY. LIMITED	SOUTH STREET , MARSDEN PARK, NSW 2765	s.58 Licence Variation	Issued	17 Aug 2001
1014668	BARTTER ENTERPRISES PTY. LIMITED	SOUTH STREET , MARSDEN PARK, NSW 2765	s.58 Licence Variation	Issued	12 Apr 2002
1025286	BARTTER ENTERPRISES PTY. LIMITED	SOUTH STREET , MARSDEN PARK, NSW 2765	s.58 Licence Variation	Issued	24 Mar 2003
1079567	BARTTER ENTERPRISES PTY. LIMITED	SOUTH STREET , MARSDEN PARK, NSW 2765	s.58 Licence Variation	Issued	01 Nov 2007
1115186	BARTTER ENTERPRISES PTY. LIMITED	SOUTH STREET , MARSDEN PARK, NSW 2765	s.80 Approval of the Surrender of a Licence	Issued	13 Jul 2010
11497	BLACKTOWN WASTE SERVICES PTY LIMITED	RICHMOND ROAD, MARSDEN PARK, NSW 2765	POEO licence	Issued	20 Dec 2001
1015376	BLACKTOWN WASTE SERVICES PTY LIMITED	RICHMOND ROAD, MARSDEN PARK, NSW 2765	s.58 Licence Variation	Issued	03 Apr 2002
142436	BLACKTOWN WASTE SERVICES PTY LIMITED	RICHMOND ROAD, MARSDEN PARK, NSW 2765	POEO Licence Transfer	Approved	01 Jan 2004
1034185	BLACKTOWN WASTE SERVICES PTY LIMITED	RICHMOND ROAD, MARSDEN PARK, NSW 2765	s.58 Licence Variation	Issued	24 Feb 2004
1035619	BLACKTOWN WASTE SERVICES PTY LIMITED	RICHMOND ROAD, MARSDEN PARK, NSW 2765	s.58 Licence Variation	Issued	07 Apr 2004
1036931	BLACKTOWN WASTE SERVICES PTY LIMITED	RICHMOND ROAD, MARSDEN PARK, NSW 2765	s.58 Licence Variation	Issued	24 May 2004
1040181	BLACKTOWN WASTE	RICHMOND ROAD,	s.58 Licence	Issued	25 Aug 2004

	SERVICES PTY LIMITED	MARSDEN PARK, NSW 2765	Variation		
1042674	BLACKTOWN WASTE SERVICES PTY LIMITED	RICHMOND ROAD, MARSDEN PARK, NSW 2765	s.58 Licence Variation	Issued	15 Dec 2004
1043785	BLACKTOWN WASTE SERVICES PTY LIMITED	RICHMOND ROAD, MARSDEN PARK, NSW 2765	s.58 Licence Variation	Issued	07 Feb 2005
1050775	BLACKTOWN WASTE SERVICES PTY LIMITED	RICHMOND ROAD, MARSDEN PARK, NSW 2765	s.58 Licence Variation	Issued	14 Jul 2006

1 2

06 December 2011

APPENDIX C

ASSESSMENT CRITERIA OF CONTAMINATION ASSESSMENT

ASSESSMENT CRITERIA FOR CONTAMINATION ASSESSMENT

Assessment Criteria for Soil samples

The guidelines used for soil samples in this assessment were as follows;

- The National Environment Protection (Assessment of Site Contamination) Measure (NEPM, 1999) in the National Environment Protection Council (NEPC) publications provide risk-based Health Investigation Levels (HIL) for selected organic and inorganic chemicals in Table 5-A of Schedule B(1) – Guideline on the Investigation Levels for Soil. These levels are provided for a variety of exposure settings.
- As the site is proposed for residential subdivision development, where lawns and domestic gardens could be established, with regard to human health, analytical results are assessed against risk based health investigation guidelines appropriate for residential with access to soil (HIL 'A').
- With regard to the protection of the environment, the provisional phytotoxicity based investigation levels (PPBIL) published in the Guidelines for the NSW Site Auditor Scheme (NSW DEC 2006) and Ecological Investigation Levels (EIL) published in the NEPM for inorganics are used.
- The Guidelines for Assessing Service Station Sites (NSW EPA, 1994) provide guidance regarding TPH and BTEX.

The adopted assessment criteria are presented in the following table.

Contaminant	Assessment Criteria (mg/kg)			Source
	HIL 'A'	PPBIL/EIL	NSW EPA	
Inorganics				
Metals				
Arsenic	100	20	-	NEPM, 1999; NSW DEC, 2006
Cadmium	20	3	-	NEPM, 1999; NSW DEC, 2006
Chromium (III)	120,000	400	-	NEPM, 1999; NSW DEC, 2006
Copper	1000	100	-	NEPM, 1999; NSW DEC, 2006
Lead	300	600	-	NEPM, 1999; NSW DEC, 2006
Mercury (Methyl / Inorganic)	10 / 15	1[a]	-	NEPM, 1999; NSW DEC, 2006
Nickel	600	60	-	NEPM, 1999; NSW DEC, 2006
Zinc	7,000	200	-	NEPM, 1999; NSW DEC, 2006
Phenols (Total)	8,500	-	-	NEPM, 1999
Organics				
TPH/BTEX				
C_6 to C_9 Fraction	-	-	65	NSW EPA, 1994
C_{10} to C_{36} Fraction	-	-	1,000	NSW EPA, 1994
Benzene	-	-	1	NSW EPA, 1994
Toluene	-	-	1.4	NSW EPA, 1994
Ethylbenzene	-	-	3.1	NSW EPA, 1994
Total Xylenes	-	-	14	NSW EPA, 1994
PAH				
Benzo(a)pyrene	1	-	-	NEPM, 1999
Total PAH	20	-	-	NEPM, 1999

Contaminant	Assessment Criteria (mg/kg)			Source
	HIL 'A'	PPBIL/EIL	NSW EPA	
OCP				
Aldrin + Dieldrin	10	-	-	NEPM, 1999
Chlordane	50	-	-	NEPM, 1999
DDT+DDD+DDE	200	-	-	NEPM, 1999
Heptachlor	10	-	-	NEPM, 1999
PCB (Total)	10	-	-	NEPM, 1999

a: Total Mercury

In order to detect any potential "hot spots" of contamination within an individual composite sample, an adjusted HIL'A' / PPBIL is recommended for assessment of results for individual composite samples, based on Method 1, Section 6 of the EPA "Sampling Design Guidelines" 1995. The Adjusted PPBIL / HIL'A', presented in the applicable tables, were calculated by dividing the PPBIL / HIL'A' by three (i.e. three sub-samples comprised the composite). Individual composite samples were assessed against the adjusted PPBIL / HIL'A'.

If the concentration of an analyte for a composite sample is in excess of the Adjusted PPBIL / HIL'A', then all sub-samples of the failed composite samples will be analysed individually. The purpose of this is to detect potentially contaminated sub-samples within the failed composite sample.

For discrete samples, the individual concentrations of analytes were assessed against the PPBIL and HIL'A', or the suggested Levels in the EPA service station guidelines.

For asbestos assessment, the site must be free of asbestos-cement pieces and no asbestos fibre detected in the soils.

The site (or study area) will be deemed contaminated or containing contamination "hot spots" if the above criteria are unfulfilled. Further investigation at and/or in the vicinity of the contaminated area/locations, remediation and/or management will be recommended if the area of concern is found to be contaminated or contain contamination "hot spots".

Assessment Criteria for Groundwater

The "Australian and New Zealand Guidelines for Fresh and Marine Waters" 2000, published by the Australian and New Zealand Environment and Conservation Council (ANZECC) and Agriculture and Resource Management Council of Australia and New Zealand (ARMCANZ), is adopted for assessing water quality.

In order to determine whether the groundwater will impact on aquatic life within fresh water aquatic ecosystems, the groundwater test results were assessed against the available Trigger Values for a slightly / moderately disturbed freshwater system, at protection level of 95% of species, which are extracted from the abovementioned guidelines.

The groundwater test results were also assessed against the available Long-term and Short-term Trigger Values for irrigation water, available guideline values for Livestock Drinking Water and water for recreational purposes, which are extracted from the abovementioned guidelines.

In addition, the groundwater test results were assessed against the available health levels for drinking water, extracted from the "Australian Drinking Water Guidelines" 2004, published by the National Health and Medical Research Council (NHMRC) in collaboration with the Natural Resource Management Ministerial Council (NRMMC).

There are no reliable assessment criteria for Total Petroleum Hydrocarbons in ANZECC & ARMCANZ Guidelines 2000; reference has therefore been made to Airports (Environment Protection) Regulations 1997 (compiled and prepared on 28 May 2004). The accepted limits (for fresh water) of 150 µg/L (C_6-C_9) and 600 µg/L (>C_9) detailed in that Regulations are considered applicable for the protection of fresh water.

The adopted assessment criteria are presented in Tables L to Q in Appendix J.

APPENDIX D

TEST PIT EXCAVATION LOGS & EXPLANATORY NOTES
SAMPLE LOGS – TABLE 1
ENGINEERING LOGS – MONITORING WELLS

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engineering log - excavation

Client : Winten Property Group
Project : Marsden Park Precinct
Location : North West Growth Centre, Marsden Park

Job No : 12576/1
Pit No : 1
Date : 27/10/2011
Logged/Checked by: AN/ZA

Equipment type and model: Backhoe
R.L. surface :
Excavation dimensions : 2 **m long** 0.5 **m wide** **datum :**

groundwater	env samples	PID reading (ppm)	geo samples	field tests	depth or R.L. in meters	graphic log	classification symbol	MATERIAL DESCRIPTION soil type, plasticity or particle characteristic, colour, secondary and minor components.	moisture condition	consistency density index	hand penetrometer kPa	Remarks and additional observations
Dry	G		DS		0			TOPSOIL; Silty Clay, low plasticity, brown, trace of roots				
							CL-CI	Silty CLAY, low to medium plasticity, grey-brown, trace of ironstones	M=PL	F-St		Alluvium
					0.5		CH	CLAY, high plasticity, yellow-brown, trace of ironstones	M=PL	St		
			DS		1							
					1.5		CH	CLAY, high plasticity, pale grey, trace of ironstones	M≤PL	St-VSt		Possible Residual
			DS		2		CH	CLAY, high plasticity, pale grey, with ironstones and shale fragments	M<PL	VSt		
					2.5			Test Pit No 1 terminated at 2.5m				
					3							
					3.5							
					4							
					4.5							

GEOTECHNIQUE
PTY LTD

engineering log - excavation

Client : Winten Property Group
Project : Marsden Park Precinct
Location : North West Growth Centre, Marsden Park

Job No : 12576/1
Pit No : 2
Date : 28/10/2011
Logged/Checked by: AN/ZA

Equipment type and model: Backhoe
R.L. surface :
Excavation dimensions : 2 **m long** 0.5 **m wide** **datum :**

groundwater	env samples	PID reading (ppm)	geo samples	field tests	depth or R.L. in meters	graphic log	classification symbol	MATERIAL DESCRIPTION soil type, plasticity or particle characteristic, colour, secondary and minor components.	moisture condition	consistency density index	hand penetrometer kPa	Remarks and additional observations
Dry	G		DS		0		CL-CI	TOPSOIL; Silty Clay, low plasticity, brown, trace of roots	M=PL	F-St		Alluvium
								Silty CLAY, low to medium plasticity, grey-brown, trace of ironstones				
							CH	CLAY, high plasticity, yellow-brown, with ironstones	M=PL	St-VSt		
			DS		0.5							
					1							
			DS		1.5		CH	CLAY, high plasticity, pale grey, trace of ironstones	M=PL	VSt		
					2							
					2.5			Test Pit No 2 terminated at 2.5m				
					3							
					3.5							
					4							
					4.5							

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engineering log - excavation

Client : Winten Property Group
Project : Marsden Park Precinct
Location : North West Growth Centre, Marsden Park

Job No : 12576/1
Pit No : 3
Date : 31/10/2011
Logged/Checked by: AN/ZA

Equipment type and model: Backhoe
R.L. surface :
Excavation dimensions : 2 **m long** 0.5 **m wide** **datum :**

groundwater	env samples	PID reading (ppm)	geo samples	field tests	depth or R.L. in meters	graphic log	classification symbol	MATERIAL DESCRIPTION soil type, plasticity or particle characteristic, colour, secondary and minor components.	moisture condition	consistency density index	hand penetrometer kPa	Remarks and additional observations
Dry	G		DS		0			TOPSOIL; Silty Clay, low plasticity, brown, trace of roots				
							CL-CI	Silty CLAY, low to medium plasticity, grey-brown, trace of ironstones , with river gravels	M<PL	F-St		Alluvium
			DS/DB		0.5		CH	CLAY, high plasticity, yellow-brown, trace of ironstones	M<PL	St		
					1							
			DS		1.5		CI	Sandy CLAY, medium plasticity, light grey, with ironstones	M<PL	VSt		
					2							
					2.5			Test Pit No 3 terminated at 2.5m				
					3							
					3.5							
					4							
					4.5							

GEOTECHNIQUE
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engineering log - excavation

Client : Winten Property Group
Project : Marsden Park Precinct
Location : North West Growth Centre, Marsden Park

Job No : 12576/1
Pit No : 4
Date : 28/10/2011
Logged/Checked by: AN/ZA

Equipment type and model: Backhoe
R.L. surface :
Excavation dimensions : 2 **m long** 0.5 **m wide** **datum :**

groundwater	env samples	PID reading (ppm)	geo samples	field tests	depth or R.L. in meters	graphic log	classification symbol	MATERIAL DESCRIPTION soil type, plasticity or particle characteristic, colour, secondary and minor components.	moisture condition	consistency density index	hand penetrometer kPa	Remarks and additional observations
Dry	G		DS		0		CL-CI	TOPSOIL; Silty Clay, low plasticity, brown, trace of roots	M<PL	F-St		Alluvium
								Silty CLAY, low to medium plasticity, grey-brown, trace of ironstones				
							CH	CLAY, high plasticity, yellow-brown, trace of ironstones	M<PL	St		
					0.5							
			DS		1							
					1.5		CH	CLAY, high plasticity, pale grey, with ironstones	M=PL	St-VSt		
			DS		2							
					2.5			Test Pit No 4 terminated at 2.5m				
					3							
					3.5							
					4							
					4.5							

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engineering log - excavation

Client : Winten Property Group
Project : Marsden Park Precinct
Location : North West Growth Centre, Marsden Park

Job No : 12576/1
Pit No : 5
Date : 28/10/2011
Logged/Checked by: AN/ZA

Equipment type and model: Backhoe
R.L. surface :
Excavation dimensions : 2 **m long** 0.5 **m wide** **datum :**

groundwater	env samples	PID reading (ppm)	geo samples	field tests	depth or R.L. in meters	graphic log	classification symbol	MATERIAL DESCRIPTION soil type, plasticity or particle characteristic, colour, secondary and minor components.	moisture condition	consistency density index	hand penetrometer kPa	Remarks and additional observations
Dry	G		DS		0			TOPSOIL; Silty Clay, low plasticity, brown, trace of roots				
							CL-CI	Silty CLAY, low to medium plasticity, grey-brown, trace of ironstones	M<PL			Alluvium
			DS		0.5		CH	CLAY, high plasticity, yellow-brown, trace of ironstones	M<PL	St		
			DS		1.5		CH	CLAY, high plasticity, pale grey, trace of ironstones	M≤PL	St-VSt		
					2.5			Test Pit No 5 terminated at 2.5m				

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engineering log - excavation

Client : Winten Property Group
Project : Marsden Park Precinct
Location : North West Growth Centre, Marsden Park

Job No : 12576/1
Pit No : 6
Date : 28/10/2011
Logged/Checked by: AN/ZA

Equipment type and model: Backhoe
R.L. surface :
Excavation dimensions : 2 **m long** 0.5 **m wide** **datum :**

groundwater	env samples	PID reading (ppm)	geo samples	field tests	depth or R.L. in meters	graphic log	classification symbol	MATERIAL DESCRIPTION soil type, plasticity or particle characteristic, colour, secondary and minor components.	moisture condition	consistency density index	hand penetrometer kPa	Remarks and additional observations
Dry	G		DS		0		CL-CI	Silty CLAY, low to medium plasticity, grey-brown, trace of ironstones	M<PL	St		Alluvium
							CH	CLAY, high plasticity, yellow-brown, trace of ironstones	M<PL	St		
			DS		0.5		ML	SILT, low plasticity, brown, with rounded ironstones	M<PL	VSt		Alluvium
			DS		1.5							
					2							
					2.5			Test Pit No 6 terminated at 2.5m				
					3							
					3.5							
					4							
					4.5							

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engineering log - excavation

Client : Winten Property Group
Project : Marsden Park Precinct
Location : North West Growth Centre, Marsden Park

Job No : 12576/1
Pit No : 7
Date : 28/10/2011
Logged/Checked by: AN/ZA

Equipment type and model: Backhoe
R.L. surface :
Excavation dimensions : 2 **m long** 0.5 **m wide** **datum :**

groundwater	env samples	PID reading (ppm)	geo samples	field tests	depth or R.L. in meters	graphic log	classification symbol	MATERIAL DESCRIPTION soil type, plasticity or particle characteristic, colour, secondary and minor components.	moisture condition	consistency density index	hand penetrometer kPa	Remarks and additional observations
Dry	G		DS		0		ML	SILT, low plasticity, brown, with rounded ironstones	M<PL	F		Alluvium
					0.5		ML	Clayey SILT, low plasticity, orange, red	M<PL	St		
			DS		1							
					1.5							
			DS		2							
					2.5			Test Pit No 7 terminated at 2.5m				
					3							
					3.5							
					4							
					4.5							

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engineering log - excavation

Client : Winten Property Group
Project : Marsden Park Precinct
Location : North West Growth Centre, Marsden Park

Job No : 12576/1
Pit No : 8
Date : 28/10/2011
Logged/Checked by: AN/ZA

Equipment type and model: Backhoe
R.L. surface :
Excavation dimensions : 2 **m long** 0.5 **m wide** **datum :**

groundwater	env samples	PID reading (ppm)	geo samples	field tests	depth or R.L. in meters	graphic log	classification symbol	MATERIAL DESCRIPTION soil type, plasticity or particle characteristic, colour, secondary and minor components.	moisture condition	consistency density index	hand penetrometer kPa	Remarks and additional observations
	G		DS		0		CL-CI	Silty CLAY, low to medium plasticity, grey-brown, trace of ironstones	M≤PL	St		Alluvium
					0.5							
							CH	CLAY, high plasticity, yellow-brown, trace of ironstones	M=PL	St		
			DS		1							
					1.5		CI	Sandy CLAY, medium plasticity, light grey, with ironstones	M≥PL	St		Seepage @ 1.5m
			DS		2							
					2.5			Test Pit No 8 terminated at 2.5m				
					3							
					3.5							
					4							
					4.5							

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engineering log - excavation

Client : Winten Property Group
Project : Marsden Park Precinct
Location : North West Growth Centre, Marsden Park

Job No : 12576/1
Pit No : 9
Date : 28/10/2011
Logged/Checked by: AN/ZA

Equipment type and model: Backhoe
R.L. surface :
Excavation dimensions : 2 **m long** 0.5 **m wide** **datum :**

groundwater	env samples	PID reading (ppm)	geo samples	field tests	depth or R.L. in meters	graphic log	classification symbol	MATERIAL DESCRIPTION soil type, plasticity or particle characteristic, colour, secondary and minor components.	moisture condition	consistency density index	hand penetrometer kPa	Remarks and additional observations
	G		DS		0			TOPSOIL; Silty Clay, low plasticity, brown, trace of roots				
							CL-CI	Silty CLAY, low to medium plasticity, grey-brown, trace of ironstones	M<PL	F		Alluvium
			DS		0.5		CH	CLAY, high plasticity, yellow-brown, trace of ironstones	M≤PL	St		
Dry					1		CH	CLAY, high plasticity, pale grey, with ironstone and river gravels	M≤PL	VSt		
			DS		1.5							
					2							
					2.5			Test Pit No 9 terminated at 2.5m				
					3							
					3.5							
					4							
					4.5							

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engineering log - excavation

Client : Winten Property Group
Project : Marsden Park Precinct
Location : North West Growth Centre, Marsden Park

Job No : 12576/1
Pit No : 10
Date : 28/10/2011
Logged/Checked by: AN/ZA

Equipment type and model: Backhoe
R.L. surface :
Excavation dimensions : 2 **m long** 0.5 **m wide** **datum :**

groundwater	env samples	PID reading (ppm)	geo samples	field tests	depth or R.L. in meters	graphic log	classification symbol	MATERIAL DESCRIPTION soil type, plasticity or particle characteristic, colour, secondary and minor components.	moisture condition	consistency density index	hand penetrometer kPa	Remarks and additional observations
Dry	G/P/P G/P G		DS DS DS		0 0.5 1 1.5 2 2.5		CH CH	FILL; Sand, fine to medium grained, brown, with brick, concrete and sandstone fragments, trace of fibro cement fragments CLAY, high plasticity, yellow-brown, trace of ironstones CLAY, high plasticity, pale grey, with ironstones Test Pit No 10 terminated at 2.5m	M<PL M<PL	St VSt		D1 + SS1 Uncontrolled fill Alluvium

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engineering log - excavation

Client : Winten Property Group
Project : Marsden Park Precinct
Location : North West Growth Centre, Marsden Park

Job No : 12576/1
Pit No : 11
Date : 28/10/2011
Logged/Checked by: AN/ZA

Equipment type and model: Backhoe
R.L. surface :
Excavation dimensions : 2 **m long** 0.5 **m wide** **datum :**

groundwater	env samples	PID reading (ppm)	geo samples	field tests	depth or R.L. in meters	graphic log	classification symbol	MATERIAL DESCRIPTION soil type, plasticity or particle characteristic, colour, secondary and minor components.	moisture condition	consistency density index	hand penetrometer kPa	Remarks and additional observations
Dry	G		DS		0		ML	SILT, low plasticity, brown, with rounded ironstones	M<PL	St		Alluvium
			DS		0.5		CH	CLAY, high plasticity, yellow-brown, trace of ironstones	M<PL	St-VSt		Alluvium
			DS		1.5		CI	Sandy CLAY, medium plasticity, light grey, with ironstones and pockets of sand	M<PL	St-VSt		
					2.5			Test Pit No 11 terminated at 2.5m				
					3							
					3.5							
					4							
					4.5							

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engineering log - excavation

Client : Winten Property Group
Project : Marsden Park Precinct
Location : North West Growth Centre, Marsden Park

Job No : 12576/1
Pit No : 12
Date : 28/10/2011
Logged/Checked by: AN/ZA

Equipment type and model: Backhoe
R.L. surface :
Excavation dimensions : 2 **m long** 0.5 **m wide** **datum :**

groundwater	env samples	PID reading (ppm)	geo samples	field tests	depth or R.L. in meters	graphic log	classification symbol	MATERIAL DESCRIPTION soil type, plasticity or particle characteristic, colour, secondary and minor components.	moisture condition	consistency density index	hand penetrometer kPa	Remarks and additional observations
Dry	G		DS		0		CH	TOPSOIL; Silty Clay, low plasticity, brown, trace of roots				
							CH	CLAY, high plasticity, yellow-brown, trace of ironstones	M≤PL	St		Alluvium
					0.5		CH	CLAY, high plasticity, pale grey, trace of ironstones	M<PL	St-VSt		
			DS		1							
					1.5							
			DS		2							
					2.5			Test Pit No 12 terminated at 2.5m				
					3							
					3.5							
					4							
					4.5							

GEOTECHNIQUE
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engineering log - excavation

Client : Winten Property Group
Project : Marsden Park Precinct
Location : North West Growth Centre, Marsden Park

Job No : 12576/1
Pit No : 13
Date : 28/10/2011
Logged/Checked by: AN/ZA

Equipment type and model: Backhoe
R.L. surface :
Excavation dimensions : 2 **m long** 0.5 **m wide** **datum :**

groundwater	env samples	PID reading (ppm)	geo samples	field tests	depth or R.L. in meters	graphic log	classification symbol	MATERIAL DESCRIPTION soil type, plasticity or particle characteristic, colour, secondary and minor components.	moisture condition	consistency density index	hand penetrometer kPa	Remarks and additional observations
Dry	G		DS		0		CL-CI	Silty CLAY, low to medium plasticity, grey-brown, trace of ironstones	M<PL	F-St		Alluvium
							CH	CLAY, high plasticity, yellow-brown, trace of ironstones	M≤PL	F-St		
			DS		0.5							
					1							
					1.5		CH	CLAY, high plasticity, pale grey, trace of ironstones	M≤PL	St		
			DS		2							
					2.5			Test Pit No 13 terminated at 2.5m				
					3							
					3.5							
					4							
					4.5							

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engineering log - excavation

Client : Winten Property Group
Project : Marsden Park Precinct
Location : North West Growth Centre, Marsden Park

Job No : 12576/1
Pit No : 14
Date : 27/10/2011
Logged/Checked by: AN/ZA

Equipment type and model: Backhoe
R.L. surface :
Excavation dimensions : 2 **m long** 0.5 **m wide** **datum :**

groundwater	env samples	PID reading (ppm)	geo samples	field tests	depth or R.L. in meters	graphic log	classification symbol	MATERIAL DESCRIPTION soil type, plasticity or particle characteristic, colour, secondary and minor components.	moisture condition	consistency density index	hand penetrometer kPa	Remarks and additional observations
	G		DS		0			TOPSOIL; Silty Clay, low plasticity, brown, trace of roots				
							CH	CLAY, high plasticity, yellow-brown, trace of ironstones	M≤PL	St		Alluvium
			DS		0.5		CH	CLAY, high plasticity, pale grey, trace of ironstones	M<PL	St-VSt		
			DS		1.5		CH	CLAY, high plasticity, pale grey, with ironstones and shale fragments	M<PL	VSt		Possible Residual
Dry					2			SHALE, grey, low to medium strength, extremely to distinctly weathered				Bedrock
					2.5			Test pit No 14 terminated at 2.3m on shale bedrock				
					3							
					3.5							
					4							
					4.5							

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engineering log - excavation

Client : Winten Property Group
Project : Marsden Park Precinct
Location : North West Growth Centre, Marsden Park

Job No : 12576/1
Pit No : 15
Date : 27/10/2011
Logged/Checked by: AN/ZA

Equipment type and model: Backhoe
R.L. surface :
Excavation dimensions : 2 **m long** 0.5 **m wide** **datum :**

groundwater	env samples	PID reading (ppm)	geo samples	field tests	depth or R.L. in meters	graphic log	classification symbol	MATERIAL DESCRIPTION soil type, plasticity or particle characteristic, colour, secondary and minor components.	moisture condition	consistency density index	hand penetrometer kPa	Remarks and additional observations
	G		DS		0			TOPSOIL; Silty Clay, low plasticity, brown, trace of roots				
							CH	CLAY, high plasticity, yellow-brown, trace of ironstones	M<PL	St		Alluvium
					0.5							
							CI-CH	Silty CLAY, medium to high plasticity, grey-brown, with ironstones and siltstones	M≤PL	VSt-H		
			DS		1							
					1.5		CH	CLAY, high plasticity, pale grey, with ironstones and shale fragments	M≤PL	VSt		Residual
Dry			DS		2							
					2.5			Test Pit No 15 terminated at 2.5m				
					3							
					3.5							
					4							
					4.5							

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engineering log - excavation

Client : Winten Property Group
Project : Marsden Park Precinct
Location : North West Growth Centre, Marsden Park

Job No : 12576/1
Pit No : 16
Date : 27/10/2011
Logged/Checked by: AN/ZA

Equipment type and model: Backhoe
R.L. surface :
Excavation dimensions : 2 **m long** 0.5 **m wide** **datum :**

groundwater	env samples	PID reading (ppm)	geo samples	field tests	depth or R.L. in meters	graphic log	classification symbol	MATERIAL DESCRIPTION soil type, plasticity or particle characteristic, colour, secondary and minor components.	moisture condition	consistency density index	hand penetrometer kPa	Remarks and additional observations
Dry	G		DS		0			TOPSOIL; Silty Clay, low plasticity, brown, trace of roots				
							CL-CI	Silty CLAY, low to medium plasticity, grey-brown, trace of ironstones	M≤PL	F-St		Alluvium
			DS		0.5		CH	CLAY, high plasticity, pale grey, with ironstones	M≤PL	St-VSt		
			DS		1							
					1.5							
					2							
					2.5			Test Pit No 16 terminated at 2.5m				
					3							
					3.5							
					4							
					4.5							

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engineering log - excavation

Client : Winten Property Group
Project : Marsden Park Precinct
Location : North West Growth Centre, Marsden Park

Job No : 12576/1
Pit No : 17
Date : 31/10/2011
Logged/Checked by: AN/ZA

Equipment type and model: Backhoe
R.L. surface :
Excavation dimensions : 2 **m long** 0.5 **m wide** **datum :**

groundwater	env samples	PID reading (ppm)	geo samples	field tests	depth or R.L. in meters	graphic log	classification symbol	MATERIAL DESCRIPTION soil type, plasticity or particle characteristic, colour, secondary and minor components.	moisture condition	consistency density index	hand penetrometer kPa	Remarks and additional observations
	G		DS		0			TOPSOIL; Silty Clay, low plasticity, brown, trace of roots				
							ML	SILT, low plasticity, brown, with rounded ironstones	M<PL	F		Alluvium
					0.5		CH	CLAY, high plasticity, yellow-brown, trace of ironstones	M<PL	F-St		Alluvium
			DS/DB		1							
					1.5		CH	CLAY, high plasticity, pale grey, trace of ironstones, with ironstones and river gravels	M<PL	St-VSt		
Dry			DS		2							
					2.5			Test Pit No 17 terminated at 2.5m				
					3							
					3.5							
					4							
					4.5							

GEOTECHNIQUE
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engineering log - excavation

Client : Winten Property Group
Project : Marsden Park Precinct
Location : North West Growth Centre, Marsden Park

Job No : 12576/1
Pit No : 18
Date : 28/10/2011
Logged/Checked by: AN/ZA

Equipment type and model: Backhoe
R.L. surface :
Excavation dimensions : 2 **m long** 0.5 **m wide** **datum :**

groundwater	env samples	PID reading (ppm)	geo samples	field tests	depth or R.L. in meters	graphic log	classification symbol	MATERIAL DESCRIPTION soil type, plasticity or particle characteristic, colour, secondary and minor components.	moisture condition	consistency density index	hand penetrometer kPa	Remarks and additional observations
	G		DS		0			TOPSOIL; Silty Clay, low plasticity, brown, trace of roots				
							CL-CI	Silty CLAY, low to medium plasticity, grey-brown, trace of ironstones	M<PL	F		Alluvium
					0.5		CH	CLAY, high plasticity, pale grey, trace of ironstones	M=PL	St		
					1							
					1.5							
							CI	Sandy CLAY, medium plasticity, light grey, with ironstones and river gravels	M≥PL	VSt		
			DS		2							
Dry					2.5			Test Pit No 18 terminated at 2.5m				
					3							
					3.5							
					4							
					4.5							

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engineering log - excavation

Client : Winten Property Group
Project : Marsden Park Precinct
Location : North West Growth Centre, Marsden Park

Job No : 12576/1
Pit No : 19
Date : 28/10/2011
Logged/Checked by: AN/ZA

Equipment type and model: Backhoe
R.L. surface :
Excavation dimensions : 2 **m long** 0.5 **m wide** **datum :**

groundwater	env samples	PID reading (ppm)	geo samples	field tests	depth or R.L. in meters	graphic log	classification symbol	MATERIAL DESCRIPTION soil type, plasticity or particle characteristic, colour, secondary and minor components.	moisture condition	consistency density index	hand penetrometer kPa	Remarks and additional observations
Dry	G		DS		0			TOPSOIL; Silty Clay, low plasticity, brown, trace of roots				
							CL-CI	Silty CLAY, low to medium plasticity, grey-brown, trace of ironstones	M<PL	F		Alluvium
							CH	CLAY, high plasticity, yellow-brown, trace of ironstones	M≤PL	St		
			DS		0.5							
							CH	CLAY, high plasticity, pale grey, trace of ironstones	M=PL	St		
			DS		1.5							
					2							
					2.5			Test Pit No 19 terminated at 2.5m				
					3							
					3.5							
					4							
					4.5							

GEOTECHNIQUE
PTY LTD

engineering log - excavation

Client : Winten Property Group
Project : Marsden Park Precinct
Location : North West Growth Centre, Marsden Park

Job No : 12576/1
Pit No : 20
Date : 31/10/2011
Logged/Checked by: AN/ZA

Equipment type and model: Backhoe
R.L. surface :
Excavation dimensions : 2 **m long** 0.5 **m wide** **datum :**

groundwater	env samples	PID reading (ppm)	geo samples	field tests	depth or R.L. in meters	graphic log	classification symbol	MATERIAL DESCRIPTION soil type, plasticity or particle characteristic, colour, secondary and minor components.	moisture condition	consistency density index	hand penetrometer kPa	Remarks and additional observations
	G		DS		0		CL-CI	Silty CLAY, low to medium plasticity, grey-brown, trace of ironstones	M≤PL	F		Alluvium
							CH	CLAY, high plasticity, yellow-brown, trace of ironstones	M≥PL	F-St		
			DS/DB		0.5							
							CI	Sandy CLAY, medium plasticity, light grey, with ironstones				
			DS		1.5							Ironstones and river gravels from 1.5m Seepage @ 1.5m
					2							
					2.5			Test Pit No 20 terminated at 2.5m				
					3							
					3.5							
					4							
					4.5							

GEOTECHNIQUE
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engineering log - excavation

Client : Winten Property Group
Project : Marsden Park Precinct
Location : North West Growth Centre, Marsden Park

Job No : 12576/1
Pit No : 21
Date : 27/10/2011
Logged/Checked by: AN/ZA

Equipment type and model: Backhoe
R.L. surface :
Excavation dimensions : 2 **m long** 0.5 **m wide** **datum :**

groundwater	env samples	PID reading (ppm)	geo samples	field tests	depth or R.L. in meters	graphic log	classification symbol	MATERIAL DESCRIPTION soil type, plasticity or particle characteristic, colour, secondary and minor components.	moisture condition	consistency density index	hand penetrometer kPa	Remarks and additional observations
Dry	G		DS		0		CL-CI	TOPSOIL; Silty Clay, low plasticity, brown, trace of roots	M>PL	F		Alluvium
								Silty CLAY, low to medium plasticity, grey-brown, trace of ironstones				
							CH	CLAY, high plasticity, pale grey, trace of ironstones	M=PL	F-St		
			DS		0.5							
					1							
					1.5							
			DS		2							
					2.5			Test Pit No 21 terminated at 2.5m				
					3							
					3.5							
					4							
					4.5							

GEOTECHNIQUE
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engineering log - excavation

Client : Winten Property Group
Project : Marsden Park Precinct
Location : North West Growth Centre, Marsden Park

Job No : 12576/1
Pit No : 22
Date : 27/10/2011
Logged/Checked by: AN/ZA

Equipment type and model: Backhoe
R.L. surface :
Excavation dimensions : 2 **m long** 0.5 **m wide** **datum :**

groundwater	env samples	PID reading (ppm)	geo samples	field tests	depth or R.L. in meters	graphic log	classification symbol	MATERIAL DESCRIPTION soil type, plasticity or particle characteristic, colour, secondary and minor components.	moisture condition	consistency density index	hand penetrometer kPa	Remarks and additional observations
Dry	G		DS		0		ML	SILT, low plasticity, brown, with rounded ironstones				Alluvium
							CH	CLAY, high plasticity, yellow-brown, with ironstones	M≥PL	St-VSt		Alluvium
			DS		0.5							
					1							
					1.5							
			DS		2		CH	CLAY, high plasticity, pale grey, trace of ironstones	M<PL	VSt		
					2.5			Test Pit No 22 terminated at 2.5m				
					3							
					3.5							
					4							
					4.5							

GEOTECHNIQUE
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engineering log - excavation

Client : Winten Property Group
Project : Marsden Park Precinct
Location : North West Growth Centre, Marsden Park

Job No : 12576/1
Pit No : 23
Date : 27/10/2011
Logged/Checked by: AN/ZA

Equipment type and model: Backhoe
R.L. surface :
Excavation dimensions : 2 **m long** 0.5 **m wide** **datum :**

groundwater	env samples	PID reading (ppm)	geo samples	field tests	depth or R.L. in meters	graphic log	classification symbol	MATERIAL DESCRIPTION soil type, plasticity or particle characteristic, colour, secondary and minor components.	moisture condition	consistency density index	hand penetrometer kPa	Remarks and additional observations
	G		DS		0		ML	SILT, low plasticity, brown, with rounded ironstones				Alluvium
							CH	CLAY, high plasticity, yellow-brown, with ironstones	M≤PL	St		Alluvium
			DS		0.5							
							CH	CLAY, high plasticity, pale grey, trace of ironstones	M=PL	St		
			DS		1							
					1.5							
					2							
Dry					2.5			Test Pit No 23 terminated at 2.5m				
					3							
					3.5							
					4							
					4.5							

GEOTECHNIQUE
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engineering log - excavation

Client : Winten Property Group
Project : Marsden Park Precinct
Location : North West Growth Centre, Marsden Park

Job No : 12576/1
Pit No : 24
Date : 27/10/2011
Logged/Checked by: AN/ZA

Equipment type and model: Backhoe
R.L. surface :
Excavation dimensions : 2 **m long** 0.5 **m wide** **datum :**

groundwater	env samples	PID reading (ppm)	geo samples	field tests	depth or R.L. in meters	graphic log	classification symbol	MATERIAL DESCRIPTION soil type, plasticity or particle characteristic, colour, secondary and minor components.	moisture condition	consistency density index	hand penetrometer kPa	Remarks and additional observations
	G		DS		0		ML	SILT, low plasticity, brown, with rounded ironstones	M<PL	F		Alluvium
							CH	CLAY, high plasticity, yellow-brown, with ironstones	M≥PL	St-VSt		Alluvium
					0.5							
					1							
			DS		1.5							
					2							
Dry			DS				CH	CLAY, high plasticity, pale grey, with ironstones and shale fragments	M=PL	VSt		Possible Residual
					2.5			Test Pit No 24 terminated at 2.5m				
					3							
					3.5							
					4							
					4.5							

GEOTECHNIQUE
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engineering log - excavation

Client : Winten Property Group
Project : Marsden Park Precinct
Location : North West Growth Centre, Marsden Park

Job No : 12576/1
Pit No : 25
Date : 27/10/2011
Logged/Checked by: AN/ZA

Equipment type and model: Backhoe
R.L. surface :
Excavation dimensions : 2 **m long** 0.5 **m wide** **datum :**

groundwater	env samples	PID reading (ppm)	geo samples	field tests	depth or R.L. in meters	graphic log	classification symbol	MATERIAL DESCRIPTION soil type, plasticity or particle characteristic, colour, secondary and minor components.	moisture condition	consistency density index	hand penetrometer kPa	Remarks and additional observations
Dry	G		DS		0		CL-CI	Silty CLAY, low to medium plasticity, grey-brown, trace of ironstones	M<PL	F		Alluvium
					0.5		CH	CLAY, high plasticity, yellow-brown, trace of ironstones	M=PL	St		
			DS		1							
					1.5		CI	Sandy CLAY, medium plasticity, light grey, with ironstones and river gravels	M≥PL	VSt		
			DS		2							
					2.5			Test Pit No 25 terminated at 2.5m				
					3							
					3.5							
					4							
					4.5							

GEOTECHNIQUE
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engineering log - excavation

Client : Winten Property Group
Project : Marsden Park Precinct
Location : North West Growth Centre, Marsden Park

Job No : 12576/1
Pit No : 26
Date : 27/10/2011
Logged/Checked by: AN/ZA

Equipment type and model: Backhoe
R.L. surface :
Excavation dimensions : 2 **m long** 0.5 **m wide** **datum :**

groundwater	env samples	PID reading (ppm)	geo samples	field tests	depth or R.L. in meters	graphic log	classification symbol	MATERIAL DESCRIPTION soil type, plasticity or particle characteristic, colour, secondary and minor components.	moisture condition	consistency density index	hand penetrometer kPa	Remarks and additional observations
	G		DS		0		CL-CI	Silty CLAY, low to medium plasticity, grey-brown, trace of ironstones	M=PL	F-St		Alluvium
							CH	CLAY, high plasticity, yellow-brown, trace of ironstones, with river gravels	M>PL	St-VSt		
			DS		0.5							Seepage @ 0.5m
					1							
			DS		1.5		CI	Sandy CLAY, medium plasticity, light grey, with ironstones and river gravels	M>PL	VSt		
					2							
					2.5			Test Pit No 26 terminated at 2.5m				
					3							
					3.5							
					4							
					4.5							

GEOTECHNIQUE
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engineering log - excavation

Client : Winten Property Group
Project : Marsden Park Precinct
Location : North West Growth Centre, Marsden Park

Job No : 12576/1
Pit No : 27
Date : 27/10/2011
Logged/Checked by: AN/ZA

Equipment type and model: Backhoe
R.L. surface :
Excavation dimensions : 2 **m long** 0.5 **m wide** **datum :**

groundwater	env samples	PID reading (ppm)	geo samples	field tests	depth or R.L. in meters	graphic log	classification symbol	MATERIAL DESCRIPTION soil type, plasticity or particle characteristic, colour, secondary and minor components.	moisture condition	consistency density index	hand penetrometer kPa	Remarks and additional observations
	G		DS		0		ML	SILT, low plasticity, brown, with rounded ironstones	M=PL	F		Alluvium
							CI	Sandy CLAY, medium plasticity, light grey, with ironstones	M>PL	St-VSt		Alluvium
			DS		0.5							
					1							
			DS		1.5							
					2			Ironstones and rounded river gravels from 2.0-2.3m				Ironstones and rounded river gravels from 2.0-2.3m
Dry							CH	CLAY, high plasticity, pale grey, with ironstones	M=PL	VSt		
					2.5			Test Pit No 27 terminated at 2.5m				
					3							
					3.5							
					4							
					4.5							

GEOTECHNIQUE
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engineering log - excavation

Client : Winten Property Group
Project : Marsden Park Precinct
Location : North West Growth Centre, Marsden Park

Job No : 12576/1
Pit No : 28
Date : 28/10/2011
Logged/Checked by: AN/ZA

Equipment type and model: Backhoe
R.L. surface :
Excavation dimensions : 2 **m long** 0.5 **m wide** **datum :**

groundwater	env samples	PID reading (ppm)	geo samples	field tests	depth or R.L. in meters	graphic log	classification symbol	MATERIAL DESCRIPTION soil type, plasticity or particle characteristic, colour, secondary and minor components.	moisture condition	consistency density index	hand penetrometer kPa	Remarks and additional observations
	G		DS		0			TOPSOIL; Silty Clay, low plasticity, brown, trace of roots				
							CL-CI	Silty CLAY, low to medium plasticity, grey-brown, trace of ironstones	M>PL	F		Alluvium
							CH	CLAY, high plasticity, yellow-brown, trace of ironstones	M≤PL	St		
			DS		0.5							
							CI	Sandy CLAY, medium plasticity, light grey, with ironstones and river gravels	M<PL	VSt-H		
Dry			DS		1.5							
								Test Pit No 28 terminated at 1.6m due to refusal on river gravels/cobbles				
					2							
					2.5							
					3							
					3.5							
					4							
					4.5							

GEOTECHNIQUE
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engineering log - excavation

Client : Winten Property Group
Project : Marsden Park Precinct
Location : North West Growth Centre, Marsden Park

Job No : 12576/1
Pit No : 29
Date : 28/10/2011
Logged/Checked by: AN/ZA

Equipment type and model: Backhoe
R.L. surface :
Excavation dimensions : 2 **m long** 0.5 **m wide** **datum :**

groundwater	env samples	PID reading (ppm)	geo samples	field tests	depth or R.L. in meters	graphic log	classification symbol	MATERIAL DESCRIPTION soil type, plasticity or particle characteristic, colour, secondary and minor components.	moisture condition	consistency density index	hand penetrometer kPa	Remarks and additional observations
Dry	G		DS		0			TOPSOIL; Silty Clay, low plasticity, brown, trace of roots				
							CL-CI	Silty CLAY, low to medium plasticity, grey-brown, trace of ironstones	M<PL	F		Alluvium
					0.5		CH	CLAY, high plasticity, yellow-brown, trace of ironstones	M<PL	St		
			DS		1		CH	CLAY, high plasticity, pale grey, trace of ironstones	M<PL	St-VSt		
			DS		1.5							
					2							
					2.5			Test Pit No 29 terminated at 2.5m				
					3							
					3.5							
					4							
					4.5							

GEOTECHNIQUE
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engineering log - excavation

Client : Winten Property Group
Project : Marsden Park Precinct
Location : North West Growth Centre, Marsden Park

Job No : 12576/1
Pit No : 30
Date : 28/10/2011
Logged/Checked by: AN/ZA

Equipment type and model: Backhoe
R.L. surface :
Excavation dimensions : 2 **m long** 0.5 **m wide** **datum :**

groundwater	env samples	PID reading (ppm)	geo samples	field tests	depth or R.L. in meters	graphic log	classification symbol	MATERIAL DESCRIPTION soil type, plasticity or particle characteristic, colour, secondary and minor components.	moisture condition	consistency density index	hand penetrometer kPa	Remarks and additional observations
	G		DS		0			TOPSOIL; Silty Clay, low plasticity, brown, trace of roots, with river pebbles				
							CL-CI	Silty CLAY, low to medium plasticity, grey-brown, trace of ironstones , with river gravels	M<PL	St-VSt		Alluvium
					0.5		CH	CLAY, high plasticity, yellow-brown, with ironstones and river gravels	M≥PL	VSt		
			DS		1							
							CH	CLAY, high plasticity, pale grey, with ironstones	M=PL	VSt		Seepage @ 1.1m
			DS		1.5							
					2							
					2.5			Test Pit No 30 terminated at 2.5m				
					3							
					3.5							
					4							
					4.5							

GEOTECHNIQUE
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engineering log - excavation

Client : Winten Property Group
Project : Marsden Park Precinct
Location : North West Growth Centre, Marsden Park

Job No : 12576/1
Pit No : 31
Date : 27/10/2011
Logged/Checked by: AN/ZA

Equipment type and model: Backhoe
R.L. surface :
Excavation dimensions : 2 **m long** 0.5 **m wide** **datum :**

groundwater	env samples	PID reading (ppm)	geo samples	field tests	depth or R.L. in meters	graphic log	classification symbol	MATERIAL DESCRIPTION soil type, plasticity or particle characteristic, colour, secondary and minor components.	moisture condition	consistency density index	hand penetrometer kPa	Remarks and additional observations
	G		DS		0		CL-CI	Silty CLAY, low to medium plasticity, grey-brown, trace of ironstones	M≥PL	F		Alluvium
							CH	CLAY, high plasticity, yellow-brown, trace of ironstones	M≥PL	St		
					0.5		CI	Sandy CLAY, medium plasticity, light grey, with ironstones	M>PL	VSt		Seepage @ 0.6m
			DS		1							
					1.5							
							CH	CLAY, high plasticity, pale grey, with ironstones	M>PL	VSt		
			DS		2							
					2.5			Test Pit No 31 terminated at 2.5m				
					3							
					3.5							
					4							
					4.5							

GEOTECHNIQUE
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engineering log - excavation

Client : Winten Property Group
Project : Marsden Park Precinct
Location : North West Growth Centre, Marsden Park

Job No : 12576/1
Pit No : 32
Date : 27/10/2011
Logged/Checked by: AN/ZA

Equipment type and model: Backhoe
R.L. surface :
Excavation dimensions : 2 **m long** 0.5 **m wide** **datum :**

groundwater	env samples	PID reading (ppm)	geo samples	field tests	depth or R.L. in meters	graphic log	classification symbol	MATERIAL DESCRIPTION soil type, plasticity or particle characteristic, colour, secondary and minor components.	moisture condition	consistency density index	hand penetrometer kPa	Remarks and additional observations
Dry	G		DS		0		CL-CI	Silty CLAY, low to medium plasticity, grey-brown, trace of ironstones	M<PL	F-St		Alluvium
			DS		0.5		CH	Sandy CLAY, high plasticity, light grey, with ironstones	M≥PL	St-VSt		
			DS		1							
					1.5							
					2		CH	CLAY, high plasticity, pale grey, trace of ironstones	M≤PL	VSt		
					2.5			Test Pit No 32 terminated at 2.5m				
					3							
					3.5							
					4							
					4.5							

GEOTECHNIQUE
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engineering log - excavation

Client : Winten Property Group
Project : Marsden Park Precinct
Location : North West Growth Centre, Marsden Park

Job No : 12576/1
Pit No : 33
Date : 27/10/2011
Logged/Checked by: AN/ZA

Equipment type and model: Backhoe
R.L. surface :
Excavation dimensions : 2 **m long** 0.5 **m wide** **datum :**

groundwater	env samples	PID reading (ppm)	geo samples	field tests	depth or R.L. in meters	graphic log	classification symbol	MATERIAL DESCRIPTION soil type, plasticity or particle characteristic, colour, secondary and minor components.	moisture condition	consistency density index	hand penetrometer kPa	Remarks and additional observations
Dry	G		DS		0		ML	SILT, low plasticity, brown, with rounded ironstones	M<PL	F-St		Alluvium
					0.5		CH	CLAY, high plasticity, yellow-brown, trace of ironstones	M≥PL	St		Alluvium
			DS		1							
					1.5		CI	Sandy CLAY, medium plasticity, light grey, with ironstones	M=PL	St-VSt		
			DS		2							
					2.5			Test Pit No 33 terminated at 2.5m				
					3							
					3.5							
					4							
					4.5							

GEOTECHNIQUE
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engineering log - excavation

Client : Winten Property Group
Project : Marsden Park Precinct
Location : North West Growth Centre, Marsden Park

Job No : 12576/1
Pit No : 34
Date : 27/10/2011
Logged/Checked by: AN/ZA

Equipment type and model: Backhoe
R.L. surface :
Excavation dimensions : 2 **m long** 0.5 **m wide** **datum :**

groundwater	env samples	PID reading (ppm)	geo samples	field tests	depth or R.L. in meters	graphic log	classification symbol	MATERIAL DESCRIPTION soil type, plasticity or particle characteristic, colour, secondary and minor components.	moisture condition	consistency density index	hand penetrometer kPa	Remarks and additional observations
Dry	G		DS		0		ML	SILT, low plasticity, brown, with rounded ironstones				Alluvium
							CH	CLAY, high plasticity, yellow-brown, trace of ironstones	M=PL	St		Alluvium
			DS		0.5							
					1		Cl	Sandy CLAY, medium plasticity, light grey, with ironstones	M≤PL	VSt		
			DS		1.5							
					2							
					2.5			Test Pit No 34 terminated at 2.5m				
					3							
					3.5							
					4							
					4.5							

GEOTECHNIQUE
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engineering log - excavation

Client : Winten Property Group
Project : Marsden Park Precinct
Location : North West Growth Centre, Marsden Park

Job No : 12576/1
Pit No : 35
Date : 27/10/2011
Logged/Checked by: AN/ZA

Equipment type and model: Backhoe
R.L. surface :
Excavation dimensions : 2 **m long** 0.5 **m wide** **datum :**

groundwater	env samples	PID reading (ppm)	geo samples	field tests	depth or R.L. in meters	graphic log	classification symbol	MATERIAL DESCRIPTION soil type, plasticity or particle characteristic, colour, secondary and minor components.	moisture condition	consistency density index	hand penetrometer kPa	Remarks and additional observations
Dry	G		DS		0		CL-CI	TOPSOIL; Silty Clay, low plasticity, brown, trace of roots	M<PL	F-St		Alluvium
								Silty CLAY, low to medium plasticity, grey-brown, trace of ironstones				
							CH	CLAY, high plasticity, yellow-brown, trace of ironstones	M≥PL	St		
			DS		0.5							
					1							
					1.5							
			DS		2		CH	CLAY, high plasticity, pale grey, trace of ironstones	M≤PL	VSt		
					2.5			Test Pit No 35 terminated at 2.5m				
					3							
					3.5							
					4							
					4.5							

GEOTECHNIQUE
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engineering log - excavation

Client : Winten Property Group
Project : Marsden Park Precinct
Location : North West Growth Centre, Marsden Park

Job No : 12576/1
Pit No : 36
Date : 28/10/2011
Logged/Checked by: AN/ZA

Equipment type and model: Backhoe
R.L. surface :
Excavation dimensions : 2 **m long** 0.5 **m wide** **datum :**

groundwater	env samples	PID reading (ppm)	geo samples	field tests	depth or R.L. in meters	graphic log	classification symbol	MATERIAL DESCRIPTION soil type, plasticity or particle characteristic, colour, secondary and minor components.	moisture condition	consistency density index	hand penetrometer kPa	Remarks and additional observations
Dry	G		DS		0			TOPSOIL; Silty Clay, low plasticity, brown, trace of roots				
							CL-CI	Silty CLAY, low to medium plasticity, grey-brown, trace of ironstones	M<PL	F-St		Alluvium
					0.5		CH	CLAY, high plasticity, yellow-brown, trace of ironstones	M<PL	St		
			DS		1		CH	CLAY, high plasticity, pale grey, trace of ironstones	M≤PL	St-VSt		Ironstone inclusion increases with depth
					1.5							
			DS		2							
					2.5							
					3			Test Pit No 36 terminated at 3.0m				
					3.5							
					4							
					4.5							

GEOTECHNIQUE
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engineering log - excavation

Client : Winten Property Group
Project : Marsden Park Precinct
Location : North West Growth Centre, Marsden Park

Job No : 12576/1
Pit No : 37
Date : 01/11/2011
Logged/Checked by: AN/ZA

Equipment type and model: Backhoe
R.L. surface :
Excavation dimensions : 2 **m long** 0.5 **m wide** **datum :**

groundwater	env samples	PID reading (ppm)	geo samples	field tests	depth or R.L. in meters	graphic log	classification symbol	MATERIAL DESCRIPTION soil type, plasticity or particle characteristic, colour, secondary and minor components.	moisture condition	consistency density index	hand penetrometer kPa	Remarks and additional observations
Dry	G		DS		0		ML	SILT, low plasticity, brown, with rounded ironstones	M<PL	F-St		Alluvium
							CL-CI	Silty CLAY, low to medium plasticity, grey-brown, trace of ironstones	M<PL	St		Alluvium
					0.5		CI-CH	Silty CLAY, medium to high plasticity, grey-brown, with ironstones and siltstones	M<PL	St-VSt		
			DS/DB		1							
					1.5							
			DS		2							
					2.5			Test Pit No 37 terminated at 2.5m				
					3							
					3.5							
					4							
					4.5							

GEOTECHNIQUE
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engineering log - excavation

Client : Winten Property Group
Project : Marsden Park Precinct
Location : North West Growth Centre, Marsden Park

Job No : 12576/1
Pit No : 38
Date : 01/11/2011
Logged/Checked by: AN/ZA

Equipment type and model: Backhoe
R.L. surface :
Excavation dimensions : 2 **m long** 0.5 **m wide**
datum :

groundwater	env samples	PID reading (ppm)	geo samples	field tests	depth or R.L. in meters	graphic log	classification symbol	MATERIAL DESCRIPTION soil type, plasticity or particle characteristic, colour, secondary and minor components.	moisture condition	consistency density index	hand penetrometer kPa	Remarks and additional observations
Dry	G		DS		0		ML	SILT, low plasticity, brown, with rounded ironstones	M<PL	St		Alluvium
					0.5		CL-CI	Silty CLAY, low to medium plasticity, grey-brown, trace of ironstones	M<PL	St		Alluvium
			DS				CI-CH	Silty CLAY, medium to high plasticity, grey-brown, with ironstones and siltstones	M<PL	VSt		
					1							
					1.5							
			DS/DB				CH	CLAY, high plasticity, pale grey, trace of ironstones	M<PL	VSt		
					2							
					2.5			Test Pit No 38 terminated at 2.5m				
					3							
					3.5							
					4							
					4.5							

GEOTECHNIQUE
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engineering log - excavation

Client : Winten Property Group
Project : Marsden Park Precinct
Location : North West Growth Centre, Marsden Park

Job No : 12576/1
Pit No : 39
Date : 01/11/2011
Logged/Checked by: AN/ZA

Equipment type and model: Backhoe
R.L. surface :
Excavation dimensions : 2 **m long** 0.5 **m wide** **datum :**

groundwater	env samples	PID reading (ppm)	geo samples	field tests	depth or R.L. in meters	graphic log	classification symbol	MATERIAL DESCRIPTION soil type, plasticity or particle characteristic, colour, secondary and minor components.	moisture condition	consistency density index	hand penetrometer kPa	Remarks and additional observations
Dry	G		DS		0			TOPSOIL; Silty Clay, low plasticity, brown, trace of roots				
							CL-CI	Silty CLAY, low to medium plasticity, grey-brown, trace of ironstones	M<PL	St		Alluvium
					0.5		CI-CH	Silty CLAY, medium to high plasticity, grey-brown, with ironstones and siltstones	M<PL	St-VSt		
			DS		1		CH	CLAY, high plasticity, yellow-brown, trace of ironstones	M<PL	VSt		
					1.5		CH	CLAY, high plasticity, pale grey, trace of ironstones	M<PL	VSt		
			DS/DB		2							
					2.5			Test Pit No 39 terminated at 2.5m				
					3							
					3.5							
					4							
					4.5							

GEOTECHNIQUE
PTY LTD

engineering log - excavation

Client : Winten Property Group
Project : Marsden Park Precinct
Location : North West Growth Centre, Marsden Park

Job No : 12576/1
Pit No : 40
Date : 01/11/2011
Logged/Checked by: AN/ZA

Equipment type and model: Backhoe
R.L. surface :
Excavation dimensions : 2 **m long** 0.5 **m wide** **datum :**

groundwater	env samples	PID reading (ppm)	geo samples	field tests	depth or R.L. in meters	graphic log	classification symbol	MATERIAL DESCRIPTION soil type, plasticity or particle characteristic, colour, secondary and minor components.	moisture condition	consistency density index	hand penetrometer kPa	Remarks and additional observations
Dry	G		DS		0		ML	SILT, low plasticity, brown, with rounded ironstones	M<PL	F		Alluvium
							CI	Sandy CLAY, medium plasticity, light grey, with ironstones	M<PL	St-VSt		Alluvium
			DS/DB		0.5							
					1							
			DS		1.5							
					2							
					2.5			Test Pit No 40 terminated at 2.5m				
					3							
					3.5							
					4							
					4.5							

GEOTECHNIQUE
PTY LTD

engineering log - excavation

Client : Winten Property Group
Project : Marsden Park Precinct
Location : North West Growth Centre, Marsden Park

Job No : 12576/1
Pit No : 41
Date : 01/11/2011
Logged/Checked by: AN/ZA

Equipment type and model: Backhoe
R.L. surface :
Excavation dimensions : 2 **m long** 0.5 **m wide** **datum :**

groundwater	env samples	PID reading (ppm)	geo samples	field tests	depth or R.L. in meters	graphic log	classification symbol	MATERIAL DESCRIPTION soil type, plasticity or particle characteristic, colour, secondary and minor components.	moisture condition	consistency density index	hand penetrometer kPa	Remarks and additional observations
Dry	G		DS		0		ML	SILT, low plasticity, brown, with rounded ironstones	M<PL	F		Alluvium
							ML	Clayey SILT, low plasticity, orange, red	M<PL	VSt-H		
			DS/DB		0.5							
					1							
					1.5							Becoming cemented below 1.4m
			DS		2							
					2.5			Test Pit No 41 terminated at 2.5m				
					3							
					3.5							
					4							
					4.5							

GEOTECHNIQUE
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engineering log - excavation

Client : Winten Property Group
Project : Marsden Park Precinct
Location : North West Growth Centre, Marsden Park

Job No : 12576/1
Pit No : 42
Date : 01/11/2011
Logged/Checked by: AN/ZA

Equipment type and model: Backhoe
R.L. surface :
Excavation dimensions : 2 **m long** 0.5 **m wide** **datum :**

groundwater	env samples	PID reading (ppm)	geo samples	field tests	depth or R.L. in meters	graphic log	classification symbol	MATERIAL DESCRIPTION soil type, plasticity or particle characteristic, colour, secondary and minor components.	moisture condition	consistency density index	hand penetrometer kPa	Remarks and additional observations
Dry	G		DS		0			TOPSOIL; Silty Clay, low plasticity, brown, trace of roots				
							CH	CLAY, high plasticity, yellow-brown, trace of ironstones	M<PL	St		Alluvium
			DS		0.5							
					1							
							ML	Clayey SILT, low plasticity, orange, red	M<PL	St-VSt		Alluvium
			DS/DB		1.5							
					2							
					2.5			Test Pit No 42 terminated at 2.5m				
					3							
					3.5							
					4							
					4.5							

GEOTECHNIQUE
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engineering log - excavation

Client : Winten Property Group
Project : Marsden Park Precinct
Location : North West Growth Centre, Marsden Park

Job No : 12576/1
Pit No : 43
Date : 01/11/2011
Logged/Checked by: AN/ZA

Equipment type and model: Backhoe
R.L. surface :
Excavation dimensions : 2 **m long** 0.5 **m wide** **datum :**

groundwater	env samples	PID reading (ppm)	geo samples	field tests	depth or R.L. in meters	graphic log	classification symbol	MATERIAL DESCRIPTION soil type, plasticity or particle characteristic, colour, secondary and minor components.	moisture condition	consistency density index	hand penetrometer kPa	Remarks and additional observations
Dry	G		DS		0		CL-CI	Silty CLAY, low to medium plasticity, grey-brown, trace of ironstones	M<PL	St		Alluvium
					0.5		CI-CH	Silty CLAY, medium to high plasticity, grey-brown, with ironstones and siltstones	M<PL	VSt		
			DS		1							
					1.5		CH	CLAY, high plasticity, pale grey, trace of ironstones	M<PL	VSt		
			DS/DB		2							
					2.5			Test Pit No 43 terminated at 2.5m				
					3							
					3.5							
					4							
					4.5							

GEOTECHNIQUE
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engineering log - excavation

Client : Winten Property Group
Project : Marsden Park Precinct
Location : North West Growth Centre, Marsden Park

Job No : 12576/1
Pit No : 44
Date : 01/11/2011
Logged/Checked by: AN/ZA

Equipment type and model: Backhoe
R.L. surface :
Excavation dimensions : 2 **m long** 0.5 **m wide** **datum :**

groundwater	env samples	PID reading (ppm)	geo samples	field tests	depth or R.L. in meters	graphic log	classification symbol	MATERIAL DESCRIPTION soil type, plasticity or particle characteristic, colour, secondary and minor components.	moisture condition	consistency density index	hand penetrometer kPa	Remarks and additional observations
Dry	G		DS		0			TOPSOIL; Silty Clay, low plasticity, brown, trace of roots				
							CH	CLAY, high plasticity, yellow-brown, trace of ironstones	M<PL	St		Alluvium
			DS		0.5		CH	CLAY, high plasticity, pale grey, trace of ironstones	M≤PL	VSt		
			DS/DB		1.5		CI	Sandy CLAY, medium plasticity, light grey, with ironstones	M=PL	VSt-H		
					2.5			Test Pit No 44 terminated at 2.5m				

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GEOTECHNIQUE
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engineering log - excavation

Client : Winten Property Group
Project : Marsden Park Precinct
Location : North West Growth Centre, Marsden Park

Job No : 12576/1
Pit No : 45
Date : 01/11/2011
Logged/Checked by: AN/ZA

Equipment type and model: Backhoe
R.L. surface :
Excavation dimensions : 2 **m long** 0.5 **m wide** **datum :**

groundwater	env samples	PID reading (ppm)	geo samples	field tests	depth or R.L. in meters	graphic log	classification symbol	MATERIAL DESCRIPTION soil type, plasticity or particle characteristic, colour, secondary and minor components.	moisture condition	consistency density index	hand penetrometer kPa	Remarks and additional observations
Dry	G		DS		0		CH	TOPSOIL; Silty Clay, low plasticity, brown, trace of roots				
							CH	CLAY, high plasticity, yellow-brown, trace of ironstones	M<PL	St		Alluvium
					0.5		CH	CLAY, high plasticity, pale grey, trace of ironstones	M<PL	VSt		
			DS/DB		1							
					1.5							
			DS		2							
					2.5			Test Pit No 45 terminated at 2.5m				
					3							
					3.5							
					4							
					4.5							

GEOTECHNIQUE
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engineering log - excavation

Client : Winten Property Group
Project : Marsden Park Precinct
Location : North West Growth Centre, Marsden Park

Job No : 12576/1
Pit No : 46
Date : 01/11/2011
Logged/Checked by: AN/ZA

Equipment type and model: Backhoe
R.L. surface :
Excavation dimensions : 2 **m long** 0.5 **m wide** **datum :**

groundwater	env samples	PID reading (ppm)	geo samples	field tests	depth or R.L. in meters	graphic log	classification symbol	MATERIAL DESCRIPTION soil type, plasticity or particle characteristic, colour, secondary and minor components.	moisture condition	consistency density index	hand penetrometer kPa	Remarks and additional observations
	G		DS		0			TOPSOIL; Silty Clay, low plasticity, brown, trace of roots				
							ML	SILT, low plasticity, brown, with rounded ironstones	M=PL	F-St		Alluvium
			DS/DB		0.5							
					1		CH	CLAY, high plasticity, pale grey, trace of ironstones, with ironstone and some river gravels	M=PL	St-VSt		Alluvium
			DS		1.5							
Dry					2							
					2.5			Test Pit No 46 terminated at 2.5m				
					3							
					3.5							
					4							
					4.5							

GEOTECHNIQUE
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engineering log - excavation

Client : Winten Property Group
Project : Marsden Park Precinct
Location : North West Growth Centre, Marsden Park

Job No : 12576/1
Pit No : 47
Date : 01/11/2011
Logged/Checked by: AN/ZA

Equipment type and model: Backhoe
R.L. surface :
Excavation dimensions : 2 **m long** 0.5 **m wide** **datum :**

groundwater	env samples	PID reading (ppm)	geo samples	field tests	depth or R.L. in meters	graphic log	classification symbol	MATERIAL DESCRIPTION soil type, plasticity or particle characteristic, colour, secondary and minor components.	moisture condition	consistency density index	hand penetrometer kPa	Remarks and additional observations
Dry	G/P		DS		0			FILL; Silty Clay, medium plasticity, brown, with gravels, sandstones and brick fragments				
								FILL; Clay, high plasticity, pale grey				
	G				0.5							
			DS		1							
	G											
					1.5		CL-CI	Silty CLAY, low to medium plasticity, grey-brown, trace of ironstones	M<PL	St		Alluvium
							CH	CLAY, high plasticity, yellow-brown, trace of ironstones	M<PL	St		
			DS/DB		2		CH	CLAY, high plasticity, pale grey, trace of ironstones	M=PL	St-VSt		
					2.5			Test Pit No 47 terminated at 2.5m				
					3							
					3.5							
					4							
					4.5							

GEOTECHNIQUE
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engineering log - excavation

Client : Winten Property Group
Project : Marsden Park Precinct
Location : North West Growth Centre, Marsden Park

Job No : 12576/1
Pit No : 48
Date : 01/11/2011
Logged/Checked by: AN/ZA

Equipment type and model: Backhoe
R.L. surface :
Excavation dimensions : 2 **m long** 0.5 **m wide** **datum :**

groundwater	env samples	PID reading (ppm)	geo samples	field tests	depth or R.L. in meters	graphic log	classification symbol	MATERIAL DESCRIPTION soil type, plasticity or particle characteristic, colour, secondary and minor components.	moisture condition	consistency density index	hand penetrometer kPa	Remarks and additional observations
Dry	G		DS		0			TOPSOIL; Silty Clay, low plasticity, brown, trace of roots				
							CL-CI	Silty CLAY, low to medium plasticity, grey-brown, trace of ironstones	M<PL	F-St		Alluvium
			DS		0.5		CH	CLAY, high plasticity, yellow-brown, trace of ironstones	M<PL	St		
			DS/DB		1		CL	Silty CLAY, low plasticity, grey, with shale, ironstone and siltstone gravels	M<PL	VSt-H		
					1.5			Test Pit No 48 terminated at 1.3m on river boulders				
					2							
					2.5							
					3							
					3.5							
					4							
					4.5							

GEOTECHNIQUE
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engineering log - excavation

Client : Winten Property Group
Project : Marsden Park Precinct
Location : North West Growth Centre, Marsden Park

Job No : 12576/1
Pit No : 49
Date : 01/11/2011
Logged/Checked by: AN/ZA

Equipment type and model: Backhoe
R.L. surface :
Excavation dimensions : 2 **m long** 0.5 **m wide** **datum :**

groundwater	env samples	PID reading (ppm)	geo samples	field tests	depth or R.L. in meters	graphic log	classification symbol	MATERIAL DESCRIPTION soil type, plasticity or particle characteristic, colour, secondary and minor components.	moisture condition	consistency density index	hand penetrometer kPa	Remarks and additional observations
	G		DS		0			TOPSOIL; Silty Clay, low plasticity, brown, trace of roots				
							CH	CLAY, high plasticity, yellow-brown, trace of ironstones	M<PL	St		Alluvium
					0.5		CH	CLAY, high plasticity, pale grey, trace of ironstones	M<PL	VSt		
			DS		1							
					1.5							
			DS/DB		2							
Dry					2.5			Test Pit No 49 terminated at 2.5m				
					3							
					3.5							
					4							
					4.5							

GEOTECHNIQUE
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engineering log - excavation

Client : Winten Property Group
Project : Marsden Park Precinct
Location : North West Growth Centre, Marsden Park

Job No : 12576/1
Pit No : 50
Date : 01/11/2011
Logged/Checked by: AN/ZA

Equipment type and model: Backhoe
R.L. surface :
Excavation dimensions : 2 **m long** 0.5 **m wide** **datum :**

groundwater	env samples	PID reading (ppm)	geo samples	field tests	depth or R.L. in meters	graphic log	classification symbol	MATERIAL DESCRIPTION soil type, plasticity or particle characteristic, colour, secondary and minor components.	moisture condition	consistency density index	hand penetrometer kPa	Remarks and additional observations
	G		DS		0			TOPSOIL; Silty Clay, low plasticity, brown, trace of roots				
	G		DS		0.5			FILL; Clay, high plasticity, pale grey				
Dry			DS/DB		1 1.5 2		CH	CLAY, high plasticity, pale grey, trace of ironstones	M=PL	St-VSt		Alluvium
					2.5			Test Pit No 50 terminated at 2.5m				
					3 3.5 4 4.5							

GEOTECHNIQUE
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engineering log - excavation

Client : Winten Property Group
Project : Marsden Park Precinct
Location : North West Growth Centre, Marsden Park

Job No : 12576/1
Pit No : 51
Date : 01/11/2011
Logged/Checked by: AN/ZA

Equipment type and model: Backhoe
R.L. surface :
Excavation dimensions : 2 **m long** 0.5 **m wide** **datum :**

groundwater	env samples	PID reading (ppm)	geo samples	field tests	depth or R.L. in meters	graphic log	classification symbol	MATERIAL DESCRIPTION soil type, plasticity or particle characteristic, colour, secondary and minor components.	moisture condition	consistency density index	hand penetrometer kPa	Remarks and additional observations
Dry	G		DS		0			TOPSOIL; Silty Clay, low plasticity, brown, trace of roots				
							CH	CLAY, high plasticity, yellow-brown, trace of ironstones	M<PL	St		Alluvium
			DS/DB		0.5							
					1							
					1.5		CL	Silty CLAY, low plasticity, grey, with shale, ironstone and siltstone gravels	M<PL	St-VSt		
			DS		2							
					2.5			Test Pit No 51 terminated at 2.5m				
					3							
					3.5							
					4							
					4.5							

GEOTECHNIQUE
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engineering log - excavation

Client : Winten Property Group
Project : Marsden Park Precinct
Location : North West Growth Centre, Marsden Park

Job No : 12576/1
Pit No : 52
Date : 01/11/2011
Logged/Checked by: AN/ZA

Equipment type and model: Backhoe
R.L. surface :
Excavation dimensions : 2 **m long** 0.5 **m wide** **datum :**

groundwater	env samples	PID reading (ppm)	geo samples	field tests	depth or R.L. in meters	graphic log	classification symbol	MATERIAL DESCRIPTION soil type, plasticity or particle characteristic, colour, secondary and minor components.	moisture condition	consistency density index	hand penetrometer kPa	Remarks and additional observations
	G		DS		0			TOPSOIL; Silty Clay, low plasticity, brown, trace of roots				
							CH	CLAY, high plasticity, yellow-brown, trace of ironstones	M<PL	St		Alluvium
			DS/DB		0.5							
							CL	Shaley CLAY, low plasticity, grey, with shale, ironstone and siltstone gravels	M<PL	VSt-H		Residual
					1							
			DS		1.5							
dry					2			Test Pit No 52 terminated at 2.0m on siltstone bedrock				Bedrock
					2.5							
					3							
					3.5							
					4							
					4.5							

GEOTECHNIQUE
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engineering log - excavation

Client : Winten Property Group
Project : Marsden Park Precinct
Location : North West Growth Centre, Marsden Park

Job No : 12576/1
Pit No : 53
Date : 02/11/2011
Logged/Checked by: AN/ZA

Equipment type and model: Backhoe
R.L. surface :
Excavation dimensions : 2 **m long** 0.5 **m wide** **datum :**

groundwater	env samples	PID reading (ppm)	geo samples	field tests	depth or R.L. in meters	graphic log	classification symbol	MATERIAL DESCRIPTION soil type, plasticity or particle characteristic, colour, secondary and minor components.	moisture condition	consistency density index	hand penetrometer kPa	Remarks and additional observations
Dry	G/P G/P G/P G		DS DS DS/DB		0 0.5 1 1.5 2			FILL; Silty Clay, low to medium plasticity, brown, with gravels, trace of concrete fragments				
							CL-CI	Silty CLAY, low to medium plasticity, grey-brown, trace of ironstones	M≤PL	F		Alluvium
							CH	CLAY, high plasticity, yellow-brown, trace of ironstones	M=PL	St		
					2.5			Test Pit No 53 terminated at 2.5m				
					3 3.5 4 4.5							

GEOTECHNIQUE
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engineering log - excavation

Client : Winten Property Group
Project : Marsden Park Precinct
Location : North West Growth Centre, Marsden Park

Job No : 12576/1
Pit No : 54
Date : 02/11/2011
Logged/Checked by: AN/ZA

Equipment type and model: Backhoe
R.L. surface :
Excavation dimensions : 2 **m long** 0.5 **m wide** **datum :**

groundwater	env samples	PID reading (ppm)	geo samples	field tests	depth or R.L. in meters	graphic log	classification symbol	MATERIAL DESCRIPTION soil type, plasticity or particle characteristic, colour, secondary and minor components.	moisture condition	consistency density index	hand penetrometer kPa	Remarks and additional observations
			DS		0			FILL; Silty Clay, low to medium plasticity, brown, with gravels and brick fragments				
	G/P						CL-CI	Silty CLAY, low to medium plasticity, grey-brown, trace of ironstones	M<PL	St		Alluvium
	G		DS		0.5		CH	CLAY, high plasticity, yellow-brown, trace of ironstones	M<PL	St		
					1							
Dry			DS/DB		1.5		CL	Shaley CLAY, low plasticity, grey, with shale, ironstone and siltstone gravels	M<PL	VSt-H		Residual
					2			Test Pit No 54 terminated at 1.7m on siltstone bedrock				Bedrock
					2.5							
					3							
					3.5							
					4							
					4.5							

GEOTECHNIQUE
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engineering log - excavation

Client : Winten Property Group
Project : Marsden Park Precinct
Location : North West Growth Centre, Marsden Park

Job No : 12576/1
Pit No : 55
Date : 02/11/2011
Logged/Checked by: AN/ZA

Equipment type and model: Backhoe
R.L. surface :
Excavation dimensions : 2 **m long** 0.5 **m wide** **datum :**

groundwater	env samples	PID reading (ppm)	geo samples	field tests	depth or R.L. in meters	graphic log	classification symbol	MATERIAL DESCRIPTION soil type, plasticity or particle characteristic, colour, secondary and minor components.	moisture condition	consistency density index	hand penetrometer kPa	Remarks and additional observations
Dry	G/P		DS		0			FILL; Silty Clay, low to medium plasticity, brown, with gravels and sandstone fragments, trace of fibro cement fragments				
	G/P				0.5			FILL; Clay, high plasticity, pale grey				
	G		DS/DB		1		CL-CI	Silty CLAY, low to medium plasticity, grey-brown, trace of ironstones	M≤PL	St		Alluvium
					1.5		CH	CLAY, high plasticity, pale grey, trace of ironstones	M≤PL	St-VSt		Residual
			DS		2							
					2.5			Test Pit No 55 terminated at 2.5m				
					3							
					3.5							
					4							
					4.5							

GEOTECHNIQUE
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engineering log - excavation

Client : Winten Property Group
Project : Marsden Park Precinct
Location : North West Growth Centre, Marsden Park

Job No : 12576/1
Pit No : 56
Date : 02/11/2011
Logged/Checked by: AN/ZA

Equipment type and model: Backhoe
R.L. surface :
Excavation dimensions : 2 **m long** 0.5 **m wide** **datum :**

groundwater	env samples	PID reading (ppm)	geo samples	field tests	depth or R.L. in meters	graphic log	classification symbol	MATERIAL DESCRIPTION soil type, plasticity or particle characteristic, colour, secondary and minor components.	moisture condition	consistency density index	hand penetrometer kPa	Remarks and additional observations
Dry	G		DS		0			TOPSOIL; Silty Clay, low plasticity, brown, trace of roots				
							CL-CI	Silty CLAY, low to medium plasticity, grey-brown, trace of ironstones	M<PL			Alluvium
			DS/DB		0.5		CH	CLAY, high plasticity, yellow-brown, trace of ironstones	M<PL	St		
					1		CH	CLAY, high plasticity, pale grey, trace of ironstones, with siltstone gravel from 2.0m	M≤PL	St-VSt		
			DS		1.5							
					2							
					2.5			Test Pit No 56 terminated at 2.5m				
					3							
					3.5							
					4							
					4.5							

GEOTECHNIQUE
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engineering log - excavation

Client : Winten Property Group
Project : Marsden Park Precinct
Location : North West Growth Centre, Marsden Park

Job No : 12576/1
Pit No : 57
Date : 02/11/2011
Logged/Checked by: AN/ZA

Equipment type and model: Backhoe
R.L. surface :
Excavation dimensions : 2 **m long** 0.5 **m wide** **datum :**

groundwater	env samples	PID reading (ppm)	geo samples	field tests	depth or R.L. in meters	graphic log	classification symbol	MATERIAL DESCRIPTION soil type, plasticity or particle characteristic, colour, secondary and minor components.	moisture condition	consistency density index	hand penetrometer kPa	Remarks and additional observations
	G		DS		0			TOPSOIL; Silty Clay, low plasticity, brown, trace of roots				
							CL-CI	Silty CLAY, low to medium plasticity, grey-brown, trace of ironstones	M<PL	St		Alluvium
					0.5		CH	CLAY, high plasticity, yellow-brown, trace of ironstones	M<PL	St		
							CH	CLAY, high plasticity, pale grey, trace of ironstones	M≤PL	St-VSt		
			DS/DB		1							
					1.5							
			DS		2							
Dry					2.5			Test Pit No 57 terminated at 2.5m				
					3							
					3.5							
					4							
					4.5							

GEOTECHNIQUE
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engineering log - excavation

Client : Winten Property Group
Project : Marsden Park Precinct
Location : North West Growth Centre, Marsden Park

Job No : 12576/1
Pit No : 58
Date : 02/11/2011
Logged/Checked by: AN/ZA

Equipment type and model: Backhoe
R.L. surface :
Excavation dimensions : 2 **m long** 0.5 **m wide** **datum :**

groundwater	env samples	PID reading (ppm)	geo samples	field tests	depth or R.L. in meters	graphic log	classification symbol	MATERIAL DESCRIPTION soil type, plasticity or particle characteristic, colour, secondary and minor components.	moisture condition	consistency density index	hand penetrometer kPa	Remarks and additional observations
Dry	G		DS		0			FILL; Silty Clay, low to medium plasticity, brown, with gravels and brick fragments				
							CH	CLAY, high plasticity, yellow-brown, trace of ironstones	M≤PL	St		Alluvium
			DS		0.5							
					1		CH	CLAY, high plasticity, pale grey, trace of ironstones	M=PL	St-VSt		
			DS/DB		1.5							
					2							
					2.5			Test Pit No 58 terminated at 2.5m				
					3							
					3.5							
					4							
					4.5							

GEOTECHNIQUE
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engineering log - excavation

Client : Winten Property Group
Project : Marsden Park Precinct
Location : North West Growth Centre, Marsden Park

Job No : 12576/1
Pit No : 59
Date : 02/11/2011
Logged/Checked by: AN/ZA

Equipment type and model: Backhoe
R.L. surface :
Excavation dimensions : 2 **m long** 0.5 **m wide** **datum :**

groundwater	env samples	PID reading (ppm)	geo samples	field tests	depth or R.L. in meters	graphic log	classification symbol	MATERIAL DESCRIPTION soil type, plasticity or particle characteristic, colour, secondary and minor components.	moisture condition	consistency density index	hand penetrometer kPa	Remarks and additional observations
Dry	G/P		DS		0			FILL; Silty Clay, low to medium plasticity, brown, with gravels and sandstone fragments, trace of asphaltic concrete				
	G/P				0.5							
	G		DS		1		CH	CLAY, high plasticity, yellow-brown, trace of ironstones	M≤PL	St		Alluvium
							CH	CLAY, high plasticity, pale grey, trace of ironstones	M≤PL	St-VSt		
			DS/DB		1.5							
					2							
					2.5			Test Pit No 59 terminated at 2.5m				
					3							
					3.5							
					4							
					4.5							

GEOTECHNIQUE
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engineering log - excavation

Client : Winten Property Group
Project : Marsden Park Precinct
Location : North West Growth Centre, Marsden Park

Job No : 12576/1
Pit No : 60
Date : 03/11/2011
Logged/Checked by: AN/ZA

Equipment type and model: Backhoe
R.L. surface :
Excavation dimensions : 2 **m long** 0.5 **m wide** **datum :**

groundwater	env samples	PID reading (ppm)	geo samples	field tests	depth or R.L. in meters	graphic log	classification symbol	MATERIAL DESCRIPTION soil type, plasticity or particle characteristic, colour, secondary and minor components.	moisture condition	consistency density index	hand penetrometer kPa	Remarks and additional observations
	G		DS		0			TOPSOIL; Silty Clay, low plasticity, brown, trace of roots				
							CL-CI	Silty CLAY, low to medium plasticity, grey-brown, trace of ironstones	M<PL	F-St		Alluvium
			DS/DB		0.5		CI	CLAY, medium plasticity, yellow-brown, trace of ironstones	M≤PL	St		
					1		CI	CLAY, medium plasticity, pale grey, with ironstone from 1.9m	M≤PL	St-VSt		
			DS		1.5							
dry					2			Test Pit No 60 terminated at 2.0m due to refusal on ironstones				
					2.5							
					3							
					3.5							
					4							
					4.5							

GEOTECHNIQUE
PTY LTD

engineering log - excavation

Client : Winten Property Group
Project : Marsden Park Precinct
Location : North West Growth Centre, Marsden Park

Job No : 12576/1
Pit No : 61
Date : 03/11/2011
Logged/Checked by: AN/ZA

Equipment type and model: Backhoe
R.L. surface :
Excavation dimensions : 2 **m long** 0.5 **m wide** **datum :**

groundwater	env samples	PID reading (ppm)	geo samples	field tests	depth or R.L. in meters	graphic log	classification symbol	MATERIAL DESCRIPTION soil type, plasticity or particle characteristic, colour, secondary and minor components.	moisture condition	consistency density index	hand penetrometer kPa	Remarks and additional observations
	G		DS		0			TOPSOIL; Silty Clay, low plasticity, brown, trace of roots				
							CL-CI	Silty CLAY, low to medium plasticity, grey-brown, trace of ironstones	M<PL	F-St		Alluvium
					0.5		CI	CLAY, medium plasticity, yellow-brown, trace of ironstones	M>PL	St		
			DS/DB		1							
					1.5		CI	CLAY, medium plasticity, pale grey, trace of ironstones	M>PL	St-VSt		Residual
Dry			DS		2			SILTSTONE, grey, very low to low strength, extremely to distinctly weathered				Bedrock
								Test Pit No 61 terminated at 2.1m on siltstone bedrock				
					2.5							
					3							
					3.5							
					4							
					4.5							

GEOTECHNIQUE
PTY LTD

engineering log - excavation

Client : Winten Property Group
Project : Marsden Park Precinct
Location : North West Growth Centre, Marsden Park

Job No : 12576/1
Pit No : 62
Date : 03/11/2011
Logged/Checked by: AN/ZA

Equipment type and model: Backhoe
R.L. surface :
Excavation dimensions : 2 **m long** 0.5 **m wide** **datum :**

groundwater	env samples	PID reading (ppm)	geo samples	field tests	depth or R.L. in meters	graphic log	classification symbol	MATERIAL DESCRIPTION soil type, plasticity or particle characteristic, colour, secondary and minor components.	moisture condition	consistency density index	hand penetrometer kPa	Remarks and additional observations
Dry	G		DS		0			TOPSOIL; Silty Clay, low plasticity, brown, trace of roots				
							CL-CI	Silty CLAY, low to medium plasticity, grey-brown, trace of ironstones	M<PL	F		Alluvium
							CI	CLAY, medium plasticity, yellow-brown, trace of ironstones	M>PL	F-St		
			DS/DB		0.5							
							CI	CLAY, medium plasticity, pale grey, trace of ironstones	M>PL	St		
			DS		1.5							
					2		CH	CLAY, high plasticity, pale grey, with ironstones and shale fragments	M≥PL	St		Residual
					2.5			Test Pit No 62 terminated at 2.5m				
					3							
					3.5							
					4							
					4.5							

GEOTECHNIQUE
PTY LTD

engineering log - excavation

Client : Winten Property Group
Project : Marsden Park Precinct
Location : North West Growth Centre, Marsden Park

Job No : 12576/1
Pit No : 63
Date : 03/11/2011
Logged/Checked by: AN/ZA

Equipment type and model: Backhoe
R.L. surface :
Excavation dimensions : 2 **m long** 0.5 **m wide** **datum :**

groundwater	env samples	PID reading (ppm)	geo samples	field tests	depth or R.L. in meters	graphic log	classification symbol	MATERIAL DESCRIPTION soil type, plasticity or particle characteristic, colour, secondary and minor components.	moisture condition	consistency density index	hand penetrometer kPa	Remarks and additional observations
	G		DS		0			TOPSOIL; Silty Clay, low plasticity, brown, trace of roots				
							CL-CI	Silty CLAY, low to medium plasticity, grey-brown, trace of ironstones				Alluvium
							CH	CLAY, high plasticity, yellow-brown, trace of ironstones				
					0.5		CI	Sandy CLAY, medium plasticity, light grey, with ironstones	M<PL	St		
			DS/DB		1		CL	Shaley CLAY, low plasticity, grey, with ironstones and siltstones	M<PL	VSt		Residual
Dry					1.5			Test Pit No 63 terminated at 1.5 on siltstone bedrock				Bedrock
					2							
					2.5							
					3							
					3.5							
					4							
					4.5							

GEOTECHNIQUE
PTY LTD

engineering log - excavation

Client : Winten Property Group
Project : Marsden Park Precinct
Location : North West Growth Centre, Marsden Park

Job No : 12576/1
Pit No : 64
Date : 03/11/2011
Logged/Checked by: AN/ZA

Equipment type and model: Backhoe
R.L. surface :
Excavation dimensions : 2 **m long** 0.5 **m wide** **datum :**

groundwater	env samples	PID reading (ppm)	geo samples	field tests	depth or R.L. in meters	graphic log	classification symbol	MATERIAL DESCRIPTION soil type, plasticity or particle characteristic, colour, secondary and minor components.	moisture condition	consistency density index	hand penetrometer kPa	Remarks and additional observations
Dry	G		DS		0			FILL; Silty Clay, low to medium plasticity, brown, with gravels and sandstone fragments				
							CL-CI	Silty CLAY, low to medium plasticity, grey-brown, trace of ironstones	M<PL	F-St		Alluvium
	G				0.5		CH	CLAY, high plasticity, yellow-brown, trace of ironstones	M≤PL	St		
			DS		1		CH	CLAY, high plasticity, pale grey, trace of ironstones, with ironstones	M=PL	St-VSt		
			DS/DB		2							
					2.5			Test Pit No 64 terminated at 2.5m				
					3							
					3.5							
					4							
					4.5							

GEOTECHNIQUE
PTY LTD

engineering log - excavation

Client : Winten Property Group
Project : Marsden Park Precinct
Location : North West Growth Centre, Marsden Park

Job No : 12576/1
Pit No : 65
Date : 03/11/2011
Logged/Checked by: AN/ZA

Equipment type and model: Backhoe
R.L. surface :
Excavation dimensions : 2 **m long** 0.5 **m wide**
datum :

groundwater	env samples	PID reading (ppm)	geo samples	field tests	depth or R.L. in meters	graphic log	classification symbol	MATERIAL DESCRIPTION soil type, plasticity or particle characteristic, colour, secondary and minor components.	moisture condition	consistency density index	hand penetrometer kPa	Remarks and additional observations
Dry	G		DS		0			FILL; Clay, high plasticity, pale grey				
	G		DS		0.5							
	G				1		CL-CI	Silty CLAY, low to medium plasticity, grey-brown, trace of ironstones	M<PL	F-St		Alluvium
	G		DS/DB		1.5		CH	CLAY, high plasticity, yellow-brown, trace of ironstones	M≤PL	St		
					2		CH	CLAY, high plasticity, pale grey, trace of ironstones	M≤PL	St		
					2.5			Test Pit No 65 terminated at 2.5m				
					3							
					3.5							
					4							
					4.5							

GEOTECHNIQUE
PTY LTD

engineering log - excavation

Client : Winten Property Group
Project : Marsden Park Precinct
Location : North West Growth Centre, Marsden Park

Job No : 12576/1
Pit No : 66
Date : 03/11/2011
Logged/Checked by: AN/ZA

Equipment type and model: Backhoe
R.L. surface :
Excavation dimensions : 2 **m long** 0.5 **m wide** **datum :**

groundwater	env samples	PID reading (ppm)	geo samples	field tests	depth or R.L. in meters	graphic log	classification symbol	MATERIAL DESCRIPTION soil type, plasticity or particle characteristic, colour, secondary and minor components.	moisture condition	consistency density index	hand penetrometer kPa	Remarks and additional observations
Dry	G		DS		0			FILL; Silty Clay, low to medium plasticity, brown, with gravels and sandstone fragments				
	G						CL-CI	Silty CLAY, low to medium plasticity, grey-brown, trace of ironstones	M<PL	St		Alluvium
					0.5		CH	CLAY, high plasticity, pale grey, trace of ironstones	M≤PL	St-VSt		
			DS/DB		1							
					1.5							
			DS		2							
					2.5			Test Pit No 66 terminated at 2.5m				
					3							
					3.5							
					4							
					4.5							

GEOTECHNIQUE
PTY LTD

engineering log - excavation

Client : Winten Property Group
Project : Marsden Park Precinct
Location : North West Growth Centre, Marsden Park

Job No : 12576/1
Pit No : 67
Date : 03/11/2011
Logged/Checked by: AN/ZA

Equipment type and model: Backhoe
R.L. surface :
Excavation dimensions : 2 **m long** 0.5 **m wide** **datum :**

groundwater	env samples	PID reading (ppm)	geo samples	field tests	depth or R.L. in meters	graphic log	classification symbol	MATERIAL DESCRIPTION soil type, plasticity or particle characteristic, colour, secondary and minor components.	moisture condition	consistency density index	hand penetrometer kPa	Remarks and additional observations
	G		DS		0			TOPSOIL; Silty Clay, low plasticity, brown, trace of roots				
							CL-CI	Silty CLAY, low to medium plasticity, grey-brown, trace of ironstones	M<PL	St		Alluvium
					0.5		CH	CLAY, high plasticity, pale grey, trace of ironstones, with ironstones and shale fragments	M≤PL	VSt-H		Residual
Dry			DS		1							
					1.5							
								Test Pit No 67 terminated at 1.8m on shale bedrock				Bedrock
					2							
					2.5							
					3							
					3.5							
					4							
					4.5							

GEOTECHNIQUE
PTY LTD

engineering log - excavation

Client : Winten Property Group
Project : Marsden Park Precinct
Location : North West Growth Centre, Marsden Park

Job No : 12576/1
Pit No : 68
Date : 03/11/2011
Logged/Checked by: AN/ZA

Equipment type and model: Backhoe
R.L. surface :
Excavation dimensions : 2 **m long** 0.5 **m wide** **datum :**

groundwater	env samples	PID reading (ppm)	geo samples	field tests	depth or R.L. in meters	graphic log	classification symbol	MATERIAL DESCRIPTION soil type, plasticity or particle characteristic, colour, secondary and minor components.	moisture condition	consistency density index	hand penetrometer kPa	Remarks and additional observations
	G		DS		0			TOPSOIL; Silty Clay, low plasticity, brown, trace of roots				
							CH	CLAY, high plasticity, yellow-brown, trace of ironstones	M<PL	St		Alluvium
							CH	CLAY, high plasticity, pale grey, trace of ironstones	M≤PL	St-VSt		
					0.5							
			DS/DB		1							
					1.5							
							CH	CLAY, high plasticity, pale grey, with ironstones and shale fragments				Residual
Dry			DS		2							
								Test Pit No 68 terminated at 2.2m on shale bedrock				Bedrock
					2.5							
					3							
					3.5							
					4							
					4.5							

GEOTECHNIQUE
PTY LTD

engineering log - excavation

Client : Winten Property Group
Project : Marsden Park Precinct
Location : North West Growth Centre, Marsden Park

Job No : 12576/1
Pit No : 69
Date : 03/11/2011
Logged/Checked by: AN/ZA

Equipment type and model: Backhoe
R.L. surface :
Excavation dimensions : 2 **m long** 0.5 **m wide** **datum :**

groundwater	env samples	PID reading (ppm)	geo samples	field tests	depth or R.L. in meters	graphic log	classification symbol	MATERIAL DESCRIPTION soil type, plasticity or particle characteristic, colour, secondary and minor components.	moisture condition	consistency density index	hand penetrometer kPa	Remarks and additional observations
	G		DS		0			TOPSOIL; Silty Clay, low plasticity, brown, trace of roots				
							CL-CI	Silty CLAY, low to medium plasticity, grey-brown, trace of ironstones	M<PL	F-St		Alluvium
			DS		0.5		CH	CLAY, high plasticity, yellow-brown, trace of ironstones	M≤PL	St		
					1		CH	CLAY, high plasticity, pale grey, trace of ironstones	M≤PL	St-VSt		
			DS/DB		1.5							
					2		CH	CLAY, high plasticity, pale grey, with ironstones and shale fragments	M<PL	VSt		Residual
Dry					2.5			Test Pit No 69 terminated at 2.5m				
					3							
					3.5							
					4							
					4.5							

GEOTECHNIQUE
PTY LTD

engineering log - excavation

Client : Winten Property Group
Project : Marsden Park Precinct
Location : North West Growth Centre, Marsden Park

Job No : 12576/1
Pit No : 70
Date : 04/11/2011
Logged/Checked by: AN/ZA

Equipment type and model: Backhoe
R.L. surface :
Excavation dimensions : 2 **m long** 0.5 **m wide** **datum :**

groundwater	env samples	PID reading (ppm)	geo samples	field tests	depth or R.L. in meters	graphic log	classification symbol	MATERIAL DESCRIPTION soil type, plasticity or particle characteristic, colour, secondary and minor components.	moisture condition	consistency density index	hand penetrometer kPa	Remarks and additional observations
Dry	G		DS		0			TOPSOIL; Silty Clay, low plasticity, brown, trace of roots				
	G							FILL; Silty Clay, medium plasticity, brown, with gravels, sandstones	M<PL			
	G		DS		0.5		CL-CI	Silty CLAY, low to medium plasticity, grey-brown, trace of ironstones	M>PL	F		Alluvium
							CI	Silty CLAY, medium plasticity, grey-brown, with ironstones and siltstones	M>PL	St		
			DS/DB		1.5		CH	CLAY, high plasticity, pale grey, trace of ironstones	M≤PL	St-VSt		Residual
					2.5			Test Pit No 70 terminated at 2.5m				
					3							
					3.5							
					4							
					4.5							

GEOTECHNIQUE
PTY LTD

engineering log - excavation

Client : Winten Property Group
Project : Marsden Park Precinct
Location : North West Growth Centre, Marsden Park

Job No : 12576/1
Pit No : 71
Date : 04/11/2011
Logged/Checked by: AN/ZA

Equipment type and model: Backhoe
R.L. surface :
Excavation dimensions : 2 **m long** 0.5 **m wide** **datum :**

groundwater	env samples	PID reading (ppm)	geo samples	field tests	depth or R.L. in meters	graphic log	classification symbol	MATERIAL DESCRIPTION soil type, plasticity or particle characteristic, colour, secondary and minor components.	moisture condition	consistency density index	hand penetrometer kPa	Remarks and additional observations
	G		DS		0			TOPSOIL; Silty Clay, low plasticity, brown, trace of roots				
							CL-CI	Silty CLAY, low to medium plasticity, grey-brown, trace of ironstones	M<PL	F		Alluvium
			DS/DB		0.5		CI	Sandy CLAY, medium plasticity, orange-brown, pale grey	M>PL	F-St		
					1							
			DS		1.5		GL	Clayey GRAVEL, fine to coarse grained, brown-yellow, grey, clay of low to medium plasticity	M	D-VD		Alluvium
Dry					2		CI	Sandy CLAY, medium plasticity, light grey, with ironstones	M>PL	VSt		Alluvium
					2.5			Test Pit No 71 terminated at 2.5m				
					3							
					3.5							
					4							
					4.5							

GEOTECHNIQUE
PTY LTD

engineering log - excavation

Client : Winten Property Group
Project : Marsden Park Precinct
Location : North West Growth Centre, Marsden Park

Job No : 12576/1
Pit No : 72
Date : 04/11/2011
Logged/Checked by: AN/ZA

Equipment type and model: Backhoe
R.L. surface :
Excavation dimensions : 2 **m long** 0.5 **m wide** **datum :**

groundwater	env samples	PID reading (ppm)	geo samples	field tests	depth or R.L. in meters	graphic log	classification symbol	MATERIAL DESCRIPTION soil type, plasticity or particle characteristic, colour, secondary and minor components.	moisture condition	consistency density index	hand penetrometer kPa	Remarks and additional observations
dry	G		DS		0			TOPSOIL; Silty Clay, low plasticity, brown, trace of roots				
	G							FILL; Silty Clay, low to medium plasticity, brown, with large concrete pieces (garden decoration)				
					0.5		CH	CLAY, high plasticity, pale grey, with ironstones and shale fragments	M>PL	St-VSt		Alluvium
	G											
			DS/DB		1							
							CH	CLAY, high plasticity, pale grey, trace of ironstones	M≥PL	VSt		Residual
			DS		1.5							
					2			Test Pit No 72 terminated at 2.0m due to refusal on shale/siltstone bedrock				Bedrock
					2.5							
					3							
					3.5							
					4							
					4.5							

GEOTECHNIQUE
PTY LTD

engineering log - excavation

Client : Winten Property Group
Project : Marsden Park Precinct
Location : North West Growth Centre, Marsden Park

Job No : 12576/1
Pit No : 73
Date : 04/11/2011
Logged/Checked by: AN/ZA

Equipment type and model: Backhoe
R.L. surface :
Excavation dimensions : 2 **m long** 0.5 **m wide** **datum :**

groundwater	env samples	PID reading (ppm)	geo samples	field tests	depth or R.L. in meters	graphic log	classification symbol	MATERIAL DESCRIPTION soil type, plasticity or particle characteristic, colour, secondary and minor components.	moisture condition	consistency density index	hand penetrometer kPa	Remarks and additional observations
	G		DS		0			TOPSOIL; Silty Clay, low plasticity, brown, trace of roots				
							CL-CI	Silty CLAY, low to medium plasticity, grey-brown, trace of ironstones	M<PL	F-St		Alluvium
			DS/DB		0.5		CH	CLAY, high plasticity, pale grey, with ironstones and shale fragments	M>PL	St-VSt		
					1							
			DS		1.5		CH	CLAY, high plasticity, pale grey, trace of ironstones	M>PL	VSt		Residual
Dry					2							
					2.5			Test Pit No 73 terminated at 2.5m				
					3							
					3.5							
					4							
					4.5							

GEOTECHNIQUE
PTY LTD

engineering log - excavation

Client : Winten Property Group
Project : Marsden Park Precinct
Location : North West Growth Centre, Marsden Park

Job No : 12576/1
Pit No : 74
Date : 04/11/2011
Logged/Checked by: AN/ZA

Equipment type and model: Backhoe
R.L. surface :
Excavation dimensions : 2 **m long** 0.5 **m wide** **datum :**

groundwater	env samples	PID reading (ppm)	geo samples	field tests	depth or R.L. in meters	graphic log	classification symbol	MATERIAL DESCRIPTION soil type, plasticity or particle characteristic, colour, secondary and minor components.	moisture condition	consistency density index	hand penetrometer kPa	Remarks and additional observations
	G		DS		0			TOPSOIL; Silty Clay, low plasticity, brown, trace of roots				
							CL-CI	Silty CLAY, low to medium plasticity, grey-brown, trace of ironstones	M>PL	F-St		Alluvium
					0.5		CH	CLAY, high plasticity, yellow-brown, trace of ironstones	M>PL	St		
			DS/DB		1		CH	CLAY, high plasticity, pale grey, with ironstones and shale fragments	M>PL	VSt		
					1.5							
			DS		2		GC	Clayey GRAVEL, fine to coarse grained, brown-yellow, grey, clay of low to medium plasticity	M	D-VD		Alluvium
Dry					2.5			Test Pit No 74 terminated at 2.5m				
					3							
					3.5							
					4							
					4.5							

GEOTECHNIQUE
PTY LTD

engineering log - excavation

Client : Winten Property Group
Project : Marsden Park Precinct
Location : North West Growth Centre, Marsden Park

Job No : 12576/1
Pit No : 75
Date : 04/11/2011
Logged/Checked by: AN/ZA

Equipment type and model: Backhoe
R.L. surface :
Excavation dimensions : 2 **m long** 0.5 **m wide** **datum :**

groundwater	env samples	PID reading (ppm)	geo samples	field tests	depth or R.L. in meters	graphic log	classification symbol	MATERIAL DESCRIPTION soil type, plasticity or particle characteristic, colour, secondary and minor components.	moisture condition	consistency density index	hand penetrometer kPa	Remarks and additional observations
Dry	G		DS		0			TOPSOIL; Silty Clay, low plasticity, brown, trace of roots				
							CL-CI	Silty CLAY, low to medium plasticity, grey-brown, trace of ironstones	M<PL	F		Alluvium
			DS/DB		0.5		CH	CLAY, high plasticity, yellow-brown, trace of ironstones	M>PL	F-St		
					1		CH	CLAY, high plasticity, pale grey, trace of ironstones	M>PL	St		
			DS		1.5		CH	CLAY, high plasticity, pale grey, with ironstones and shale fragments	M≥PL	St-VSt		Residual
					2.5			Test Pit No 75 terminated at 2.5m				
					3							
					3.5							
					4							
					4.5							

GEOTECHNIQUE
PTY LTD

engineering log - excavation

Client : Winten Property Group
Project : Marsden Park Precinct
Location : North West Growth Centre, Marsden Park

Job No : 12576/1
Pit No : 76
Date : 04/11/2011
Logged/Checked by: AN/ZA

Equipment type and model: Backhoe
R.L. surface :
Excavation dimensions : 2 **m long** 0.5 **m wide** **datum :**

groundwater	env samples	PID reading (ppm)	geo samples	field tests	depth or R.L. in meters	graphic log	classification symbol	MATERIAL DESCRIPTION soil type, plasticity or particle characteristic, colour, secondary and minor components.	moisture condition	consistency density index	hand penetrometer kPa	Remarks and additional observations
Dry	G		DS		0			FILL; Silty Clay, low to medium plasticity, brown, with large concrete pieces (garden decorations)				
	G				0.5		CL-CI	Silty CLAY, low to medium plasticity, grey-brown, trace of ironstones	M>PL	F		Alluvium
			DS/DB		1		CH	CLAY, high plasticity, yellow-brown, trace of ironstones	M>PL	F-St		
					1.5		CH	CLAY, high plasticity, pale grey, with ironstones and shale fragments	M>PL	St		Residual
			DS		2							
					2.5			Test Pit No 76 terminated at 2.5m				
					3							
					3.5							
					4							
					4.5							

GEOTECHNIQUE
PTY LTD

engineering log - excavation

Client : Winten Property Group
Project : Marsden Park Precinct
Location : North West Growth Centre, Marsden Park

Job No : 12576/1
Pit No : 77
Date : 04/11/2011
Logged/Checked by: AN/ZA

Equipment type and model: Backhoe
R.L. surface :
Excavation dimensions : 2 **m long** 0.5 **m wide** **datum :**

groundwater	env samples	PID reading (ppm)	geo samples	field tests	depth or R.L. in meters	graphic log	classification symbol	MATERIAL DESCRIPTION soil type, plasticity or particle characteristic, colour, secondary and minor components.	moisture condition	consistency density index	hand penetrometer kPa	Remarks and additional observations
	G		DS		0			FILL; Silty Clay, low to medium plasticity, brown, with large concrete pieces (garden decorations)				
	G		DS/DB		0.5		CH	CLAY, high plasticity, pale grey, trace of ironstones	M>PL	F-St		Alluvium
			DS		1.5		CH	CLAY, high plasticity, pale grey, with ironstones and shale fragments	M>PL	St-VSt		
Dry					2		CH	CLAY, high plasticity, pale grey, with ironstones and shale fragments	M>PL	VSt		Residual
					2.5			Test Pit No 77 terminated at 2.5m				
					3							
					3.5							
					4							
					4.5							

GEOTECHNIQUE
PTY LTD

engineering log - excavation

Client : Winten Property Group
Project : Marsden Park Precinct
Location : North West Growth Centre, Marsden Park

Job No : 12576/1
Pit No : 78
Date : 04/11/2011
Logged/Checked by: AN/ZA

Equipment type and model: Backhoe
R.L. surface :
Excavation dimensions : 2 **m long** 0.5 **m wide** **datum :**

groundwater	env samples	PID reading (ppm)	geo samples	field tests	depth or R.L. in meters	graphic log	classification symbol	MATERIAL DESCRIPTION soil type, plasticity or particle characteristic, colour, secondary and minor components.	moisture condition	consistency density index	hand penetrometer kPa	Remarks and additional observations
Dry	G		DS		0			FILL; Silty Clay, low to medium plasticity, brown, with gravel				
	G				0.5		CL-CI	Silty CLAY, low to medium plasticity, grey-brown, trace of ironstones	M<PL	St		Alluvium
			DS/DB		1		CI	Sandy CLAY, medium plasticity, light grey, inclusion of ironstones	M≥PL	VSt		
			DS		1.5							
					2							
					2.5			Test Pit No 78 terminated at 2.5m				
					3							
					3.5							
					4							
					4.5							

GEOTECHNIQUE
PTY LTD

engineering log - excavation

Client : Winten Property Group
Project : Marsden Park Precinct
Location : North West Growth Centre, Marsden Park

Job No : 12576/1
Pit No : 79
Date : 04/11/2011
Logged/Checked by: AN/ZA

Equipment type and model: Backhoe
R.L. surface :
Excavation dimensions : 2 **m long** 0.5 **m wide**
datum :

groundwater	env samples	PID reading (ppm)	geo samples	field tests	depth or R.L. in meters	graphic log	classification symbol	MATERIAL DESCRIPTION soil type, plasticity or particle characteristic, colour, secondary and minor components.	moisture condition	consistency density index	hand penetrometer kPa	Remarks and additional observations
Dry	G		DS		0		CL-CI	Silty CLAY, low to medium plasticity, grey-brown, trace of ironstones	M<PL			Alluvium
							CI	Silty CLAY, medium plasticity, brown-red	M<PL	VSt		
			DS/DB		0.5							
							CI-CH	Silty CLAY, medium to high plasticity, grey-brown, with ironstones and siltstones	M<PL	VSt		
					1							
					1.5		CI-CH	Silty CLAY, medium to high plasticity, grey, with shale fragments	M<PL	VSt-H		Residual
			DS									
					2							
					2.5			Test Pit No 79 terminated at 2.5m				
					3							
					3.5							
					4							
					4.5							

GEOTECHNIQUE
PTY LTD

engineering log - excavation

Client : Winten Property Group
Project : Marsden Park Precinct
Location : North West Growth Centre, Marsden Park

Job No : 12576/1
Pit No : 80
Date : 04/11/2011
Logged/Checked by: AN/ZA

Equipment type and model: Backhoe
R.L. surface :
Excavation dimensions : 2 **m long** 0.5 **m wide** **datum :**

groundwater	env samples	PID reading (ppm)	geo samples	field tests	depth or R.L. in meters	graphic log	classification symbol	MATERIAL DESCRIPTION soil type, plasticity or particle characteristic, colour, secondary and minor components.	moisture condition	consistency density index	hand penetrometer kPa	Remarks and additional observations
Dry	G		DS		0			TOPSOIL; Silty Clay, low plasticity, brown, trace of roots				
							CI-CL	Silty CLAY, low to medium plasticity, grey-brown, trace of ironstones				Alluvium
					0.5		CI-CH	Silty CLAY, medium to high plasticity, grey, with shale fragments	M<PL	St		
			DS/DB		1							
							CI-CH	Silty CLAY, medium to high plasticity, grey-brown, with ironstones and siltstones	M≥PL	St-VSt		
					1.5							
							CH	CLAY, high plasticity, pale grey, with ironstones and shale fragments	M≥PL	St-VSt		Residual
			DS		2							
					2.5			Test Pit No 80 terminated at 2.5m				
					3							
					3.5							
					4							
					4.5							

GEOTECHNIQUE PTY LTD

Project	**Marsden Park Precinct**	**Job No**	**12576/1**
Location	**North West Growth Centre, Marsden Park**	**Refer to Drawing No**	**12576/1-AA4**
		Logged & Sampled by	**AN/JK**

TABLE 1

Sample	Depth (m)	Sample Depth (m)	Date	Time	Material Description	Remarks*
SD1	0.0-0.1	0.0-0.1	27/10/2011	-	SEDIMENT; Silty Clay, low to medium plasticity, grey-brown	
SD2	0.0-0.1	0.0-0.1	"	-	SEDIMENT; Silty Clay, low to medium plasticity, grey-brown	
SD3	0.0-0.1	0.0-0.1	28/10/2011	-	SEDIMENT; Silty Clay, low to medium plasticity, grey-brown	
SD4	0.0-0.1	0.0-0.1	01/11/2011	-	SEDIMENT; Silty Clay, low to medium plasticity, grey-brown	
SD5	0.0-0.1	0.0-0.1	01/11/2011	-	SEDIMENT; Silty Clay, low to medium plasticity, grey-brown	
SD6	0.0-0.1	0.0-0.1	04/11/2011	-	SEDIMENT; Silty Clay, low to medium plasticity, grey-brown	
AST1	0.0-0.2	0.0-0.2	31/10/2011	-	FILL; Gravelly Sand, fine to coarse grained, grey, petroleum smell, with river pebbles	
	0.2-0.4	0.25-0.4	"	-	(CL-CI) Silty CLAY, low to medium plasticity, grey, trace of ironstones	
	0.4-1.1	0.7-0.8	"	-	(CH) Silty CLAY, high plasticity, yellow-brown, trace of ironstones	
	1.1-1.5	1.2-1.3	"	-	(ML) Clayey SILT, low plasticity, orange-grey, with inclusion of siltstones	
UST1	0.0-0.3	0.0-0.3	"	-	FILL; Gravelly Sand, fine to coarse grained, grey, petroleum smell, with river pebbles	
	0.3-1.1	0.35-0.5	"	-	(CH) Silty CLAY, high plasticity, yellow-brown, trace of ironstones	
		0.9-1.0	"	-	(CH) Silty CLAY, high plasticity, yellow-brown, trace of ironstones	
	1.1-1.5	1.2-1.3	"	-	(ML) Clayey SILT, low plasticity, orange-grey, with inclusion of siltstones	
SP1	-	-	02/11/2011	-	STOCKPILE; Gravelly Sand, fine to coarse grained, grey, with sandstone, concrete and asphaltic concrete fragments, trace of fibro cement fragments	
SP2	-	-	04/11/2011	-	STOCKPILE; Gravelly Clay, low to medium plasticity, dark brown, dark grey	

*Odour (O), Discolouration (D), Petroleum Hydrocarbon Staining (PHS), Asbestos Pieces (ASBP), Ash Material (ASHM), Demolition Waste (DW), Groundwater (GW), Perched Water (PW) PID reading etc.

GEOTECHNIQUE
PTY LTD

engineering log - monitoring well

Client : Winten Property Group
Project : Marsden Park Precinct
Location : North West Growth Centre, Marsden Park

Job No. : 12576/1
Borehole No. : MW1
Date : 09/11/2011
Logged/Checked by: JK/AB

drill rig : Edson
R.L. surface : **AHD**

groundwater 09/11/2011 : 8.2 (m)

groundwater	samples	PID Reading (ppm)	depth or R.L. in meters	graphic log	classification symbol	MATERIAL DESCRIPTION soil type, plasticity or particle characteristic, colour, secondary and minor components.	MONITORING WELL Graphic Log	Description
			0			TOPSOIL: Silty Sand, fine to medium grained, brown, traces of roots		Clay
		N=4 1,1,3	1		CI	CLAY, medium plasticity, pale grey, orange-brown		
		N=20 4,9,11	2		CI	CLAY, medium to high plasticity, pale grey, traces of ironstone		
		N=24 7,9,15	3					
			4			SHALE, grey, extremely low strength, extremely weathered		Bentonite
			5					
			6					Sand
			7					Screen with filter sock
▼			8					
			9					

form no. MW01 version 05 - 11/11

GEOTECHNIQUE
PTY LTD

engineering log - monitoring well

Client : Winten Property Group
Project : Marsden Park Precinct
Location : North West Growth Centre, Marsden Park

Job No. : 12576/1
Borehole No. : MW1
Date : 09/11/2011
Logged/Checked by: JK/AB

drill rig : Edson
R.L. surface : **AHD**

groundwater 09/11/2011 : 8.2 (m)

groundwater	samples	PID Reading (ppm)	depth or R.L. in meters	graphic log	classification symbol	MATERIAL DESCRIPTION soil type, plasticity or particle characteristic, colour, secondary and minor components.	MONITORING WELL Graphic Log	 Description
			10			Monitoring Well MW1 terminated at 10.0m		
			11					
			12					
			13					
			14					
			15					
			16					
			17					
			18					

GEOTECHNIQUE
PTY LTD

engineering log - monitoring well

Client : Winten Property Group
Project : Marsden Park Precinct
Location : North West Growth Centre, Marsden Park

Job No. : 12576/1
Borehole No. : MW2
Date : 09/11/2011
Logged/Checked by: JK/AB

drill rig : Edson
R.L. surface : AHD

groundwater 09/11/2011 : 2.5 (m)
groundwater 09/11/2011 : 1.8 (m)

groundwater	samples	PID Reading (ppm)	depth or R.L. in meters	graphic log	classification symbol	MATERIAL DESCRIPTION soil type, plasticity or particle characteristic, colour, secondary and minor components.	MONITORING WELL Graphic Log	Description
			0			FILL: Silty Sandy Clay, low plasticity, brown, traces of roots		Bentonite
					CI	CLAY, medium plasticity, grey, red-brown		
		N=4 1,2,2	1					
▼					CI-CH	Silty CLAY, medium to high plasticity, pale grey/white, traces of ironstone		Sand
		N=19 3,6,13	2					Screen with filter sock
▼								
			3			SHALE, grey, extremely low strength, extremely weathered		
			4					
			5			Monitoring Well MW2 terminated at 5.0m		
			6					
			7					
			8					
			9					

EXPLANATORY NOTES

Introduction
These notes have been provided to simplify the geotechnical report with regard to investigation procedures, classification methods and certain matters relating to the Discussion and Comments section. Not all notes are necessarily relevant to all reports.

Geotechnical reports are based on information gained from finite sub-surface probing, excavation, boring, sampling or other means of investigation, supplemented by experience and knowledge of local geology. For this reason they must be regarded as interpretative rather than factual documents, limited to some extent by the scope of information on which they rely.

Description and Classification Methods
The methods of description and classification of soils and rocks used in this report are based on AS1726 - 1993 "Geotechnical Site Investigations". In general, descriptions cover the following properties; strength or density, colour, structure, soil or rock type, and inclusions. Identification and classification of soil and rock involves, to a large extent, judgement within the acceptable level commonly adopted by current geotechnical practices.

Soil types are described according to the predominating particle size, qualified by the grading or other particles present (e.g. sandy clay) on the following basis:

Soil Classification	Particle Size
Clay	Less than 0.002mm
Silt	0.002 to 0.06mm
Sand	0.06 to 2.00mm
Gravel	2.00mm to 60.00mm

Cohesive soils are classified on the basis of strength, either by laboratory testing or engineering examination. The strength terms are defined as follows:

Classification	Undrained Shear Strength kPa
Very Soft	Less than 12
Soft	12 – 25
Firm	25 – 50
Stiff	50 – 100
Very Stiff	100 – 200
Hard	Greater than 200

Non-cohesive soils are classified on the basis of relative density, generally from the results of standard penetration tests (SPT) or Dutch cone penetrometer tests (CPT), as below:

Relative Density	SPT 'N' Value (blows/300mm)	CPT Cone Value (q_c-MPQ)
Very Loose	Less than 5	Less than 2
Loose	5 – 10	2 – 5
Medium Dense	10 – 30	5 – 15
Dense	30 – 50	15 – 25
Very Dense	>50	>25

Rock types are classified by their geological names, together with descriptive terms on degrees of weathering, strength, defects and other minor components. Where relevant, further information regarding rock classification is given on the following sheet.

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

Disturbed samples taken during drilling provide information on plasticity, grain size, colour, type, moisture content, 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 (normally known as U_{50}) into the soil and withdrawing 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. Details of the type and method of sampling are given in the report.

Field Investigation Methods
The following is a brief summary of investigation methods currently carried out by this Company and comments on their use and application.

Hand Auger Drilling
The borehole is advanced by manually operated equipment. The diameter of the borehole ranges from 50mm to 100mm. Penetration depth of hand augered boreholes may be limited by premature refusal on a variety of materials, such as hard clay, gravels or ironstone.

Test Pits
These are excavated with a tractor-mounted backhoe or a tracked excavator, allowing close examination of the insitu soils if it is safe to descend into the pit. The depth of penetration is limited to about 3.0m for a backhoe and up to 6.0m for an excavator. A potential disadvantage is the disturbance caused by the excavation.

Care must be taken if construction is to be carried out near, or within the test pit locations, to either adequately recompact the backfill during construction, or to design the structure to accommodate the poorly compacted backfill.

Large Diameter Auger (e.g. Pengo)
The hole is advanced by a rotating plate or short spiral auger, generally 300mm or larger in diameter. The cuttings are returned to the surface at intervals (generally of not more than 0.5m) 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 sampling.

Continuous Spiral Flight Augers
The hole is advanced by using 90mm-115mm diameter continuous spiral flight augers, which are withdrawn at intervals to allow sampling or insitu testing. This is a relatively economical means of drilling in clays and in sands above the water table. Samples are returned to the surface, or may be collected after withdrawal of the auger flights, but they are very disturbed and may be highly mixed with soil of other stratum.

Information from the drilling (as distinct from specific sampling by SPT or undisturbed samples) is of relatively lower reliability due to remoulding, mixing or softening of samples by groundwater, resulting in uncertainties of the original sample depth.

The spiral augers are usually advanced by using a V-bit through the soil profile to refusal, followed by Tungsten Carbide (TC) bit, to penetrate into bedrock. The quality and continuity of the bedrock may be assessed by examination of recovered rock fragments and through observation of the drilling penetration resistance.

Non-core Rotary Drilling (Wash Boring)
The hole is advanced by a rotary bit, with water being pumped down the drill rod 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 feel and rate of penetration.

Rotary Mud Stabilised Drilling
This is similar to rotary drilling, but uses drilling mud as a circulating fluid, which may consist of a range of products from bentonite to polymers such as Revert or Biogel. The mud tends to mask the cuttings and reliable identification is again only possible from separate intact sampling (e.g. SPT and U_{50}) samples).

Continuous Core Drilling
A continuous core sample is obtained using a diamond tipped core barrel. Providing full core recovery is achieved (which is not always possible in very low strength rocks and granular soils), this technique provides a very reliable (but relatively expensive) method of investigation. In rocks, an NMLC triple tube core barrel, which gives a core of about 50mm diameter, is usually used with water flush.

Portable Proline Drilling
This is manually operated equipment and is only used in sites which require bedrock core sampling and there is restricted site access to truck mounted drill rigs. The boreholes are usually advanced initially using a tricone roller bit and water circulation to penetrate the upper soil profile. In some instances, a hand auger may be used to penetrate the soil profile. Subsequent drilling into bedrock involves the use of NMLC triple tube equipment, using water as a lubricant.

Standard Penetration Tests
Standard penetration tests are used mainly in non-cohesive soils, but occasionally also in cohesive soils, as a means of determining density or strength and of obtaining a relatively undisturbed sample. The test procedure is described in AS1289 6.3.1.

The test is carried out in a borehole by driving a 50mm diameter split sample tube under the impact of a 63kg hammer with a free fall of 769mm. It is normal for the tube to be driven in three successive 150mm increments and the 'N' value is taken as the number of blows for the last 300mm. In dense sands, very hard clays or weak rock, the full 450mm penetration may not be practicable and the test is discontinued.

The test results are reported in the following form:

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

  N = 13
  4,6,7

- In a case where the test is discontinued short of full penetration, say after 15 blows for the first 150mm and 30 blows for the next 40mm as;

  15, 30/40mm

The results of the tests can be related empirically to the engineering properties of the soil. Occasionally the test method is used to obtain samples in 50mm diameter thin walled sample tubes in clays. In these circumstances, the test results are shown on the bore logs in brackets.

Cone Penetrometer Testing and Interpretation
Cone penetrometer testing (sometimes referred to as Dutch Cone-CPT) described in this report, has been carried out using an electrical friction cone penetrometer and the test is described in AS1289 6.5.1.

In the test, a 35mm diameter rod with cone tipped end is pushed continuously into the soil, the reaction being provided by a specially designed truck or rig, which is fitted with a hydraulic ram system. Measurements are made of the end bearing resistance on the cone and the friction resistance on a separate 130mm long sleeve, immediately behind the cone. Transducers in the tip of the assembly are connected by electrical wires passing through the centre of the push rods to an amplifier and recorder unit mounted on the control truck.

As penetration occurs (at a rate of approximately 20mm per second) the information is output on continuous chart recorders. The plotted results given in this report have been traced from the original records. The information provided on the charts comprises:

- Cone resistance - the actual end bearing force divided by the cross sectional area of the cone, expressed in MPa *
- Sleeve friction - the frictional force on the sleeve divided by the surface area, expressed in kPa

The ratios of the sleeve resistance to cone resistance will vary with the type of soil encountered, with higher relative friction in clays than in sands. Friction ratios of 1% to 2% are commonly encountered in sands and very soft clays, rising to 4% to 10% in stiff clays.

In sands, the relationship between cone resistance and SPT value is commonly in the range:

$$q_c \text{ (MPa)} = (0.4 \text{ to } 0.6) \text{ N (blows per 300mm)}$$

In clays, the relationship between undrained shear strength and cone resistance is commonly in the range:

$$q_c=(12 \text{ to } 18)C_u$$

Interpretation of CPT values can also be made to allow estimate of modulus or compressibility values, to allow calculation of foundation settlements. Inferred stratification, as shown on the attached report, is assessed from the cone and friction traces, from experience and information from nearby boreholes etc.

This information is presented for general guidance, but must be regarded as being to some extent interpretive. The test method provides a continuous profile of engineering properties and where precise information or soil classification is required, direct drilling and sampling may be preferable.

Portable Dynamic Cone Penetrometer (DCP)
Portable Dynamic Cone Penetrometer tests are carried out by driving a rod into the ground with a falling weight hammer and measuring the blows per successive 100mm increment of penetration.

There are two similar tests, Cone Penetrometer (commonly known as Scala Penetrometer) AS1289 6.3.2 and the Perth Sand Penetrometer AS1289 6.3.3. Scala Penetrometer is commonly adopted by this company and consists of a 16mm rod with a 20mm diameter cone end, driven with a 9kg hammer, dropping 510mm (AS1289 Test P3.2).

Laboratory Testing
Laboratory testing is carried out in accordance with Australian Standard 1289 "Methods of Testing Soil for Engineering Purposes". Details of the test procedures are given on the individual report forms.

Engineering Logs
The engineering logs presented herein are an engineering and/or geological interpretation of the sub-surface conditions and their reliability will depend to some extent on frequency of sampling and the method of drilling. Ideally, continuous undisturbed sampling or core drilling will provide the most reliable assessment, however, this is not always practicable or possible to justify economically. As it is, the boreholes represent only a small sample of the total sub-surface profile. Interpretation of the information and its application to design and construction should take into account the spacing of boreholes, frequency of sampling and the possibility of other than 'straight line' variations between the boreholes.

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

- in low permeability soils groundwater, although present, may enter the hole slowly or perhaps not at all during the investigation period
- 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 due to the seasons or recent weather changes. They may not be the same at the time of construction as indicated in the report
- 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 be washed out of the hole if water observations are to be made

More reliable measurements can be achieved by installing standpipes that are read at intervals over several days, or 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 or surface water.

Engineering Reports
Engineering reports are prepared by qualified personnel and are based on the information obtained and on current engineering standards of interpretation and analysis. Where the report has been prepared for a specific design proposal, perhaps a three-storey building, the information and interpretation may not be relevant if the design proposal is changed, say to a twenty-storey building. If this occurs, the Company will be pleased to review the report and sufficiency of the investigation work.

Every care is taken with the report as it relates to interpretation of sub-surface conditions, discussions of geotechnical aspects and recommendations or suggestions for design and construction. However, the Company cannot always anticipate or assume responsibility for:

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

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

Site Anomalies
In the event that conditions encountered on-site during construction appear to vary from those that were expected from the information contained in the report, the Company requests immediate notification. Most problems are much more easily resolved when conditions are exposed rather than at some later stage, well after the event.

Reproduction of Information for Contractual Purposes
Attention is drawn to the document "Guidelines for the Provision of Geotechnical Information in Tender Documents", published by the Institute of Engineers Australia. Where information obtained from this Investigation 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. The Company would be pleased to assist in this regard and/or make additional copies of the report available for contract purposes, at a nominal charge.

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

Review of Design
Where major civil or structural developments are proposed, or where only a limited investigation has been completed, or where the geotechnical conditions are complex, it is prudent to have the design reviewed by a Senior Geotechnical Engineer.

APPENDIX E

LABORATORY TEST RESULTS CERTIFICATES

Geotechnical

GEOTECH TESTING PTY LTD
ABN 71 076 676 321

Certified System
Quality
ISO 9001
SAI GLOBAL

WINTEN PROPERTY GROUP
LEVEL 10, 61 LAVENDER STREET
MILSONS POINT NSW 2061

LAND CAPABILITY STUDY
MARSDEN PARK PRECINCT - NORTH WEST GROWTH CENTRE, MARSDEN PARK

Emerson Crumb Dispersion

Job No. 12576/1 **Date:** 22/11/2011

Sample Identification:	12576/1-1	**Test Pit No:**	3
Test Procedure:	AS 1289 3.8.1	**Depth (m):**	0.5 - 0.6

Immersion of Air Dried Crumbs

- Does not Slake ☐
- Slakes ☑
  - Swells ☐ (7)
  - Does not swell ☐ (8)
  - Complete Dispersion ☐ (1)
  - Partial Dispersion ☐ (2)
  - No Dispersion ☑
    - Disperses ☐ (3)
    - Does not disperse ☑
      - Calcite or gypsum
        - Present ☑ (4)
        - Absent ☐
          - Vigorous shaking
            - Disperses ☐ (5)
            - Flocculates ☐ (6)

Material Description:
(CH) CLAY, high plasticity, yellow-brown, trace of fine to medium gravel

Type of Water Used:	Distilled
Water Temperature:	18.5°C

EMERSON CLASS NUMBER 4

Form No R010 Version 04 06/11 - issued by ER

NATA ACCREDITED FOR TECHNICAL COMPETENCE
Nata Accreditation Number 2734
Corporate Site Number 2727

A Kench 22/11/2011

Approved signatory

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GEOTECH TESTING PTY LTD
ABN 71 076 676 321

Certified System
Quality
ISO 9001
SAI GLOBAL

WINTEN PROPERTY GROUP
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MILSONS POINT NSW 2061

LAND CAPABILITY STUDY
MARSDEN PARK PRECINCT - NORTH WEST GROWTH CENTRE, MARSDEN PARK

Emerson Crumb Dispersion

Job No. 12576/1 **Date:** 22/11/2011

Sample Identification:	12576/1-2	**Test Pit No:**	16
Test Procedure:	AS 1289 3.8.1	**Depth (m):**	1.5 - 1.6

Immersion of Air Dried Crumbs

- Does not Slake ☐
- Slakes ☑
  - Swells ☐ → 7
  - Does not swell ☐ → 8
  - Complete Dispersion ☐ → 1
  - Partial Dispersion ☐ → 2
  - No Dispersion ☑
    - Disperses ☐ → 3
    - Does not disperse ☑
      - Calcite or gypsum
        - Present ☑ → 4
        - Absent ☐
          - Vigorous shaking
            - Disperses ☐ → 5
            - Flocculates ☐ → 6

Material Description:
(CH) CLAY, high plasticity, pale grey, some fine to medium gravel

Type of Water Used:	Distilled
Water Temperature:	18.5°C

EMERSON CLASS NUMBER 4

Form No R010 Version 04 06/11 - issued by ER

NATA ACCREDITED FOR TECHNICAL COMPETENCE
Nata Accreditation Number 2734
Corporate Site Number 2727

A Kench 22/11/2011

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Certified System
Quality
ISO 9001
SAI GLOBAL

WINTEN PROPERTY GROUP
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MILSONS POINT NSW 2061

LAND CAPABILITY STUDY
MARSDEN PARK PRECINCT - NORTH WEST GROWTH CENTRE, MARSDEN PARK

Emerson Crumb Dispersion

Job No. 12576/1 **Date:** 22/11/2011

Sample Identification:	12576/1-3	**Test Pit No:**	22
Test Procedure:	AS 1289 3.8.1	**Depth (m):**	2.0 - 2.5

Immersion of Air Dried Crumbs

- Does not Slake ☐
- Slakes ☑
  - Swells ☐ → 7
  - Does not swell ☐ → 8
  - Complete Dispersion ☑ → 1
  - Partial Dispersion ☐ → 2
  - No Dispersion ☐
    - Disperses ☐ → 3
    - Does not disperse ☐
      - Calcite or gypsum
        - Present ☐ → 4
        - Absent ☐
          - Vigorous shaking
            - Disperses ☐ → 5
            - Flocculates ☐ → 6

Material Description:
(CH) CLAY, high plasticity, pale grey, trace of fine to medium gravel

Type of Water Used:	Distilled
Water Temperature:	18.5°C

EMERSON CLASS NUMBER	1

Form No R010 Version 04 06/11 - issued by ER

NATA
ACCREDITED FOR TECHNICAL COMPETENCE
Nata Accreditation Number 2734
Corporate Site Number 2727

A Kench 22/11/2011

Approved signatory

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GEOTECH TESTING PTY LTD
ABN 71 076 676 321

Certified System
Quality
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LEVEL 10, 61 LAVENDER STREET
MILSONS POINT NSW 2061

LAND CAPABILITY STUDY
MARSDEN PARK PRECINCT - NORTH WEST GROWTH CENTRE, MARSDEN PARK

Emerson Crumb Dispersion

Job No. 12576/1 **Date:** 22/11/2011

Sample Identification:	12576/1-4	**Test Pit No:**	25
Test Procedure:	AS 1289 3.8.1	**Depth (m):**	0.0 - 0.1

Immersion of Air Dried Crumbs

- Does not Slake ☐
- Slakes ☑
  - Swells ☐ → 7
  - Does not swell ☐ → 8
  - Complete Dispersion ☐ → 1
  - Partial Dispersion ☐ → 2
  - No Dispersion ☑
    - Disperses ☐ → 3
    - Does not disperse ☑
      - Calcite or gypsum
        - Present ☐ → 4
        - Absent ☑
          - Vigorous shaking
            - Disperses ☑ → 5
            - Flocculates ☐ → 6

Material Description:
(CL-CI) Silty CLAY, low to medium plasticity, grey-brown, trace of fine to medium gravel

Type of Water Used:	Distilled
Water Temperature:	18.5°C

EMERSON CLASS NUMBER 5

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A Kench 22/11/2011

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LAND CAPABILITY STUDY
MARSDEN PARK PRECINCT - NORTH WEST GROWTH CENTRE, MARSDEN PARK

Emerson Crumb Dispersion

Job No. 12576/1 **Date:** 22/11/2011

Sample Identification:	12576/1-5	**Test Pit No:**	27
Test Procedure:	AS 1289 3.8.1	**Depth (m):**	0.5 - 0.6

Immersion of Air Dried Crumbs

- Does not Slake ☐
- Slakes ☑
  - Swells ☐ (7)
  - Does not swell ☐ (8)
  - Complete Dispersion ☐ (1)
  - Partial Dispersion ☐ (2)
  - No Dispersion ☑
    - Disperses ☐ (3)
    - Does not disperse ☑
      - Calcite or gypsum
        - Present ☐ (4)
        - Absent ☑
          - Vigorous shaking
            - Disperses ☑ (5)
            - Flocculates ☐ (6)

Material Description:
(Cl) Sandy CLAY, medium plasticity, pale grey, trace of fine to medium gravel

Type of Water Used:	Distilled
Water Temperature:	18.5°C

EMERSON CLASS NUMBER 5

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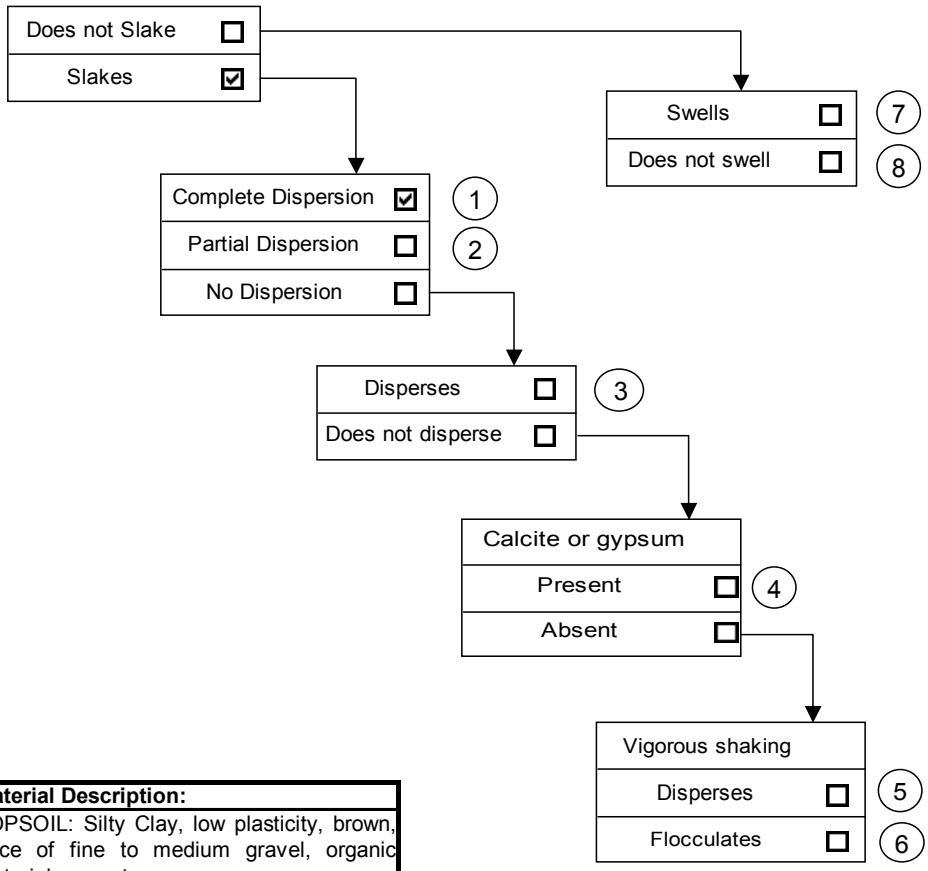
LAND CAPABILITY STUDY
MARSDEN PARK PRECINCT - NORTH WEST GROWTH CENTRE, MARSDEN PARK

Emerson Crumb Dispersion

Job No. 12576/1 **Date:** 22/11/2011

Sample Identification:	12576/1-6	**Test Pit No:**	30
Test Procedure:	AS 1289 3.8.1	**Depth (m):**	0.0 - 0.1

Immersion of Air Dried Crumbs



Material Description:
TOPSOIL: Silty Clay, low plasticity, brown, trace of fine to medium gravel, organic material present

Type of Water Used:	Distilled
Water Temperature:	18.5°C

EMERSON CLASS NUMBER	1

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LAND CAPABILITY STUDY
MARSDEN PARK PRECINCT - NORTH WEST GROWTH CENTRE, MARSDEN PARK

Emerson Crumb Dispersion

Job No. 12576/1 **Date:** 22/11/2011

Sample Identification:	12576/1-7	**Test Pit No:**	31
Test Procedure:	AS 1289 3.8.1	**Depth (m):**	1.0 - 1.1

Immersion of Air Dried Crumbs

- Does not Slake ☐
- Slakes ☑
  - Swells ☐ → 7
  - Does not swell ☐ → 8
  - Complete Dispersion ☐ → 1
  - Partial Dispersion ☐ → 2
  - No Dispersion ☑
    - Disperses ☑ → 3
    - Does not disperse ☐
      - Calcite or gypsum
        - Present ☐ → 4
        - Absent ☐
          - Vigorous shaking
            - Disperses ☐ → 5
            - Flocculates ☐ → 6

Material Description:
(CI) Sandy CLAY, medium plasticity, pale grey, trace of fine to medium gravel

Type of Water Used:	Distilled
Water Temperature:	18.5°C

EMERSON CLASS NUMBER	3

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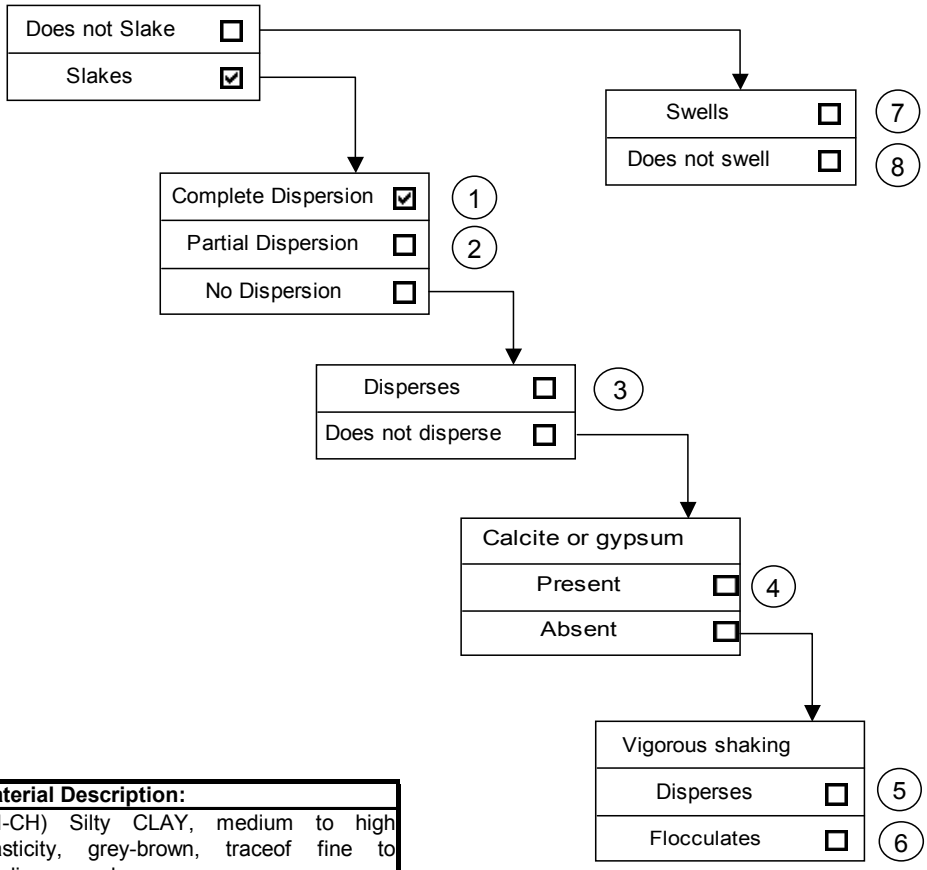
LAND CAPABILITY STUDY
MARSDEN PARK PRECINCT - NORTH WEST GROWTH CENTRE, MARSDEN PARK

Emerson Crumb Dispersion

Job No. 12576/1 **Date:** 22/11/2011

Sample Identification:	12576/1-8	**Test Pit No:**	37
Test Procedure:	AS 1289 3.8.1	**Depth (m):**	1.0 - 1.1

Immersion of Air Dried Crumbs



Material Description:
(CI-CH) Silty CLAY, medium to high plasticity, grey-brown, traceof fine to medium gravel

Type of Water Used:	Distilled
Water Temperature:	18.5°C

EMERSON CLASS NUMBER	1

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LAND CAPABILITY STUDY
MARSDEN PARK PRECINCT - NORTH WEST GROWTH CENTRE, MARSDEN PARK

Emerson Crumb Dispersion

Job No. 12576/1 **Date:** 22/11/2011

Sample Identification:	12576/1-9	**Test Pit No:**	43
Test Procedure:	AS 1289 3.8.1	**Depth (m):**	2.0 - 2.1

Immersion of Air Dried Crumbs

- Does not Slake ☐
- Slakes ☑
  - Swells ☐ (7)
  - Does not swell ☐ (8)
  - Complete Dispersion ☐ (1)
  - Partial Dispersion ☐ (2)
  - No Dispersion ☑
    - Disperses ☑ (3)
    - Does not disperse ☐
      - Calcite or gypsum
        - Present ☐ (4)
        - Absent ☐
          - Vigorous shaking
            - Disperses ☐ (5)
            - Flocculates ☐ (6)

Material Description:
(CH) CLAY, high plasticity, pale grey, trace of fine to medium gravel

Type of Water Used:	Distilled
Water Temperature:	18.5°C

EMERSON CLASS NUMBER	3

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LAND CAPABILITY STUDY
MARSDEN PARK PRECINCT - NORTH WEST GROWTH CENTRE, MARSDEN PARK

Emerson Crumb Dispersion

Job No. 12576/1 **Date:** 22/11/2011

Sample Identification:	12576/1-10	**Test Pit No:**	60
Test Procedure:	AS 1289 3.8.1	**Depth (m):**	0.5 - 0.6

Immersion of Air Dried Crumbs

- Does not Slake ☐
- Slakes ☑
  - Swells ☐ (7)
  - Does not swell ☐ (8)
  - Complete Dispersion ☐ (1)
  - Partial Dispersion ☐ (2)
  - No Dispersion ☑
    - Disperses ☐ (3)
    - Does not disperse ☑
      - Calcite or gypsum
        - Present ☑ (4)
        - Absent ☐
          - Vigorous shaking
            - Disperses ☐ (5)
            - Flocculates ☐ (6)

Material Description:
(CI) CLAY, medium plasticity, yellow-brown, trace of fine to medium gravel

Type of Water Used:	Distilled
Water Temperature:	18.5°C

EMERSON CLASS NUMBER 4

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LAND CAPABILITY STUDY
MARSDEN PARK PRECINCT - NORTH WEST GROWTH CENTRE, MARSDEN PARK

TEST RESULTS - ATTERBERG LIMITS

Test Procedure AS1289 3.1.1, 3.2.1, 3.3.1, 3.4.1

Job No: 12576/1		Tested By:	AN
Laboratory Penrith		Checked By:	AP
Date Tested 14/11/2011			
Sample Identification	Test Pit 4	Test Pit 13	Test Pit 18
Laboratory Number	12576/1-11	12576/1-12	12576/1-13
Depth (m)	1.0 - 1.1	1.0 - 1.1	0.0 - 0.1
Test Description			
Liquid Limit (W_L)	60%	56%	22%
Plastic Limit (W_P)	18%	16%	20%
Plastic Index (I_P)	42%	40%	2%
Linear Shrinkage (LS)	8.5%	13.5%	1.0%
Mould Length (mm)	125	125	125
Sample History	Oven Dried Dry Sieved	Oven Dried Dry Sieved	Oven Dried Dry Sieved
Material Description	(CH) CLAY, high plasticity, yellow-brown, trace of fine to medium gravel	(CH) CLAY, high plasticity, yellow-brown, trace of fine to medium gravel	TOPSOIL, silty Clay, brown organic matter present

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WINTEN PROPERTY GROUP
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LAND CAPABILITY STUDY
MARSDEN PARK PRECINCT - NORTH WEST GROWTH CENTRE, MARSDEN PARK

TEST RESULTS - ATTERBERG LIMITS

Test Procedure AS1289 3.1.1, 3.2.1, 3.3.1, 3.4.1

Job No:	12576/1	Tested By:	AN
Laboratory	Penrith	Checked By:	AP
Date Tested	14/11/2011		

Sample Identification	Test Pit 40	Test Pit 61
Laboratory Number	12576/1-14	12576/1-15
Depth (m)	0.5 - 0.6	1.0 - 1.1
Test Description		
Liquid Limit (W_L)	32%	43%
Plastic Limit (W_P)	15%	18%
Plastic Index (I_P)	17%	25%
Linear Shrinkage (LS)	9.5%	12.5%
Mould Length (mm)	127	127
Sample History	Oven Dried Dry Sieved	Oven Dried Dry Sieved
Material Description	(CL) Sandy CLAY, low plasticity, pale grey, trace of fine to medium gravel	(CI) CLAY, medium plasticity, yellow-brown, trace of fine to medium gravel

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LAND CAPABILITY STUDY
MARSDEN PARK PRECINCT - NORTH WEST GROWTH CENTRE, MARSDEN PARK

TEST RESULTS - ATTERBERG LIMITS

Test Procedure AS1289 3.1.1, 3.2.1, 3.3.1, 3.4.1

Job No:	12576/1	Tested By:	AN
Laboratory	Penrith	Checked By:	AK
Date Tested	07/12/2011		

Sample Identification	Test Pit 19
Laboratory Number	12576/1-16
Depth (m)	0.5 - 0.6
Test Description	
Liquid Limit (W_L)	64%
Plastic Limit (W_P)	22%
Plastic Index (I_P)	42%
Linear Shrinkage (LS)	17.5%
Mould Length (mm)	127
Sample History	Oven Dried Dry Sieved
Material Description	(CH) CLAY, high plasticity, yellow-brown, trace of fine to medium gravel

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LAND CAPABILITY STUDY
MARSDEN PARK PRECINCT - NORTH WEST GROWTH CENTRE, MARSDEN PARK

Emerson Crumb Dispersion

Job No. 12576/1 **Date:** 08/12/2011

Sample Identification:	12576/1-17	**Test Pit No:**	25
Test Procedure:	AS 1289 3.8.1	**Depth (m):**	2.0 - 2.1

Immersion of Air Dried Crumbs

- Does not Slake ☐
- Slakes ☑
  - Complete Dispersion ☑ (1)
  - Partial Dispersion ☐ (2)
  - No Dispersion ☐
    - Disperses ☐ (3)
    - Does not disperse ☐
      - Calcite or gypsum
        - Present ☐ (4)
        - Absent ☐
          - Vigorous shaking
            - Disperses ☐ (5)
            - Flocculates ☐ (6)
- Swells ☐ (7)
- Does not swell ☐ (8)

Material Description:
(CI) Sandy CLAY, medium plasticity, pale grey, trace of fine to medium gravel

Type of Water Used:	Distilled
Water Temperature:	20.5°C

EMERSON CLASS NUMBER	1

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LAND CAPABILITY STUDY
MARSDEN PARK PRECINCT - NORTH WEST GROWTH CENTRE, MARSDEN PARK

Emerson Crumb Dispersion

Job No. 12576/1 **Date:** 08/12/2011

Sample Identification:	12576/1-18	**Test Pit No:**	30
Test Procedure:	AS 1289 3.8.1	**Depth (m):**	2.0 - 2.1

Immersion of Air Dried Crumbs

- Does not Slake ☐
- Slakes ☑
  - Complete Dispersion ☐ (1)
  - Partial Dispersion ☐ (2)
  - No Dispersion ☑
    - Disperses ☐ (3)
    - Does not disperse ☑
      - Calcite or gypsum
        - Present ☐ (4)
        - Absent ☑
          - Vigorous shaking
            - Disperses ☑ (5)
            - Flocculates ☐ (6)
- Swells ☐ (7)
- Does not swell ☐ (8)

Material Description:
(CH) CLAY, high plasticity, pale grey, trace of fine to medium gravel

Type of Water Used:	Distilled
Water Temperature:	20.5°C

EMERSON CLASS NUMBER 5

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APPENDIX F

LABORATORY TEST RESULTS CERTIFICATES

Salinity

ANALYTICAL REPORT

WORLD RECOGNISED ACCREDITATION

CLIENT DETAILS

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Client	Geotechnique
Address	P.O. Box 880 PENRITH NSW 2751
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Facsimile	02 4722 6161
Email	Emged@geotech.com.au
Project	**12576/1 - Marsden Park Precinct**
Order Number	(Not specified)
Samples	99

LABORATORY DETAILS

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Laboratory	SGS Alexandria Environmental
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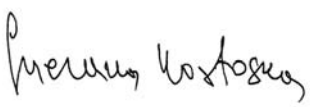
SGS Reference	SE102938 R0
Report Number	0000011543
Date Reported	10 Nov 2011
Date Received	31 Oct 2011

COMMENTS

The document is issued in accordance with NATA's accreditation requirements.
Accredited for compliance with ISO/IEC 17025. NATA accredited laboratory 2562(4354).

Cation Exchange Capacity subcontracted to SGS Cairns, 2/58 Comport St, Portsmith QLD 4870, NATA Accreditation Number: 2562, Site Number: 3146, CE74772.

SIGNATORIES



Snezana Kostoska
Inorganics Chemist

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	SE102938.001 Soil 27 Oct 2011 TP-1 0.0-0.1	SE102938.002 Soil 27 Oct 2011 TP-1 1.0-1.1	SE102938.003 Soil 27 Oct 2011 TP-1 2.0-2.1	SE102938.004 Soil 28 Oct 2011 TP-2 0.0-0.1	SE102938.005 Soil 28 Oct 2011 TP-2 0.5-0.6
Conductivity and TDS by Calculation - Soil Method: AN106								
Conductivity	µS/cm	1		310	380	630	500	380
Conductivity (1:5 dry sample basis)	µS/cm	1		380	450	760	600	490
Total Dissolved Solids (by calculation)	mg/kg	5		1100	1300	2300	1800	1500
pH in soil (1:5) Method: AN101								
pH	pH Units	-		5.7	5.6	6.4	5.8	4.6
Soluble Anions in Soil by Ion Chromatography Method: AN245								
Chloride	mg/kg	0.25		580	-	-	-	740
Sulphate	mg/kg	0.5		55	-	-	-	6.9
Moisture Content Method: AN234								
% Moisture	%	0.5		17.6	14.4	16.9	15.9	21.9

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	SE102938.006 Soil 28 Oct 2011 TP-2 1.5-1.6	SE102938.007 Soil 28 Oct 2011 TP-4 0.0-0.1	SE102938.008 Soil 28 Oct 2011 TP-4 1.0-1.1	SE102938.009 Soil 28 Oct 2011 TP-4 2.0-2.1	SE102938.010 Soil 28 Oct 2011 TP-5 0.0-0.1
Conductivity and TDS by Calculation - Soil Method: AN106								
Conductivity	µS/cm	1		550	34	90	100	78
Conductivity (1:5 dry sample basis)	µS/cm	1		700	40	110	120	91
Total Dissolved Solids (by calculation)	mg/kg	5		2100	120	330	370	270
pH in soil (1:5) Method: AN101								
pH	pH Units	-		5.8	6.2	5.8	5.6	5.8
Soluble Anions in Soil by Ion Chromatography Method: AN245								
Chloride	mg/kg	0.25		-	-	-	96	-
Sulphate	mg/kg	0.5		-	-	-	110	-
Moisture Content Method: AN234								
% Moisture	%	0.5		22.1	15.6	17.8	17.8	14.2

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	SE102938.011 Soil 28 Oct 2011 TP-5 0.5-0.6	SE102938.012 Soil 28 Oct 2011 TP-5 1.5-1.6	SE102938.013 Soil 28 Oct 2011 TP-6 0.0-0.1	SE102938.014 Soil 28 Oct 2011 TP-6 0.5-0.6	SE102938.015 Soil 28 Oct 2011 TP-6 1.5-1.6
Conductivity and TDS by Calculation - Soil Method: AN106								
Conductivity	µS/cm	1		82	23	120	78	60
Conductivity (1:5 dry sample basis)	µS/cm	1		100	28	140	88	67
Total Dissolved Solids (by calculation)	mg/kg	5		310	85	410	260	200

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name SE102938.011 Soil 28 Oct 2011 TP-5 0.5-0.6	SE102938.012 Soil 28 Oct 2011 TP-5 1.5-1.6	SE102938.013 Soil 28 Oct 2011 TP-6 0.0-0.1	SE102938.014 Soil 28 Oct 2011 TP-6 0.5-0.6	SE102938.015 Soil 28 Oct 2011 TP-6 1.5-1.6
pH in soil (1:5) Method: AN101							
pH	pH Units	-	5.5	6.1	5.4	5.5	5.7
Soluble Anions in Soil by Ion Chromatography Method: AN245							
Chloride	mg/kg	0.25	-	130	9.8	-	-
Sulphate	mg/kg	0.5	-	130	33	-	-
Moisture Content Method: AN234							
% Moisture	%	0.5	20.1	19.9	10.0	11.5	10.8

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name SE102938.016 Soil 28 Oct 2011 TP-7 0.0-0.1	SE102938.017 Soil 28 Oct 2011 TP-7 1.0-1.1	SE102938.018 Soil 28 Oct 2011 TP-7 2.0-2.1	SE102938.019 Soil 28 Oct 2011 TP-8 0.0-0.1	SE102938.020 Soil 28 Oct 2011 TP-8 1.0-1.1
Conductivity and TDS by Calculation - Soil Method: AN106							
Conductivity	µS/cm	1	30	48	31	2700	1500
Conductivity (1:5 dry sample basis)	µS/cm	1	33	56	34	3200	1800
Total Dissolved Solids (by calculation)	mg/kg	5	98	170	100	9600	5300
pH in soil (1:5) Method: AN101							
pH	pH Units	-	5.6	6.2	6.5	5.2	7.0
Soluble Anions in Soil by Ion Chromatography Method: AN245							
Chloride	mg/kg	0.25	-	45	-	-	-
Sulphate	mg/kg	0.5	-	43	-	-	-
Moisture Content Method: AN234							
% Moisture	%	0.5	9.0	13.8	10.3	14.6	17.9

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name SE102938.021 Soil 28 Oct 2011 TP-8 2.0-2.1	SE102938.022 Soil 28 Oct 2011 TP-9 0.0-0.1	SE102938.023 Soil 28 Oct 2011 TP-9 0.6-0.7	SE102938.024 Soil 28 Oct 2011 TP-9 1.5-1.6	SE102938.025 Soil 28 Oct 2011 TP-10 0.0-0.1
Conductivity and TDS by Calculation - Soil Method: AN106							
Conductivity	µS/cm	1	1400	220	510	340	240
Conductivity (1:5 dry sample basis)	µS/cm	1	1800	260	610	400	260
Total Dissolved Solids (by calculation)	mg/kg	5	5300	790	1800	1200	780
pH in soil (1:5) Method: AN101							
pH	pH Units	-	7.3	5.4	4.6	4.5	7.4

Parameter	Units	LOR	Sample Number / Sample Matrix / Sample Date / Sample Name				
			SE102938.021 Soil 28 Oct 2011 TP-8 2.0-2.1	SE102938.022 Soil 28 Oct 2011 TP-9 0.0-0.1	SE102938.023 Soil 28 Oct 2011 TP-9 0.6-0.7	SE102938.024 Soil 28 Oct 2011 TP-9 1.5-1.6	SE102938.025 Soil 28 Oct 2011 TP-10 0.0-0.1
Soluble Anions in Soil by Ion Chromatography Method: AN245							
Chloride	mg/kg	0.25	2700	390	-	-	-
Sulphate	mg/kg	0.5	210	2.1	-	-	-
Moisture Content Method: AN234							
% Moisture	%	0.5	17.5	15.3	16.5	16.1	9.4

Parameter	Units	LOR	Sample Number / Sample Matrix / Sample Date / Sample Name				
			SE102938.026 Soil 28 Oct 2011 TP-10 1.0-1.1	SE102938.027 Soil 28 Oct 2011 TP-10 2.0-2.1	SE102938.028 Soil 28 Oct 2011 TP-11 0.0-0.1	SE102938.029 Soil 28 Oct 2011 TP-11 0.6-0.7	SE102938.030 Soil 28 Oct 2011 TP-11 1.5-1.6
Conductivity and TDS by Calculation - Soil Method: AN106							
Conductivity	µS/cm	1	370	800	180	410	1000
Conductivity (1:5 dry sample basis)	µS/cm	1	420	930	200	480	1200
Total Dissolved Solids (by calculation)	mg/kg	5	1300	2800	600	1400	3600
pH in soil (1:5) Method: AN101							
pH	pH Units	-	4.7	4.6	6.3	5.3	5.6
Soluble Anions in Soil by Ion Chromatography Method: AN245							
Chloride	mg/kg	0.25	470	-	-	670	-
Sulphate	mg/kg	0.5	210	-	-	42	-
Moisture Content Method: AN234							
% Moisture	%	0.5	13.2	14.6	10.4	14.2	15.6

Parameter	Units	LOR	Sample Number / Sample Matrix / Sample Date / Sample Name				
			SE102938.031 Soil 28 Oct 2011 TP-12 0.0-0.1	SE102938.032 Soil 28 Oct 2011 TP-12 1.0-1.1	SE102938.033 Soil 28 Oct 2011 TP-12 2.0-2.1	SE102938.034 Soil 28 Oct 2011 TP-13 0.0-0.1	SE102938.035 Soil 28 Oct 2011 TP-13 1.0-1.1
Conductivity and TDS by Calculation - Soil Method: AN106							
Conductivity	µS/cm	1	96	440	780	79	410
Conductivity (1:5 dry sample basis)	µS/cm	1	110	530	940	87	490
Total Dissolved Solids (by calculation)	mg/kg	5	330	1600	2800	260	1500
pH in soil (1:5) Method: AN101							
pH	pH Units	-	5.6	4.8	4.9	5.8	5.0
Soluble Anions in Soil by Ion Chromatography Method: AN245							
Chloride	mg/kg	0.25	-	-	1200	-	-
Sulphate	mg/kg	0.5	-	-	320	-	-

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	SE102938.031 Soil 28 Oct 2011 TP-12 0.0-0.1	SE102938.032 Soil 28 Oct 2011 TP-12 1.0-1.1	SE102938.033 Soil 28 Oct 2011 TP-12 2.0-2.1	SE102938.034 Soil 28 Oct 2011 TP-13 0.0-0.1	SE102938.035 Soil 28 Oct 2011 TP-13 1.0-1.1
Moisture Content Method: AN234								
% Moisture	%	0.5		12.1	17.7	16.6	9.1	16.4

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	SE102938.036 Soil 28 Oct 2011 TP-13 2.0-2.1	SE102938.037 Soil 27 Oct 2011 TP-14 0.0-0.1	SE102938.038 Soil 27 Oct 2011 TP-14 0.6-0.7	SE102938.039 Soil 27 Oct 2011 TP-14 1.7-1.8	SE102938.040 Soil 27 Oct 2011 TP-15 0.0-0.1
Conductivity and TDS by Calculation - Soil Method: AN106								
Conductivity	µS/cm	1		290	300	470	470	45
Conductivity (1:5 dry sample basis)	µS/cm	1		330	360	580	570	53
Total Dissolved Solids (by calculation)	mg/kg	5		990	1100	1700	1700	160
pH in soil (1:5) Method: AN101								
pH	pH Units	-		5.2	5.7	4.8	6.2	6.0
Soluble Anions in Soil by Ion Chromatography Method: AN245								
Chloride	mg/kg	0.25		290	380	-	-	-
Sulphate	mg/kg	0.5		100	170	-	-	-
Moisture Content Method: AN234								
% Moisture	%	0.5		12.8	16.2	18.7	16.9	13.7

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	SE102938.041 Soil 27 Oct 2011 TP-15 1.0-1.1	SE102938.042 Soil 27 Oct 2011 TP-15 2.0-2.1	SE102938.043 Soil 27 Oct 2011 TP-16 0.0-0.1	SE102938.044 Soil 27 Oct 2011 TP-16 0.6-0.7	SE102938.045 Soil 27 Oct 2011 TP-16 1.5-1.6
Conductivity and TDS by Calculation - Soil Method: AN106								
Conductivity	µS/cm	1		260	770	160	290	670
Conductivity (1:5 dry sample basis)	µS/cm	1		290	920	170	350	830
Total Dissolved Solids (by calculation)	mg/kg	5		870	2800	510	1100	2500
pH in soil (1:5) Method: AN101								
pH	pH Units	-		5.0	5.3	5.3	5.3	5.0
Soluble Anions in Soil by Ion Chromatography Method: AN245								
Chloride	mg/kg	0.25		260	-	-	690	-
Sulphate	mg/kg	0.5		190	-	-	110	-
Moisture Content Method: AN234								
% Moisture	%	0.5		10.7	16.3	8.7	18.6	18.9

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	SE102938.046 Soil 28 Oct 2011 TP-18 0.0-0.1	SE102938.047 Soil 28 Oct 2011 TP-18 1.0-1.1	SE102938.048 Soil 28 Oct 2011 TP-18 2.0-2.1	SE102938.049 Soil 28 Oct 2011 TP-19 0.0-0.1	SE102938.050 Soil 28 Oct 2011 TP-19 0.5-0.6
Conductivity and TDS by Calculation - Soil Method: AN106								
Conductivity	µS/cm	1		150	760	650	120	360
Conductivity (1:5 dry sample basis)	µS/cm	1		170	940	810	140	460
Total Dissolved Solids (by calculation)	mg/kg	5		500	2800	2400	430	1400
pH in soil (1:5) Method: AN101								
pH	pH Units	-		5.9	5.0	5.3	5.6	5.0
Soluble Anions in Soil by Ion Chromatography Method: AN245								
Chloride	mg/kg	0.25		-	-	640	150	-
Sulphate	mg/kg	0.5		-	-	92	34	-
Moisture Content Method: AN234								
% Moisture	%	0.5		11.5	19.7	19.9	16.4	20.4

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	SE102938.051 Soil 28 Oct 2011 TP-19 1.5-1.6	SE102938.052 Soil 27 Oct 2011 TP-21 0.0-0.1	SE102938.053 Soil 27 Oct 2011 TP-21 1.0-1.1	SE102938.054 Soil 27 Oct 2011 TP-21 2.0-2.1	SE102938.055 Soil 27 Oct 2011 TP-22 0.0-0.1
Conductivity and TDS by Calculation - Soil Method: AN106								
Conductivity	µS/cm	1		910	37	760	1200	240
Conductivity (1:5 dry sample basis)	µS/cm	1		1200	41	980	1500	270
Total Dissolved Solids (by calculation)	mg/kg	5		3500	120	2900	4400	820
pH in soil (1:5) Method: AN101								
pH	pH Units	-		4.4	6.1	5.0	5.1	5.7
Soluble Anions in Soil by Ion Chromatography Method: AN245								
Chloride	mg/kg	0.25		1500	-	890	-	-
Sulphate	mg/kg	0.5		47	-	270	-	-
Moisture Content Method: AN234								
% Moisture	%	0.5		21.5	10.4	22.5	18.1	13.0

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	SE102938.056 Soil 27 Oct 2011 TP-22 1.0-1.1	SE102938.057 Soil 27 Oct 2011 TP-22 2.0-2.1	SE102938.058 Soil 27 Oct 2011 TP-23 0.0-0.1	SE102938.059 Soil 27 Oct 2011 TP-23 0.5-0.6	SE102938.060 Soil 27 Oct 2011 TP-23 1.5-1.6
Conductivity and TDS by Calculation - Soil Method: AN106								
Conductivity	µS/cm	1		800	1200	410	420	1200
Conductivity (1:5 dry sample basis)	µS/cm	1		980	1400	440	500	1400
Total Dissolved Solids (by calculation)	mg/kg	5		2900	4300	1300	1500	4300

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	SE102938.056 Soil 27 Oct 2011 TP-22 1.0-1.1	SE102938.057 Soil 27 Oct 2011 TP-22 2.0-2.1	SE102938.058 Soil 27 Oct 2011 TP-23 0.0-0.1	SE102938.059 Soil 27 Oct 2011 TP-23 0.5-0.6	SE102938.060 Soil 27 Oct 2011 TP-23 1.5-1.6
pH in soil (1:5) Method: AN101								
pH	pH Units	-		7.1	7.3	5.8	5.8	5.1
Soluble Anions in Soil by Ion Chromatography Method: AN245								
Chloride	mg/kg	0.25		1100	-	-	460	-
Sulphate	mg/kg	0.5		190	-	-	180	-
Moisture Content Method: AN234								
% Moisture	%	0.5		18.9	16.9	6.8	16.4	18.6

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	SE102938.061 Soil 27 Oct 2011 TP-24 0.0-0.1	SE102938.062 Soil 27 Oct 2011 TP-24 1.5-1.6	SE102938.063 Soil 27 Oct 2011 TP-24 2.3-2.4	SE102938.064 Soil 27 Oct 2011 TP-25 0.0-0.1	SE102938.065 Soil 27 Oct 2011 TP-25 1.2-1.3
Conductivity and TDS by Calculation - Soil Method: AN106								
Conductivity	µS/cm	1		300	870	1100	3400	1700
Conductivity (1:5 dry sample basis)	µS/cm	1		340	1100	1300	3900	1900
Total Dissolved Solids (by calculation)	mg/kg	5		1000	3200	4000	12000	5800
pH in soil (1:5) Method: AN101								
pH	pH Units	-		6.4	6.7	6.8	5.3	7.6
Soluble Anions in Soil by Ion Chromatography Method: AN245								
Chloride	mg/kg	0.25		-	-	1600	-	2200
Sulphate	mg/kg	0.5		-	-	280	-	370
Moisture Content Method: AN234								
% Moisture	%	0.5		12.0	17.9	14.4	13.9	14.8

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	SE102938.066 Soil 27 Oct 2011 TP-25 2.0-2.1	SE102938.067 Soil 27 Oct 2011 TP-26 0.0-0.1	SE102938.068 Soil 27 Oct 2011 TP-26 0.5-0.6	SE102938.069 Soil 27 Oct 2011 TP-26 1.5-1.6	SE102938.070 Soil 27 Oct 2011 TP-27 0.0-0.1
Conductivity and TDS by Calculation - Soil Method: AN106								
Conductivity	µS/cm	1		1300	210	240	340	1000
Conductivity (1:5 dry sample basis)	µS/cm	1		1700	260	300	400	1200
Total Dissolved Solids (by calculation)	mg/kg	5		5100	770	900	1200	3500
pH in soil (1:5) Method: AN101								
pH	pH Units	-		7.4	6.1	5.6	5.4	5.5

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	SE102938.066 Soil 27 Oct 2011 TP-25 2.0-2.1	SE102938.067 Soil 27 Oct 2011 TP-26 0.0-0.1	SE102938.068 Soil 27 Oct 2011 TP-26 0.5-0.6	SE102938.069 Soil 27 Oct 2011 TP-26 1.5-1.6	SE102938.070 Soil 27 Oct 2011 TP-27 0.0-0.1
Soluble Anions in Soil by Ion Chromatography Method: AN245								
Chloride	mg/kg	0.25		-	-	390	-	-
Sulphate	mg/kg	0.5		-	-	56	-	-
Moisture Content Method: AN234								
% Moisture	%	0.5		21.5	17.4	21.6	15.5	14.6

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	SE102938.071 Soil 27 Oct 2011 TP-27 0.5-0.6	SE102938.072 Soil 27 Oct 2011 TP-27 1.5-1.6	SE102938.073 Soil 28 Oct 2011 TP-28 0.0-0.1	SE102938.074 Soil 28 Oct 2011 TP-28 0.5-0.6	SE102938.075 Soil 28 Oct 2011 TP-28 1.5-1.6
Conductivity and TDS by Calculation - Soil Method: AN106								
Conductivity	µS/cm	1		520	470	39	210	240
Conductivity (1:5 dry sample basis)	µS/cm	1		620	560	43	280	280
Total Dissolved Solids (by calculation)	mg/kg	5		1900	1700	130	830	840
pH in soil (1:5) Method: AN101								
pH	pH Units	-		4.8	5.9	5.9	5.2	5.2
Soluble Anions in Soil by Ion Chromatography Method: AN245								
Chloride	mg/kg	0.25		-	630	19	-	-
Sulphate	mg/kg	0.5		-	160	13	-	-
Moisture Content Method: AN234								
% Moisture	%	0.5		16.6	17.6	11.3	23.6	16.1

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	SE102938.076 Soil 28 Oct 2011 TP-29 0.0-0.1	SE102938.077 Soil 28 Oct 2011 TP-29 1.1-1.2	SE102938.078 Soil 28 Oct 2011 TP-29 2.0-2.1	SE102938.079 Soil 28 Oct 2011 TP-30 0.0-0.1	SE102938.080 Soil 28 Oct 2011 TP-30 1.0-1.1
Conductivity and TDS by Calculation - Soil Method: AN106								
Conductivity	µS/cm	1		35	470	450	19	50
Conductivity (1:5 dry sample basis)	µS/cm	1		38	540	520	21	61
Total Dissolved Solids (by calculation)	mg/kg	5		110	1600	1600	62	180
pH in soil (1:5) Method: AN101								
pH	pH Units	-		6.2	5.8	6.0	5.8	5.8
Soluble Anions in Soil by Ion Chromatography Method: AN245								
Chloride	mg/kg	0.25		-	540	-	-	48
Sulphate	mg/kg	0.5		-	250	-	-	24

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	SE102938.076 Soil 28 Oct 2011 TP-29 0.0-0.1	SE102938.077 Soil 28 Oct 2011 TP-29 1.1-1.2	SE102938.078 Soil 28 Oct 2011 TP-29 2.0-2.1	SE102938.079 Soil 28 Oct 2011 TP-30 0.0-0.1	SE102938.080 Soil 28 Oct 2011 TP-30 1.0-1.1
Moisture Content Method: AN234								
% Moisture	%	0.5		6.8	13.3	14.7	8.1	18.2

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	SE102938.081 Soil 28 Oct 2011 TP-30 2.0-2.1	SE102938.082 Soil 27 Oct 2011 TP-31 0.0-0.1	SE102938.083 Soil 27 Oct 2011 TP-31 1.0-1.1	SE102938.084 Soil 27 Oct 2011 TP-31 2.0-2.1	SE102938.085 Soil 27 Oct 2011 TP-32 0.0-0.1
Conductivity and TDS by Calculation - Soil Method: AN106								
Conductivity	µS/cm	1		53	130	78	650	1000
Conductivity (1:5 dry sample basis)	µS/cm	1		63	160	94	780	1200
Total Dissolved Solids (by calculation)	mg/kg	5		190	490	280	2300	3600
pH in soil (1:5) Method: AN101								
pH	pH Units	-		5.7	6.6	6.4	6.8	6.2
Soluble Anions in Soil by Ion Chromatography Method: AN245								
Chloride	mg/kg	0.25		-	97	-	-	-
Sulphate	mg/kg	0.5		-	96	-	-	-
Moisture Content Method: AN234								
% Moisture	%	0.5		16.2	17.7	16.7	16.1	16.4

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	SE102938.086 Soil 27 Oct 2011 TP-32 0.6-0.7	SE102938.087 Soil 27 Oct 2011 TP-32 1.5-1.6	SE102938.088 Soil 27 Oct 2011 TP-33 0.0-0.1	SE102938.089 Soil 27 Oct 2011 TP-33 1.0-1.1	SE102938.090 Soil 27 Oct 2011 TP-33 2.0-2.1
Conductivity and TDS by Calculation - Soil Method: AN106								
Conductivity	µS/cm	1		1700	1500	1200	1000	1000
Conductivity (1:5 dry sample basis)	µS/cm	1		2000	1700	1500	1300	1200
Total Dissolved Solids (by calculation)	mg/kg	5		6100	5200	4400	3800	3700
pH in soil (1:5) Method: AN101								
pH	pH Units	-		7.3	7.8	5.3	6.8	6.7
Soluble Anions in Soil by Ion Chromatography Method: AN245								
Chloride	mg/kg	0.25		2700	-	2100	-	-
Sulphate	mg/kg	0.5		330	-	310	-	-
Moisture Content Method: AN234								
% Moisture	%	0.5		17.6	16.7	14.9	18.5	19.2

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	SE102938.091 Soil 27 Oct 2011 TP-34 0.0-0.1	SE102938.092 Soil 27 Oct 2011 TP-34 0.5-0.6	SE102938.093 Soil 27 Oct 2011 TP-34 1.5-1.6	SE102938.094 Soil 27 Oct 2011 TP-35 0.0-0.1	SE102938.095 Soil 27 Oct 2011 TP-35 1.0-1.1
Conductivity and TDS by Calculation - Soil Method: AN106								
Conductivity	µS/cm	1		48	570	690	52	940
Conductivity (1:5 dry sample basis)	µS/cm	1		52	710	790	61	1200
Total Dissolved Solids (by calculation)	mg/kg	5		160	2100	2400	180	3600
pH in soil (1:5) Method: AN101								
pH	pH Units	-		5.9	4.9	5.1	6.4	6.5
Soluble Anions in Soil by Ion Chromatography Method: AN245								
Chloride	mg/kg	0.25		-	-	910	-	1200
Sulphate	mg/kg	0.5		-	-	180	-	220
Moisture Content Method: AN234								
% Moisture	%	0.5		8.0	20.0	12.9	14.7	22.3

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	SE102938.096 Soil 27 Oct 2011 TP-35 2.0-2.1	SE102938.097 Soil 28 Oct 2011 TP-36 0.0-0.1	SE102938.098 Soil 28 Oct 2011 TP-36 1.0-1.1	SE102938.099 Soil 28 Oct 2011 TP-36 2.0-2.1
Conductivity and TDS by Calculation - Soil Method: AN106							
Conductivity	µS/cm	1		1000	83	850	850
Conductivity (1:5 dry sample basis)	µS/cm	1		1200	99	1100	1100
Total Dissolved Solids (by calculation)	mg/kg	5		3700	300	3200	3200
pH in soil (1:5) Method: AN101							
pH	pH Units	-		7.2	5.9	5.1	4.9
Soluble Anions in Soil by Ion Chromatography Method: AN245							
Chloride	mg/kg	0.25		-	65	-	-
Sulphate	mg/kg	0.5		-	31	-	-
Moisture Content Method: AN234							
% Moisture	%	0.5		16.2	15.8	21.2	20.0

QC SUMMARY

MB blank results are compared to the Limit of Reporting
LCS and MS spike recoveries are measured as the percentage of analyte recovered from the sample compared the the amount of analyte spiked into the sample.
DUP and MSD relative percent differences are measured against their original counterpart samples according to the formula: *the absolute difference of the two results divided by the average of the two results as a percentage*. Where the DUP RPD is 'NA' , the results are less than the LOR and thus the RPD is not applicable.

Conductivity and TDS by Calculation - Soil **Method: ME-(AU)-[ENV]AN106**

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
Conductivity	LB008001	µS/cm	1	<1	7 - 16%	102%
	LB008002	µS/cm	1	<1	2 - 4%	99%
	LB008003	µS/cm	1	<1	2 - 7%	99%
	LB008004	µS/cm	1	<1	9 - 12%	98%
	LB008006	µS/cm	1	<1	3 - 8%	102%
Conductivity (1:5 dry sample basis)	LB008001	µS/cm	1	<1	7 - 16%	NA
	LB008002	µS/cm	1	<1	2 - 4%	NA
	LB008003	µS/cm	1	<1	2 - 7%	NA
	LB008004	µS/cm	1	<1	9 - 12%	NA
	LB008006	µS/cm	1	<1	3 - 8%	NA
Total Dissolved Solids (by calculation)	LB008001	mg/kg	5	<5	7 - 16%	102%
	LB008002	mg/kg	5	<5	2 - 4%	99%
	LB008003	mg/kg	5	<5	2 - 7%	99%
	LB008004	mg/kg	5	<5	9 - 12%	98%
	LB008006	mg/kg	5	<5	3 - 8%	102%

pH in soil (1:5) **Method: ME-(AU)-[ENV]AN101**

Parameter	QC Reference	Units	LOR	DUP %RPD	LCS %Recovery
pH	LB008007	pH Units	-	1 - 2%	99%
	LB008008	pH Units	-	1 - 2%	100%
	LB008010	pH Units	-	0%	100%
	LB008011	pH Units	-	1%	99%
	LB008013	pH Units	-	0 - 2%	100%

Soluble Anions in Soil by Ion Chromatography **Method: ME-(AU)-[ENV]AN245**

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
Chloride	LB007933	mg/kg	0.25	<0.25	1 - 5%	102 - 103%
	LB007934	mg/kg	0.25	<0.25	0%	102%
Sulphate	LB007933	mg/kg	0.5	<0.5	2 - 4%	102%
	LB007934	mg/kg	0.5	<0.5	0%	102%

METHOD SUMMARY

METHOD	METHODOLOGY SUMMARY
AN101	pH in Soil Sludge Sediment and Water: pH is measured electrometrically using a combination electrode (glass plus reference electrode) and is calibrated against 3 buffers purchased commercially. For soils, an extract with water is made at a ratio of 1:5 and the pH determined and reported on the extract. Reference APHA 4500-H+.
AN106	Conductivity and TDS by Calculation: Conductivity is measured by meter with temperature compensation and is calibrated against a standard solution of potassium chloride. Conductivity is generally reported as µmhos/cm or µS/cm @ 25°C. For soils, an extract with water is made at a ratio of 1:5 and the EC determined and reported on the extract, or calculated back to the as-received sample. Salinity can be estimated from conductivity using a conversion factor, which for natural waters, is in the range 0.55 to 0.75. Reference APHA 2520 B.
AN234	The test is carried out by drying (at either 40°C or 105°C) a known mass of sample in a weighed evaporating basin. After fully dry the sample is re-weighed. Samples such as sludge and sediment having high percentages of moisture will take some time in a drying oven for complete removal of water.
AN245	Anions by Ion Chromatography: A water sample is injected into an eluent stream that passes through the ion chromatographic system where the anions of interest ie Br, Cl, NO2, NO3 and SO4 are separated on their relative affinities for the active sites on the column packing material. Changes to the conductivity and the UV-visible absorbance of the eluent enable identification and quantitation of the anions based on their retention time and peak height or area. APHA 4110 B

FOOTNOTES

IS	Insufficient sample for analysis.
LNR	Sample listed, but not received.
*	This analysis is not covered by the scope of accreditation.
^	Performed by outside laboratory.
LOR	Limit of Reporting
↑↓	Raised or Lowered Limit of Reporting
QFH	QC result is above the upper tolerance
QFL	QC result is below the lower tolerance
-	The sample was not analysed for this analyte
NVL	Not Validated

Samples analysed as received.
Solid samples expressed on a dry weight basis.

Some totals may not appear to add up because the total is rounded after adding up the raw values.

The QC criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here: http://www.au.sgs.com/sgs-mp-au-env-qu-022-qa-qc-plan-en-09.pdf

STATEMENT OF QA/QC PERFORMANCE AGAINST DATA QUALITY OBJECTIVES

SE102938 R0

CLIENT DETAILS

Contact	Emged Rizkalla
Client	Geotechnique
Address	P.O. Box 880 PENRITH NSW 2751
Telephone	02 4722 2700
Facsimile	02 4722 6161
Email	Emged@geotech.com.au
Project	**12576/1 - Marsden Park Precinct**
Order Number	(Not specified)
Samples	99

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
SGS Reference	SE102938 R0
Report Number	0000011638
Date Reported	11 Nov 2011

COMMENTS

All the laboratory data for each environmental matrix was compared to the SGS Environmental Services' stated data quality objectives (DQO).
Comments arising from the comparison were made and are reported below.
The data relating to sampling was taken from the chain of custody document and was supplied by the client.
This QA/QC statement must be read in conjunction with the referenced analytical report.
The statement and the analytical report must not be reproduced except in full.

All Data Quality Objectives were met.

SAMPLE SUMMARY

Sample counts by matrix	99 Soils	Type of documentation received	Email
Date documentation received	31/10/11@1:14pm	Samples received in good order	Yes
Samples received without headspace	N/A	Sample temperature upon receipt	20°C
Sample container provider	Client	Turnaround time requested	Standard
Samples received in correct containers	Yes	Sufficient sample for analysis	Yes
Sample cooling method	None	Samples clearly labelled	Yes
Complete documentation received	Yes		

HOLDING TIME SUMMARY

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HOLDING TIMES

SGS holding time criteria are drawn from current regulations and are highly dependent on sample container preservation as specified in the SGS “Field sampling guide for containers and holding time” (Ref: GU-(AU)-ENV.001). Soil samples guidelines are derived from NEPM "Schedule B(3) Guideline on Laboratory Analysis of Potentially Contaminated Soils". Water sample guidelines are derived from "AS/NZS 5667.1 : 1998 Water Quality - sampling part 1" and APHA "Standard Methods for the Examination of Water and Wastewater" 21st edition 2005.

The extraction and analysis holding time due dates listed are calculated from the date sampled, although holding times may be extended after laboratory extraction for some analytes. The due dates are the suggested dates that samples may be held before extraction or analysis and still be considered valid.

Extraction and Analysis dates are shown in **Green** when within suggested criteria and in **Bold** with an appended dagger symbol and Red† when outside suggested criteria. If the sampled date is not supplied then compliance with criteria cannot be determined. If the received date is after one or both due dates then holding time will fail by default.

Sample Name	Sample Number	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
Conductivity and TDS by Calculation - Soil Method: ME-(AU)-[ENV]AN106								
TP-1 0.0-0.1	SE102938.001	LB008001	27 Oct 2011	31 Oct 2011	03 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
TP-1 1.0-1.1	SE102938.002	LB008001	27 Oct 2011	31 Oct 2011	03 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
TP-1 2.0-2.1	SE102938.003	LB008001	27 Oct 2011	31 Oct 2011	03 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
TP-2 0.0-0.1	SE102938.004	LB008001	28 Oct 2011	31 Oct 2011	04 Nov 2011	01 Nov 2011	04 Nov 2011	01 Nov 2011
TP-2 0.5-0.6	SE102938.005	LB008001	28 Oct 2011	31 Oct 2011	04 Nov 2011	01 Nov 2011	04 Nov 2011	01 Nov 2011
TP-2 1.5-1.6	SE102938.006	LB008001	28 Oct 2011	31 Oct 2011	04 Nov 2011	01 Nov 2011	04 Nov 2011	01 Nov 2011
TP-4 0.0-0.1	SE102938.007	LB008001	28 Oct 2011	31 Oct 2011	04 Nov 2011	01 Nov 2011	04 Nov 2011	01 Nov 2011
TP-4 1.0-1.1	SE102938.008	LB008001	28 Oct 2011	31 Oct 2011	04 Nov 2011	01 Nov 2011	04 Nov 2011	01 Nov 2011
TP-4 2.0-2.1	SE102938.009	LB008001	28 Oct 2011	31 Oct 2011	04 Nov 2011	01 Nov 2011	04 Nov 2011	01 Nov 2011
TP-5 0.0-0.1	SE102938.010	LB008001	28 Oct 2011	31 Oct 2011	04 Nov 2011	01 Nov 2011	04 Nov 2011	01 Nov 2011
TP-5 0.5-0.6	SE102938.011	LB008001	28 Oct 2011	31 Oct 2011	04 Nov 2011	01 Nov 2011	04 Nov 2011	01 Nov 2011
TP-5 1.5-1.6	SE102938.012	LB008001	28 Oct 2011	31 Oct 2011	04 Nov 2011	01 Nov 2011	04 Nov 2011	01 Nov 2011
TP-6 0.0-0.1	SE102938.013	LB008001	28 Oct 2011	31 Oct 2011	04 Nov 2011	01 Nov 2011	04 Nov 2011	01 Nov 2011
TP-6 0.5-0.6	SE102938.014	LB008001	28 Oct 2011	31 Oct 2011	04 Nov 2011	01 Nov 2011	04 Nov 2011	01 Nov 2011
TP-6 1.5-1.6	SE102938.015	LB008001	28 Oct 2011	31 Oct 2011	04 Nov 2011	01 Nov 2011	04 Nov 2011	01 Nov 2011
TP-7 0.0-0.1	SE102938.016	LB008001	28 Oct 2011	31 Oct 2011	04 Nov 2011	01 Nov 2011	04 Nov 2011	01 Nov 2011
TP-7 1.0-1.1	SE102938.017	LB008001	28 Oct 2011	31 Oct 2011	04 Nov 2011	01 Nov 2011	04 Nov 2011	01 Nov 2011
TP-7 2.0-2.1	SE102938.018	LB008001	28 Oct 2011	31 Oct 2011	04 Nov 2011	01 Nov 2011	04 Nov 2011	01 Nov 2011
TP-8 0.0-0.1	SE102938.019	LB008001	28 Oct 2011	31 Oct 2011	04 Nov 2011	01 Nov 2011	04 Nov 2011	01 Nov 2011
TP-8 1.0-1.1	SE102938.020	LB008001	28 Oct 2011	31 Oct 2011	04 Nov 2011	01 Nov 2011	04 Nov 2011	01 Nov 2011
TP-8 2.0-2.1	SE102938.021	LB008002	28 Oct 2011	31 Oct 2011	04 Nov 2011	01 Nov 2011	04 Nov 2011	01 Nov 2011
TP-9 0.0-0.1	SE102938.022	LB008002	28 Oct 2011	31 Oct 2011	04 Nov 2011	01 Nov 2011	04 Nov 2011	01 Nov 2011
TP-9 0.6-0.7	SE102938.023	LB008002	28 Oct 2011	31 Oct 2011	04 Nov 2011	01 Nov 2011	04 Nov 2011	01 Nov 2011
TP-9 1.5-1.6	SE102938.024	LB008002	28 Oct 2011	31 Oct 2011	04 Nov 2011	01 Nov 2011	04 Nov 2011	01 Nov 2011
TP-10 0.0-0.1	SE102938.025	LB008002	28 Oct 2011	31 Oct 2011	04 Nov 2011	01 Nov 2011	04 Nov 2011	01 Nov 2011
TP-10 1.0-1.1	SE102938.026	LB008002	28 Oct 2011	31 Oct 2011	04 Nov 2011	01 Nov 2011	04 Nov 2011	01 Nov 2011
TP-10 2.0-2.1	SE102938.027	LB008002	28 Oct 2011	31 Oct 2011	04 Nov 2011	01 Nov 2011	04 Nov 2011	01 Nov 2011
TP-11 0.0-0.1	SE102938.028	LB008002	28 Oct 2011	31 Oct 2011	04 Nov 2011	01 Nov 2011	04 Nov 2011	01 Nov 2011
TP-11 0.6-0.7	SE102938.029	LB008002	28 Oct 2011	31 Oct 2011	04 Nov 2011	01 Nov 2011	04 Nov 2011	01 Nov 2011
TP-11 1.5-1.6	SE102938.030	LB008002	28 Oct 2011	31 Oct 2011	04 Nov 2011	01 Nov 2011	04 Nov 2011	01 Nov 2011
TP-12 0.0-0.1	SE102938.031	LB008002	28 Oct 2011	31 Oct 2011	04 Nov 2011	01 Nov 2011	04 Nov 2011	01 Nov 2011
TP-12 1.0-1.1	SE102938.032	LB008002	28 Oct 2011	31 Oct 2011	04 Nov 2011	01 Nov 2011	04 Nov 2011	01 Nov 2011
TP-12 2.0-2.1	SE102938.033	LB008002	28 Oct 2011	31 Oct 2011	04 Nov 2011	01 Nov 2011	04 Nov 2011	01 Nov 2011
TP-13 0.0-0.1	SE102938.034	LB008002	28 Oct 2011	31 Oct 2011	04 Nov 2011	01 Nov 2011	04 Nov 2011	01 Nov 2011
TP-13 1.0-1.1	SE102938.035	LB008002	28 Oct 2011	31 Oct 2011	04 Nov 2011	01 Nov 2011	04 Nov 2011	01 Nov 2011
TP-13 2.0-2.1	SE102938.036	LB008002	28 Oct 2011	31 Oct 2011	04 Nov 2011	01 Nov 2011	04 Nov 2011	01 Nov 2011
TP-14 0.0-0.1	SE102938.037	LB008002	27 Oct 2011	31 Oct 2011	03 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
TP-14 0.6-0.7	SE102938.038	LB008002	27 Oct 2011	31 Oct 2011	03 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
TP-14 1.7-1.8	SE102938.039	LB008002	27 Oct 2011	31 Oct 2011	03 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
TP-15 0.0-0.1	SE102938.040	LB008002	27 Oct 2011	31 Oct 2011	03 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
TP-15 1.0-1.1	SE102938.041	LB008003	27 Oct 2011	31 Oct 2011	03 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
TP-15 2.0-2.1	SE102938.042	LB008003	27 Oct 2011	31 Oct 2011	03 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
TP-16 0.0-0.1	SE102938.043	LB008003	27 Oct 2011	31 Oct 2011	03 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
TP-16 0.6-0.7	SE102938.044	LB008003	27 Oct 2011	31 Oct 2011	03 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
TP-16 1.5-1.6	SE102938.045	LB008003	27 Oct 2011	31 Oct 2011	03 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
TP-18 0.0-0.1	SE102938.046	LB008003	28 Oct 2011	31 Oct 2011	04 Nov 2011	01 Nov 2011	04 Nov 2011	01 Nov 2011
TP-18 1.0-1.1	SE102938.047	LB008003	28 Oct 2011	31 Oct 2011	04 Nov 2011	01 Nov 2011	04 Nov 2011	01 Nov 2011
TP-18 2.0-2.1	SE102938.048	LB008003	28 Oct 2011	31 Oct 2011	04 Nov 2011	01 Nov 2011	04 Nov 2011	01 Nov 2011
TP-19 0.0-0.1	SE102938.049	LB008003	28 Oct 2011	31 Oct 2011	04 Nov 2011	01 Nov 2011	04 Nov 2011	01 Nov 2011
TP-19 0.5-0.6	SE102938.050	LB008003	28 Oct 2011	31 Oct 2011	04 Nov 2011	01 Nov 2011	04 Nov 2011	01 Nov 2011

HOLDING TIME SUMMARY

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HOLDING TIMES

SGS holding time criteria are drawn from current regulations and are highly dependent on sample container preservation as specified in the SGS “Field sampling guide for containers and holding time” (Ref: GU-(AU)-ENV.001). Soil samples guidelines are derived from NEPM "Schedule B(3) Guideline on Laboratory Analysis of Potentially Contaminated Soils". Water sample guidelines are derived from "AS/NZS 5667.1 : 1998 Water Quality - sampling part 1" and APHA "Standard Methods for the Examination of Water and Wastewater" 21st edition 2005.

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Extraction and Analysis dates are shown in **Green** when within suggested criteria and in **Bold** with an appended dagger symbol and Red† when outside suggested criteria. If the sampled date is not supplied then compliance with criteria cannot be determined. If the received date is after one or both due dates then holding time will fail by default.

Sample Name	Sample Number	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
TP-19 1.5-1.6	SE102938.051	LB008003	28 Oct 2011	31 Oct 2011	04 Nov 2011	01 Nov 2011	04 Nov 2011	01 Nov 2011
TP-21 0.0-0.1	SE102938.052	LB008003	27 Oct 2011	31 Oct 2011	03 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
TP-21 1.0-1.1	SE102938.053	LB008003	27 Oct 2011	31 Oct 2011	03 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
TP-21 2.0-2.1	SE102938.054	LB008003	27 Oct 2011	31 Oct 2011	03 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
TP-22 0.0-0.1	SE102938.055	LB008003	27 Oct 2011	31 Oct 2011	03 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
TP-22 1.0-1.1	SE102938.056	LB008003	27 Oct 2011	31 Oct 2011	03 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
TP-22 2.0-2.1	SE102938.057	LB008003	27 Oct 2011	31 Oct 2011	03 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
TP-23 0.0-0.1	SE102938.058	LB008003	27 Oct 2011	31 Oct 2011	03 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
TP-23 0.5-0.6	SE102938.059	LB008003	27 Oct 2011	31 Oct 2011	03 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
TP-23 1.5-1.6	SE102938.060	LB008003	27 Oct 2011	31 Oct 2011	03 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
TP-24 0.0-0.1	SE102938.061	LB008004	27 Oct 2011	31 Oct 2011	03 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
TP-24 1.5-1.6	SE102938.062	LB008004	27 Oct 2011	31 Oct 2011	03 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
TP-24 2.3-2.4	SE102938.063	LB008004	27 Oct 2011	31 Oct 2011	03 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
TP-25 0.0-0.1	SE102938.064	LB008004	27 Oct 2011	31 Oct 2011	03 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
TP-25 1.2-1.3	SE102938.065	LB008004	27 Oct 2011	31 Oct 2011	03 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
TP-25 2.0-2.1	SE102938.066	LB008004	27 Oct 2011	31 Oct 2011	03 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
TP-26 0.0-0.1	SE102938.067	LB008004	27 Oct 2011	31 Oct 2011	03 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
TP-26 0.5-0.6	SE102938.068	LB008004	27 Oct 2011	31 Oct 2011	03 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
TP-26 1.5-1.6	SE102938.069	LB008004	27 Oct 2011	31 Oct 2011	03 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
TP-27 0.0-0.1	SE102938.070	LB008004	27 Oct 2011	31 Oct 2011	03 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
TP-27 0.5-0.6	SE102938.071	LB008004	27 Oct 2011	31 Oct 2011	03 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
TP-27 1.5-1.6	SE102938.072	LB008004	27 Oct 2011	31 Oct 2011	03 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
TP-28 0.0-0.1	SE102938.073	LB008004	28 Oct 2011	31 Oct 2011	04 Nov 2011	01 Nov 2011	04 Nov 2011	01 Nov 2011
TP-28 0.5-0.6	SE102938.074	LB008004	28 Oct 2011	31 Oct 2011	04 Nov 2011	01 Nov 2011	04 Nov 2011	01 Nov 2011
TP-28 1.5-1.6	SE102938.075	LB008004	28 Oct 2011	31 Oct 2011	04 Nov 2011	01 Nov 2011	04 Nov 2011	01 Nov 2011
TP-29 0.0-0.1	SE102938.076	LB008004	28 Oct 2011	31 Oct 2011	04 Nov 2011	01 Nov 2011	04 Nov 2011	01 Nov 2011
TP-29 1.1-1.2	SE102938.077	LB008004	28 Oct 2011	31 Oct 2011	04 Nov 2011	01 Nov 2011	04 Nov 2011	01 Nov 2011
TP-29 2.0-2.1	SE102938.078	LB008004	28 Oct 2011	31 Oct 2011	04 Nov 2011	01 Nov 2011	04 Nov 2011	01 Nov 2011
TP-30 0.0-0.1	SE102938.079	LB008004	28 Oct 2011	31 Oct 2011	04 Nov 2011	01 Nov 2011	04 Nov 2011	01 Nov 2011
TP-30 1.0-1.1	SE102938.080	LB008004	28 Oct 2011	31 Oct 2011	04 Nov 2011	01 Nov 2011	04 Nov 2011	01 Nov 2011
TP-30 2.0-2.1	SE102938.081	LB008006	28 Oct 2011	31 Oct 2011	04 Nov 2011	01 Nov 2011	04 Nov 2011	01 Nov 2011
TP-31 0.0-0.1	SE102938.082	LB008006	27 Oct 2011	31 Oct 2011	03 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
TP-31 1.0-1.1	SE102938.083	LB008006	27 Oct 2011	31 Oct 2011	03 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
TP-31 2.0-2.1	SE102938.084	LB008006	27 Oct 2011	31 Oct 2011	03 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
TP-32 0.0-0.1	SE102938.085	LB008006	27 Oct 2011	31 Oct 2011	03 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
TP-32 0.6-0.7	SE102938.086	LB008006	27 Oct 2011	31 Oct 2011	03 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
TP-32 1.5-1.6	SE102938.087	LB008006	27 Oct 2011	31 Oct 2011	03 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
TP-33 0.0-0.1	SE102938.088	LB008006	27 Oct 2011	31 Oct 2011	03 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
TP-33 1.0-1.1	SE102938.089	LB008006	27 Oct 2011	31 Oct 2011	03 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
TP-33 2.0-2.1	SE102938.090	LB008006	27 Oct 2011	31 Oct 2011	03 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
TP-34 0.0-0.1	SE102938.091	LB008006	27 Oct 2011	31 Oct 2011	03 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
TP-34 0.5-0.6	SE102938.092	LB008006	27 Oct 2011	31 Oct 2011	03 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
TP-34 1.5-1.6	SE102938.093	LB008006	27 Oct 2011	31 Oct 2011	03 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
TP-35 0.0-0.1	SE102938.094	LB008006	27 Oct 2011	31 Oct 2011	03 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
TP-35 1.0-1.1	SE102938.095	LB008006	27 Oct 2011	31 Oct 2011	03 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
TP-35 2.0-2.1	SE102938.096	LB008006	27 Oct 2011	31 Oct 2011	03 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
TP-36 0.0-0.1	SE102938.097	LB008006	28 Oct 2011	31 Oct 2011	04 Nov 2011	01 Nov 2011	04 Nov 2011	01 Nov 2011
TP-36 1.0-1.1	SE102938.098	LB008006	28 Oct 2011	31 Oct 2011	04 Nov 2011	01 Nov 2011	04 Nov 2011	01 Nov 2011
TP-36 2.0-2.1	SE102938.099	LB008006	28 Oct 2011	31 Oct 2011	04 Nov 2011	01 Nov 2011	04 Nov 2011	01 Nov 2011

HOLDING TIME SUMMARY

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HOLDING TIMES

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Extraction and Analysis dates are shown in **Green** when within suggested criteria and in **Bold** with an appended dagger symbol and Red† when outside suggested criteria. If the sampled date is not supplied then compliance with criteria cannot be determined. If the received date is after one or both due dates then holding time will fail by default.

Sample Name	Sample Number	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
Moisture Content Method: ME-(AU)-[ENV]AN234								
TP-1 0.0-0.1	SE102938.001	LB007976	27 Oct 2011	31 Oct 2011	10 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011
TP-1 1.0-1.1	SE102938.002	LB007976	27 Oct 2011	31 Oct 2011	10 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011
TP-1 2.0-2.1	SE102938.003	LB007976	27 Oct 2011	31 Oct 2011	10 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011
TP-2 0.0-0.1	SE102938.004	LB007976	28 Oct 2011	31 Oct 2011	11 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011
TP-2 0.5-0.6	SE102938.005	LB007976	28 Oct 2011	31 Oct 2011	11 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011
TP-2 1.5-1.6	SE102938.006	LB007976	28 Oct 2011	31 Oct 2011	11 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011
TP-4 0.0-0.1	SE102938.007	LB007976	28 Oct 2011	31 Oct 2011	11 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011
TP-4 1.0-1.1	SE102938.008	LB007976	28 Oct 2011	31 Oct 2011	11 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011
TP-4 2.0-2.1	SE102938.009	LB007976	28 Oct 2011	31 Oct 2011	11 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011
TP-5 0.0-0.1	SE102938.010	LB007976	28 Oct 2011	31 Oct 2011	11 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011
TP-5 0.5-0.6	SE102938.011	LB007976	28 Oct 2011	31 Oct 2011	11 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011
TP-5 1.5-1.6	SE102938.012	LB007976	28 Oct 2011	31 Oct 2011	11 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011
TP-6 0.0-0.1	SE102938.013	LB007976	28 Oct 2011	31 Oct 2011	11 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011
TP-6 0.5-0.6	SE102938.014	LB007976	28 Oct 2011	31 Oct 2011	11 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011
TP-6 1.5-1.6	SE102938.015	LB007976	28 Oct 2011	31 Oct 2011	11 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011
TP-7 0.0-0.1	SE102938.016	LB007976	28 Oct 2011	31 Oct 2011	11 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011
TP-7 1.0-1.1	SE102938.017	LB007976	28 Oct 2011	31 Oct 2011	11 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011
TP-7 2.0-2.1	SE102938.018	LB007976	28 Oct 2011	31 Oct 2011	11 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011
TP-8 0.0-0.1	SE102938.019	LB007976	28 Oct 2011	31 Oct 2011	11 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011
TP-8 1.0-1.1	SE102938.020	LB007976	28 Oct 2011	31 Oct 2011	11 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011
TP-8 2.0-2.1	SE102938.021	LB007977	28 Oct 2011	31 Oct 2011	11 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011
TP-9 0.0-0.1	SE102938.022	LB007977	28 Oct 2011	31 Oct 2011	11 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011
TP-9 0.6-0.7	SE102938.023	LB007977	28 Oct 2011	31 Oct 2011	11 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011
TP-9 1.5-1.6	SE102938.024	LB007977	28 Oct 2011	31 Oct 2011	11 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011
TP-10 0.0-0.1	SE102938.025	LB007977	28 Oct 2011	31 Oct 2011	11 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011
TP-10 1.0-1.1	SE102938.026	LB007977	28 Oct 2011	31 Oct 2011	11 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011
TP-10 2.0-2.1	SE102938.027	LB007977	28 Oct 2011	31 Oct 2011	11 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011
TP-11 0.0-0.1	SE102938.028	LB007977	28 Oct 2011	31 Oct 2011	11 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011
TP-11 0.6-0.7	SE102938.029	LB007977	28 Oct 2011	31 Oct 2011	11 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011
TP-11 1.5-1.6	SE102938.030	LB007977	28 Oct 2011	31 Oct 2011	11 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011
TP-12 0.0-0.1	SE102938.031	LB007977	28 Oct 2011	31 Oct 2011	11 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011
TP-12 1.0-1.1	SE102938.032	LB007977	28 Oct 2011	31 Oct 2011	11 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011
TP-12 2.0-2.1	SE102938.033	LB007977	28 Oct 2011	31 Oct 2011	11 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011
TP-13 0.0-0.1	SE102938.034	LB007977	28 Oct 2011	31 Oct 2011	11 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011
TP-13 1.0-1.1	SE102938.035	LB007977	28 Oct 2011	31 Oct 2011	11 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011
TP-13 2.0-2.1	SE102938.036	LB007977	28 Oct 2011	31 Oct 2011	11 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011
TP-14 0.0-0.1	SE102938.037	LB007977	27 Oct 2011	31 Oct 2011	10 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011
TP-14 0.6-0.7	SE102938.038	LB007977	27 Oct 2011	31 Oct 2011	10 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011
TP-14 1.7-1.8	SE102938.039	LB007977	27 Oct 2011	31 Oct 2011	10 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011
TP-15 0.0-0.1	SE102938.040	LB007977	27 Oct 2011	31 Oct 2011	10 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011
TP-15 1.0-1.1	SE102938.041	LB007978	27 Oct 2011	31 Oct 2011	10 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011
TP-15 2.0-2.1	SE102938.042	LB007978	27 Oct 2011	31 Oct 2011	10 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011
TP-16 0.0-0.1	SE102938.043	LB007978	27 Oct 2011	31 Oct 2011	10 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011
TP-16 0.6-0.7	SE102938.044	LB007978	27 Oct 2011	31 Oct 2011	10 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011
TP-16 1.5-1.6	SE102938.045	LB007978	27 Oct 2011	31 Oct 2011	10 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011
TP-18 0.0-0.1	SE102938.046	LB007978	28 Oct 2011	31 Oct 2011	11 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011
TP-18 1.0-1.1	SE102938.047	LB007978	28 Oct 2011	31 Oct 2011	11 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011
TP-18 2.0-2.1	SE102938.048	LB007978	28 Oct 2011	31 Oct 2011	11 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011
TP-19 0.0-0.1	SE102938.049	LB007978	28 Oct 2011	31 Oct 2011	11 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011
TP-19 0.5-0.6	SE102938.050	LB007978	28 Oct 2011	31 Oct 2011	11 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011

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Sample Name	Sample Number	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
TP-19 1.5-1.6	SE102938.051	LB007978	28 Oct 2011	31 Oct 2011	11 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011
TP-21 0.0-0.1	SE102938.052	LB007978	27 Oct 2011	31 Oct 2011	10 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011
TP-21 1.0-1.1	SE102938.053	LB007978	27 Oct 2011	31 Oct 2011	10 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011
TP-21 2.0-2.1	SE102938.054	LB007978	27 Oct 2011	31 Oct 2011	10 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011
TP-22 0.0-0.1	SE102938.055	LB007978	27 Oct 2011	31 Oct 2011	10 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011
TP-22 1.0-1.1	SE102938.056	LB007978	27 Oct 2011	31 Oct 2011	10 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011
TP-22 2.0-2.1	SE102938.057	LB007978	27 Oct 2011	31 Oct 2011	10 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011
TP-23 0.0-0.1	SE102938.058	LB007978	27 Oct 2011	31 Oct 2011	10 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011
TP-23 0.5-0.6	SE102938.059	LB007978	27 Oct 2011	31 Oct 2011	10 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011
TP-23 1.5-1.6	SE102938.060	LB007978	27 Oct 2011	31 Oct 2011	10 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011
TP-24 0.0-0.1	SE102938.061	LB007979	27 Oct 2011	31 Oct 2011	10 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011
TP-24 1.5-1.6	SE102938.062	LB007979	27 Oct 2011	31 Oct 2011	10 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011
TP-24 2.3-2.4	SE102938.063	LB007979	27 Oct 2011	31 Oct 2011	10 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011
TP-25 0.0-0.1	SE102938.064	LB007979	27 Oct 2011	31 Oct 2011	10 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011
TP-25 1.2-1.3	SE102938.065	LB007979	27 Oct 2011	31 Oct 2011	10 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011
TP-25 2.0-2.1	SE102938.066	LB007979	27 Oct 2011	31 Oct 2011	10 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011
TP-26 0.0-0.1	SE102938.067	LB007979	27 Oct 2011	31 Oct 2011	10 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011
TP-26 0.5-0.6	SE102938.068	LB007979	27 Oct 2011	31 Oct 2011	10 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011
TP-26 1.5-1.6	SE102938.069	LB007979	27 Oct 2011	31 Oct 2011	10 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011
TP-27 0.0-0.1	SE102938.070	LB007979	27 Oct 2011	31 Oct 2011	10 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011
TP-27 0.5-0.6	SE102938.071	LB007979	27 Oct 2011	31 Oct 2011	10 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011
TP-27 1.5-1.6	SE102938.072	LB007979	27 Oct 2011	31 Oct 2011	10 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011
TP-28 0.0-0.1	SE102938.073	LB007979	28 Oct 2011	31 Oct 2011	11 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011
TP-28 0.5-0.6	SE102938.074	LB007979	28 Oct 2011	31 Oct 2011	11 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011
TP-28 1.5-1.6	SE102938.075	LB007979	28 Oct 2011	31 Oct 2011	11 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011
TP-29 0.0-0.1	SE102938.076	LB007979	28 Oct 2011	31 Oct 2011	11 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011
TP-29 1.1-1.2	SE102938.077	LB007979	28 Oct 2011	31 Oct 2011	11 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011
TP-29 2.0-2.1	SE102938.078	LB007979	28 Oct 2011	31 Oct 2011	11 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011
TP-30 0.0-0.1	SE102938.079	LB007979	28 Oct 2011	31 Oct 2011	11 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011
TP-30 1.0-1.1	SE102938.080	LB007979	28 Oct 2011	31 Oct 2011	11 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011
TP-30 2.0-2.1	SE102938.081	LB007980	28 Oct 2011	31 Oct 2011	11 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011
TP-31 0.0-0.1	SE102938.082	LB007980	27 Oct 2011	31 Oct 2011	10 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011
TP-31 1.0-1.1	SE102938.083	LB007980	27 Oct 2011	31 Oct 2011	10 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011
TP-31 2.0-2.1	SE102938.084	LB007980	27 Oct 2011	31 Oct 2011	10 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011
TP-32 0.0-0.1	SE102938.085	LB007980	27 Oct 2011	31 Oct 2011	10 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011
TP-32 0.6-0.7	SE102938.086	LB007980	27 Oct 2011	31 Oct 2011	10 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011
TP-32 1.5-1.6	SE102938.087	LB007980	27 Oct 2011	31 Oct 2011	10 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011
TP-33 0.0-0.1	SE102938.088	LB007980	27 Oct 2011	31 Oct 2011	10 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011
TP-33 1.0-1.1	SE102938.089	LB007980	27 Oct 2011	31 Oct 2011	10 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011
TP-33 2.0-2.1	SE102938.090	LB007980	27 Oct 2011	31 Oct 2011	10 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011
TP-34 0.0-0.1	SE102938.091	LB007980	27 Oct 2011	31 Oct 2011	10 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011
TP-34 0.5-0.6	SE102938.092	LB007980	27 Oct 2011	31 Oct 2011	10 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011
TP-34 1.5-1.6	SE102938.093	LB007980	27 Oct 2011	31 Oct 2011	10 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011
TP-35 0.0-0.1	SE102938.094	LB007980	27 Oct 2011	31 Oct 2011	10 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011
TP-35 1.0-1.1	SE102938.095	LB007980	27 Oct 2011	31 Oct 2011	10 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011
TP-35 2.0-2.1	SE102938.096	LB007980	27 Oct 2011	31 Oct 2011	10 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011
TP-36 0.0-0.1	SE102938.097	LB007980	28 Oct 2011	31 Oct 2011	11 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011
TP-36 1.0-1.1	SE102938.098	LB007980	28 Oct 2011	31 Oct 2011	11 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011
TP-36 2.0-2.1	SE102938.099	LB007980	28 Oct 2011	31 Oct 2011	11 Nov 2011	02 Nov 2011	07 Nov 2011	03 Nov 2011

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Sample Name	Sample Number	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
pH in soil (1:5) Method: ME-(AU)-[ENV]AN101								
TP-1 0.0-0.1	SE102938.001	LB008007	27 Oct 2011	31 Oct 2011	03 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
TP-1 1.0-1.1	SE102938.002	LB008007	27 Oct 2011	31 Oct 2011	03 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
TP-1 2.0-2.1	SE102938.003	LB008007	27 Oct 2011	31 Oct 2011	03 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
TP-2 0.0-0.1	SE102938.004	LB008007	28 Oct 2011	31 Oct 2011	04 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
TP-2 0.5-0.6	SE102938.005	LB008007	28 Oct 2011	31 Oct 2011	04 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
TP-2 1.5-1.6	SE102938.006	LB008007	28 Oct 2011	31 Oct 2011	04 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
TP-4 0.0-0.1	SE102938.007	LB008007	28 Oct 2011	31 Oct 2011	04 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
TP-4 1.0-1.1	SE102938.008	LB008007	28 Oct 2011	31 Oct 2011	04 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
TP-4 2.0-2.1	SE102938.009	LB008007	28 Oct 2011	31 Oct 2011	04 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
TP-5 0.0-0.1	SE102938.010	LB008007	28 Oct 2011	31 Oct 2011	04 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
TP-5 0.5-0.6	SE102938.011	LB008007	28 Oct 2011	31 Oct 2011	04 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
TP-5 1.5-1.6	SE102938.012	LB008007	28 Oct 2011	31 Oct 2011	04 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
TP-6 0.0-0.1	SE102938.013	LB008007	28 Oct 2011	31 Oct 2011	04 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
TP-6 0.5-0.6	SE102938.014	LB008007	28 Oct 2011	31 Oct 2011	04 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
TP-6 1.5-1.6	SE102938.015	LB008007	28 Oct 2011	31 Oct 2011	04 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
TP-7 0.0-0.1	SE102938.016	LB008007	28 Oct 2011	31 Oct 2011	04 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
TP-7 1.0-1.1	SE102938.017	LB008007	28 Oct 2011	31 Oct 2011	04 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
TP-7 2.0-2.1	SE102938.018	LB008007	28 Oct 2011	31 Oct 2011	04 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
TP-8 0.0-0.1	SE102938.019	LB008007	28 Oct 2011	31 Oct 2011	04 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
TP-8 1.0-1.1	SE102938.020	LB008007	28 Oct 2011	31 Oct 2011	04 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
TP-8 2.0-2.1	SE102938.021	LB008008	28 Oct 2011	31 Oct 2011	04 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
TP-9 0.0-0.1	SE102938.022	LB008008	28 Oct 2011	31 Oct 2011	04 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
TP-9 0.6-0.7	SE102938.023	LB008008	28 Oct 2011	31 Oct 2011	04 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
TP-9 1.5-1.6	SE102938.024	LB008008	28 Oct 2011	31 Oct 2011	04 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
TP-10 0.0-0.1	SE102938.025	LB008008	28 Oct 2011	31 Oct 2011	04 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
TP-10 1.0-1.1	SE102938.026	LB008008	28 Oct 2011	31 Oct 2011	04 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
TP-10 2.0-2.1	SE102938.027	LB008008	28 Oct 2011	31 Oct 2011	04 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
TP-11 0.0-0.1	SE102938.028	LB008008	28 Oct 2011	31 Oct 2011	04 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
TP-11 0.6-0.7	SE102938.029	LB008008	28 Oct 2011	31 Oct 2011	04 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
TP-11 1.5-1.6	SE102938.030	LB008008	28 Oct 2011	31 Oct 2011	04 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
TP-12 0.0-0.1	SE102938.031	LB008008	28 Oct 2011	31 Oct 2011	04 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
TP-12 1.0-1.1	SE102938.032	LB008008	28 Oct 2011	31 Oct 2011	04 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
TP-12 2.0-2.1	SE102938.033	LB008008	28 Oct 2011	31 Oct 2011	04 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
TP-13 0.0-0.1	SE102938.034	LB008008	28 Oct 2011	31 Oct 2011	04 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
TP-13 1.0-1.1	SE102938.035	LB008008	28 Oct 2011	31 Oct 2011	04 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
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TP-14 0.0-0.1	SE102938.037	LB008008	27 Oct 2011	31 Oct 2011	03 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
TP-14 0.6-0.7	SE102938.038	LB008008	27 Oct 2011	31 Oct 2011	03 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
TP-14 1.7-1.8	SE102938.039	LB008008	27 Oct 2011	31 Oct 2011	03 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
TP-15 0.0-0.1	SE102938.040	LB008008	27 Oct 2011	31 Oct 2011	03 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
TP-15 1.0-1.1	SE102938.041	LB008010	27 Oct 2011	31 Oct 2011	03 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
TP-15 2.0-2.1	SE102938.042	LB008010	27 Oct 2011	31 Oct 2011	03 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
TP-16 0.0-0.1	SE102938.043	LB008010	27 Oct 2011	31 Oct 2011	03 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
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TP-19 0.0-0.1	SE102938.049	LB008010	28 Oct 2011	31 Oct 2011	04 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
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TP-21 1.0-1.1	SE102938.053	LB008010	27 Oct 2011	31 Oct 2011	03 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
TP-21 2.0-2.1	SE102938.054	LB008010	27 Oct 2011	31 Oct 2011	03 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
TP-22 0.0-0.1	SE102938.055	LB008010	27 Oct 2011	31 Oct 2011	03 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
TP-22 1.0-1.1	SE102938.056	LB008010	27 Oct 2011	31 Oct 2011	03 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
TP-22 2.0-2.1	SE102938.057	LB008010	27 Oct 2011	31 Oct 2011	03 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
TP-23 0.0-0.1	SE102938.058	LB008010	27 Oct 2011	31 Oct 2011	03 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
TP-23 0.5-0.6	SE102938.059	LB008010	27 Oct 2011	31 Oct 2011	03 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
TP-23 1.5-1.6	SE102938.060	LB008010	27 Oct 2011	31 Oct 2011	03 Nov 2011	01 Nov 2011	03 Nov 2011	01 Nov 2011
TP-24 0.0-0.1	SE102938.061	LB008011	27 Oct 2011	31 Oct 2011	03 Nov 2011	02 Nov 2011	04 Nov 2011	01 Nov 2011
TP-24 1.5-1.6	SE102938.062	LB008011	27 Oct 2011	31 Oct 2011	03 Nov 2011	02 Nov 2011	04 Nov 2011	01 Nov 2011
TP-24 2.3-2.4	SE102938.063	LB008011	27 Oct 2011	31 Oct 2011	03 Nov 2011	02 Nov 2011	04 Nov 2011	01 Nov 2011
TP-25 0.0-0.1	SE102938.064	LB008011	27 Oct 2011	31 Oct 2011	03 Nov 2011	02 Nov 2011	04 Nov 2011	01 Nov 2011
TP-25 1.2-1.3	SE102938.065	LB008011	27 Oct 2011	31 Oct 2011	03 Nov 2011	02 Nov 2011	04 Nov 2011	01 Nov 2011
TP-25 2.0-2.1	SE102938.066	LB008011	27 Oct 2011	31 Oct 2011	03 Nov 2011	02 Nov 2011	04 Nov 2011	01 Nov 2011
TP-26 0.0-0.1	SE102938.067	LB008011	27 Oct 2011	31 Oct 2011	03 Nov 2011	02 Nov 2011	04 Nov 2011	01 Nov 2011
TP-26 0.5-0.6	SE102938.068	LB008011	27 Oct 2011	31 Oct 2011	03 Nov 2011	02 Nov 2011	04 Nov 2011	01 Nov 2011
TP-26 1.5-1.6	SE102938.069	LB008011	27 Oct 2011	31 Oct 2011	03 Nov 2011	02 Nov 2011	04 Nov 2011	01 Nov 2011
TP-27 0.0-0.1	SE102938.070	LB008011	27 Oct 2011	31 Oct 2011	03 Nov 2011	02 Nov 2011	04 Nov 2011	01 Nov 2011
TP-27 0.5-0.6	SE102938.071	LB008011	27 Oct 2011	31 Oct 2011	03 Nov 2011	02 Nov 2011	04 Nov 2011	01 Nov 2011
TP-27 1.5-1.6	SE102938.072	LB008011	27 Oct 2011	31 Oct 2011	03 Nov 2011	02 Nov 2011	04 Nov 2011	01 Nov 2011
TP-28 0.0-0.1	SE102938.073	LB008011	28 Oct 2011	31 Oct 2011	04 Nov 2011	02 Nov 2011	04 Nov 2011	01 Nov 2011
TP-28 0.5-0.6	SE102938.074	LB008011	28 Oct 2011	31 Oct 2011	04 Nov 2011	02 Nov 2011	04 Nov 2011	01 Nov 2011
TP-28 1.5-1.6	SE102938.075	LB008011	28 Oct 2011	31 Oct 2011	04 Nov 2011	02 Nov 2011	04 Nov 2011	01 Nov 2011
TP-29 0.0-0.1	SE102938.076	LB008011	28 Oct 2011	31 Oct 2011	04 Nov 2011	02 Nov 2011	04 Nov 2011	01 Nov 2011
TP-29 1.1-1.2	SE102938.077	LB008011	28 Oct 2011	31 Oct 2011	04 Nov 2011	02 Nov 2011	04 Nov 2011	01 Nov 2011
TP-29 2.0-2.1	SE102938.078	LB008011	28 Oct 2011	31 Oct 2011	04 Nov 2011	02 Nov 2011	04 Nov 2011	01 Nov 2011
TP-30 0.0-0.1	SE102938.079	LB008011	28 Oct 2011	31 Oct 2011	04 Nov 2011	02 Nov 2011	04 Nov 2011	01 Nov 2011
TP-30 1.0-1.1	SE102938.080	LB008011	28 Oct 2011	31 Oct 2011	04 Nov 2011	02 Nov 2011	04 Nov 2011	01 Nov 2011
TP-30 2.0-2.1	SE102938.081	LB008013	28 Oct 2011	31 Oct 2011	04 Nov 2011	02 Nov 2011	04 Nov 2011	01 Nov 2011
TP-31 0.0-0.1	SE102938.082	LB008013	27 Oct 2011	31 Oct 2011	03 Nov 2011	02 Nov 2011	04 Nov 2011	01 Nov 2011
TP-31 1.0-1.1	SE102938.083	LB008013	27 Oct 2011	31 Oct 2011	03 Nov 2011	02 Nov 2011	04 Nov 2011	01 Nov 2011
TP-31 2.0-2.1	SE102938.084	LB008013	27 Oct 2011	31 Oct 2011	03 Nov 2011	02 Nov 2011	04 Nov 2011	01 Nov 2011
TP-32 0.0-0.1	SE102938.085	LB008013	27 Oct 2011	31 Oct 2011	03 Nov 2011	02 Nov 2011	04 Nov 2011	01 Nov 2011
TP-32 0.6-0.7	SE102938.086	LB008013	27 Oct 2011	31 Oct 2011	03 Nov 2011	02 Nov 2011	04 Nov 2011	01 Nov 2011
TP-32 1.5-1.6	SE102938.087	LB008013	27 Oct 2011	31 Oct 2011	03 Nov 2011	02 Nov 2011	04 Nov 2011	01 Nov 2011
TP-33 0.0-0.1	SE102938.088	LB008013	27 Oct 2011	31 Oct 2011	03 Nov 2011	02 Nov 2011	04 Nov 2011	01 Nov 2011
TP-33 1.0-1.1	SE102938.089	LB008013	27 Oct 2011	31 Oct 2011	03 Nov 2011	02 Nov 2011	04 Nov 2011	01 Nov 2011
TP-33 2.0-2.1	SE102938.090	LB008013	27 Oct 2011	31 Oct 2011	03 Nov 2011	02 Nov 2011	04 Nov 2011	01 Nov 2011
TP-34 0.0-0.1	SE102938.091	LB008013	27 Oct 2011	31 Oct 2011	03 Nov 2011	02 Nov 2011	04 Nov 2011	01 Nov 2011
TP-34 0.5-0.6	SE102938.092	LB008013	27 Oct 2011	31 Oct 2011	03 Nov 2011	02 Nov 2011	04 Nov 2011	01 Nov 2011
TP-34 1.5-1.6	SE102938.093	LB008013	27 Oct 2011	31 Oct 2011	03 Nov 2011	02 Nov 2011	04 Nov 2011	01 Nov 2011
TP-35 0.0-0.1	SE102938.094	LB008013	27 Oct 2011	31 Oct 2011	03 Nov 2011	02 Nov 2011	04 Nov 2011	01 Nov 2011
TP-35 1.0-1.1	SE102938.095	LB008013	27 Oct 2011	31 Oct 2011	03 Nov 2011	02 Nov 2011	04 Nov 2011	01 Nov 2011
TP-35 2.0-2.1	SE102938.096	LB008013	27 Oct 2011	31 Oct 2011	03 Nov 2011	02 Nov 2011	04 Nov 2011	01 Nov 2011
TP-36 0.0-0.1	SE102938.097	LB008013	28 Oct 2011	31 Oct 2011	04 Nov 2011	02 Nov 2011	04 Nov 2011	01 Nov 2011
TP-36 1.0-1.1	SE102938.098	LB008013	28 Oct 2011	31 Oct 2011	04 Nov 2011	02 Nov 2011	04 Nov 2011	01 Nov 2011
TP-36 2.0-2.1	SE102938.099	LB008013	28 Oct 2011	31 Oct 2011	04 Nov 2011	02 Nov 2011	04 Nov 2011	01 Nov 2011

HOLDING TIME SUMMARY

SE102938 R0

HOLDING TIMES

SGS holding time criteria are drawn from current regulations and are highly dependent on sample container preservation as specified in the SGS “Field sampling guide for containers and holding time” (Ref: GU-(AU)-ENV.001). Soil samples guidelines are derived from NEPM "Schedule B(3) Guideline on Laboratory Analysis of Potentially Contaminated Soils". Water sample guidelines are derived from "AS/NZS 5667.1 : 1998 Water Quality - sampling part 1" and APHA "Standard Methods for the Examination of Water and Wastewater" 21st edition 2005.

The extraction and analysis holding time due dates listed are calculated from the date sampled, although holding times may be extended after laboratory extraction for some analytes. The due dates are the suggested dates that samples may be held before extraction or analysis and still be considered valid.

Extraction and Analysis dates are shown in **Green** when within suggested criteria and in **Bold** with an appended dagger symbol and Red† when outside suggested criteria. If the sampled date is not supplied then compliance with criteria cannot be determined. If the received date is after one or both due dates then holding time will fail by default.

Sample Name	Sample Number	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
Soluble Anions in Soil by Ion Chromatography **Method: ME-(AU)-[ENV]AN245**								
TP-1 0.0-0.1	SE102938.001	LB007933	27 Oct 2011	31 Oct 2011	24 Nov 2011	01 Nov 2011	24 Nov 2011	07 Nov 2011
TP-2 0.5-0.6	SE102938.005	LB007933	28 Oct 2011	31 Oct 2011	25 Nov 2011	01 Nov 2011	25 Nov 2011	07 Nov 2011
TP-4 2.0-2.1	SE102938.009	LB007933	28 Oct 2011	31 Oct 2011	25 Nov 2011	01 Nov 2011	25 Nov 2011	07 Nov 2011
TP-5 1.5-1.6	SE102938.012	LB007933	28 Oct 2011	31 Oct 2011	25 Nov 2011	01 Nov 2011	25 Nov 2011	07 Nov 2011
TP-6 0.0-0.1	SE102938.013	LB007933	28 Oct 2011	31 Oct 2011	25 Nov 2011	01 Nov 2011	25 Nov 2011	07 Nov 2011
TP-7 1.0-1.1	SE102938.017	LB007933	28 Oct 2011	31 Oct 2011	25 Nov 2011	01 Nov 2011	25 Nov 2011	07 Nov 2011
TP-8 2.0-2.1	SE102938.021	LB007933	28 Oct 2011	31 Oct 2011	25 Nov 2011	01 Nov 2011	25 Nov 2011	07 Nov 2011
TP-9 0.0-0.1	SE102938.022	LB007933	28 Oct 2011	31 Oct 2011	25 Nov 2011	01 Nov 2011	25 Nov 2011	07 Nov 2011
TP-10 1.0-1.1	SE102938.026	LB007933	28 Oct 2011	31 Oct 2011	25 Nov 2011	01 Nov 2011	25 Nov 2011	07 Nov 2011
TP-11 0.6-0.7	SE102938.029	LB007933	28 Oct 2011	31 Oct 2011	25 Nov 2011	01 Nov 2011	25 Nov 2011	07 Nov 2011
TP-12 2.0-2.1	SE102938.033	LB007933	28 Oct 2011	31 Oct 2011	25 Nov 2011	01 Nov 2011	25 Nov 2011	07 Nov 2011
TP-13 2.0-2.1	SE102938.036	LB007933	28 Oct 2011	31 Oct 2011	25 Nov 2011	01 Nov 2011	25 Nov 2011	07 Nov 2011
TP-14 0.0-0.1	SE102938.037	LB007933	27 Oct 2011	31 Oct 2011	24 Nov 2011	01 Nov 2011	24 Nov 2011	07 Nov 2011
TP-15 1.0-1.1	SE102938.041	LB007933	27 Oct 2011	31 Oct 2011	24 Nov 2011	01 Nov 2011	24 Nov 2011	07 Nov 2011
TP-16 0.6-0.7	SE102938.044	LB007933	27 Oct 2011	31 Oct 2011	24 Nov 2011	01 Nov 2011	24 Nov 2011	07 Nov 2011
TP-18 2.0-2.1	SE102938.048	LB007933	28 Oct 2011	31 Oct 2011	25 Nov 2011	01 Nov 2011	25 Nov 2011	07 Nov 2011
TP-19 0.0-0.1	SE102938.049	LB007933	28 Oct 2011	31 Oct 2011	25 Nov 2011	01 Nov 2011	25 Nov 2011	07 Nov 2011
TP-19 1.5-1.6	SE102938.051	LB007933	28 Oct 2011	31 Oct 2011	25 Nov 2011	01 Nov 2011	25 Nov 2011	07 Nov 2011
TP-21 1.0-1.1	SE102938.053	LB007933	27 Oct 2011	31 Oct 2011	24 Nov 2011	01 Nov 2011	24 Nov 2011	07 Nov 2011
TP-22 1.0-1.1	SE102938.056	LB007933	27 Oct 2011	31 Oct 2011	24 Nov 2011	01 Nov 2011	24 Nov 2011	07 Nov 2011
TP-23 0.5-0.6	SE102938.059	LB007934	27 Oct 2011	31 Oct 2011	24 Nov 2011	01 Nov 2011	24 Nov 2011	07 Nov 2011
TP-24 2.3-2.4	SE102938.063	LB007934	27 Oct 2011	31 Oct 2011	24 Nov 2011	01 Nov 2011	24 Nov 2011	07 Nov 2011
TP-25 1.2-1.3	SE102938.065	LB007934	27 Oct 2011	31 Oct 2011	24 Nov 2011	01 Nov 2011	24 Nov 2011	07 Nov 2011
TP-26 0.5-0.6	SE102938.068	LB007934	27 Oct 2011	31 Oct 2011	24 Nov 2011	01 Nov 2011	24 Nov 2011	07 Nov 2011
TP-27 1.5-1.6	SE102938.072	LB007934	27 Oct 2011	31 Oct 2011	24 Nov 2011	01 Nov 2011	24 Nov 2011	07 Nov 2011
TP-28 0.0-0.1	SE102938.073	LB007934	28 Oct 2011	31 Oct 2011	25 Nov 2011	01 Nov 2011	25 Nov 2011	07 Nov 2011
TP-29 1.1-1.2	SE102938.077	LB007934	28 Oct 2011	31 Oct 2011	25 Nov 2011	01 Nov 2011	25 Nov 2011	07 Nov 2011
TP-30 1.0-1.1	SE102938.080	LB007934	28 Oct 2011	31 Oct 2011	25 Nov 2011	01 Nov 2011	25 Nov 2011	07 Nov 2011
TP-31 0.0-0.1	SE102938.082	LB007934	27 Oct 2011	31 Oct 2011	24 Nov 2011	01 Nov 2011	24 Nov 2011	07 Nov 2011
TP-32 0.6-0.7	SE102938.086	LB007934	27 Oct 2011	31 Oct 2011	24 Nov 2011	01 Nov 2011	24 Nov 2011	07 Nov 2011
TP-33 0.0-0.1	SE102938.088	LB007934	27 Oct 2011	31 Oct 2011	24 Nov 2011	01 Nov 2011	24 Nov 2011	07 Nov 2011
TP-34 1.5-1.6	SE102938.093	LB007934	27 Oct 2011	31 Oct 2011	24 Nov 2011	01 Nov 2011	24 Nov 2011	07 Nov 2011
TP-35 1.0-1.1	SE102938.095	LB007934	27 Oct 2011	31 Oct 2011	24 Nov 2011	01 Nov 2011	24 Nov 2011	07 Nov 2011
TP-36 0.0-0.1	SE102938.097	LB007934	28 Oct 2011	31 Oct 2011	25 Nov 2011	01 Nov 2011	25 Nov 2011	07 Nov 2011

Surrogate results are evaluated against upper and lower limit criteria established in the SGS QA/QC plan (Ref: MP-(AU)-[ENV]QU-022). At least two of three routine level soil sample surrogate spike recoveries for BTEX/VOC are to be within 70-130% where control charts have not been developed and within the established control limits for charted surrogates. Matrix effects may void this as an acceptance criterion. Water sample surrogate spike recoveries are to be within 40-130%. The presence of emulsions, surfactants and particulates may void this as an acceptance criterion.
Result is shown in **Green** when within suggested criteria or **Bold** with an appended dagger symbol and Red† when outside suggested criteria.

No Surrogates were required for this job.

Blank results are evaluated against the limit of reporting (LOR), for the chosen method and its associated instrumentation, which is typically 2.5 times the statistically determined method detection limit (MDL).
Result is shown in **Green** when within suggested criteria or **Bold** with an appended dagger symbol and Red† when outside suggested criteria.

Parameter	Units	Control LOR	BLK MB
Conductivity and TDS by Calculation - Soil Method: ME-(AU)-[ENV]AN106			
LB008001.001			
Conductivity	µS/cm	1	<1
Total Dissolved Solids (by calculation)	mg/kg	5	<5
LB008002.001			
Conductivity	µS/cm	1	<1
Total Dissolved Solids (by calculation)	mg/kg	5	<5
LB008003.001			
Conductivity	µS/cm	1	<1
Total Dissolved Solids (by calculation)	mg/kg	5	<5
LB008004.001			
Conductivity	µS/cm	1	<1
Total Dissolved Solids (by calculation)	mg/kg	5	<5
LB008006.001			
Conductivity	µS/cm	1	<1
Total Dissolved Solids (by calculation)	mg/kg	5	<5
Soluble Anions in Soil by Ion Chromatography Method: ME-(AU)-[ENV]AN245			
LB007933.001			
Chloride	mg/kg	0.25	<0.25
Sulphate	mg/kg	0.5	<0.5
LB007933.027			
Chloride	mg/kg	0.25	<0.25
Sulphate	mg/kg	0.5	<0.5
LB007934.001			
Chloride	mg/kg	0.25	<0.25
Sulphate	mg/kg	0.5	<0.5

Duplicates are calculated as relative percent difference (RPD) using the formula RPD = | OriginalResult - ReplicateResult | x 100 / Mean
The RPD is evaluated against the maximum allowable RPD criteria and can be graphically represented by a curve calculated from the statistical detection limit and limiting repeatability using the formula: MaxAllowableDifference = 100 x StatisticalDetectionLimit / Mean + LimitingRepeatability
Where the MaxAllowableDifference evaluates to a number larger than 200 it is displayed as 200.
RPD is shown in **Green** when within suggested criteria or **Bold** with an appended dagger symbol and Red† when outside suggested criteria.

	Sample Name		SE102938.001-DUP			
Parameter	Units	LOR	Original Result	Duplicate Result	Criteria %	RPD %
Conductivity and TDS by Calculation - Soil Method: ME-(AU)-[ENV]AN106						
LB008001.004						
Conductivity	µS/cm	1	310	340	30	7
Conductivity (1:5 dry sample basis)	µS/cm	1	380	410	30	7
Total Dissolved Solids (by calculation)	mg/kg	5	1100	1200	30	7
pH in soil (1:5) Method: ME-(AU)-[ENV]AN101						
LB008007.003						
pH	pH Units	-	5.7	5.6	32	1
Soluble Anions in Soil by Ion Chromatography Method: ME-(AU)-[ENV]AN245						
LB007933.004						
Chloride	mg/kg	0.25	580	590	30	1
Sulphate	mg/kg	0.5	55	56	31	2

	Sample Name		SE102938.010-DUP			
Parameter	Units	LOR	Original Result	Duplicate Result	Criteria %	RPD %
Conductivity and TDS by Calculation - Soil Method: ME-(AU)-[ENV]AN106						
LB008001.014						
Conductivity	µS/cm	1	78	66	31	16
Conductivity (1:5 dry sample basis)	µS/cm	1	91	77	31	16
Total Dissolved Solids (by calculation)	mg/kg	5	270	230	32	16
pH in soil (1:5) Method: ME-(AU)-[ENV]AN101						
LB008007.013						
pH	pH Units	-	5.8	5.9	32	2

	Sample Name		SE102938.021-DUP			
Parameter	Units	LOR	Original Result	Duplicate Result	Criteria %	RPD %
Conductivity and TDS by Calculation - Soil Method: ME-(AU)-[ENV]AN106						
LB008002.004						
Conductivity	µS/cm	1	1400	1500	30	2
Conductivity (1:5 dry sample basis)	µS/cm	1	1800	1800	30	2
Total Dissolved Solids (by calculation)	mg/kg	5	5300	5400	30	2
pH in soil (1:5) Method: ME-(AU)-[ENV]AN101						
LB008008.003						
pH	pH Units	-	7.3	7.5	31	2

Duplicates are calculated as relative percent difference (RPD) using the formula RPD = | OriginalResult - ReplicateResult | x 100 / Mean
The RPD is evaluated against the maximum allowable RPD criteria and can be graphically represented by a curve calculated from the statistical detection limit and limiting repeatability using the formula: MaxAllowableDifference = 100 x StatisticalDetectionLimit / Mean + LimitingRepeatability
Where the MaxAllowableDifference evaluates to a number larger than 200 it is displayed as 200.
RPD is shown in **Green** when within suggested criteria or **Bold** with an appended dagger symbol and Red† when outside suggested criteria.

	Sample Name		SE102938.029-DUP			
Parameter	Units	LOR	Original Result	Duplicate Result	Criteria %	RPD %
Soluble Anions in Soil by Ion Chromatography Method: ME-(AU)-[ENV]AN245						
LB007933.015						
Chloride	mg/kg	0.25	670	640	30	5
Sulphate	mg/kg	0.5	42	53	31	24

	Sample Name		SE102938.031-DUP			
Parameter	Units	LOR	Original Result	Duplicate Result	Criteria %	RPD %
Conductivity and TDS by Calculation - Soil Method: ME-(AU)-[ENV]AN106						
LB008002.015						
Conductivity	µS/cm	1	96	92	31	4
Conductivity (1:5 dry sample basis)	µS/cm	1	110	100	31	4
Total Dissolved Solids (by calculation)	mg/kg	5	330	310	32	4
pH in soil (1:5) Method: ME-(AU)-[ENV]AN101						
LB008008.014						
pH	pH Units	-	5.6	5.7	32	1

	Sample Name		SE102938.043-DUP			
Parameter	Units	LOR	Original Result	Duplicate Result	Criteria %	RPD %
Conductivity and TDS by Calculation - Soil Method: ME-(AU)-[ENV]AN106						
LB008003.006						
Conductivity	µS/cm	1	160	170	31	7
Conductivity (1:5 dry sample basis)	µS/cm	1	170	180	31	7
Total Dissolved Solids (by calculation)	mg/kg	5	510	540	31	7
pH in soil (1:5) Method: ME-(AU)-[ENV]AN101						
LB008010.005						
pH	pH Units	-	5.3	5.3	32	0

	Sample Name		SE102938.051-DUP			
Parameter	Units	LOR	Original Result	Duplicate Result	Criteria %	RPD %
Soluble Anions in Soil by Ion Chromatography Method: ME-(AU)-[ENV]AN245						
LB007933.024						
Chloride	mg/kg	0.25	1500	1500	30	1
Sulphate	mg/kg	0.5	47	49	31	4

	Sample Name		SE102938.052-DUP			
Parameter	Units	LOR	Original Result	Duplicate Result	Criteria %	RPD %
Conductivity and TDS by Calculation - Soil Method: ME-(AU)-[ENV]AN106						
LB008003.016						
Conductivity	µS/cm	1	37	38	33	2
Conductivity (1:5 dry sample basis)	µS/cm	1	41	42	32	2
Total Dissolved Solids (by calculation)	mg/kg	5	120	130	34	2

Duplicates are calculated as relative percent difference (RPD) using the formula RPD = | OriginalResult - ReplicateResult | x 100 / Mean
The RPD is evaluated against the maximum allowable RPD criteria and can be graphically represented by a curve calculated from the statistical detection limit and limiting repeatability using the formula: MaxAllowableDifference = 100 x StatisticalDetectionLimit / Mean + LimitingRepeatability
Where the MaxAllowableDifference evaluates to a number larger than 200 it is displayed as 200.
RPD is shown in **Green** when within suggested criteria or **Bold** with an appended dagger symbol and Red† when outside suggested criteria.

	Sample Name		SE102938.052-DUP			
Parameter	Units	LOR	Original Result	Duplicate Result	Criteria %	RPD %
pH in soil (1:5) Method: ME-(AU)-[ENV]AN101						
LB008010.015						
pH	pH Units	-	6.1	6.0	32	0

	Sample Name		SE102938.061-DUP			
Parameter	Units	LOR	Original Result	Duplicate Result	Criteria %	RPD %
Conductivity and TDS by Calculation - Soil Method: ME-(AU)-[ENV]AN106						
LB008004.004						
Conductivity	µS/cm	1	300	280	30	9
Conductivity (1:5 dry sample basis)	µS/cm	1	340	310	30	9
Total Dissolved Solids (by calculation)	mg/kg	5	1000	940	31	9
pH in soil (1:5) Method: ME-(AU)-[ENV]AN101						
LB008011.003						
pH	pH Units	-	6.4	6.4	32	1

	Sample Name		SE102938.071-DUP			
Parameter	Units	LOR	Original Result	Duplicate Result	Criteria %	RPD %
Conductivity and TDS by Calculation - Soil Method: ME-(AU)-[ENV]AN106						
LB008004.015						
Conductivity	µS/cm	1	520	460	30	12
Conductivity (1:5 dry sample basis)	µS/cm	1	620	560	30	12
Total Dissolved Solids (by calculation)	mg/kg	5	1900	1700	30	12
pH in soil (1:5) Method: ME-(AU)-[ENV]AN101						
LB008011.014						
pH	pH Units	-	4.8	4.9	32	1

	Sample Name		SE102938.072-DUP			
Parameter	Units	LOR	Original Result	Duplicate Result	Criteria %	RPD %
Soluble Anions in Soil by Ion Chromatography Method: ME-(AU)-[ENV]AN245						
LB007934.008						
Chloride	mg/kg	0.25	630	630	30	0
Sulphate	mg/kg	0.5	160	160	30	0

	Sample Name		SE102938.081-DUP			
Parameter	Units	LOR	Original Result	Duplicate Result	Criteria %	RPD %
Conductivity and TDS by Calculation - Soil Method: ME-(AU)-[ENV]AN106						
LB008006.004						
Conductivity	µS/cm	1	53	54	32	3
Conductivity (1:5 dry sample basis)	µS/cm	1	63	65	32	3
Total Dissolved Solids (by calculation)	mg/kg	5	190	200	33	3

Duplicates are calculated as relative percent difference (RPD) using the formula RPD = | OriginalResult - ReplicateResult | x 100 / Mean
The RPD is evaluated against the maximum allowable RPD criteria and can be graphically represented by a curve calculated from the statistical detection limit and limiting repeatability using the formula: MaxAllowableDifference = 100 x StatisticalDetectionLimit / Mean + LimitingRepeatability
Where the MaxAllowableDifference evaluates to a number larger than 200 it is displayed as 200.
RPD is shown in **Green** when within suggested criteria or **Bold** with an appended dagger symbol and Red† when outside suggested criteria.

	Sample Name		SE102938.081-DUP			
Parameter	Units	LOR	Original Result	Duplicate Result	Criteria %	RPD %
pH in soil (1:5) Method: ME-(AU)-[ENV]AN101						
LB008013.003						
pH	pH Units	-	5.7	5.6	32	2

	Sample Name		SE102938.091-DUP			
Parameter	Units	LOR	Original Result	Duplicate Result	Criteria %	RPD %
Conductivity and TDS by Calculation - Soil Method: ME-(AU)-[ENV]AN106						
LB008006.015						
Conductivity	µS/cm	1	48	52	32	8
Conductivity (1:5 dry sample basis)	µS/cm	1	52	56	32	8
Total Dissolved Solids (by calculation)	mg/kg	5	160	170	33	8
pH in soil (1:5) Method: ME-(AU)-[ENV]AN101						
LB008013.014						
pH	pH Units	-	5.9	5.9	32	0

Laboratory Control Standard (LCS) results are evaluated against an expected result, typically the concentration of analyte spiked into the control during the sample preparation stage, producing a percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA/QC plan (Ref: MP-(AU)-[ENV]QU-022).
For more information refer to the footnotes in the concluding page of the report.
Recovery is shown in **Green** when within suggested criteria or **Bold** with an appended dagger symbol and Red† when outside suggested criteria.

		Control	LCS STD			
Parameter	Units	LOR	Result	Expected Result	Criteria %	Recovery %
Conductivity and TDS by Calculation - Soil Method: ME-(AU)-[ENV]AN106						
LB008001.002						
Conductivity	µS/cm	1	310	303	85 - 115	102
Total Dissolved Solids (by calculation)	mg/kg	5	930	909	85 - 115	102
LB008002.002						
Conductivity	µS/cm	1	300	303	85 - 115	99
Total Dissolved Solids (by calculation)	mg/kg	5	900	909	85 - 115	99
LB008003.002						
Conductivity	µS/cm	1	300	303	85 - 115	99
Total Dissolved Solids (by calculation)	mg/kg	5	900	909	85 - 115	99
LB008004.002						
Conductivity	µS/cm	1	300	303	85 - 115	98
Total Dissolved Solids (by calculation)	mg/kg	5	890	909	85 - 115	98
LB008006.002						
Conductivity	µS/cm	1	310	303	85 - 115	102
Total Dissolved Solids (by calculation)	mg/kg	5	930	909	85 - 115	102
pH in soil (1:5) Method: ME-(AU)-[ENV]AN101						
LB008007.001						
pH	pH Units	-	7.4	7.41	98 - 102	99
LB008008.001						
pH	pH Units	-	7.4	7.41	98 - 102	100
LB008010.001						
pH	pH Units	-	7.4	7.41	98 - 102	100
LB008011.001						
pH	pH Units	-	7.4	7.41	98 - 102	99
LB008013.001						
pH	pH Units	-	7.4	7.41	98 - 102	100
Soluble Anions in Soil by Ion Chromatography Method: ME-(AU)-[ENV]AN245						
LB007933.002						
Chloride	mg/kg	0.25	100	100	70 - 130	103
Sulphate	mg/kg	0.5	100	100	70 - 130	102
LB007933.028						
Chloride	mg/kg	0.25	100	100	70 - 130	102
Sulphate	mg/kg	0.5	100	100	70 - 130	102
LB007934.002						
Chloride	mg/kg	0.25	100	100	70 - 130	102
Sulphate	mg/kg	0.5	100	100	70 - 130	102

Matrix spike (MS) results are evaluated as the percentage recovery of an expected result, typically the concentration of analyte spiked into a field sub-sample during the sample preparation stage. The original sample's result is subtracted from the sub-sample result before determining the percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA/QC plan (Ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of the report. Recovery is shown in **Green** when within suggested criteria or **Bold** with an appended dagger symbol and Red† when outside suggested criteria.

No Matrix Spikes were required for this job.

Matrix spike duplicates are calculated as relative percent difference using the formula RPD = | OriginalResult - ReplicateResult | x 100 / Mean
The original result is the analyte concentration of the matrix spike and the replicate result is the analyte concentration of the matrix spike duplicate.
The RPD is evaluated against the maximum allowable RPD criteria and can be graphically represented by a curve calculated from the statistical detection limit and limiting repeatability using the formula: MaxAllowableDifference = 100 x StatisticalDetectionLimit / Mean + LimitingRepeatability
RPD is shown in **Green** when within suggested criteria or **Bold** with an appended dagger symbol and Red† when outside suggested criteria.

No Matrix Spike Duplicates were required for this job.

FOOTNOTES

IS	Insufficient sample for analysis.
LNR	Sample listed, but not received.
*	NATA Accreditation does not cover this analysis.
^	Performed by outside laboratory.
LOR	Limit of Reporting
QFH	QC result is above the upper tolerance
QFL	QC result is below the lower tolerance
NA	The sample was not analysed for this analyte

Samples analysed as received.
Solid samples expressed on a dry weight basis.

The QC criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here: http://www.au.sgs.com/sgs-mp-au-env-qu-022-qa-qc-plan-en-09.pdf

LABORATORY REPORT COVERSHEET

Date: 10 November 2011

To: Geotechnique Pty Ltd
PO Box 880
PENRITH NSW 2750

Attention: Emged Rizkalla

Your Reference: Geotechnique 12576/1 Marsden Park (SE102938)
Laboratory Report No: CE74722

Samples Received: 1/11/2011
Samples / Quantity: 34 Soil

The above samples were received intact and analysed according to your written instructions. Unless otherwise stated, solid samples are reported on a dry weight basis and liquid samples as received.

Jon Dicker
Manager
CAIRNS

Shey Goddard
Administration Manager
CAIRNS

SGS Australia Pty Ltd
ABN 44 000 964 278
Environmental Services Unit 2, 58 Comport Street, Portsmith 4870 QLD Australia
t +61 (0)7 4035 5111 f +61 (0)7 4035 5122

CLIENT: Geotechnique Pty Ltd
PROJECT: Geotechnique 12576/1 Marsden Park (SE102938) **Laboratory Report No:** CE74722

LABORATORY REPORT

Cation Exchange Capacity Suite Our Reference Your Reference Type of Sample Date Sampled Sample Description	Units	CE74722-1 SE102938-1 Soil 27/10/2011 TP-1 0-0.1	CE74722-2 SE102938-5 Soil 28/10/2011 TP-2 0.5-0.6	CE74722-3 SE102938-9 Soil 28/10/2011 TP-4 2.0-2.1
Date Extracted		7/11/2011	7/11/2011	7/11/2011
Date Analysed		10/11/2011	10/11/2011	10/11/2011
Sodium, Na	mg/kg	440	510	470
Sodium (meq%)	meq%	1.9	2.2	2.0
Exchangeable Sodium	%	20	24	25
Potassium, K	mg/kg	130	72	120
Potassium (meq%)	meq%	0.33	0.18	0.31
Exchangeable Potassium	%	3	2	4
Calcium, Ca	mg/kg	460	34	19
Calcium (meq%)	meq%	2.3	0.17	0.10
Exchangeable Calcium	%	24	2	1
Magnesium, Mg	mg/kg	620	800	710
Magnesium (meq%)	meq%	5.1	6.6	5.8
Exchangeable Magnesium	%	53	72	70
CEC	meq%	9.6	9.1	8.3

CLIENT: Geotechnique Pty Ltd
PROJECT: Geotechnique 12576/1 Marsden Park (SE102938) **Laboratory Report No:** CE74722

LABORATORY REPORT

Cation Exchange Capacity Suite Our Reference Your Reference Type of Sample Date Sampled Sample Description	Units	CE74722-4 SE102938-12 Soil 28/10/2011 TP-5 1.5-1.6	CE74722-5 SE102938-13 Soil 28/10/2011 TP-6 0.0-0.1	CE74722-6 SE102938-17 Soil 28/10/2011 TP-7 1.0-1.1
Date Extracted		7/11/2011	7/11/2011	7/11/2011
Date Analysed		10/11/2011	10/11/2011	10/11/2011
Sodium, Na	mg/kg	750	45	75
Sodium (meq%)	meq%	3.3	0.20	0.33
Exchangeable Sodium	%	30	4	5
Potassium, K	mg/kg	210	270	150
Potassium (meq%)	meq%	0.54	0.69	0.38
Exchangeable Potassium	%	5	13	6
Calcium, Ca	mg/kg	16	150	570
Calcium (meq%)	meq%	0.08	0.75	2.8
Exchangeable Calcium	%	<1	15	46
Magnesium, Mg	mg/kg	850	430	320
Magnesium (meq%)	meq%	7.0	3.5	2.6
Exchangeable Magnesium	%	64	68	42
CEC	meq%	11	5.2	6.2

CLIENT: Geotechnique Pty Ltd
PROJECT: Geotechnique 12576/1 Marsden Park (SE102938) **Laboratory Report No:** CE74722

LABORATORY REPORT

Cation Exchange Capacity Suite Our Reference Your Reference Type of Sample Date Sampled Sample Description	Units	CE74722-7 SE102938-21 Soil 28/10/2011 TP-8 2.0-2.1	CE74722-8 SE102938-22 Soil 28/10/2011 TP-9 0.0-0.1	CE74722-9 SE102938-26 Soil 28/10/2011 TP-10 1.0-1.1
Date Extracted		7/11/2011	7/11/2011	7/11/2011
Date Analysed		10/11/2011	10/11/2011	10/11/2011
Sodium, Na	mg/kg	1,800	220	590
Sodium (meq%)	meq%	7.8	0.96	2.6
Exchangeable Sodium	%	54	25	25
Potassium, K	mg/kg	150	65	140
Potassium (meq%)	meq%	0.38	0.17	0.36
Exchangeable Potassium	%	3	4	4
Calcium, Ca	mg/kg	220	130	120
Calcium (meq%)	meq%	1.1	0.65	0.60
Exchangeable Calcium	%	8	17	6
Magnesium, Mg	mg/kg	620	250	810
Magnesium (meq%)	meq%	5.1	2.0	6.6
Exchangeable Magnesium	%	35	54	65
CEC	meq%	14	3.8	10

CLIENT: Geotechnique Pty Ltd
PROJECT: Geotechnique 12576/1 Marsden Park (SE102938) **Laboratory Report No:** CE74722

LABORATORY REPORT

Cation Exchange Capacity Suite Our Reference Your Reference Type of Sample Date Sampled Sample Description	Units	CE74722-10 SE102938-29 Soil 28/10/2011 TP-11 0.6-0.7	CE74722-11 SE102938-33 Soil 28/10/2011 TP-12 2.0-2.1	CE74722-12 SE102938-36 Soil 28/10/2011 TP-13 2.0-2.1
Date Extracted		7/11/2011	7/11/2011	7/11/2011
Date Analysed		10/11/2011	10/11/2011	10/11/2011
Sodium, Na	mg/kg	490	1,800	910
Sodium (meq%)	meq%	2.1	7.8	4.0
Exchangeable Sodium	%	15	41	31
Potassium, K	mg/kg	130	460	190
Potassium (meq%)	meq%	0.33	1.2	0.49
Exchangeable Potassium	%	2	6	4
Calcium, Ca	mg/kg	540	12	5
Calcium (meq%)	meq%	2.7	0.06	0.02
Exchangeable Calcium	%	19	<1	<1
Magnesium, Mg	mg/kg	1,100	1,200	1,000
Magnesium (meq%)	meq%	9.0	9.8	8.2
Exchangeable Magnesium	%	64	52	65
CEC	meq%	14	19	13

CLIENT: Geotechnique Pty Ltd
PROJECT: Geotechnique 12576/1 Marsden Park (SE102938) **Laboratory Report No:** CE74722

LABORATORY REPORT

Cation Exchange Capacity Suite Our Reference Your Reference Type of Sample Date Sampled Sample Description	Units	CE74722-13 SE102938-37 Soil 27/10/2011 TP-14 0.0-0.1	CE74722-14 SE102938-41 Soil 27/10/2011 TP-15 1.0-1.1	CE74722-15 SE102938-44 Soil 27/10/2011 TP-16 0.6-0.7
Date Extracted		7/11/2011	7/11/2011	7/11/2011
Date Analysed		10/11/2011	10/11/2011	10/11/2011
Sodium, Na	mg/kg	470	550	920
Sodium (meq%)	meq%	2.0	2.4	4.0
Exchangeable Sodium	%	20	28	32
Potassium, K	mg/kg	190	170	91
Potassium (meq%)	meq%	0.49	0.43	0.23
Exchangeable Potassium	%	5	5	2
Calcium, Ca	mg/kg	390	28	96
Calcium (meq%)	meq%	1.9	0.14	0.48
Exchangeable Calcium	%	19	2	4
Magnesium, Mg	mg/kg	700	680	970
Magnesium (meq%)	meq%	5.7	5.6	7.9
Exchangeable Magnesium	%	56	65	63
CEC	meq%	10	8.5	13

CLIENT: Geotechnique Pty Ltd
PROJECT: Geotechnique 12576/1 Marsden Park (SE102938) **Laboratory Report No:** CE74722

LABORATORY REPORT

Cation Exchange Capacity Suite Our Reference Your Reference Type of Sample Date Sampled Sample Description	Units	CE74722-16 SE102938-48 Soil 28/10/2011 TP-18 2.0-2.1	CE74722-17 SE102938-49 Soil 28/10/2011 TP-19 0.0-0.1	CE74722-18 SE102938-51 Soil 28/10/2011 TP-19 1.5-1.6
Date Extracted		7/11/2011	7/11/2011	7/11/2011
Date Analysed		10/11/2011	10/11/2011	10/11/2011
Sodium, Na	mg/kg	2,000	150	1,900
Sodium (meq%)	meq%	8.7	0.65	8.3
Exchangeable Sodium	%	39	12	43
Potassium, K	mg/kg	260	100	170
Potassium (meq%)	meq%	0.66	0.26	0.43
Exchangeable Potassium	%	3	5	2
Calcium, Ca	mg/kg	7	370	16
Calcium (meq%)	meq%	0.04	1.8	0.08
Exchangeable Calcium	%	<1	34	<1
Magnesium, Mg	mg/kg	1,600	330	1,300
Magnesium (meq%)	meq%	13	2.7	11
Exchangeable Magnesium	%	58	50	55
CEC	meq%	23	5.5	19

CLIENT: Geotechnique Pty Ltd
PROJECT: Geotechnique 12576/1 Marsden Park (SE102938) **Laboratory Report No:** CE74722

LABORATORY REPORT

Cation Exchange Capacity Suite Our Reference Your Reference Type of Sample Date Sampled Sample Description	Units	CE74722-19 SE102938-53 Soil 27/10/2011 TP-21 1.0-1.1	CE74722-20 SE102938-56 Soil 27/10/2011 TP-22 1.0-1.1	CE74722-21 SE102938-59 Soil 27/10/2011 TP-23 0.5-0.6
Date Extracted		7/11/2011	7/11/2011	7/11/2011
Date Analysed		10/11/2011	10/11/2011	10/11/2011
Sodium, Na	mg/kg	1,900	1,700	610
Sodium (meq%)	meq%	8.3	7.4	2.6
Exchangeable Sodium	%	28	49	29
Potassium, K	mg/kg	150	210	93
Potassium (meq%)	meq%	0.38	0.54	0.24
Exchangeable Potassium	%	1	4	3
Calcium, Ca	mg/kg	97	10	45
Calcium (meq%)	meq%	0.49	0.05	0.23
Exchangeable Calcium	%	2	<1	2
Magnesium, Mg	mg/kg	2,500	870	720
Magnesium (meq%)	meq%	20	7.1	5.9
Exchangeable Magnesium	%	69	47	65
CEC	meq%	30	15	9.0

CLIENT: Geotechnique Pty Ltd
PROJECT: Geotechnique 12576/1 Marsden Park (SE102938) **Laboratory Report No:** CE74722

LABORATORY REPORT

Cation Exchange Capacity Suite Our Reference Your Reference Type of Sample Date Sampled Sample Description	Units	CE74722-22 SE102938-63 Soil 27/10/2011 TP-24 2.3-2.4	CE74722-23 SE102938-65 Soil 27/10/2011 TP-25 1.2-1.3	CE74722-24 SE102938-68 Soil 27/10/2011 TP-26 0.5-0.6
Date Extracted		7/11/2011	7/11/2011	7/11/2011
Date Analysed		10/11/2011	10/11/2011	10/11/2011
Sodium, Na	mg/kg	1,900	2,800	250
Sodium (meq%)	meq%	8.3	12	1.1
Exchangeable Sodium	%	45	51	24
Potassium, K	mg/kg	260	140	47
Potassium (meq%)	meq%	0.66	0.36	0.12
Exchangeable Potassium	%	4	1	3
Calcium, Ca	mg/kg	48	170	16
Calcium (meq%)	meq%	0.24	0.85	0.08
Exchangeable Calcium	%	1	4	2
Magnesium, Mg	mg/kg	1,100	1,300	400
Magnesium (meq%)	meq%	9.0	11	3.3
Exchangeable Magnesium	%	50	44	72
CEC	meq%	18	24	4.6

CLIENT: Geotechnique Pty Ltd
PROJECT: Geotechnique 12576/1 Marsden Park (SE102938) **Laboratory Report No:** CE74722

LABORATORY REPORT

Cation Exchange Capacity Suite Our Reference Your Reference Type of Sample Date Sampled Sample Description	Units	CE74722-25 SE102938-72 Soil 27/10/2011 TP-27 1.5-1.6	CE74722-26 SE102938-73 Soil 28/10/2011 TP-28 0.0-0.1	CE74722-27 SE102938-77 Soil 28/10/2011 TP-29 1.1-1.2
Date Extracted		7/11/2011	7/11/2011	7/11/2011
Date Analysed		10/11/2011	10/11/2011	10/11/2011
Sodium, Na	mg/kg	760	96	1,100
Sodium (meq%)	meq%	3.3	0.42	4.8
Exchangeable Sodium	%	35	14	39
Potassium, K	mg/kg	150	49	77
Potassium (meq%)	meq%	0.38	0.13	0.20
Exchangeable Potassium	%	4	4	2
Calcium, Ca	mg/kg	41	220	9
Calcium (meq%)	meq%	0.21	1.1	0.04
Exchangeable Calcium	%	2	36	<1
Magnesium, Mg	mg/kg	670	170	870
Magnesium (meq%)	meq%	5.5	1.4	7.1
Exchangeable Magnesium	%	59	46	59
CEC	meq%	9.4	3.0	12

CLIENT: Geotechnique Pty Ltd
PROJECT: Geotechnique 12576/1 Marsden Park (SE102938) **Laboratory Report No:** CE74722

LABORATORY REPORT

Cation Exchange Capacity Suite Our Reference Your Reference Type of Sample Date Sampled Sample Description	Units	CE74722-28 SE102938-80 Soil 28/10/2011 TP-30 1.0-1.1	CE74722-29 SE102938-82 Soil 27/10/2011 TP-31 0.0-0.1	CE74722-30 SE102938-86 Soil 27/10/2011 TP-32 0.6-0.7
Date Extracted		7/11/2011	7/11/2011	7/11/2011
Date Analysed		10/11/2011	10/11/2011	10/11/2011
Sodium, Na	mg/kg	97	240	1,800
Sodium (meq%)	meq%	0.42	1.0	7.8
Exchangeable Sodium	%	7	14	52
Potassium, K	mg/kg	71	80	110
Potassium (meq%)	meq%	0.18	0.20	0.28
Exchangeable Potassium	%	3	3	2
Calcium, Ca	mg/kg	95	390	120
Calcium (meq%)	meq%	0.48	1.9	0.60
Exchangeable Calcium	%	8	26	4
Magnesium, Mg	mg/kg	630	520	780
Magnesium (meq%)	meq%	5.2	4.3	6.4
Exchangeable Magnesium	%	83	57	42
CEC	meq%	6.2	7.5	15

CLIENT: Geotechnique Pty Ltd
PROJECT: Geotechnique 12576/1 Marsden Park (SE102938) **Laboratory Report No:** CE74722

LABORATORY REPORT

Cation Exchange Capacity Suite Our Reference Your Reference Type of Sample Date Sampled Sample Description	Units	CE74722-31 SE102938-88 Soil 27/10/2011 TP-33 0.0-0.1	CE74722-32 SE102938-93 Soil 27/10/2011 TP-34 1.5-1.6	CE74722-33 SE102938-95 Soil 27/10/2011 TP-35 1.0-1.1
Date Extracted		7/11/2011	7/11/2011	7/11/2011
Date Analysed		10/11/2011	10/11/2011	10/11/2011
Sodium, Na	mg/kg	1,300	900	2,300
Sodium (meq%)	meq%	5.6	3.9	10
Exchangeable Sodium	%	57	35	36
Potassium, K	mg/kg	60	140	310
Potassium (meq%)	meq%	0.15	0.36	0.79
Exchangeable Potassium	%	2	3	3
Calcium, Ca	mg/kg	120	5	13
Calcium (meq%)	meq%	0.60	0.03	0.07
Exchangeable Calcium	%	6	<1	<1
Magnesium, Mg	mg/kg	420	830	2,100
Magnesium (meq%)	meq%	3.4	6.8	17
Exchangeable Magnesium	%	35	61	61
CEC	meq%	9.8	11	28

CLIENT: Geotechnique Pty Ltd
PROJECT: Geotechnique 12576/1 Marsden Park (SE102938) **Laboratory Report No:** CE74722

LABORATORY REPORT

Cation Exchange Capacity Suite Our Reference Your Reference Type of Sample Date Sampled Sample Description	Units	CE74722-34 SE102938-97 Soil 28/10/2011 TP-36 0.0-0.1
Date Extracted		7/11/2011
Date Analysed		10/11/2011
Sodium, Na	mg/kg	120
Sodium (meq%)	meq%	0.52
Exchangeable Sodium	%	10
Potassium, K	mg/kg	99
Potassium (meq%)	meq%	0.25
Exchangeable Potassium	%	5
Calcium, Ca	mg/kg	530
Calcium (meq%)	meq%	2.6
Exchangeable Calcium	%	51
Magnesium, Mg	mg/kg	220
Magnesium (meq%)	meq%	1.8
Exchangeable Magnesium	%	34
CEC	meq%	5.2

CLIENT: Geotechnique Pty Ltd
PROJECT: Geotechnique 12576/1 Marsden Park (SE102938) **Laboratory Report No:** CE74722

LABORATORY REPORT

TEST PARAMETERS	UNITS	LOR	METHOD
Date Extracted			
Date Analysed			
Sodium, Na	mg/kg	2	AN122 / AN320 RL15D3
Sodium (meq%)	meq%	0.01	Calculation
Exchangeable Sodium	%	1	Calculation
Potassium, K	mg/kg	2	AN122 / AN320 RL15D3
Potassium (meq%)	meq%	0.01	Calculation
Exchangeable Potassium	%	1	Calculation
Calcium, Ca	mg/kg	2	AN122 / AN320 RL15D3
Calcium (meq%)	meq%	0.01	Calculation
Exchangeable Calcium	%	1	Calculation
Magnesium, Mg	mg/kg	2	AN122 / AN320 RL15D3
Magnesium (meq%)	meq%	0.01	Calculation
Exchangeable Magnesium	%	1	Calculation
CEC	meq%	0.01	AN122 / AN320 RL15D3

CLIENT: Geotechnique Pty Ltd

PROJECT: Geotechnique 12576/1 Marsden Park (SE102938) **Laboratory Report No:** CE74722

LABORATORY REPORT

QUALITY CONTROL	UNITS	Blank	Duplicate Sm#	Duplicate Sample||Duplicate	Spike Sm#	Spike Recovery
Date Extracted		-	CE74722-1	7/11/2011 || 7/11/2011	Batch Spike	-
Date Analysed		-	CE74722-1	10/11/2011 || 10/11/2011	Batch Spike	-
Sodium, Na	mg/kg	<2	CE74722-1	440 || 440 || RPD: 0	Batch Spike	91%
Sodium (meq%)	meq%	-	CE74722-1	1.9 || 1.9 || RPD: 0	Batch Spike	-
Exchangeable Sodium	%	-	CE74722-1	20 || 20 || RPD: 0	Batch Spike	-
Potassium, K	mg/kg	<2	CE74722-1	130 || 130 || RPD: 0	Batch Spike	91%
Potassium (meq%)	meq%	-	CE74722-1	0.33 || 0.33 || RPD: 0	Batch Spike	-
Exchangeable Potassium	%	-	CE74722-1	3 || 3 || RPD: 0	Batch Spike	-
Calcium, Ca	mg/kg	<2	CE74722-1	460 || 450 || RPD: 2	Batch Spike	98%
Calcium (meq%)	meq%	-	CE74722-1	2.3 || 2.2 || RPD: 4	Batch Spike	-
Exchangeable Calcium	%	-	CE74722-1	24 || 23 || RPD: 4	Batch Spike	-
Magnesium, Mg	mg/kg	<2	CE74722-1	620 || 620 || RPD: 0	Batch Spike	97%
Magnesium (meq%)	meq%	-	CE74722-1	5.1 || 5.1 || RPD: 0	Batch Spike	-
Exchangeable Magnesium	%	-	CE74722-1	53 || 53 || RPD: 0	Batch Spike	-
CEC	meq%	-	CE74722-1	9.6 || 9.6 || RPD: 0	Batch Spike	-

CLIENT: Geotechnique Pty Ltd

PROJECT: Geotechnique 12576/1 Marsden Park (SE102938) **Laboratory Report No:** CE74722

LABORATORY REPORT

QUALITY CONTROL	UNITS	Blank	Duplicate Sm#	Duplicate Sample||Duplicate
Date Extracted		[NT]	CE74722-11	7/11/2011 || 7/11/2011
Date Analysed		[NT]	CE74722-11	10/11/2011 || 10/11/2011
Sodium, Na	mg/kg	[NT]	CE74722-11	1800 || 1800 || RPD: 0
Sodium (meq%)	meq%	[NT]	CE74722-11	7.8 || 7.8 || RPD: 0
Exchangeable Sodium	%	[NT]	CE74722-11	41 || 41 || RPD: 0
Potassium, K	mg/kg	[NT]	CE74722-11	460 || 460 || RPD: 0
Potassium (meq%)	meq%	[NT]	CE74722-11	1.2 || 1.2 || RPD: 0
Exchangeable Potassium	%	[NT]	CE74722-11	6 || 6 || RPD: 0
Calcium, Ca	mg/kg	[NT]	CE74722-11	12 || 12 || RPD: 0
Calcium (meq%)	meq%	[NT]	CE74722-11	0.06 || 0.06 || RPD: 0
Exchangeable Calcium	%	[NT]	CE74722-11	<1 || <1
Magnesium, Mg	mg/kg	[NT]	CE74722-11	1200 || 1200 || RPD: 0
Magnesium (meq%)	meq%	[NT]	CE74722-11	9.8 || 9.8 || RPD: 0
Exchangeable Magnesium	%	[NT]	CE74722-11	52 || 52 || RPD: 0
CEC	meq%	[NT]	CE74722-11	19 || 19 || RPD: 0

CLIENT: Geotechnique Pty Ltd

PROJECT: Geotechnique 12576/1 Marsden Park (SE102938) **Laboratory Report No:** CE74722

LABORATORY REPORT

QUALITY CONTROL	UNITS	Blank	Duplicate Sm#	Duplicate Sample||Duplicate
Date Extracted		[NT]	CE74722-21	7/11/2011 || 7/11/2011
Date Analysed		[NT]	CE74722-21	10/11/2011 || 10/11/2011
Sodium, Na	mg/kg	[NT]	CE74722-21	610 || 600 || RPD: 2
Sodium (meq%)	meq%	[NT]	CE74722-21	2.6 || 2.6 || RPD: 0
Exchangeable Sodium	%	[NT]	CE74722-21	29 || 29 || RPD: 0
Potassium, K	mg/kg	[NT]	CE74722-21	93 || 93 || RPD: 0
Potassium (meq%)	meq%	[NT]	CE74722-21	0.24 || 0.24 || RPD: 0
Exchangeable Potassium	%	[NT]	CE74722-21	3 || 3 || RPD: 0
Calcium, Ca	mg/kg	[NT]	CE74722-21	45 || 45 || RPD: 0
Calcium (meq%)	meq%	[NT]	CE74722-21	0.23 || 0.23 || RPD: 0
Exchangeable Calcium	%	[NT]	CE74722-21	2 || 3 || RPD: 40
Magnesium, Mg	mg/kg	[NT]	CE74722-21	720 || 710 || RPD: 1
Magnesium (meq%)	meq%	[NT]	CE74722-21	5.9 || 5.8 || RPD: 2
Exchangeable Magnesium	%	[NT]	CE74722-21	65 || 65 || RPD: 0
CEC	meq%	[NT]	CE74722-21	9.0 || 8.9 || RPD: 1

CLIENT: Geotechnique Pty Ltd

PROJECT: Geotechnique 12576/1 Marsden Park (SE102938) **Laboratory Report No:** CE74722

LABORATORY REPORT

QUALITY CONTROL	UNITS	Blank	Duplicate Sm#	Duplicate Sample||Duplicate
Date Extracted		[NT]	CE74722-31	7/11/2011 || 7/11/2011
Date Analysed		[NT]	CE74722-31	10/11/2011 || 10/11/2011
Sodium, Na	mg/kg	[NT]	CE74722-31	1300 || 1300 || RPD: 0
Sodium (meq%)	meq%	[NT]	CE74722-31	5.6 || 5.6 || RPD: 0
Exchangeable Sodium	%	[NT]	CE74722-31	57 || 57 || RPD: 0
Potassium, K	mg/kg	[NT]	CE74722-31	60 || 60 || RPD: 0
Potassium (meq%)	meq%	[NT]	CE74722-31	0.15 || 0.15 || RPD: 0
Exchangeable Potassium	%	[NT]	CE74722-31	2 || 2 || RPD: 0
Calcium, Ca	mg/kg	[NT]	CE74722-31	120 || 120 || RPD: 0
Calcium (meq%)	meq%	[NT]	CE74722-31	0.60 || 0.60 || RPD: 0
Exchangeable Calcium	%	[NT]	CE74722-31	6 || 6 || RPD: 0
Magnesium, Mg	mg/kg	[NT]	CE74722-31	420 || 420 || RPD: 0
Magnesium (meq%)	meq%	[NT]	CE74722-31	3.4 || 3.4 || RPD: 0
Exchangeable Magnesium	%	[NT]	CE74722-31	35 || 35 || RPD: 0
CEC	meq%	[NT]	CE74722-31	9.8 || 9.8 || RPD: 0

CLIENT: Geotechnique Pty Ltd
PROJECT: Geotechnique 12576/1 Marsden Park (SE102938) **Laboratory Report No:** CE74722

LABORATORY REPORT

NOTES:
LOR - Limit of Reporting.
The significance of all reported results are defined by their analytical limit of reporting.
Method from Rayment & Lyons - "Soil Chemical Methods - Australasia" 2011.

Analysis Date: **Between** 1/11/11 **and** 10/11/11

SGS Terms and Conditions are available at www.au.sgs.com

COC received 31/10/14 @ 1:14 pm

GEOTECHNIQUE PTY LTD

Laboratory Test Request / Chain of Custody Record

Lemko Place
PENRITH NSW 2750

P O Box 880
PENRITH NSW 2751

Tel: (02) 4722 2700
Fax: (02) 4722 6161
email: info@geotech.com.au

TO: SGS ENVIRONMENTAL SERVICES
UNIT 16
33 MADDOX STREET
ALEXANDRIA NSW 2015

PH: 02 8594 0400 FAX: 02 8594 0499
ATTN: MS ANGELA MAMALICOS

Sampling By: AN
Job No: 12576/1
Project: Marsden Park Precinct
Project Manager: ER
Location: Northwest Growth Centre, Marsden Park

Results required by:

	Location	Depth (m)	Date	Time	Soil	Water	EC	pH	Sulphate	Chloride	ESP					KEEP SAMPLE
1	TP-1	0.0 - 0.1	27/10/2011		DSP		✓	✓	✓	✓	✓					YES
2		1.0 -1.1			DSP		✓	✓								YES
3		2.0-2.1			DSP		✓	✓								YES
4	TP-2	0.0 - 0.1	28/10/2011		DSP		✓	✓								YES
5		0.5 - 0.6			DSP		✓	✓	✓	✓	✓					YES
6		1.5 - 1.6			DSP		✓	✓								YES
7	TP-4	0.0 - 0.1	28/10/2011		DSP		✓	✓								YES
8		1.0 - 1.1			DSP		✓	✓								YES
9		2.0 - 2.1			DSP		✓	✓	✓	✓	✓					YES
10	TP-5	0.0 - 0.1	28/10/2011		DSP		✓	✓								YES
11		0.5 - 0.6			DSP		✓	✓								YES
12		1.5 - 1.6			DSP		✓	✓	✓	✓	✓					YES

SGS
Received 31/10/14
By SS
Time 2:25 pm
Samples intact
Ice/Cooler Pack 20°C
Temperature on Receipt
Storage Location soil room shelf
SE 10 2938

Relinquished by			Received by		
Name	Signature	Date	Name	Signature	Date
Emged Rizkalla	ER	31.10.11	Suba	[signature]	31/10/14 2:25pm

Legend:

WG	Water sample, glass bottle	USG	Undisturbed soil sample (glass jar)	DSP	Disturbed soil sample (small plastic bag)	* Purge & Trap	@ mole H^+/tonne
WP	Water sample, plastic bottle	DSG	Disturbed soil sample (glass jar)	✓	Test required	# Geotechnique Screen	

G EOTECHNIQUE PTY LTD

Laboratory Test Request / Chain of Custody Record

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PENRITH NSW 2751

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UNIT 16
33 MADDOX STREET
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PH: 02 8594 0400 FAX: 02 8594 0499
ATTN: MS ANGELA MAMALICOS

Sampling By: AN
Job No: 12576/1
Project: Marsden Park Precinct
Project Manager: ER
Location: Northwest Growth Centre, Marsden Park

	Sampling details				Sample type		Results required by:									
	Location	Depth (m)	Date	Time	Soil	Water	EC	pH	Sulphate	Chloride	ESP					KEEP SAMPLE
13	TP-6	0.0 - 0.1	28/10/2011		DSP		✓	✓	✓	✓	✓					YES
14		0.5-0.6			DSP		✓	✓								YES
15		1.5-1.6			DSP		✓	✓								YES
16	TP-7	0.0 - 0.1	28/10/2011		DSP		✓	✓								YES
17		1.0-1.1			DSP		✓	✓	✓	✓	✓					YES
18		2.0-2.1			DSP		✓	✓								YES
19	TP-8	0.0 - 0.1	28/10/2011		DSP		✓	✓								YES
20		1.0 - 1.1			DSP		✓	✓								YES
21		2.0 - 2.1			DSP		✓	✓	✓	✓	✓					YES
22	TP-9	0.0 - 0.1	28/10/2011		DSP		✓	✓	✓	✓	✓					YES
23		0.6-0.7			DSP		✓	✓								YES
24		1.5 - 1.6			DSP		✓	✓								YES
25																

Relinquished by			Received by		
Name	Signature	Date	Name	Signature	Date
			Suba		31/10/11 2:25PM

Legend:

WG	Water sample, glass bottle	USG	Undisturbed soil sample (glass jar)	DSP	Disturbed soil sample (small plastic bag)	* Purge & Trap	@ mole H^+/tonne
WP	Water sample, plastic bottle	DSG	Disturbed soil sample (glass jar)	✓	Test required	# Geotechnique Screen	

G EOTECHNIQUE PTY LTD

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PH: 02 8594 0400 FAX: 02 8594 0499
ATTN: MS ANGELA MAMALICOS

Sampling By: AN
Job No: 12576/1
Project: Marsden Park Precinct
Project Manager: ER
Location: Northwest Growth Centre, Marsden Park

	Sampling details				Sample type		Results required by:									
	Location	Depth (m)	Date	Time	Soil	Water	EC	pH	Sulphate	Chloride	ESP					KEEP SAMPLE
25	TP-10	0.0 - 0.1	28/10/2011		DSP		✓	✓								YES
26		1.0-1.1			DSP		✓	✓	✓	✓	✓					YES
27		2.0-2.1			DSP		✓	✓								YES
28	TP-11	0.0 - 0.1	28/10/2011		DSP		✓	✓								YES
29		0.6-0.7			DSP		✓	✓	✓	✓	✓					YES
30		1.5-1.6			DSP		✓	✓								YES
31	TP-12	0.0 - 0.1	28/10/2011		DSP		✓	✓								YES
32		1.0 - 1.1			DSP		✓	✓								YES
33		2.0 - 2.1			DSP		✓	✓	✓	✓	✓					YES
34	TP-13	0.0 - 0.1	28/10/2011		DSP		✓	✓								YES
35		1.0-1.1			DSP		✓	✓								YES
36		2.0-2.1			DSP		✓	✓	✓	✓	✓					YES

Relinquished by			Received by		
Name	Signature	Date	Name	Signature	Date
			Suba		31/10/11 2.25pm

Legend:

WG	Water sample, glass bottle	USG	Undisturbed soil sample (glass jar)	DSP	Disturbed soil sample (small plastic bag)	* Purge & Trap	@ mole H^+/tonne
WP	Water sample, plastic bottle	DSG	Disturbed soil sample (glass jar)	✓	Test required	# Geotechnique Screen	