

NOTES

1. CONCRETE PAD DIMENSIONS.

Vessel pad: 4.05m x 4.05m.
 Hardstanding: 5.45m x 5.3m.
 Emergency supply cylinders: 2.5m x 2.7m x 150mm.

2. SECURITY FENCES

Vessel - Steel Mesh; Swing gates (outward opening) 2 x 0.6m; overall height: 2.2m.
 Emergency supply cylinders - Chain wire; Swing gates (outward opening) 2 x 1m; overall height: 2m

3. WATER SUPPLY 3/4" stop screwed tap is provided in enclosure.

4. 415V POWER OUTLET 32 amp 3 phase waterproof mains power outlet is provided outside enclosure.

5. FIRE PROTECTION: Minimum requirement is a garden hose permanently attached to water supply.

6. LEAF LITTER: to be cleaned up regularly inside enclosure and for a distance of 5m from enclosure. Tree branches overhanging vessel to be regularly inspected and lopped where necessary

7. WORKCOVER NSW require a dangerous goods licence to be obtained for all vessel installations exceeding 600m3.

8. REFERENCES: This drawing has been prepared in accordance with the Dangerous Goods (General) Regulation 1999, Australian Standard AS 1894-1997 The storage and handling of non-flammable cryogenic and refrigerated liquids and Australia & New Zealand Industrial Gas Association (ANZIGA) Drawing No. 1962-01 Revision 3.

9. DIMENSIONS are in metres

10. DISCLAIMER: This drawing has been prepared from information supplied to L.J. Consulting & Drafting Pty Ltd by BOC Limited. No responsibility will be taken by L.J. Consulting & Drafting Pty Ltd for any errors or omissions..

LEGEND - EMERGENCY INFORMATION PANEL

- Non-flammable Non-toxic Gas Class Diamond
- Oxidizing Gas Class Diamond
- Liquid Oxygen
- UN No. 1073
- Hazchem Code
- Emergency/Specialist Contacts

LEGEND - TANK

- No Smoking
- Operating Instructions
- First Aid Instructions
- P&I Diagram

DEPOT NO. BOC 1 for 5,550 m3 of DG Class 2.2/5.1

as shown on this plan conforms with the Dangerous Goods Act 1975 and Australian Standard AS 1894-1997

Jean Seymour
 JEAN SEYMOUR
 L.J. Consulting & Drafting Pty Ltd

16 September 2004

Revisions		
No	Revision	Date
-	-	-

Scale	1:200	Date	16 Sept. 2004
Drawn by	Jean Seymour	Prepared for	Jeff Reece
Drawing No.	04-1609/A3	Revision	-



35/018505

Page 1 of 1

SCIENTIFIC SERVICES BRANCH
Dangerous Goods Licensing
ph. (02) 9370 5187 fax (02) 9370 6104
e-mail: scid@workcover.nsw.gov.au

Licensee GOULBURN BASE HOSPITAL
GOULBURN HEALTH SERVICE
LOCKED BAG 15 GOULBURN NSW 2580

LICENCE FOR THE KEEPING OF DANGEROUS GOODS

ISSUED UNDER AND SUBJECT TO THE PROVISIONS OF THE DANGEROUS GOODS ACT, 1975 AND REGULATION THEREUNDER

Licence Number: 35/018505 **Expiry Date** 13/12/2002 **Number of Depots:** 2

Licensee contact DON COLQUHONN Ph. 024827 3111 Fax: 024827 3248

Premises Licensed to Keep Dangerous Goods

GOULBURN HEALTH SERVICE
130 GOLDSMITH ST GOULBURN NSW 2580

Nature of site HOSPITALS (EXCEPT PSYCHIATRIC HOSPITALS)

Major Supplier of Dangerous Goods UNKNOWN OR OTHER

Emergency Contact for this Site DON COLQUHONN Ph. 024827 3111

Site Staffing 24 HRS 7 DAYS

Details of Depots

Depot No	Depot Type	Goods Stored in depot	Qty
1	ABOVE-GROUND TANK	Class 2.2	2000 L
		UN 1073 OXYGEN, REFRIGERATED LIQUID	2000 L
2	FLAMMABLE LIQUIDS CABINET	Class 3	120 L
		UN 1170 ETHANOL (ETHYL ALCOHOL)	40 L
		UN 1230 METHANOL	40 L
		UN 1307 XYLENES	40 L

PLEASE RETAIN AS PROOF OF LICENCE

Issued by WorkCover Authority of New South Wales on 17 August 2001

Application for Licence to Keep Dangerous Goods



Application for new licence amendment transfer renewal of expired licence

PART A - Applicant and site information See page 2 of Guidance Notes.

1 Name of applicant	ACN			
GOULBOURN BASE HOSPITAL				
2 Postal address of applicant	Suburb/Town	Postcode		
LOCKED BAG 15	GOULBOURN	2580		
3 Trading name or site occupier's name				
GOULBOURN BASE HOSPITAL				
4 Contact for licence inquiries	Phone	Fax	Name	
	48273111	X48273248	DON COLQUHOUNN MANAGER	
5 Previous licence number (if known)	35/018505			
6 Previous occupier (if known)				
7 Site to be licensed	No	Street	Suburb / Town	Postcode
	130	GOLDSMITH ST	GOULBOURN	NSW 2580
8 Main business of site	HEALTHCARE			
9 Site staffing: Hours per day	14	Days per week	7	
10 Site emergency contact	Phone	Name		
	48273111	X DON COLQUHOUNN - MANAGER		
11 Major supplier of dangerous goods	FRONING PTY LTD			
12 If a new site or for amendments to depots - see page 4 of Guidance Notes.				
Plan stamped by:	Name of Accredited Consultant	Date stamped		

I certify that the details in this application (including any accompanying computer disk) are correct and cover all licensable quantities of dangerous goods kept on the premises.

13 Signature of applicant	Printed name	Date
	R.J. KEATCH	1/5/01
PH 48273111		EXT 3286

Please send your application, marked **CONFIDENTIAL**, to: **Dangerous Goods Licensing, WorkCover NSW, Level 3, GPO Box 5364, SYDNEY NSW 2001**

What is a depot? See page 5 of the Guidance Notes.

PART C - Dangerous Goods Storage Complete one section per depot.

If you have more depots than the space provided, photocopy sufficient sheets first.

Depot Number	Type of depot (see page 5)	Depot Class	Maximum storage capacity
0002	FLAMMABLE LIQUIDS CABINET	3	120 L. ✓

UN Number	Proper Shipping Name	Class (I, II, III)	PG Class (I, II, III)	Product or common name	Typical quantity	Unit, e.g. L, kg, m ³
1170	HISTO ETHANOL	3	II	HISTO ETHANOL	40	L
1230	METHANOL	3	II	METHANOL	40	L

Depot Number	Type of depot (see page 5)	Depot Class	Maximum storage capacity
001		3	

UN Number	Proper Shipping Name	Class (I, II, III)	PG Class (I, II, III)	Product or common name	Typical quantity	Unit, e.g. L, kg, m ³
1307	HISTO XYLENES	3	II	XYLOL	40	L

Depot Number	Type of depot (see page 5)	Depot Class	Maximum storage capacity
1	A/G TANK	2.2	2000 L

UN Number	Proper Shipping Name	Class (I, II, III)	PG Class (I, II, III)	Product or common name	Typical quantity	Unit, e.g. L, kg, m ³
1073	? LIQUID OXYGEN	2.2			2000	L
2PE						

Depot Number	Type of depot (see page 5)	Depot Class	Maximum storage capacity

UN Number	Proper Shipping Name	Class (I, II, III)	PG Class (I, II, III)	Product or common name	Typical quantity	Unit, e.g. L, kg, m ³

SCIENTIFIC SERVICES
BRANCH
-4 DEC 1992
DANGEROUS
GOODS



Chemical Safety Unit
Locked Bag 10, P O CLARENCE ST NSW 2000
Ph. (02) 370 5191 OR (02) 370 51 92
Fax (02) 370 6105

Licensee
GOULBURN BASE HOSPITAL

20 NOV 1992

~~BOX 80 P O
GOULBURN 2580~~

THE GOULBURN HEALTH SERVICE

ADDRESS CHANGE

LOCKED MAIL BAG 11
GOULBURN 2580



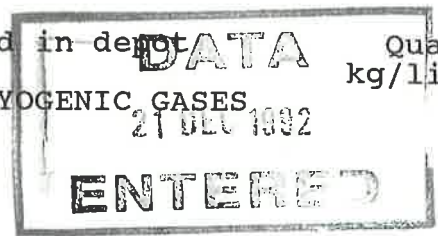
Dear Sir/Madam,

RE APPLICATION FOR RENEWAL OF LICENCE FOR THE KEEPING OF DANGEROUS GOODS

Our records indicate 39 goods with licence number 35/018505 for keeping dangerous goods at GOULBURN 2580.

Details of depots at site.

Depot No.	Depot type	Goods stored in depot	Quantity
1	ABOVEGROUND TANK	POISONOUS/CRYOGENIC GASES	2 000



This licence is now due for renewal. If you are keeping these dangerous goods at the site mentioned you need TO RENEW YOUR LICENCE. Please carefully check the details shown in this letter and make any required corrections. Then, SIGN and DATE the declaration below and return this letter to the WorkCover Authority, Chemical Safety Unit. Fees for these licences have been abolished. DO NOT SEND ANY MONIES.

Declaration: Please renew this licence to 15/12/93. I certify that the licence details shown in this letter are correct.

McCormack
(Signature)

IAN MCCORMACK
(Please print name)

1.12.92
(Date signed)

If renewal of the licence is not required. Please provide the Chemical Safety Unit with a signed statement giving the reason why it is not be renewed. If you have sold/vacated the site please provide the name and address of the new owner/occupier so we may contact them.

Yours faithfully
Chief Inspector of Dangerous Goods.

Insert

LICENCE No. 35018505.7

DANGEROUS GOODS ACT, 1975 DI 8012.0001 - - - 81-

APPLICATION FOR LICENCE (or AMENDMENT or TRANSFER of LICENCE) FOR THE KEEPING OF DANGEROUS GOODS

Application is hereby made for ~~the transfer of the licence~~ *a licence (or amendment of the licence) for the keeping of dangerous goods in or on the premises described below. (*delete whichever is not required)

FEE: \$10.00 per Depot

RECEIPT
2014
28.11.80
10-00
AMOUNT



GOURBURN BIKE HOSPITAL

Name of Applicant in full (see over) Surname GOURBURN Given Names BIKE HOSPITAL

Trading (if any) or occupier's no. 9692 297127/011 030

Postal address PO. Box 80 GOURBURN NSW Postcode 2580

Telephone number of applicant STD Code 048 Number 21344

Address of the premises in or on which the depot or depots are situated (including street number, if any) 130 GOLDSMITH ST, GOURBURN NSW Postcode 2580

Nature of premises (see over) PUBLIC HOSPITAL No. W. 0179

PLEASE ATTACH SITE PLAN

DEPARTMENT OF INDUSTRIAL RELATIONS WOLLONGONG
RECEIVED
No. W. 0179

Particulars of type of depots and maximum quantities of dangerous goods to be kept at any one time. DD001.040.0

Depot number	Type of depot (see over)	Storage capacity	Dangerous goods	
			Product being stored	C & C Office use only
1	<u>Above Ground Tank</u>	<u>2500 L</u>	<u>OX/BEN</u>	<u>1.040.23</u>
2		<u>(2/30 m³)</u>		
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				

RECEIVED
10 DEC 1980

Name of company supplying flammable liquid (if any) C.16

Have premises previously been licensed? No

If known, state name of previous occupier _____ Licence No. _____

Signature of applicant [Signature] Date 14.11.80
CHIEF EXECUTIVE OFFICER

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

FOR OFFICE USE ONLY
CERTIFICATE OF INSPECTION

I, Wallace B.D. 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 [Signature] Date 28.11.80

DANGEROUS GOODS ACT 1975

PREMISES

Geelbarn Bone Hospital -

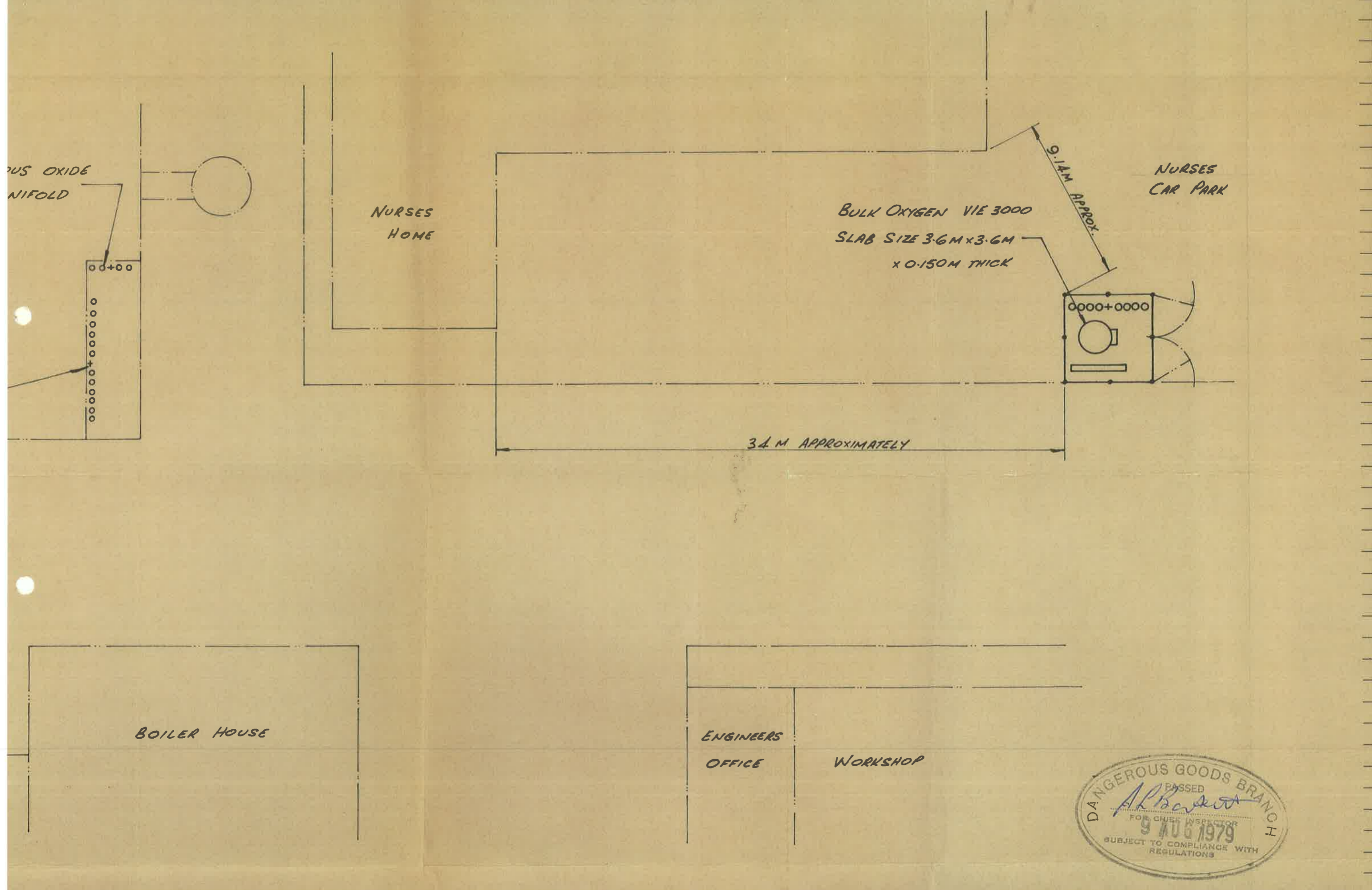
STORAGE: Oxygen (cryogenic), Dangerous Goods Class 2.3

JS 006

SITING	REQUIREMENT	REMARKS
Location of vessel	outside	✓
Surface surrounding	non combustible	✓
Access	ground level, tank vehicle	<i>good</i>
Separation, buildings	15 m combustible structures 8 m fire resistive structure 5 m opening into building (horizontally) 3 m opening into building (vertically) 1.5 m from wall	<i>complied</i>
, Storage, a/g, DG 3.1-3.3	5000 l 3 m (screen wall) 15 m	✓
	5000 l 6 m (screen wall) 25 m	
, Storage, a/g, DG 3.4	5000 l 3 m (screen wall) 5 m	✓
	5000 l 5 m (screen wall) 8 m	
, Storage, a/g, DG 2.1 (liquefied)	6000 l 3 m (screen wall) 10 m (wc)	✓
	6000 l 3 m (screen wall) 15 m (wc)	
, Storage, a/g, DG 2.1 (compressed)	1000 m ³ 3 m (screen wall) 10 m	✓
	1000 m ³ 3 m (screen wall) 15 m	
, Storage, u/g, DG 3	vent, dip, fill 3 m	✓
, Storage, paper etc.	15 m	✓
, Storage, coal, timber, etc.	8 m	✓
, Electrical substation	5 m	✓
, Underground drain opening	4 m	✓
, lunch room, office, etc.	8 m	✓
, place of public assembly	15 m	✓
, public place	3 m	✓
, boundary of premises	1.5 m	✓
, Surrounding walls	20 m, 10 m	✓

REDUCED OR DISCLOSED, NOR MUST ANY INFORMATION BE
REPRODUCED, WITHOUT THE PRIOR CONSENT IN WRITING OF THE
S.L.S. LIMITED.

DO NOT SCALE DIM. IF IN DOUBT, REFER TO



MATL.

THE COMMONWEALTH INDUSTRIAL GASES LIMITED
GAS PROCESSES, N.S.W.

Appendix B: Borehole Logs



BOREHOLE LOG

Borehole No.

1

1/2

Client: HEALTH INFRASTRUCTURE
Project: PROPOSED NEW ACUTE SERVICES BUILDING
Location: GOULBURN HOSPITAL, 130 GOLDSMITH STREET, GOULBURN, NSW

Job No. 30116V **Method:** SPIRAL AUGER JK305 **R.L. Surface:** ≈ 652.2m
Date: 31/1/17 **Datum:** AHD
Logged/Checked by: A.B./F.V.

Groundwater Record	SAMPLES			Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
	ES	U50	DB									
DRY ON COMPLETION					0		-	ASPHALTIC CONCRETE: 20mm.t FILL: Sandy gravel, fine to coarse grained igneous gravel, dark grey, fine to medium grained sand, light grey.	D			APPEARS WELL COMPACTED
				N = 18 6,10,8	1			FILL: Silty sand, fine to coarse grained, dark grey, with fine to coarse grained igneous gravel, orange and red, trace of slag.	M			
					2		CH	SILTY CLAY: high plasticity, light brown.	MC<PL	H	400 410 520	RESIDUAL
				N >39 10,18, 21/90mm REFUSAL	3		-	SANDSTONE: tuffaceous, fine to medium grained, yellow brown, with clay seams.	XW	EL		
				5					DW	VL-L		LOW 'TC' BIT RESISTANCE WITH MODERATE BANDS
				6								
				7								



BOREHOLE LOG

Borehole No.
1
 2/2

Client: HEALTH INFRASTRUCTURE
Project: PROPOSED NEW ACUTE SERVICES BUILDING
Location: GOULBURN HOSPITAL, 130 GOLDSMITH STREET, GOULBURN, NSW

Job No. 30116V **Method:** SPIRAL AUGER JK305 **R.L. Surface:** ≈ 652.2m
Date: 31/1/17 **Datum:** AHD
Logged/Checked by: A.B./F.V.

Groundwater Record	SAMPLES				Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
	ES	U50	DB	DS									
									SANDSTONE: tuffaceous, fine to medium grained, yellow brown, with clay se	DW	VL-L		LOW 'TC' BIT RESISTANCE WITH MODERATE BANDS
					8								
					9								
					10								
					11								
					12								
					13								
					14								



Borehole No.
2
 1/1

BOREHOLE LOG

Client: HEALTH INFRASTRUCTURE
Project: PROPOSED NEW ACUTE SERVICES BUILDING
Location: GOULBURN HOSPITAL, 130 GOLDSMITH STREET, GOULBURN, NSW

Job No. 30116V **Method:** SPIRAL AUGER JK305 **R.L. Surface:** ≈ 653.3m
Date: 31/1/17 **Datum:** AHD
Logged/Checked by: A.B./F.V.

Groundwater Record	SAMPLES			Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
	ES	U50	DB									
DRY ON COMPLETION					0		-	ASPHALTIC CONCRETE: 45mm.t	D			APPEARS WELL COMPACTED
				N = 18 7,9,9	0.5		CH	FILL: Sandy gravel, fine to coarse grained, dark grey, igneous, fine to medium grained sand, light grey. FILL: Silty clay, low to medium plasticity, brown, with fine grained sand, trace of fine grained igneous gravel.	MC<PL	H	>600 >600	RESIDUAL
				N = 13 7,6,7	1.5		CH	GRAVELLY CLAY: high plasticity, light brown, fine to medium grained, black and red brown, ferruginous gravel.	MC<PL		>600 580 450	
				N = SPT 15/70mm REFUSAL	3.0		-	SANDSTONE: tuffaceous, fine to coarse grained, green grey.	XW-DW	EL-VL		LOW 'TC' BIT RESISTANCE
					4.0		-	as above, but orange brown.	DW	VL		LOW RESISTANCE WITH MODERATE BANDS
					5.0		-			L		MODERATE RESISTANCE
				6.0				END OF BOREHOLE AT 6.0m				
					7.0							

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BOREHOLE LOG

Borehole No.

3

1/1

Client: HEALTH INFRASTRUCTURE
Project: PROPOSED NEW ACUTE SERVICES BUILDING
Location: GOULBURN HOSPITAL, 130 GOLDSMITH STREET, GOULBURN, NSW

Job No. 30116V **Method:** SPIRAL AUGER **R.L. Surface:** ≈ 654.7m
Date: 31/1/17 **JK305** **Datum:** AHD
Logged/Checked by: A.B./F.V.

Groundwater Record	SAMPLES			Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/Weathering	Strength/Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
	ES	U50	DB									
DRY ON COMPLETION					0		CH	FILL: Silty clay, low plasticity, dark brown, with fine to medium grained igneous and ironstone gravel.	MC<PL	VSt		GRASS COVER
				N = 10 3,5,5	0.5			GRAVELLY CLAY: high plasticity, light brown and orange, fine to medium grained, black and red brown, ferruginous gravel.	MC>PL		240 260	RESIDUAL
				N = 24 6,8,16	1.5			GRAVELLY CLAY: high plasticity, light grey, fine to coarse grained, orange brown, siliceous gravel.	MC<PL	H	470 430	
				N > 15 12,15/ 100mm REFUSAL	2.5							
					3		-	SANDSTONE: tuffaceous, fine to coarse grained, yellow brown.	XW	EL		
					3.5				XW-DW	EL-VL		
					4			as above, but iron indurated bands.	DW	L		LOW 'TC' BIT RESISTANCE
					6			END OF BOREHOLE AT 6.0m				
					7							

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BOREHOLE LOG

Borehole No.

4

1/1

Client: HEALTH INFRASTRUCTURE
Project: PROPOSED NEW ACUTE SERVICES BUILDING
Location: GOULBURN HOSPITAL, 130 GOLDSMITH STREET, GOULBURN, NSW

Job No. 30116V **Method:** SPIRAL AUGER **R.L. Surface:** ≈ 652.8m
Date: 31/1/17 JK305 **Datum:** AHD
Logged/Checked by: A.B./F.V.

Groundwater Record	SAMPLES			Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/Weathering	Strength/Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
	ES	U50	DB									
DRY ON COMPLETION					0			FILL: Silty sand, fine to medium grained, dark brown, with fine to medium grained igneous gravel.	M			RESIDUAL
					0.5	CH	SILTY CLAY: high plasticity, light brown.	MC>PL	VSt	370 330 260		
				N = 11 3,6,5	1							
				N > 15 7,15/ 100mm REFUSAL	2		-	MUDSTONE: grey, with sandstone, fine grained, grey seams and clay seams.	XW	EL		LOW 'TC' BIT RESISTANCE
					2			MUDSTONE: grey, with iron indurated bands.	DW	L-M		
					3							
				4			MUDSTONE: brown and grey, with iron indurated bands.		M		MODERATE RESISTANCE WITH HIGH BANDS	
					4					M-H		MODERATE RESISTANCE
					5							HIGH RESISTANCE
					6							LOW TO MODERATE RESISTANCE
					6			END OF BOREHOLE AT 6.0m				
					7							



ENVIRONMENTAL LOG

Borehole No.
5
1/1

Environmental logs are not to be used for geotechnical purposes

Client:	HEALTH INFRASTRUCTURE
Project:	GOULBURN HOSPITAL & HEALTH SERVICES REDEVELOPMENT PLANNING PROJECT
Location:	GOULBURN BASE HOSPITAL, 130 GOLDSMITH, GOULBURN, NSW

Job No. E30116K	Method: EZIPROBE	R.L. Surface: N/A
Date: 31-1-17	Datum:	
Logged/Checked by: K.T./G.F.		

Groundwater Record	SAMPLES				Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/Weathering	Strength/Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
	ES	ASS	ASB	SAL									
DRY ON COMPLETION						0			ASPHALTIC CONCRETE: 40mm.t FILL: Sandy gravel, fine to medium grained, angular igneous, grey, trace of ash.	D			
						0.5							
						1		CL-CH	SILTY CLAY: medium to high plasticity, dark brown. as above, but red brown.	MC<PL			
						1.5			END OF BOREHOLE AT 1.5m				
						2							
						2.5							
						3							
						3.5							

ENVIRONMENTAL LOG

Borehole No.
6
1/1

Environmental logs are not to be used for geotechnical purposes

Client: HEALTH INFRASTRUCTURE
Project: GOULBURN HOSPITAL & HEALTH SERVICES REDEVELOPMENT PLANNING PROJECT
Location: GOULBURN BASE HOSPITAL, 130 GOLDSMITH, GOULBURN, NSW

Job No. E30116K **Method:** EZIPROBE **R.L. Surface:** N/A
Date: 31-1-17 **Datum:**
Logged/Checked by: K.T./G.F.

Groundwater Record	SAMPLES				Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/Weathering	Strength/Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
	ES	ASS	ASB	SAL									
DRY ON COMPLETION						0			FILL: Silty sand, fine to medium grained, dark brown, with fine to medium grained igneous gravel, root fibres, trace of ash.	D			
						0.5		CL-CH	FILL: Silty clay, medium to high plasticity, dark brown, with fine to medium grained ironstone gravel and root fibres. SANDY SILTY CLAY: medium to high plasticity, red brown.	MC<PL			
						1			END OF BOREHOLE AT 0.72m				PROBE REFUSAL
						1.5							
						2							
						2.5							
						3							
						3.5							

ENVIRONMENTAL LOG

Borehole No.
7
1/1

Environmental logs are not to be used for geotechnical purposes

Client:	HEALTH INFRASTRUCTURE
Project:	GOULBURN HOSPITAL & HEALTH SERVICES REDEVELOPMENT PLANNING PROJECT
Location:	GOULBURN BASE HOSPITAL, 130 GOLDSMITH, GOULBURN, NSW

Job No. E30116K	Method: EZIPROBE	R.L. Surface: N/A
Date: 31-1-17	Datum:	
Logged/Checked by: K.T./G.F.		

Groundwater Record	SAMPLES				Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/Weathering	Strength/Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
	ES	ASS	ASB	SAL									
DRY ON COMPLETION						0			FILL: Silty sand, fine to medium grained, dark brown, trace of fine to medium grained igneous gravel and root fibres.	D			GRASS COVER
						0.5		CL-CH	FILL: Sandy gravel, fine to coarse grained, angular igneous, grey, trace of ash. SILTY CLAY: medium to high plasticity, brown, trace of root fibres.	MC<PL			
						1			SANDY SILTY CLAY: medium to high plasticity, brown, with fine to medium grained sandstone gravel.				
						1.5			END OF BOREHOLE AT 1.4m				
						2							
						2.5							
						3							
						3.5							

ENVIRONMENTAL LOG

Borehole No.
8
1/1

Environmental logs are not to be used for geotechnical purposes

Client: HEALTH INFRASTRUCTURE
Project: GOULBURN HOSPITAL & HEALTH SERVICES REDEVELOPMENT PLANNING PROJECT
Location: GOULBURN BASE HOSPITAL, 130 GOLDSMITH, GOULBURN, NSW

Job No. E30116K **Method:** EZIPROBE **R.L. Surface:** N/A
Date: 31-1-17 **Datum:**
Logged/Checked by: K.T./G.F.

Groundwater Record	SAMPLES			Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/Weathering	Strength/Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
	ES	ASS	ASB									
DRY ON COMPLETION					0			FILL: Silty gravelly sand, fine to medium grained, dark brown, fine to coarse grained igneous gravel, trace of root fibres and ash.	D			GRASS COVER
				0.5			FILL: Silty clay, medium to high plasticity, brown, trace of fine to medium grained ironstone gravel and ash.	MC<PL				
				1			FILL: Sandy silty clay, medium to high plasticity, brown, fine to medium grained igneous gravel, trace of root fibres and ash.					
					1.5		CL-CH	SILTY CLAY: medium to high plasticity, red brown, trace of fine grained sandstone gravel.	MC<PL			
				2								
				2.5								
					3			END OF BOREHOLE AT 2.6m				
					3.5							

ENVIRONMENTAL LOG

Borehole No.
9
1/1

Environmental logs are not to be used for geotechnical purposes

Client:	HEALTH INFRASTRUCTURE
Project:	GOULBURN HOSPITAL & HEALTH SERVICES REDEVELOPMENT PLANNING PROJECT
Location:	GOULBURN BASE HOSPITAL, 130 GOLDSMITH, GOULBURN, NSW

Job No. E30116K	Method: EZIPROBE	R.L. Surface: N/A
Date: 31-1-17	Logged/Checked by: K.T./	Datum:

Groundwater Record	SAMPLES			Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/Weathering	Strength/Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
	ES	ASS	ASB									
DRY ON COMPLETION					0			FILL: Sandy silty clay, medium to high plasticity, dark brown, with root fibres, trace of ash.	MC<PL			GRASS COVER
					0.5		CL-CH	SILTY CLAY: medium to high plasticity, brown, trace of root fibres and fine grained sand.	MC<PL			
					1							
					1.5			END OF BOREHOLE AT 1.35m				
					2							
					2.5							
					3							
					3.5							

EXPLANATORY NOTES – ENVIRONMENTAL LOGS

INTRODUCTION

These notes have been provided to supplement the environmental report with regards to drilling and field logging. Not all notes are necessarily relevant to all reports. Where geotechnical borehole logs are utilised for environmental purpose, reference should also be made to the explanatory notes included in the geotechnical report. Environmental logs are not suitable for geotechnical purposes.

The ground is a product of continuing natural and manmade processes and therefore exhibits a variety of characteristics and properties which vary from place to place and can change with time. Environmental studies involve gathering and assimilating limited facts about these characteristics and properties in order to understand the ground on a particular site under certain conditions. These conditions are directly relevant only to the ground at the place where, and time when, the investigation was carried out.

DESCRIPTION AND CLASSIFICATION METHODS

The methods of description and classification of soils and rocks used in this report are based on Australian Standard 1726, the SAA Site Investigation Code. In general, descriptions cover the following properties – soil or rock type, colour, structure, strength or density, and inclusions. Identification and classification of soil and rock involves judgement and the Company infers accuracy only to the extent that is common in current geotechnical practice.

Soil types are described according to the predominating particle size and behaviour as set out in the attached Unified Soil Classification Table qualified by the grading of other particles present (e.g. sandy clay) as set out below (note that unless stated in the report, the soil classification is based on a qualitative field assessment, not laboratory testing):

Soil Classification	Particle Size
Clay	less than 0.002mm
Silt	0.002 to 0.075mm
Sand	0.075 to 2mm
Gravel	2 to 60mm

Non-cohesive soils are classified on the basis of relative density, generally from the results of Standard Penetration Test (SPT) as below:

Relative Density	SPT 'N' Value (blows/300mm)
Very loose	less than 4
Loose	4 – 10
Medium dense	10 – 30
Dense	30 – 50
Very Dense	greater than 50

Cohesive soils are classified on the basis of strength (consistency) either by use of hand penetrometer, laboratory testing or engineering examination. The strength terms are defined as shown in the following table:

Classification	Unconfined Compressive Strength kPa
Very Soft	less than 25
Soft	25 – 50
Firm	50 – 100
Stiff	100 – 200
Very Stiff	200 – 400
Hard	Greater than 400
Friable	Strength not attainable – soil crumbles

Rock types are classified by their geological names, together with descriptive terms regarding weathering, strength, defects, etc. Where relevant, further information regarding rock classification is given in the text of the report. In the Sydney Basin, 'Shale' is used to describe thinly bedded to laminated siltstone.

DRILLING OR EXCAVATION METHODS

The following is a brief summary of drilling and excavation methods currently adopted by the Company, and some comments on their use and application. All except test pits and hand auger drilling require the use of a mechanical drilling rig.

Test Pits: These are normally excavated with a backhoe or a tracked excavator, allowing close examination of the in-situ soils if it is safe to descend into the pit. The depth of penetration is limited to approximately 3m for a backhoe and up to 6m for an excavator. Limitations of test pits include problems associated with disturbance and difficulty of reinstatement; and the consequent effects on nearby structures. Care must be taken if construction is to be carried out near test pit locations to either properly re-compact the backfill during construction, or to design and construct the structure so as not to be adversely affected by poorly compacted backfill at the test pit location.

Hand Auger Drilling: A borehole of 50mm to 100mm diameter is advanced by manually operated equipment. Premature refusal of the hand augers can occur on a variety of materials such as fill, hard clay, gravel or ironstone, and does not necessarily indicate rock level.

Continuous Spiral Flight Augers: The borehole is advanced using 75mm to 115mm diameter continuous spiral flight augers, which are withdrawn at intervals to allow sampling and in-situ testing. This is a relatively economical means of drilling in clays and in sands above the water table. Samples are returned to the surface by the flights or may be collected after withdrawal of the auger flights, but they can be very disturbed and layers may become mixed. Information from the auger sampling (as distinct from specific sampling by SPTs or undisturbed samples) is of relatively lower reliability due to mixing or softening of samples by groundwater, or uncertainties as to the original depth of the samples. Augering below the groundwater table is of even lesser reliability than augering above the water table.

Rock Augering: Use can be made of a Tungsten Carbide (TC) bit for auger drilling into rock to indicate rock quality and continuity by variation in drilling resistance and from examination of recovered rock fragments. This method of investigation is quick and relatively inexpensive but provides only an indication of the likely rock strength and predicted values may be in error by a strength order. Where rock strengths may have a significant impact on construction feasibility or costs, then further investigation by means of cored boreholes may be warranted.

Wash Boring: The borehole is usually advanced by a rotary bit, with water being pumped down the drill rods and returned up the annulus, carrying the drill cuttings. Only major changes in stratification can be determined from the cuttings, together with some information from "feel" and rate of penetration.

Mud Stabilised Drilling: Either Wash Boring or Continuous Core Drilling can use drilling mud as a circulating fluid to stabilise the borehole. The term 'mud' encompasses a range of products ranging from bentonite to polymers such as Revert or Biogel. The mud tends to mask the cuttings and reliable identification is only possible from intermittent intact sampling (e.g. from SPT and U50 samples) or from rock coring, etc.

Continuous Core Drilling: A continuous core sample is obtained using a diamond tipped core barrel. Provided 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. The length of core recovered is compared to the length drilled and any length not recovered is shown as CORE LOSS. The locations of losses are determined on site by the supervising engineer; where the location is uncertain, the loss is placed at the top end of the drill run.

Standard Penetration Tests: Standard Penetration Tests (SPT) are used mainly in non-cohesive soils, but can also be used in cohesive soils as a means of indicating density or strength and also of obtaining a relatively undisturbed sample. The test procedure is described in Australian Standard 1289, "Methods of Testing Soils for Engineering Purposes" – Test F3.1.

The test is carried out in a borehole by driving a 50mm diameter split sample tube with a tapered shoe, under the impact of a 63kg hammer with a free fall of 760mm. 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 the 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: $N > 30 (15, 30/40\text{mm})$

The results of the test can be related empirically to the engineering properties of the soil. Occasionally, the drop hammer is used to drive 50mm diameter thin walled sample tubes (U50) in clays. In such circumstances, the test results are shown on the borehole logs in brackets.

A modification to the SPT test is where the same driving system is used with a solid 60 tipped steel cone of the same diameter as the SPT hollow sampler. The solid cone can be continuously driven for some distance in soft clays or loose sands, or may be used where damage would otherwise occur to the SPT. The results of this Solid Cone Penetration Test (SCPT) are shown as "Nc" on the borehole logs, together with the number of blows per 150mm penetration.

LOGS

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

The attached explanatory notes define the terms and symbols used in preparation of the logs.

Interpretation of the information shown on the logs, and its application to design and construction, should therefore take into account the spacing of boreholes or test pits, the method of drilling or excavation, the frequency of sampling and testing and the possibility of other than "straight line"

variations between the boreholes or test pits. Subsurface conditions between boreholes or test pits may vary significantly from conditions encountered at the borehole or test pit locations.

GROUNDWATER

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

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

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

FILL

The presence of fill materials can often be determined only by the inclusion of foreign objects (e.g. bricks, concrete, plastic, slag/ash, steel etc) or by distinctly unusual colour, texture or fabric. Identification of the extent of fill materials will also depend on investigation methods and frequency. Where natural soils similar to those at the site are used for fill, it may be difficult with limited testing and sampling to reliably determine the extent of the fill.

The presence of fill materials is usually regarded with caution as the possible variation in density, strength and material type is much greater than with natural soil deposits. If the volume and quality of fill is of importance to a project, then frequent test pit excavations are preferable to boreholes

LABORATORY TESTING

Laboratory testing has not been undertaken to confirm the soil classifications and rocks strengths indicated on the environmental logs unless noted in the report.


SITE ANOMALIES

In the event that conditions encountered on site during construction appear to vary from those which were expected from the information contained in the report, EIS should be notified immediately.

GRAPHIC LOG SYMBOLS FOR SOIL AND ROCKS

SOIL	ROCK	DEFECTS AND INCLUSIONS
FILL	CONGLOMERATE	CLAY SEAM
TOPSOIL	SANDSTONE	SHEARED OR CRUSHED SEAM
CLAY (CL, CH)	SHALE	BRECCIATED OR SHATTERED SEAM/ZONE
SILT (ML, MH)	SILTSTONE, MUDSTONE, CLAYSTONE	IRONSTONE GRAVEL
SAND (SP, SW)	LIMESTONE	ORGANIC MATERIAL
GRAVEL (GP, GW)	PHYLLITE, SCHIST	OTHER MATERIALS
SANDY CLAY (CL, CH)	TUFF	CONCRETE
SILTY CLAY (CL, CH)	GRANITE, GABBRO	BITUMINOUS CONCRETE, COAL
CLAYEY SAND (SC)	DOLERITE, DIORITE	COLLUVIUM
SILTY SAND (SM)	BASALT, ANDESITE	
GRAVELLY CLAY (CL, CH)	QUARTZITE	
CLAYEY GRAVEL (GC)		
SANDY SILT (ML)		
PEAT AND ORGANIC SOILS		

LOG SYMBOLS

LOG COLUMN	SYMBOL	DEFINITION	
Groundwater Record		Standing water level. Time delay following completion of drilling may be shown.	
		Extent of borehole collapse shortly after drilling.	
		Groundwater seepage into borehole or excavation noted during drilling or excavation.	
Samples	ES	Soil sample taken over depth indicated, for environmental analysis.	
	U50	Undisturbed 50mm diameter tube sample taken over depth indicated.	
	DB	Bulk disturbed sample taken over depth indicated.	
	DS	Small disturbed bag sample taken over depth indicated.	
	ASB	Soil sample taken over depth indicated, for asbestos screening.	
	ASS	Soil sample taken over depth indicated, for acid sulfate soil analysis.	
	SAL	Soil sample taken over depth indicated, for salinity analysis.	
Field Tests	N = 17 4, 7, 10	Standard Penetration Test (SPT) performed between depths indicated by lines. Individual show blows per 150mm penetration. 'R' as noted below.	
	N _c =	5	Solid Cone Penetration Test (SCPT) performed between depths indicated by lines. Individual figures show blows per 150mm penetration for 60 degree solid cone driven by SPT hammer. 'R' refers to apparent hammer refusal within the corresponding 150mm depth increment.
		7	
		3 R	
VNS = 25 PID = 100	Vane shear reading in kPa of Undrained Shear Strength. Photoionisation detector reading in ppm (Soil sample heads pace test).		
Moisture (Cohesive Soils) (Cohesionless)	MC > PL	Moisture content estimated to be greater than plastic limit.	
	MC ≈ PL	Moisture content estimated to be approximately equal to plastic limit.	
	MC < PL	Moisture content estimated to be less than plastic limit.	
	D	DRY – Runs freely through fingers.	
	M	MOIST – Does not run freely but no free water visible on soil surface.	
	W	WET – Free water visible on soil surface.	
Strength (Consistency) Cohesive Soils	VS	VERY SOFT – Unconfined compressive strength less than 25kPa	
	S	SOFT – Unconfined compressive strength 25-50kPa	
	F	FIRM – Unconfined compressive strength 50-100kPa	
	St	STIFF – Unconfined compressive strength 100- 200kPa	
	VSt	VERY STIFF – Unconfined compressive strength 200- 400kPa	
	H	HARD – Unconfined compressive strength greater than 400kPa	
	()	Bracketed symbol indicates estimated consistency based on tactile examination or other tests.	
Density Index/ Relative Density (Cohesionless Soils)	VL	Density Index (ID) Range (%) Very Loose < 15	
	L	Loose 15-35	
	MD	Medium Dense 35-65	
	D	Dense 65-85	
	VD	Very Dense > 85	
	()	Bracketed symbol indicates estimated density based on ease of drilling or other tests.	
Hand Penetrometer Readings	300	Numbers indicate individual test results in kPa on representative undisturbed material unless noted otherwise	
	250		
Remarks	'V' bit	Hardened steel 'V' shaped bit.	
	'TC' bit	Tungsten carbide wing bit.	
	T ₆₀	Penetration of auger string in mm under static load of rig applied by drill head hydraulics without rotation of augers.	

LOG SYMBOLS CONTINUED

ROCK STRENGTH

Rock strength is defined by the Point Load Strength Index (Is 50) and refers to the strength of the rock substance in the bedding. The test procedure is described by the International Journal of Rock Mechanics, Mining and Geomechanics Abstract Volume 22, No 2, 1985.

TERM	SYMBOL	Is (50) MPa	FIELD GUIDE
Extremely Low:	EL	0.03	Easily remoulded by hand to a material with soil properties.
Very Low:	VL		May be crumbled in the hand. Sandstone is "sugary" and friable.
Low:	L	0.1	A piece of core 150 mm long x 50mm dia. may be broken by hand and easily scored with a knife. Sharp edges of core may be friable and break during handling.
Medium Strength:	M	0.3	A piece of core 150 mm long x 50mm dia. can be broken by hand with difficulty. Readily scored with knife.
High:	H	1	A piece of core 150 mm long x 50mm dia. core cannot be broken by hand, can be slightly scratched or scored with knife; rock rings under hammer.
Very High:	VH	3	A piece of core 150 mm long x 50mm dia. may be broken with hand-held pick after more than one blow. Cannot be scratched with pen knife; rock rings under hammer.
Extremely High:	EH	10	A piece of core 150 mm long x 50mm dia. is very difficult to break with hand-held hammer. Rings when struck with a hammer.

ROCK STRENGTH

ABBREVIATION	DESCRIPTION	NOTES
Be	Bedding Plane Parting	Defect orientations measured relative to the normal to (i.e. relative to horizontal for vertical holes)
CS	Clay Seam	
J	Joint	
P	Planar	
Un	Undulating	
S	Smooth	
R	Rough	
IS	Iron stained	
XWS	Extremely Weathered Seam	
Cr	Crushed Seam	
60t	Thickness of defect in millimetres	

Appendix C: Laboratory Report & COC Documents



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CERTIFICATE OF ANALYSIS

161238

Client:

Environmental Investigation Services

PO Box 976
North Ryde BC
NSW 1670

Attention: K Taylor, A Billingham

Sample log in details:

Your Reference:	<u>E30116K, Goulburn</u>
No. of samples:	26 soils
Date samples received / completed instructions received	02/02/17 / 02/02/17

Analysis Details:

Please refer to the following pages for results, methodology summary and quality control data. Samples were analysed as received from the client. Results relate specifically to the samples as received. Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

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

Report Details:

Date results requested by: / Issue Date:	9/02/17 / 9/02/17
Date of Preliminary Report:	Not Issued

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Accredited for compliance with ISO/IEC 17025 - Testing **Tests not covered by NATA are denoted with *.**

Results Approved By:

David Springer
General Manager

Envirolab Reference: 161238
Revision No: R 00



vTRH(C6-C10)/BTEXN in Soil Our Reference: Your Reference	UNITS ----- -	161238-1 BH1	161238-3 BH1	161238-4 BH2	161238-5 BH2	161238-6 BH3
Depth	-----	0.1-0.2	1.5-1.95	0.1-0.2	0.7-0.95	0.1-0.2
Date Sampled		31/01/2017	31/01/2017	31/01/2017	31/01/2017	31/01/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	06/02/2017	06/02/2017	06/02/2017	06/02/2017	06/02/2017
Date analysed	-	07/02/2017	07/02/2017	07/02/2017	07/02/2017	07/02/2017
TRHC ₆ - C ₉	mg/kg	<25	<25	<25	<25	<25
TRHC ₆ - C ₁₀	mg/kg	<25	<25	<25	<25	<25
vTPHC ₆ - C ₁₀ less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	95	94	94	70	97

vTRH(C6-C10)/BTEXN in Soil Our Reference: Your Reference	UNITS ----- -	161238-7 BH3	161238-8 BH4	161238-9 BH4	161238-10 BH5	161238-11 BH5
Depth	-----	0.5-0.95	0-0.2	0.5-0.95	0.2-0.4	1.25-1.35
Date Sampled		31/01/2017	31/01/2017	31/01/2017	31/01/2017	31/01/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	06/02/2017	06/02/2017	06/02/2017	06/02/2017	06/02/2017
Date analysed	-	07/02/2017	07/02/2017	07/02/2017	07/02/2017	07/02/2017
TRHC ₆ - C ₉	mg/kg	<25	<25	<25	<25	<25
TRHC ₆ - C ₁₀	mg/kg	<25	<25	<25	<25	<25
vTPHC ₆ - C ₁₀ less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	92	96	91	96	88

vTRH(C6-C10)/BTEXn in Soil Our Reference: Your Reference	UNITS ----- -	161238-12 BH6	161238-14 BH6	161238-15 BH7	161238-17 BH7	161238-18 BH8
Depth	-----	0-0.15	0.5-0.75	0-0.15	0.5-0.65	0-0.15
Date Sampled		31/01/2017	31/01/2017	31/01/2017	31/01/2017	31/01/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	06/02/2017	06/02/2017	06/02/2017	06/02/2017	06/02/2017
Date analysed	-	07/02/2017	07/02/2017	07/02/2017	07/02/2017	07/02/2017
TRHC ₆ - C ₉	mg/kg	<25	<25	<25	<25	<25
TRHC ₆ - C ₁₀	mg/kg	<25	<25	<25	<25	<25
vTPHC ₆ - C ₁₀ less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	97	97	86	83	87

vTRH(C6-C10)/BTEXn in Soil Our Reference: Your Reference	UNITS ----- -	161238-20 BH8	161238-21 BH9	161238-22 BH9	161238-23 DUPKT1	161238-24 TB
Depth	-----	2.0-2.2	0-0.2	0.5-0.7	-	-
Date Sampled		31/01/2017	31/01/2017	31/01/2017	31/01/2017	31/01/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	06/02/2017	06/02/2017	06/02/2017	06/02/2017	06/02/2017
Date analysed	-	07/02/2017	07/02/2017	07/02/2017	07/02/2017	07/02/2017
TRHC ₆ - C ₉	mg/kg	<25	<25	<25	<25	<25
TRHC ₆ - C ₁₀	mg/kg	<25	<25	<25	<25	<25
vTPHC ₆ - C ₁₀ less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	84	90	89	92	92

svTRH (C10-C40) in Soil Our Reference: Your Reference	UNITS ----- -	161238-1 BH1	161238-3 BH1	161238-4 BH2	161238-5 BH2	161238-6 BH3
Depth	-----	0.1-0.2	1.5-1.95	0.1-0.2	0.7-0.95	0.1-0.2
Date Sampled		31/01/2017	31/01/2017	31/01/2017	31/01/2017	31/01/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	06/02/2017	06/02/2017	06/02/2017	06/02/2017	06/02/2017
Date analysed	-	08/02/2017	08/02/2017	08/02/2017	08/02/2017	08/02/2017
TRHC ₁₀ - C ₁₄	mg/kg	<50	<50	<50	<50	<50
TRHC ₁₅ - C ₂₈	mg/kg	<100	<100	<100	<100	<100
TRHC ₂₉ - C ₃₆	mg/kg	<100	<100	<100	<100	<100
TRH>C ₁₀ -C ₁₆	mg/kg	<50	<50	<50	<50	<50
TRH>C ₁₀ - C ₁₆ less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH>C ₁₆ -C ₃₄	mg/kg	<100	<100	<100	<100	<100
TRH>C ₃₄ -C ₄₀	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	108	108	105	103	104

svTRH (C10-C40) in Soil Our Reference: Your Reference	UNITS ----- -	161238-7 BH3	161238-8 BH4	161238-9 BH4	161238-10 BH5	161238-11 BH5
Depth	-----	0.5-0.95	0-0.2	0.5-0.95	0.2-0.4	1.25-1.35
Date Sampled		31/01/2017	31/01/2017	31/01/2017	31/01/2017	31/01/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	06/02/2017	06/02/2017	06/02/2017	06/02/2017	06/02/2017
Date analysed	-	08/02/2017	08/02/2017	08/02/2017	08/02/2017	08/02/2017
TRHC ₁₀ - C ₁₄	mg/kg	<50	<50	<50	<50	<50
TRHC ₁₅ - C ₂₈	mg/kg	<100	<100	<100	<100	<100
TRHC ₂₉ - C ₃₆	mg/kg	<100	<100	<100	<100	<100
TRH>C ₁₀ -C ₁₆	mg/kg	<50	<50	<50	<50	<50
TRH>C ₁₀ - C ₁₆ less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH>C ₁₆ -C ₃₄	mg/kg	<100	<100	<100	<100	<100
TRH>C ₃₄ -C ₄₀	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	106	103	103	102	101

Client Reference: E30116K, Goulburn

svTRH (C10-C40) in Soil Our Reference: Your Reference	UNITS ----- -	161238-12 BH6	161238-14 BH6	161238-15 BH7	161238-17 BH7	161238-18 BH8
Depth	-----	0-0.15	0.5-0.75	0-0.15	0.5-0.65	0-0.15
Date Sampled		31/01/2017	31/01/2017	31/01/2017	31/01/2017	31/01/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	06/02/2017	06/02/2017	06/02/2017	06/02/2017	06/02/2017
Date analysed	-	08/02/2017	08/02/2017	08/02/2017	08/02/2017	08/02/2017
TRHC ₁₀ - C ₁₄	mg/kg	<50	<50	<50	<50	<50
TRHC ₁₅ - C ₂₈	mg/kg	<100	<100	<100	<100	<100
TRHC ₂₉ - C ₃₆	mg/kg	<100	<100	110	<100	<100
TRH>C ₁₀ -C ₁₆	mg/kg	<50	<50	<50	<50	<50
TRH>C ₁₀ - C ₁₆ less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH>C ₁₆ -C ₃₄	mg/kg	<100	<100	110	<100	<100
TRH>C ₃₄ -C ₄₀	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C ₁₀ -C ₄₀)	mg/kg	<50	<50	110	<50	<50
Surrogate o-Terphenyl	%	101	99	106	103	102

svTRH (C10-C40) in Soil Our Reference: Your Reference	UNITS ----- -	161238-20 BH8	161238-21 BH9	161238-22 BH9	161238-23 DUPKT1
Depth	-----	2.0-2.2	0-0.2	0.5-0.7	-
Date Sampled		31/01/2017	31/01/2017	31/01/2017	31/01/2017
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	06/02/2017	06/02/2017	06/02/2017	06/02/2017
Date analysed	-	08/02/2017	08/02/2017	08/02/2017	08/02/2017
TRHC ₁₀ - C ₁₄	mg/kg	<50	<50	<50	<50
TRHC ₁₅ - C ₂₈	mg/kg	<100	<100	<100	<100
TRHC ₂₉ - C ₃₆	mg/kg	<100	<100	<100	<100
TRH>C ₁₀ -C ₁₆	mg/kg	<50	<50	<50	<50
TRH>C ₁₀ - C ₁₆ less Naphthalene (F2)	mg/kg	<50	<50	<50	<50
TRH>C ₁₆ -C ₃₄	mg/kg	<100	<100	<100	<100
TRH>C ₃₄ -C ₄₀	mg/kg	<100	<100	<100	<100
Total +ve TRH (>C ₁₀ -C ₄₀)	mg/kg	<50	<50	<50	<50
Surrogate o-Terphenyl	%	101	100	103	102

PAHs in Soil Our Reference: Your Reference	UNITS ----- -	161238-1 BH1	161238-3 BH1	161238-4 BH2	161238-5 BH2	161238-6 BH3
Depth	-----	0.1-0.2	1.5-1.95	0.1-0.2	0.7-0.95	0.1-0.2
Date Sampled		31/01/2017	31/01/2017	31/01/2017	31/01/2017	31/01/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	06/02/2017	06/02/2017	06/02/2017	06/02/2017	06/02/2017
Date analysed	-	07/02/2017	07/02/2017	07/02/2017	07/02/2017	07/02/2017
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.3
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.3
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.2
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.2
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	0.3
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	0.2
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.1
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Total +ve PAH's	mg/kg	<0.05	<0.05	<0.05	<0.05	1.9
Surrogate p-Terphenyl-d14	%	101	101	96	105	94

PAHs in Soil Our Reference: Your Reference	UNITS ----- -	161238-7 BH3	161238-8 BH4	161238-9 BH4	161238-10 BH5	161238-11 BH5
Depth	-----	0.5-0.95	0-0.2	0.5-0.95	0.2-0.4	1.25-1.35
Date Sampled		31/01/2017	31/01/2017	31/01/2017	31/01/2017	31/01/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	06/02/2017	06/02/2017	06/02/2017	06/02/2017	06/02/2017
Date analysed	-	07/02/2017	07/02/2017	07/02/2017	07/02/2017	07/02/2017
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Total +ve PAH's	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Surrogate p-Terphenyl-d14	%	103	94	96	92	109

PAHs in Soil Our Reference: Your Reference	UNITS ----- -	161238-12 BH6	161238-14 BH6	161238-15 BH7	161238-17 BH7	161238-18 BH8
Depth	-----	0-0.15	0.5-0.75	0-0.15	0.5-0.65	0-0.15
Date Sampled		31/01/2017	31/01/2017	31/01/2017	31/01/2017	31/01/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	06/02/2017	06/02/2017	06/02/2017	06/02/2017	06/02/2017
Date analysed	-	07/02/2017	07/02/2017	07/02/2017	07/02/2017	07/02/2017
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	0.2	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	0.2	0.1	0.2
Anthracene	mg/kg	<0.1	<0.1	0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	0.5	0.2	0.3
Pyrene	mg/kg	<0.1	<0.1	0.6	0.2	0.4
Benzo(a)anthracene	mg/kg	<0.1	<0.1	0.3	<0.1	0.2
Chrysene	mg/kg	<0.1	<0.1	0.3	0.1	0.2
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	0.5	<0.2	0.3
Benzo(a)pyrene	mg/kg	<0.05	<0.05	0.3	0.06	0.1
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	0.2	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	0.2	<0.1	0.1
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Total +ve PAH's	mg/kg	<0.05	<0.05	3.4	0.67	1.8
Surrogate p-Terphenyl-d14	%	92	98	103	99	100

PAHs in Soil Our Reference: Your Reference	UNITS ----- -	161238-20 BH8	161238-21 BH9	161238-22 BH9	161238-23 DUPKT1
Depth	-----	2.0-2.2	0-0.2	0.5-0.7	-
Date Sampled		31/01/2017	31/01/2017	31/01/2017	31/01/2017
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	06/02/2017	06/02/2017	06/02/2017	06/02/2017
Date analysed	-	07/02/2017	07/02/2017	07/02/2017	07/02/2017
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	0.2	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	0.3	<0.1	<0.1
Anthracene	mg/kg	<0.1	0.2	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	0.8	<0.1	<0.1
Pyrene	mg/kg	<0.1	0.8	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	0.3	<0.1	<0.1
Chrysene	mg/kg	<0.1	0.4	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	0.7	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	0.4	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	0.2	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	0.2	<0.1	<0.1
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	0.5	<0.5	<0.5
Total +ve PAH's	mg/kg	<0.05	4.5	<0.05	<0.05
Surrogate p-Terphenyl-d14	%	105	97	96	92

Organochlorine Pesticides in soil	UNITS	161238-1	161238-4	161238-6	161238-8	161238-10
Our Reference:	-----	BH1	BH2	BH3	BH4	BH5
Your Reference	-					
Depth	-----	0.1-0.2	0.1-0.2	0.1-0.2	0-0.2	0.2-0.4
Date Sampled		31/01/2017	31/01/2017	31/01/2017	31/01/2017	31/01/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	06/02/2017	06/02/2017	06/02/2017	06/02/2017	06/02/2017
Date analysed	-	08/02/2017	08/02/2017	08/02/2017	08/02/2017	08/02/2017
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	118	114	115	117	112

Organochlorine Pesticides in soil	UNITS	161238-12	161238-15	161238-18	161238-21
Our Reference:	-----	BH6	BH7	BH8	BH9
Your Reference	-				
Depth	-----	0-0.15	0-0.15	0-0.15	0-0.2
Date Sampled		31/01/2017	31/01/2017	31/01/2017	31/01/2017
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	06/02/2017	06/02/2017	06/02/2017	06/02/2017
Date analysed	-	08/02/2017	08/02/2017	08/02/2017	08/02/2017
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	109	113	113	108

Client Reference: E30116K, Goulburn

Organophosphorus Pesticides	UNITS	161238-1	161238-4	161238-6	161238-8	161238-10
Our Reference:	-----	BH1	BH2	BH3	BH4	BH5
Your Reference	-					
Depth	-----	0.1-0.2	0.1-0.2	0.1-0.2	0-0.2	0.2-0.4
Date Sampled		31/01/2017	31/01/2017	31/01/2017	31/01/2017	31/01/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	06/02/2017	06/02/2017	06/02/2017	06/02/2017	06/02/2017
Date analysed	-	08/02/2017	08/02/2017	08/02/2017	08/02/2017	08/02/2017
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	118	114	115	117	112

Organophosphorus Pesticides	UNITS	161238-12	161238-15	161238-18	161238-21
Our Reference:	-----	BH6	BH7	BH8	BH9
Your Reference	-				
Depth	-----	0-0.15	0-0.15	0-0.15	0-0.2
Date Sampled		31/01/2017	31/01/2017	31/01/2017	31/01/2017
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	06/02/2017	06/02/2017	06/02/2017	06/02/2017
Date analysed	-	08/02/2017	08/02/2017	08/02/2017	08/02/2017
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	109	113	113	108

Client Reference: E30116K, Goulburn

PCBs in Soil Our Reference: Your Reference	UNITS ----- -	161238-1 BH1	161238-4 BH2	161238-6 BH3	161238-8 BH4	161238-10 BH5
Depth	-----	0.1-0.2	0.1-0.2	0.1-0.2	0-0.2	0.2-0.4
Date Sampled		31/01/2017	31/01/2017	31/01/2017	31/01/2017	31/01/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	06/02/2017	06/02/2017	06/02/2017	06/02/2017	06/02/2017
Date analysed	-	08/02/2017	08/02/2017	08/02/2017	08/02/2017	08/02/2017
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	118	114	115	117	112

PCBs in Soil Our Reference: Your Reference	UNITS ----- -	161238-12 BH6	161238-15 BH7	161238-18 BH8	161238-21 BH9
Depth	-----	0-0.15	0-0.15	0-0.15	0-0.2
Date Sampled		31/01/2017	31/01/2017	31/01/2017	31/01/2017
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	06/02/2017	06/02/2017	06/02/2017	06/02/2017
Date analysed	-	08/02/2017	08/02/2017	08/02/2017	08/02/2017
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	109	113	113	108

Client Reference: E30116K, Goulburn

Acid Extractable metals in soil Our Reference: Your Reference	UNITS ----- -	161238-1 BH1	161238-3 BH1	161238-4 BH2	161238-5 BH2	161238-6 BH3
Depth	-----	0.1-0.2	1.5-1.95	0.1-0.2	0.7-0.95	0.1-0.2
Date Sampled		31/01/2017	31/01/2017	31/01/2017	31/01/2017	31/01/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	06/02/2017	06/02/2017	06/02/2017	06/02/2017	06/02/2017
Date analysed	-	06/02/2017	06/02/2017	06/02/2017	06/02/2017	06/02/2017
Arsenic	mg/kg	11	4	16	5	29
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	9	58	5	94	37
Copper	mg/kg	76	35	48	20	12
Lead	mg/kg	4	8	3	18	65
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	3	34	2	24	9
Zinc	mg/kg	1	51	2	14	40

Acid Extractable metals in soil Our Reference: Your Reference	UNITS ----- -	161238-7 BH3	161238-8 BH4	161238-9 BH4	161238-10 BH5	161238-11 BH5
Depth	-----	0.5-0.95	0-0.2	0.5-0.95	0.2-0.4	1.25-1.35
Date Sampled		31/01/2017	31/01/2017	31/01/2017	31/01/2017	31/01/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	06/02/2017	06/02/2017	06/02/2017	06/02/2017	06/02/2017
Date analysed	-	06/02/2017	06/02/2017	06/02/2017	06/02/2017	06/02/2017
Arsenic	mg/kg	7	26	4	19	5
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	38	39	28	7	56
Copper	mg/kg	15	56	18	89	32
Lead	mg/kg	7	54	10	3	10
Mercury	mg/kg	<0.1	0.2	<0.1	<0.1	<0.1
Nickel	mg/kg	12	15	9	1	29
Zinc	mg/kg	12	120	18	2	35

Client Reference: E30116K, Goulburn

Acid Extractable metals in soil Our Reference: Your Reference	UNITS ----- -	161238-12 BH6	161238-14 BH6	161238-15 BH7	161238-17 BH7	161238-18 BH8
Depth	-----	0-0.15	0.5-0.75	0-0.15	0.5-0.65	0-0.15
Date Sampled		31/01/2017	31/01/2017	31/01/2017	31/01/2017	31/01/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	06/02/2017	06/02/2017	06/02/2017	06/02/2017	06/02/2017
Date analysed	-	06/02/2017	06/02/2017	06/02/2017	06/02/2017	06/02/2017
Arsenic	mg/kg	34	8	5	<4	13
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	40	28	27	68	42
Copper	mg/kg	37	18	17	12	21
Lead	mg/kg	36	13	37	21	20
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	21	8	9	10	8
Zinc	mg/kg	74	17	93	16	13

Acid Extractable metals in soil Our Reference: Your Reference	UNITS ----- -	161238-20 BH8	161238-21 BH9	161238-22 BH9	161238-23 DUPKT1	161238-27 BH9 - [TRIPLICATE]
Depth	-----	2.0-2.2	0-0.2	0.5-0.7	-	0.5-0.7
Date Sampled		31/01/2017	31/01/2017	31/01/2017	31/01/2017	31/01/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	06/02/2017	06/02/2017	06/02/2017	06/02/2017	06/02/2017
Date analysed	-	06/02/2017	06/02/2017	06/02/2017	06/02/2017	06/02/2017
Arsenic	mg/kg	<4	<4	<4	15	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	55	46	58	7	33
Copper	mg/kg	20	17	26	40	15
Lead	mg/kg	9	23	10	5	5
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	25	16	26	2	16
Zinc	mg/kg	21	18	17	3	10

Client Reference: E30116K, Goulburn

Moisture Our Reference: Your Reference	UNITS ----- -	161238-1 BH1	161238-3 BH1	161238-4 BH2	161238-5 BH2	161238-6 BH3
Depth Date Sampled Type of sample	----- ----- -----	0.1-0.2 31/01/2017 Soil	1.5-1.95 31/01/2017 Soil	0.1-0.2 31/01/2017 Soil	0.7-0.95 31/01/2017 Soil	0.1-0.2 31/01/2017 Soil
Date prepared	-	06/02/2017	06/02/2017	06/02/2017	06/02/2017	06/02/2017
Date analysed	-	07/02/2017	07/02/2017	07/02/2017	07/02/2017	07/02/2017
Moisture	%	5.5	23	4.5	18	6.1

Moisture Our Reference: Your Reference	UNITS ----- -	161238-7 BH3	161238-8 BH4	161238-9 BH4	161238-10 BH5	161238-11 BH5
Depth Date Sampled Type of sample	----- ----- -----	0.5-0.95 31/01/2017 Soil	0-0.2 31/01/2017 Soil	0.5-0.95 31/01/2017 Soil	0.2-0.4 31/01/2017 Soil	1.25-1.35 31/01/2017 Soil
Date prepared	-	06/02/2017	06/02/2017	06/02/2017	06/02/2017	06/02/2017
Date analysed	-	07/02/2017	07/02/2017	07/02/2017	07/02/2017	07/02/2017
Moisture	%	15	8.8	24	6.1	21

Moisture Our Reference: Your Reference	UNITS ----- -	161238-12 BH6	161238-14 BH6	161238-15 BH7	161238-17 BH7	161238-18 BH8
Depth Date Sampled Type of sample	----- ----- -----	0-0.15 31/01/2017 Soil	0.5-0.75 31/01/2017 Soil	0-0.15 31/01/2017 Soil	0.5-0.65 31/01/2017 Soil	0-0.15 31/01/2017 Soil
Date prepared	-	06/02/2017	06/02/2017	06/02/2017	06/02/2017	06/02/2017
Date analysed	-	07/02/2017	07/02/2017	07/02/2017	07/02/2017	07/02/2017
Moisture	%	7.5	12	5.8	5.9	6.8

Moisture Our Reference: Your Reference	UNITS ----- -	161238-20 BH8	161238-21 BH9	161238-22 BH9	161238-23 DUPKT1
Depth Date Sampled Type of sample	----- ----- -----	2.0-2.2 31/01/2017 Soil	0-0.2 31/01/2017 Soil	0.5-0.7 31/01/2017 Soil	- 31/01/2017 Soil
Date prepared	-	06/02/2017	06/02/2017	06/02/2017	06/02/2017
Date analysed	-	07/02/2017	07/02/2017	07/02/2017	07/02/2017
Moisture	%	22	14	20	3.8

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Asbestos ID - soils Our Reference: Your Reference	UNITS ----- -	161238-1 BH1	161238-4 BH2	161238-6 BH3	161238-8 BH4	161238-10 BH5
Depth	-----	0.1-0.2	0.1-0.2	0.1-0.2	0-0.2	0.2-0.4
Date Sampled		31/01/2017	31/01/2017	31/01/2017	31/01/2017	31/01/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	7/02/2017	7/02/2017	7/02/2017	7/02/2017	7/02/2017
Sample mass tested	g	Approx. 40g	Approx. 35g	Approx. 30g	Approx. 35g	Approx. 35g
Sample Description	-	Beige coarse-grained soil & rocks	Beige coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

Asbestos ID - soils Our Reference: Your Reference	UNITS ----- -	161238-12 BH6	161238-15 BH7	161238-18 BH8	161238-21 BH9
Depth	-----	0-0.15	0-0.15	0-0.15	0-0.2
Date Sampled		31/01/2017	31/01/2017	31/01/2017	31/01/2017
Type of sample		Soil	Soil	Soil	Soil
Date analysed	-	7/02/2017	7/02/2017	7/02/2017	7/02/2017
Sample mass tested	g	Approx. 30g	Approx. 30g	Approx. 30g	Approx. 25g
Sample Description	-	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

MethodID	Methodology Summary
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater. Note, the Total +ve Xylene PQL is reflective of the lowest individual PQL and is therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes.
Org-014	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).
Org-012	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013. For soil results:- 1. 'TEQ PQL' values are assuming all contributing PAHs reported as <PQL are actually at the PQL. This is the most conservative approach and can give false positive TEQs given that PAHs that contribute to the TEQ calculation may not be present. 2. 'TEQ zero' values are assuming all contributing PAHs reported as <PQL are zero. This is the least conservative approach and is more susceptible to false negative TEQs when PAHs that contribute to the TEQ calculation are present but below PQL. 3. 'TEQ half PQL' values are assuming all contributing PAHs reported as <PQL are half the stipulated PQL. Hence a mid-point between the most and least conservative approaches above. Note, the Total +ve PAHs PQL is reflective of the lowest individual PQL and is therefore " Total +ve PAHs" is simply a sum of the positive individual PAHs.
Org-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Org-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's. Note, the Total +ve reported DDD+DDE+DDT PQL is reflective of the lowest individual PQL and is therefore simply a sum of the positive individually report DDD+DDE+DDT.
Org-008	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD. Note, the Total +ve PCBs PQL is reflective of the lowest individual PQL and is therefore " Total +ve PCBs" is simply a sum of the positive individual PCBs.

Method ID	Methodology Summary
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.

Client Reference: E30116K, Goulburn

QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
vTRH(C6-C10)/BTEXN in Soil						Base II Duplicate II %RPD		
Date extracted	-			06/02/2017	161238-1	06/02/2017 06/02/2017	LCS-10	06/02/2017
Date analysed	-			07/02/2017	161238-1	07/02/2017 07/02/2017	LCS-10	07/02/2017
TRHC ₆ - C ₉	mg/kg	25	Org-016	<25	161238-1	<25 <25	LCS-10	116%
TRHC ₆ - C ₁₀	mg/kg	25	Org-016	<25	161238-1	<25 <25	LCS-10	116%
Benzene	mg/kg	0.2	Org-016	<0.2	161238-1	<0.2 <0.2	LCS-10	117%
Toluene	mg/kg	0.5	Org-016	<0.5	161238-1	<0.5 <0.5	LCS-10	115%
Ethylbenzene	mg/kg	1	Org-016	<1	161238-1	<1 <1	LCS-10	116%
m+p-xylene	mg/kg	2	Org-016	<2	161238-1	<2 <2	LCS-10	116%
o-Xylene	mg/kg	1	Org-016	<1	161238-1	<1 <1	LCS-10	116%
naphthalene	mg/kg	1	Org-014	<1	161238-1	<1 <1	[NR]	[NR]
Surrogate aaa-Trifluorotoluene	%		Org-016	100	161238-1	95 96 RPD: 1	LCS-10	103%
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
svTRH(C10-C40) in Soil						Base II Duplicate II %RPD		
Date extracted	-			06/02/2017	161238-1	06/02/2017 06/02/2017	LCS-10	06/02/2017
Date analysed	-			08/02/2017	161238-1	08/02/2017 08/02/2017	LCS-10	08/02/2017
TRHC ₁₀ - C ₁₄	mg/kg	50	Org-003	<50	161238-1	<50 <50	LCS-10	116%
TRHC ₁₅ - C ₂₈	mg/kg	100	Org-003	<100	161238-1	<100 <100	LCS-10	129%
TRHC ₂₈ - C ₃₆	mg/kg	100	Org-003	<100	161238-1	<100 <100	LCS-10	121%
TRH>C ₁₀ -C ₁₆	mg/kg	50	Org-003	<50	161238-1	<50 <50	LCS-10	116%
TRH>C ₁₆ -C ₃₄	mg/kg	100	Org-003	<100	161238-1	<100 <100	LCS-10	129%
TRH>C ₃₄ -C ₄₀	mg/kg	100	Org-003	<100	161238-1	<100 <100	LCS-10	121%
Surrogate o-Terphenyl	%		Org-003	102	161238-1	108 105 RPD: 3	LCS-10	116%
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
PAHs in Soil						Base II Duplicate II %RPD		
Date extracted	-			06/02/2017	161238-1	06/02/2017 06/02/2017	LCS-10	06/02/2017
Date analysed	-			07/02/2017	161238-1	07/02/2017 07/02/2017	LCS-10	07/02/2017
Naphthalene	mg/kg	0.1	Org-012	<0.1	161238-1	<0.1 <0.1	LCS-10	102%
Acenaphthylene	mg/kg	0.1	Org-012	<0.1	161238-1	<0.1 <0.1	[NR]	[NR]
Acenaphthene	mg/kg	0.1	Org-012	<0.1	161238-1	<0.1 <0.1	[NR]	[NR]
Fluorene	mg/kg	0.1	Org-012	<0.1	161238-1	<0.1 <0.1	LCS-10	100%
Phenanthrene	mg/kg	0.1	Org-012	<0.1	161238-1	<0.1 <0.1	LCS-10	114%
Anthracene	mg/kg	0.1	Org-012	<0.1	161238-1	<0.1 <0.1	[NR]	[NR]
Fluoranthene	mg/kg	0.1	Org-012	<0.1	161238-1	<0.1 <0.1	LCS-10	106%
Pyrene	mg/kg	0.1	Org-012	<0.1	161238-1	<0.1 <0.1	LCS-10	107%
Benzo(a)anthracene	mg/kg	0.1	Org-012	<0.1	161238-1	<0.1 <0.1	[NR]	[NR]
Chrysene	mg/kg	0.1	Org-012	<0.1	161238-1	<0.1 <0.1	LCS-10	103%
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-012	<0.2	161238-1	<0.2 <0.2	[NR]	[NR]

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QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
PAHs in Soil						Base II Duplicate II %RPD		
Benzo(a)pyrene	mg/kg	0.05	Org-012	<0.05	161238-1	<0.05 <0.05	LCS-10	97%
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012	<0.1	161238-1	<0.1 <0.1	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012	<0.1	161238-1	<0.1 <0.1	[NR]	[NR]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012	<0.1	161238-1	<0.1 <0.1	[NR]	[NR]
Surrogate p-Terphenyl-d14	%		Org-012	104	161238-1	101 91 RPD: 10	LCS-10	122%
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Organochlorine Pesticides in soil						Base II Duplicate II %RPD		
Date extracted	-			06/02/2017	161238-1	06/02/2017 06/02/2017	LCS-10	06/02/2017
Date analysed	-			08/02/2017	161238-1	08/02/2017 08/02/2017	LCS-10	08/02/2017
HCB	mg/kg	0.1	Org-005	<0.1	161238-1	<0.1 <0.1	[NR]	[NR]
alpha-BHC	mg/kg	0.1	Org-005	<0.1	161238-1	<0.1 <0.1	LCS-10	100%
gamma-BHC	mg/kg	0.1	Org-005	<0.1	161238-1	<0.1 <0.1	[NR]	[NR]
beta-BHC	mg/kg	0.1	Org-005	<0.1	161238-1	<0.1 <0.1	LCS-10	113%
Heptachlor	mg/kg	0.1	Org-005	<0.1	161238-1	<0.1 <0.1	LCS-10	105%
delta-BHC	mg/kg	0.1	Org-005	<0.1	161238-1	<0.1 <0.1	[NR]	[NR]
Aldrin	mg/kg	0.1	Org-005	<0.1	161238-1	<0.1 <0.1	LCS-10	109%
Heptachlor Epoxide	mg/kg	0.1	Org-005	<0.1	161238-1	<0.1 <0.1	LCS-10	113%
gamma-Chlordane	mg/kg	0.1	Org-005	<0.1	161238-1	<0.1 <0.1	[NR]	[NR]
alpha-chlordane	mg/kg	0.1	Org-005	<0.1	161238-1	<0.1 <0.1	[NR]	[NR]
Endosulfan I	mg/kg	0.1	Org-005	<0.1	161238-1	<0.1 <0.1	[NR]	[NR]
pp-DDE	mg/kg	0.1	Org-005	<0.1	161238-1	<0.1 <0.1	LCS-10	117%
Dieldrin	mg/kg	0.1	Org-005	<0.1	161238-1	<0.1 <0.1	LCS-10	123%
Endrin	mg/kg	0.1	Org-005	<0.1	161238-1	<0.1 <0.1	LCS-10	121%
pp-DDD	mg/kg	0.1	Org-005	<0.1	161238-1	<0.1 <0.1	LCS-10	102%
Endosulfan II	mg/kg	0.1	Org-005	<0.1	161238-1	<0.1 <0.1	[NR]	[NR]
pp-DDT	mg/kg	0.1	Org-005	<0.1	161238-1	<0.1 <0.1	[NR]	[NR]
Endrin Aldehyde	mg/kg	0.1	Org-005	<0.1	161238-1	<0.1 <0.1	[NR]	[NR]
Endosulfan Sulphate	mg/kg	0.1	Org-005	<0.1	161238-1	<0.1 <0.1	LCS-10	78%
Methoxychlor	mg/kg	0.1	Org-005	<0.1	161238-1	<0.1 <0.1	[NR]	[NR]
Surrogate TCMX	%		Org-005	113	161238-1	118 114 RPD: 3	LCS-10	100%

Client Reference: E30116K, Goulburn

QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Organophosphorus Pesticides						Base II Duplicate II %RPD		
Date extracted	-			06/02/2017	161238-1	06/02/2017 06/02/2017	LCS-10	06/02/2017
Date analysed	-			08/02/2017	161238-1	08/02/2017 08/02/2017	LCS-10	08/02/2017
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-008	<0.1	161238-1	<0.1 <0.1	[NR]	[NR]
Bromophos-ethyl	mg/kg	0.1	Org-008	<0.1	161238-1	<0.1 <0.1	[NR]	[NR]
Chlorpyrifos	mg/kg	0.1	Org-008	<0.1	161238-1	<0.1 <0.1	LCS-10	112%
Chlorpyrifos-methyl	mg/kg	0.1	Org-008	<0.1	161238-1	<0.1 <0.1	[NR]	[NR]
Diazinon	mg/kg	0.1	Org-008	<0.1	161238-1	<0.1 <0.1	[NR]	[NR]
Dichlorvos	mg/kg	0.1	Org-008	<0.1	161238-1	<0.1 <0.1	LCS-10	77%
Dimethoate	mg/kg	0.1	Org-008	<0.1	161238-1	<0.1 <0.1	[NR]	[NR]
Ethion	mg/kg	0.1	Org-008	<0.1	161238-1	<0.1 <0.1	LCS-10	94%
Fenitrothion	mg/kg	0.1	Org-008	<0.1	161238-1	<0.1 <0.1	LCS-10	105%
Malathion	mg/kg	0.1	Org-008	<0.1	161238-1	<0.1 <0.1	LCS-10	79%
Parathion	mg/kg	0.1	Org-008	<0.1	161238-1	<0.1 <0.1	LCS-10	109%
Ronnel	mg/kg	0.1	Org-008	<0.1	161238-1	<0.1 <0.1	LCS-10	120%
Surrogate TCMX	%		Org-008	113	161238-1	118 114 RPD: 3	LCS-10	114%
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
PCBs in Soil						Base II Duplicate II %RPD		
Date extracted	-			06/02/2017	161238-1	06/02/2017 06/02/2017	LCS-10	06/02/2017
Date analysed	-			08/02/2017	161238-1	08/02/2017 08/02/2017	LCS-10	08/02/2017
Aroclor 1016	mg/kg	0.1	Org-006	<0.1	161238-1	<0.1 <0.1	[NR]	[NR]
Aroclor 1221	mg/kg	0.1	Org-006	<0.1	161238-1	<0.1 <0.1	[NR]	[NR]
Aroclor 1232	mg/kg	0.1	Org-006	<0.1	161238-1	<0.1 <0.1	[NR]	[NR]
Aroclor 1242	mg/kg	0.1	Org-006	<0.1	161238-1	<0.1 <0.1	[NR]	[NR]
Aroclor 1248	mg/kg	0.1	Org-006	<0.1	161238-1	<0.1 <0.1	[NR]	[NR]
Aroclor 1254	mg/kg	0.1	Org-006	<0.1	161238-1	<0.1 <0.1	LCS-10	122%
Aroclor 1260	mg/kg	0.1	Org-006	<0.1	161238-1	<0.1 <0.1	[NR]	[NR]
Surrogate TCLMX	%		Org-006	113	161238-1	118 114 RPD: 3	LCS-10	114%

Client Reference: E30116K, Goulburn

QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Acid Extractable metals in soil						Base Duplicate %RPD		
Date prepared	-			06/02/2017	161238-1	06/02/2017 06/02/2017	LCS-10	06/02/2017
Date analysed	-			06/02/2017	161238-1	06/02/2017 06/02/2017	LCS-10	06/02/2017
Arsenic	mg/kg	4	Metals-020	<4	161238-1	11 17 RPD: 43	LCS-10	101%
Cadmium	mg/kg	0.4	Metals-020	<0.4	161238-1	<0.4 <0.4	LCS-10	94%
Chromium	mg/kg	1	Metals-020	<1	161238-1	9 13 RPD: 36	LCS-10	100%
Copper	mg/kg	1	Metals-020	<1	161238-1	76 110 RPD: 37	LCS-10	99%
Lead	mg/kg	1	Metals-020	<1	161238-1	4 4 RPD: 0	LCS-10	95%
Mercury	mg/kg	0.1	Metals-021	<0.1	161238-1	<0.1 <0.1	LCS-10	91%
Nickel	mg/kg	1	Metals-020	<1	161238-1	3 3 RPD: 0	LCS-10	90%
Zinc	mg/kg	1	Metals-020	<1	161238-1	1 2 RPD: 67	LCS-10	91%

QUALITYCONTROL vTRH(C6-C10)/BTEXNin Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	161238-22	06/02/2017 06/02/2017	161238-4	06/02/2017
Date analysed	-	161238-22	07/02/2017 07/02/2017	161238-4	07/02/2017
TRHC ₆ - C ₉	mg/kg	161238-22	<25 <25	161238-4	119%
TRHC ₆ - C ₁₀	mg/kg	161238-22	<25 <25	161238-4	119%
Benzene	mg/kg	161238-22	<0.2 <0.2	161238-4	119%
Toluene	mg/kg	161238-22	<0.5 <0.5	161238-4	118%
Ethylbenzene	mg/kg	161238-22	<1 <1	161238-4	118%
m+p-xylene	mg/kg	161238-22	<2 <2	161238-4	119%
o-Xylene	mg/kg	161238-22	<1 <1	161238-4	118%
naphthalene	mg/kg	161238-22	<1 <1	[NR]	[NR]
Surrogate aaa-Trifluorotoluene	%	161238-22	89 84 RPD: 6	161238-4	98%

QUALITYCONTROL svTRH (C10-C40) in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	161238-22	06/02/2017 06/02/2017	161238-4	06/02/2017
Date analysed	-	161238-22	08/02/2017 08/02/2017	161238-4	08/02/2017
TRHC ₁₀ - C ₁₄	mg/kg	161238-22	<50 <50	161238-4	128%
TRHC ₁₅ - C ₂₈	mg/kg	161238-22	<100 <100	161238-4	128%
TRHC ₂₉ - C ₃₆	mg/kg	161238-22	<100 <100	161238-4	74%
TRH>C ₁₀ -C ₁₆	mg/kg	161238-22	<50 <50	161238-4	128%
TRH>C ₁₆ -C ₃₄	mg/kg	161238-22	<100 <100	161238-4	128%
TRH>C ₃₄ -C ₄₀	mg/kg	161238-22	<100 <100	161238-4	74%
Surrogate o-Terphenyl	%	161238-22	103 106 RPD: 3	161238-4	105%

Client Reference: E30116K, Goulburn

QUALITYCONTROL PAHs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	161238-22	06/02/2017 06/02/2017	161238-4	06/02/2017
Date analysed	-	161238-22	07/02/2017 07/02/2017	161238-4	07/02/2017
Naphthalene	mg/kg	161238-22	<0.1 <0.1	161238-4	99%
Acenaphthylene	mg/kg	161238-22	<0.1 <0.1	[NR]	[NR]
Acenaphthene	mg/kg	161238-22	<0.1 <0.1	[NR]	[NR]
Fluorene	mg/kg	161238-22	<0.1 <0.1	161238-4	102%
Phenanthrene	mg/kg	161238-22	<0.1 <0.1	161238-4	102%
Anthracene	mg/kg	161238-22	<0.1 <0.1	[NR]	[NR]
Fluoranthene	mg/kg	161238-22	<0.1 <0.1	161238-4	99%
Pyrene	mg/kg	161238-22	<0.1 <0.1	161238-4	104%
Benzo(a)anthracene	mg/kg	161238-22	<0.1 <0.1	[NR]	[NR]
Chrysene	mg/kg	161238-22	<0.1 <0.1	161238-4	95%
Benzo(b,j+k)fluoranthene	mg/kg	161238-22	<0.2 <0.2	[NR]	[NR]
Benzo(a)pyrene	mg/kg	161238-22	<0.05 <0.05	161238-4	98%
Indeno(1,2,3-c,d)pyrene	mg/kg	161238-22	<0.1 <0.1	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	161238-22	<0.1 <0.1	[NR]	[NR]
Benzo(g,h,i)perylene	mg/kg	161238-22	<0.1 <0.1	[NR]	[NR]
Surrogate p-Terphenyl-d14	%	161238-22	96 98 RPD: 2	161238-4	123%
QUALITYCONTROL Organochlorine Pesticides in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	[NT]	[NT]	161238-4	06/02/2017
Date analysed	-	[NT]	[NT]	161238-4	08/02/2017
HCB	mg/kg	[NT]	[NT]	[NR]	[NR]
alpha-BHC	mg/kg	[NT]	[NT]	161238-4	101%
gamma-BHC	mg/kg	[NT]	[NT]	[NR]	[NR]
beta-BHC	mg/kg	[NT]	[NT]	161238-4	118%
Heptachlor	mg/kg	[NT]	[NT]	161238-4	109%
delta-BHC	mg/kg	[NT]	[NT]	[NR]	[NR]
Aldrin	mg/kg	[NT]	[NT]	161238-4	116%
Heptachlor Epoxide	mg/kg	[NT]	[NT]	161238-4	118%
gamma-Chlordane	mg/kg	[NT]	[NT]	[NR]	[NR]
alpha-chlordane	mg/kg	[NT]	[NT]	[NR]	[NR]
Endosulfan I	mg/kg	[NT]	[NT]	[NR]	[NR]
pp-DDE	mg/kg	[NT]	[NT]	161238-4	125%
Dieldrin	mg/kg	[NT]	[NT]	161238-4	129%
Endrin	mg/kg	[NT]	[NT]	161238-4	131%
pp-DDD	mg/kg	[NT]	[NT]	161238-4	100%
Endosulfan II	mg/kg	[NT]	[NT]	[NR]	[NR]
pp-DDT	mg/kg	[NT]	[NT]	[NR]	[NR]
Endrin Aldehyde	mg/kg	[NT]	[NT]	[NR]	[NR]
Endosulfan Sulphate	mg/kg	[NT]	[NT]	161238-4	71%

Client Reference: E30116K, Goulburn

QUALITYCONTROL Organochlorine Pesticides in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Methoxychlor	mg/kg	[NT]	[NT]	[NR]	[NR]
Surrogate TCMX	%	[NT]	[NT]	161238-4	106%
QUALITYCONTROL Organophosphorus Pesticides	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	[NT]	[NT]	161238-4	06/02/2017
Date analysed	-	[NT]	[NT]	161238-4	08/02/2017
Azinphos-methyl (Guthion)	mg/kg	[NT]	[NT]	[NR]	[NR]
Bromophos-ethyl	mg/kg	[NT]	[NT]	[NR]	[NR]
Chlorpyriphos	mg/kg	[NT]	[NT]	161238-4	114%
Chlorpyriphos-methyl	mg/kg	[NT]	[NT]	[NR]	[NR]
Diazinon	mg/kg	[NT]	[NT]	[NR]	[NR]
Dichlorvos	mg/kg	[NT]	[NT]	161238-4	79%
Dimethoate	mg/kg	[NT]	[NT]	[NR]	[NR]
Ethion	mg/kg	[NT]	[NT]	161238-4	114%
Fenitrothion	mg/kg	[NT]	[NT]	161238-4	112%
Malathion	mg/kg	[NT]	[NT]	161238-4	68%
Parathion	mg/kg	[NT]	[NT]	161238-4	109%
Ronnel	mg/kg	[NT]	[NT]	161238-4	125%
Surrogate TCMX	%	[NT]	[NT]	161238-4	115%
QUALITYCONTROL PCBs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	[NT]	[NT]	161238-4	06/02/2017
Date analysed	-	[NT]	[NT]	161238-4	08/02/2017
Aroclor 1016	mg/kg	[NT]	[NT]	[NR]	[NR]
Aroclor 1221	mg/kg	[NT]	[NT]	[NR]	[NR]
Aroclor 1232	mg/kg	[NT]	[NT]	[NR]	[NR]
Aroclor 1242	mg/kg	[NT]	[NT]	[NR]	[NR]
Aroclor 1248	mg/kg	[NT]	[NT]	[NR]	[NR]
Aroclor 1254	mg/kg	[NT]	[NT]	161238-4	133%
Aroclor 1260	mg/kg	[NT]	[NT]	[NR]	[NR]
Surrogate TCLMX	%	[NT]	[NT]	161238-4	115%

Client Reference: E30116K, Goulburn

QUALITY CONTROL Acid Extractable metals in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date prepared	-	161238-22	06/02/2017 06/02/2017	161238-4	06/02/2017
Date analysed	-	161238-22	06/02/2017 06/02/2017	161238-4	06/02/2017
Arsenic	mg/kg	161238-22	<4 <4	161238-4	97%
Cadmium	mg/kg	161238-22	<0.4 <0.4	161238-4	100%
Chromium	mg/kg	161238-22	58 37 RPD: 44	161238-4	101%
Copper	mg/kg	161238-22	26 17 RPD: 42	161238-4	85%
Lead	mg/kg	161238-22	10 6 RPD: 50	161238-4	99%
Mercury	mg/kg	161238-22	<0.1 <0.1	161238-4	82%
Nickel	mg/kg	161238-22	26 17 RPD: 42	161238-4	97%
Zinc	mg/kg	161238-22	17 12 RPD: 34	161238-4	95%

Report Comments:

Asbestos: A portion of the supplied sample was sub-sampled for asbestos analysis according to Envirolab procedures. We cannot guarantee that this sub-sample is indicative of the entire sample. Envirolab recommends supplying 40-50g of sample in its own container.

Note: Samples 161238-1, 4, 6, 8, 10, 12, 15, 18, 21 were sub-sampled from jars provided by the client.

Acid Extractable Metals in Soil: The laboratory RPD acceptance criteria has been exceeded for 161238-22 for Pb. Therefore a triplicate result has been issued as laboratory sample number 161238-27.

Asbestos ID was analysed by Approved Identifier: Lucy Zhu
Asbestos ID was authorised by Approved Signatory: Paul Ching

INS: Insufficient sample for this test
NR: Test not required
<: Less than

PQL: Practical Quantitation Limit
RPD: Relative Percent Difference
>: Greater than

NT: Not tested
NA: Test not required
LCS: Laboratory Control Sample

SAMPLE RECEIPT ADVICE

Client Details	
Client	Environmental Investigation Services
Attention	K Taylor, A Billingham

Sample Login Details	
Your Reference	E30116K, Goulburn
Envirolab Reference	161238
Date Sample Received	02/02/2017
Date Instructions Received	02/02/2017
Date Results Expected to be Reported	09/02/2017

Sample Condition	
Samples received in appropriate condition for analysis	YES
No. of Samples Provided	26 soils
Turnaround Time Requested	Standard
Temperature on receipt (°C)	12.1
Cooling Method	Ice
Sampling Date Provided	YES

Comments
Samples will be held for 1 month for water samples and 2 months for soil samples from date of receipt of samples

Please direct any queries to:

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

Sample and Testing Details on following page

Sample Id	VTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Organochlorine Pesticides in soil	Organophosphorus Pesticides	PCBs in Soil	Acid Extractable metals in soil	Asbestos ID - soils	On Hold
BH1-0.1-0.2	✓	✓	✓	✓	✓	✓	✓	✓	
BH1-0.5-0.95									✓
BH1-1.5-1.95	✓	✓	✓				✓		
BH2-0.1-0.2	✓	✓	✓	✓	✓	✓	✓	✓	
BH2-0.7-0.95	✓	✓	✓				✓		
BH3-0.1-0.2	✓	✓	✓	✓	✓	✓	✓	✓	
BH3-0.5-0.95	✓	✓	✓				✓		
BH4-0-0.2	✓	✓	✓	✓	✓	✓	✓	✓	
BH4-0.5-0.95	✓	✓	✓				✓		
BH5-0.2-0.4	✓	✓	✓	✓	✓	✓	✓	✓	
BH5-1.25-1.35	✓	✓	✓				✓		
BH6-0-0.15	✓	✓	✓	✓	✓	✓	✓	✓	
BH6-0.2-0.3									✓
BH6-0.5-0.75	✓	✓	✓				✓		
BH7-0-0.15	✓	✓	✓	✓	✓	✓	✓	✓	
BH7-0.2-0.3									✓
BH7-0.5-0.65	✓	✓	✓				✓		
BH8-0-0.15	✓	✓	✓	✓	✓	✓	✓	✓	
BH8-1.0-1.2									✓
BH8-2.0-2.2	✓	✓	✓				✓		
BH9-0-0.2	✓	✓	✓	✓	✓	✓	✓	✓	
BH9-0.5-0.7	✓	✓	✓				✓		
DUPKT1	✓	✓	✓				✓		
TB	✓								
BH7 (EXTRA)-0.2-0.3									✓
BH8-0.4-0.6									✓

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

Quality Control Definitions

Blank: This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.

Duplicate: This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.

Matrix Spike: A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

LCS (Laboratory Control Sample): This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

Surrogate Spike: Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Laboratory Acceptance Criteria

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

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

Spikes for Physical and Aggregate Tests are not applicable.

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

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

SAMPLE AND CHAIN OF CUSTODY FORM

TO: ENVIROLAB SERVICES PTY LTD 12 ASHLEY STREET CHATSWOOD NSW 2067 P: (02) 99106200 F: (02) 99106201 Attention: Aileen	EIS Job E30116K Number: Date Results STANDARD Required: Page: 1 of 1	FROM: ENVIRONMENTAL INVESTIGATION SERVICES REAR OF 115 WICKS ROAD MACQUARIE PARK, NSW 2113 P: 02-9888 5000 F: 02-9888 5001 Attention: ktaylor@jkgroup.net.au
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Location:		Goulburn		Sample Preserved in Esky on Ice															
Sampler:		K.Taylor & A.Billingham		Tests Required															
Date Sampled	Lab Ref:	Sample Number	Depth (m)	Sample Container	PID	Sample Description	Combo 6a	Combo 3	BTEX										
3/1	1	BH1	0.1-0.2	G, A	0	Fill	X												
	2	↓	0.5-0.95	GA		Fill													
	3	↓	1.5-1.95	G		Nat		X											
	4	BH2	0.1-0.2	GA		fill	X												
	5	↓	0.7-0.95	G		Nat		X											
	6	BH3	0.1-0.2	GA		fill	X												
	7	↓	0.5-0.95	G		Nat		X											
	8	BH4	0-0.2	GA		fill	X												
	9	↓	0.5-0.95	G		Nat		X											
	10	BH5	0.2-0.4	GA		fill	X												
	11	↓	1.25-1.35	G	↓	Nat		X											
	12	BH6	0-0.15	GA	0.8	fill	X												
	13	↓	0.2-0.3	GA	0	Nat													
	14	↓	0.5-0.75	G	0	Nat		X											
	15	BH7	0-0.15	GA	1.1	fill	X												
	16	↓	0.2-0.3	GA	0	fill													
	17	↓	0.5-0.65	G	0	Nat		X											
	18	BH8	0-0.15	GA	0.5	fill	X												
	19	↓	1.0-1.2	GA	0	fill													
	20	↓	2.0-2.2	G	0	Nat		X											
	21	BH9	0-0.2	GA	0.6	fill	X												
	22	↓	0.5-0.7	G	0	Nat.		X											
	23	DUPKT1	-	G	-	fill		X											
	24	TB	-	G	-	Sand.			X										

EnviroLab Services
 12 Ashley St
 Chatswood NSW 2067
 Ph: (02) 9910 6200
 Job No: 161238
 Date Received: 2/2/17
 Time Received: 17:50
 Received by: R
 Temp: Cool/Ambient
 Cooling: Ice/Icepack
 Security: Intact/Broken/None

Remarks (comments/detection limits required):		Sample Containers: G - 250mg Glass Jar A - Ziplock Asbestos Bag P - Plastic Bag	
Relinquished By:	Date:	Time:	Received By:
extra		17:50	R
			Date: 3/2/17

25 BH 7 0.2 - 0.3 (doesn't match jar/sai)
 26 BH 8 0.4 - 0.6
 - BH

Appendix D: Report Explanatory Notes

STANDARD SAMPLING PROCEDURE (SSP)

These protocols specify the basic procedures to be used when sampling soils or groundwater for environmental site assessments undertaken by EIS.

The purpose of these protocols is to provide standard methods for: sampling, decontamination procedures for sampling equipment, sample preservation, sample storage and sample handling. Deviations from these procedures must be recorded.

Soil Sampling

- Prepare a borehole/test pit log or made a note of the sample description for stockpiles.
- Layout sampling equipment on clean plastic sheeting to prevent direct contact with ground surface. The work area should be at a distance from the drill rig/excavator such that the machine can operate in a safe manner.
- Ensure all sampling equipment has been decontaminated prior to use.
- Remove any surface debris from the immediate area of the sampling location.
- Collect samples and place in glass jar with a Teflon seal. This should be undertaken as quickly as possible to prevent the loss of any volatiles. If possible, fill the glass jars completely.
- Collect samples for asbestos analysis and place in a zip-lock plastic bag.
- Label the sampling containers with the EIS job number, sample location (eg. BH1), sampling depth interval and date. If more than one sample container is used, this should also be indicated (eg. 2 = Sample jar 1 of 2 jars).
- Photoionisation detector (PID) screening of volatile organic compounds (VOCs) should be undertaken on samples using the soil sample headspace method. Headspace measurements are taken following equilibration of the headspace gasses in partly filled zip-lock plastic bags. PID headspace data is recorded on the borehole/test pit log and the chain of custody forms.
- Record the lithology of the sample and sample depth on the borehole/test pit log generally in accordance with AS1726-1993¹⁹.
- Store the sample in a sample container cooled with ice or chill packs. On completion of the sampling the sample container should be delivered to the lab immediately or stored in the refrigerator prior to delivery to the lab. All samples are preserved in accordance with the standards outlined in the report.
- Check for the presence of groundwater after completion of each borehole using an electronic dip metre or water whistle. Boreholes should be left open until the end of fieldwork. All groundwater levels in the boreholes should be rechecked on the completion of the fieldwork.
- Backfill the boreholes/test pits with the excavation cuttings or clean sand prior to leaving the site.

Decontamination Procedures for Soil Sampling Equipment

- All sampling equipment should be decontaminated between every sampling location. This excludes single use PVC tubing used for push tubes etc. Equipment and materials required for the decontamination include:
 - Phosphate free detergent (Decon 90);
 - Potable water;
 - Stiff brushes; and
 - Plastic sheets.

¹⁹ Standards Australia, (1993), *Geotechnical Site Investigations*. (AS1726-1993)

- Ensure the decontamination materials are clean prior to proceeding with the decontamination.
- Fill both buckets with clean potable water and add phosphate free detergent to one bucket.
- In the bucket containing the detergent, scrub the sampling equipment until all the material attached to the equipment has been removed.
- Rinse sampling equipment in the bucket containing potable water.
- Place cleaned equipment on clean plastic sheets.

If all materials are not removed by this procedure, high-pressure water cleaning is recommended. If any equipment is not completely decontaminated by both these processes, then the equipment should not be used until it has been thoroughly cleaned.

Groundwater Sampling

Groundwater samples are more sensitive to contamination than soil samples and therefore adherence to this protocol is particularly important to obtain reliable, reproducible results. The recommendations detailed in AS/NZS 5667.1:1998 are considered to form a minimum standard.

The basis of this protocol is to maintain the security of the borehole and obtain accurate and representative groundwater samples. The following procedure should be used for collection of groundwater samples from previously installed groundwater monitoring wells.

- After monitoring well installation, at least three bore volumes should be pumped from the monitoring wells (well development) to remove any water introduced during the drilling process and/or the water that is disturbed during installation of the monitoring well. This should be completed prior to purging and sampling.
- Groundwater monitoring wells should then be left to recharge for at least three days before purging and sampling. Prior to purging or sampling, the condition of each well should be observed and any anomalies recorded on the field data sheets. The following information should be noted: the condition of the well, noting any signs of damage, tampering or complete destruction; the condition and operation of the well lock; the condition of the protective casing and the cement footing (raised or cracked); and, the presence of water between protective casing and well.
- Take the groundwater level from the collar of the piezometer/monitoring well using an electronic dip meter. The collar level should be taken (if required) during the site visit using a dumpy level and staff.
- Purging and sampling of piezometers/monitoring wells is done on the same site visit when using micro-purge (or other low flow) techniques.
- Layout and organize all equipment associated with groundwater sampling in a location where they will not interfere with the sampling procedure and will not pose a risk of contaminating samples. Equipment generally required includes:
 - Micropore filtration system or Stericup single-use filters (for heavy metals samples);
 - Filter paper for Micropore filtration system; Bucket with volume increments;
 - Sample containers: teflon bottles with 1 ml nitric acid, 75mL glass vials with 1 mL hydrochloric acid, 1 L amber glass bottles;
 - Bucket with volume increments;
 - Flow cell;
 - pH/EC/Eh/T meters;
 - Plastic drums used for transportation of purged water;
 - Esky and ice;
 - Nitrile gloves;
 - Distilled water (for cleaning);
 - Electronic dip meter;

- Low flow pump pack and associated tubing; and
- Groundwater sampling forms.
- If single-use stericup filtration is not used, clean the Micropore filtration system thoroughly with distilled water prior to use and between each sample. Filter paper should be changed between samples. 0.45um filter paper should be placed below the glass fibre filter paper in the filtration system.
- Ensure all non-disposable sampling equipment is decontaminated or that new disposable equipment is available prior to any work commencing at a new location. The procedure for decontamination of groundwater equipment is outlined at the end of this section.
- Disposable gloves should be used whenever samples are taken to protect the sampler and to assist in avoidance of contamination.
- Groundwater samples are obtained from the monitoring wells using low flow/micro-purge sampling equipment to reduce the disturbance of the water column and loss of volatiles.
- During pumping to purge the well, the pH, temperature, conductivity, dissolved oxygen, redox potential and groundwater levels are monitored (where possible) using calibrated field instruments to assess the development of steady state conditions. Steady state conditions are generally considered to have been achieved when the difference in the pH measurements was less than 0.2 units and the difference in conductivity was less than 10%.
- All measurements are recorded on specific data sheets.
- Once steady state conditions are considered to have been achieved, groundwater samples are obtained directly from the pump tubing and placed in appropriate glass bottles, BTEX vials or plastic bottles.
- All samples are preserved in accordance with water sampling requirements detailed in the NEPM 2013 and placed in an insulated container with ice. Groundwater samples are preserved by immediate storage in an insulated sample container with ice as outlined in the report text.
- Record the sample on the appropriate log in accordance with AS1726:1993. At the end of each water sampling complete a chain of custody form.

Decontamination Procedures for Groundwater Sampling Equipment

- All equipment associated with the groundwater sampling procedure (other than single-use items) should be decontaminated between every sampling location.
- The following equipment and materials are required for the decontamination procedure:
 - Phosphate free detergent;
 - Potable water;
 - Distilled water; and
 - Plastic Sheets or bulk bags (plastic bags).
- Fill one bucket with clean potable water and phosphate free detergent, and one bucket with distilled water.
- Flush potable water and detergent through pump head. Wash sampling equipment and pump head using brushes in the bucket containing detergent until all materials attached to the equipment are removed.
- Flush pump head with distilled water.
- Change water and detergent solution after each sampling location.
- Rinse sampling equipment in the bucket containing distilled water.
- Place cleaned equipment on clean plastic sheets.
- If all materials are not removed by this procedure that equipment should not be used until it has been thoroughly cleaned

QA/QC DEFINITIONS

The QA/QC terms used in this report are defined below. The definitions are in accordance with US EPA publication SW-846, entitled *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods* (1994²⁰) methods and those described in *Environmental Sampling and Analysis, A Practical Guide*, (H. Keith 1991²¹).

Practical Quantitation Limit (PQL), Limit of Reporting (LOR) & Estimated Quantitation Limit (EQL)

These terms all refer to the concentration above which results can be expressed with a minimum 95% confidence level. The laboratory reporting limits are generally set at ten times the standard deviation for the Method Detection limit (MDL) for each specific analyte. For the purposes of this report the LOR, PQL, and EQL are considered to be equivalent.

When assessing laboratory data it should be borne in mind that values at or near the PQL have two important limitations.

“The uncertainty of the measurement value can approach, and even equal, the reported value. Secondly, confirmation of the analytes reported is virtually impossible unless identification uses highly selective methods. These issues diminish when reliably measurable amounts of analytes are present. Accordingly, legal and regulatory actions should be limited to data at or above the reliable detection limit” Keith 1991.

Precision

The degree to which data generated from repeated measurements differ from one another due to random errors. Precision is measured using the standard deviation or Relative Percent Difference (RPD). Acceptable targets for precision in this report will be less than 50% RPD for concentrations greater than ten times the PQL, less than 75% RPD for concentrations between five and ten times the PQL and less than 100% RPD for concentrations that are less than five times the PQL.

Accuracy

Accuracy is a measure of the agreement between an experimental result and the true value of the parameter being measured. The assessment of accuracy for an analysis can be achieved through the analysis of known reference materials or assessed by the analysis of surrogates, field blanks, trip spikes and matrix spikes.

The proximity of an averaged result to the true value, where all random errors have been statistically removed. Accuracy is measured by percent recovery. Acceptable limits for accuracy generally lie between 70% to 130% recoveries. Certain laboratory methods may allow for values that lie outside these limits.

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents a characteristic of a population, parameter variations at a sampling point, or an environmental condition. Representativeness is primarily dependent upon the design and implementation of the sampling program. Representativeness of the data is partially ensured by the avoidance of contamination, adherence to sample handling and analysis protocols and use of proper chain-of-custody and documentation procedures.

²⁰ US EPA, (1994), *SW-846: Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*. (US EPA SW-846)

²¹ Keith., H, (1991), *Environmental Sampling and Analysis, A Practical Guide*.

Completeness

Completeness is a measure of the number of valid measurements in a data set compared to the total number of measurements made and overall performance against DQIs. The following information is assessed for completeness:

- Chain-of-custody forms; Sample receipt form;
- All sample results reported; All blank data reported;
- All laboratory duplicate and RPDs calculated;
- All surrogate spike data reported;
- All matrix spike and lab control spike (LCS) data reported and RPDs calculated;
- Spike recovery acceptable limits reported; and
- NATA stamp on reports.

Comparability

Comparability is the evaluation of the similarity of conditions (eg. sample depth, sample homogeneity) under which separate sets of data are produced. Data comparability checks include a bias assessment that may arise from the following sources:

- Collection and analysis of samples by different personnel; Use of different techniques;
- Collection and analysis by the same personnel using the same methods but at different times; and
- Spatial and temporal changes (due to environmental dynamics).

Blanks

The purpose of laboratory and field blanks is to check for artifacts and interferences that may arise during sampling and analysis.

Matrix Spikes

Samples are spiked with laboratory grade standards to detect interactive effects between the sample matrix and the analytes being measured. Matrix Spikes are reported as a percent recovery and are prepared for 1 in every 20 samples. Sample batches that contain less than 20 samples may be reported with a Matrix Spike from another batch. The percent recovery is calculated using the formula below. Acceptable recovery limits are 70% to 130%.

$$\frac{(\text{Spike Sample Result} - \text{Sample Result}) \times 100}{\text{Concentration of Spike Added}}$$

Surrogate Spikes

Samples are spiked with a known concentration of compounds that are chemically related to the analyte being investigated but unlikely to be detected in the environment. The purpose of the Surrogate Spikes is to check the accuracy of the analytical technique. Surrogate Spikes are reported as percent recovery.

Duplicates

Laboratory duplicates measure precision, expressed as Relative Percent Difference. Duplicates are prepared from a single field sample and analysed as two separate extraction procedures in the laboratory. The RPD is calculated using the formula where D1 is the sample concentration and D2 is the duplicate sample concentration:

$$\frac{(D1 - D2) \times 100}{\{(D1 + D2)/2\}}$$