eurofins | mgt

Certificate of Analysis

Core Consultants Pty Ltd
55 Kingford Smith Parade
Maroochydore
QLD 4558

NATA Accredited
Accreditation Number 1261
Site Number 20794 & 14271

Accredited for compliance with ISO/IEC 17025.
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Attention: **Josh Mitchell**

Report **491942-S**
Project name INFILTRATION BASIN
Project ID J000196
Received Date Mar 07, 2016

Client Sample ID			M01 **BH1 0.0-0.05**	M01 **BH1 0.05-0.2**	M01 **BH1 0.4-0.5**
Sample Matrix			**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**B16-Ma06762**	**B16-Ma06763**	**B16-Ma06764**
Date Sampled			**Mar 04, 2016**	**Mar 04, 2016**	**Mar 04, 2016**
Test/Reference	LOR	Unit			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions					
TRH C6-C9	20	mg/kg	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	91	< 50	< 50
TRH C29-C36	50	mg/kg	130	< 50	< 50
TRH C10-36 (Total)	50	mg/kg	220	< 50	< 50
BTEX					
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	55	54	115
Total Recoverable Hydrocarbons - 2013 NEPM Fractions					
Naphthalene N02	0.5	mg/kg	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	120	< 100	< 100
TRH >C34-C40	100	mg/kg	140	< 100	< 100
Total Recoverable Hydrocarbons - 2013 NEPM Fractions					
TRH C6-C10 less BTEX (F1) N04	20	mg/kg	< 20	< 20	< 20
TRH >C10-C16 less Naphthalene (F2) N01	50	mg/kg	< 50	< 50	< 50
Nitrate & Nitrite (as N)	5	mg/kg	< 5	< 5	< 5
Total Kjeldahl Nitrogen (as N)	10	mg/kg	3200	< 10	< 10
Total Nitrogen (as N)	10	mg/kg	3200	< 10	< 10
Phosphorus	5	mg/kg	1000	< 100	< 100
% Moisture	1	%	75	18	18
Particle Size Distribution by Sieve and Hydrometer			-	see attached	see attached
Heavy Metals					
Arsenic	2	mg/kg	9.4	< 2	< 2
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	34	< 5	< 5
Copper	5	mg/kg	44	< 5	< 5
Lead	5	mg/kg	35	< 5	< 5

Client Sample ID			[M01]BH1 0.0-0.05	[M01]BH1 0.05-0.2	[M01]BH1 0.4-0.5
Sample Matrix			**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**B16-Ma06762**	**B16-Ma06763**	**B16-Ma06764**
Date Sampled			**Mar 04, 2016**	**Mar 04, 2016**	**Mar 04, 2016**
Test/Reference	LOR	Unit			
Heavy Metals					
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	17	< 5	< 5
Zinc	5	mg/kg	340	5.3	< 5
Pathogens					
E.coli	1	MPN/g	45	20	<10
Thermotolerant Coliforms	1	MPN/g	[M10]>16000	[M10]700	[M10]45

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Eurofins | mgt Suite B6			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Melbourne	Mar 10, 2016	14 Day
- Method: TRH C6-C36 - LTM-ORG-2010			
BTEX	Melbourne	Mar 09, 2016	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Mar 09, 2016	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Mar 10, 2016	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Metals M8	Melbourne	Mar 09, 2016	28 Day
- Method: LTM-MET-3030 by ICP-OES (hydride ICP-OES for Mercury)			
Total Nitrogen Set (as N)			
Nitrate & Nitrite (as N)	Melbourne	Mar 10, 2016	28 Day
- Method: APHA 4500-NO3/NO2 Nitrate-Nitrite Nitrogen by FIA			
Total Kjeldahl Nitrogen (as N)	Melbourne	Mar 10, 2016	28 Day
- Method: APHA 4500 TKN			
Phosphorus	Melbourne	Mar 11, 2016	180 Day
- Method: USEPA 6010			
E.coli	Melbourne	Mar 11, 2016	72 Hour
- Method: LTM-MIC-6621			
Thermotolerant Coliforms	Melbourne	Mar 11, 2016	72 Hour
- Method: Inhouse: Thermotolerant Coliforms in Soil by MPN*			
% Moisture	Melbourne	Mar 08, 2016	14 Day
- Method: LTM-GEN-7080 Moisture			

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Company Name: Core Consultants Pty Ltd
Address: 55 Kingford Smith Parade
Maroochydore
QLD 4558

Project Name: INFILTRATION BASIN
Project ID: J000196

Order No.:
Report #: 491942
Phone: 07 5475 5900
Fax:

Received: Mar 7, 2016 3:30 PM
Due: Mar 14, 2016
Priority: 5 Day
Contact Name: Josh Mitchell

Eurofins | mgt Client Manager: Ryan Gilbert

Sample Detail					E.coli	Particle Size Distribution by Sieve and Hydrometer	Phosphorus	Thermotolerant Coliforms	Total Nitrogen Set (as N)	Moisture Set	Eurofins | mgt Suite B6
Laboratory where analysis is conducted											
Melbourne Laboratory - NATA Site # 1254 & 14271					X		X	X	X	X	X
Sydney Laboratory - NATA Site # 18217											
Brisbane Laboratory - NATA Site # 20794											
External Laboratory						X					
Sample ID	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**							
BH1 0.0-0.05	Mar 04, 2016		Soil	B16-Ma06762	X		X	X	X	X	X
BH1 0.05-0.2	Mar 04, 2016		Soil	B16-Ma06763	X	X	X	X	X	X	X
BH1 0.4-0.5	Mar 04, 2016		Soil	B16-Ma06764	X	X	X	X	X	X	X

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
4. Results are uncorrected for matrix spikes or surrogate recoveries.
5. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
6. Samples were analysed on an 'as received' basis. 7. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Advice.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per Kilogram

mg/l: milligrams per litre

ug/l: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100ml: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery
CRM	Certified Reference Material - reported as percent recovery
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands. In the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
Batch Duplicate	A second piece of analysis from a sample outside of the clients batch of samples but run within the laboratory batch of analysis.
Batch SPIKE	Spike recovery reported on a sample from outside of the clients batch of samples but run within the laboratory batch of analysis.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
ASLP	Australian Standard Leaching Procedure (Eurofins | mgt uses NATA accredited in-house method LTM-GEN-7010)
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries : Recoveries must lie between 50-150% - Phenols 20-130%.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/kg	< 20			20	Pass	
TRH C10-C14	mg/kg	< 20			20	Pass	
TRH C15-C28	mg/kg	< 50			50	Pass	
TRH C29-C36	mg/kg	< 50			50	Pass	
Method Blank							
BTEX							
Benzene	mg/kg	< 0.1			0.1	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Xylenes - Total	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
TRH >C10-C16	mg/kg	< 50			50	Pass	
TRH >C16-C34	mg/kg	< 100			100	Pass	
TRH >C34-C40	mg/kg	< 100			100	Pass	
Method Blank							
Nitrate & Nitrite (as N)	mg/kg	< 5			5	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	78			70-130	Pass	
TRH C10-C14	%	90			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	88			70-130	Pass	
Toluene	%	77			70-130	Pass	
Ethylbenzene	%	76			70-130	Pass	
m&p-Xylenes	%	75			70-130	Pass	
Xylenes - Total	%	75			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	91			70-130	Pass	
TRH C6-C10	%	71			70-130	Pass	
TRH >C10-C16	%	88			70-130	Pass	
LCS - % Recovery							
Nitrate & Nitrite (as N)	%	107			70-130	Pass	
LCS - % Recovery							

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Heavy Metals									
Arsenic			%	88			80-120	Pass	
Cadmium			%	88			80-120	Pass	
Chromium			%	93			80-120	Pass	
Copper			%	88			80-120	Pass	
Lead			%	93			80-120	Pass	
Mercury			%	112			75-125	Pass	
Nickel			%	94			80-120	Pass	
Zinc			%	93			80-120	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	B16-Ma07108	NCP	%	78			70-130	Pass	
TRH C10-C14	M16-Ma04835	NCP	%	89			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	B16-Ma07108	NCP	%	84			70-130	Pass	
Toluene	B16-Ma07108	NCP	%	80			70-130	Pass	
Ethylbenzene	B16-Ma07108	NCP	%	81			70-130	Pass	
m&p-Xylenes	B16-Ma07108	NCP	%	83			70-130	Pass	
o-Xylene	B16-Ma07108	NCP	%	80			70-130	Pass	
Xylenes - Total	B16-Ma07108	NCP	%	82			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	B16-Ma07108	NCP	%	71			70-130	Pass	
TRH C6-C10	B16-Ma07108	NCP	%	71			70-130	Pass	
TRH >C10-C16	M16-Ma04835	NCP	%	87			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	B16-Ma06762	CP	%	100			75-125	Pass	
Cadmium	B16-Ma06762	CP	%	91			75-125	Pass	
Chromium	B16-Ma06762	CP	%	96			75-125	Pass	
Copper	B16-Ma06762	CP	%	103			75-125	Pass	
Lead	B16-Ma06762	CP	%	96			75-125	Pass	
Mercury	B16-Ma06762	CP	%	104			70-130	Pass	
Nickel	B16-Ma06762	CP	%	94			75-125	Pass	
Zinc	B16-Ma06762	CP	%	91			75-125	Pass	
Spike - % Recovery									
				Result 1					
Nitrate & Nitrite (as N)	B16-Ma06763	CP	%	89			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	B16-Ma07117	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	M16-Ma04804	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	M16-Ma04804	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	M16-Ma04804	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	B16-Ma07117	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	B16-Ma07117	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	B16-Ma07117	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	B16-Ma07117	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	

Duplicate									
BTEX				Result 1	Result 2	RPD			
o-Xylene	B16-Ma07117	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	B16-Ma07117	NCP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	B16-Ma07117	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	B16-Ma07117	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH >C10-C16	M16-Ma04804	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	M16-Ma04804	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	M16-Ma04804	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Nitrate & Nitrite (as N)	B16-Ma06762	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	B16-Ma06762	CP	mg/kg	9.4	15	43	30%	Fail	Q15
Cadmium	B16-Ma06762	CP	mg/kg	< 0.4	0.7	83	30%	Fail	Q15
Chromium	B16-Ma06762	CP	mg/kg	34	34	1.0	30%	Pass	
Copper	B16-Ma06762	CP	mg/kg	44	45	<1	30%	Pass	
Lead	B16-Ma06762	CP	mg/kg	35	34	4.0	30%	Pass	
Mercury	B16-Ma06762	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	B16-Ma06762	CP	mg/kg	17	17	3.0	30%	Pass	
Zinc	B16-Ma06762	CP	mg/kg	340	350	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	B16-Ma06764	CP	%	18	18	1.0	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
M01	Microbiological Testing performed outside the recommended holding time
M10	NATA accreditation does not cover the performance of this service in soil matrices
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
Q15	The RPD reported passes Eurofins | mgt's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.

Authorised By

Ryan Gilbert	Analytical Services Manager
Emily Rosenberg	Senior Analyst-Metal (VIC)
Harry Bacalis	Senior Analyst-Volatile (VIC)
Huong Le	Senior Analyst-Inorganic (VIC)
Ian Bolch	Senior Analyst-Microbiology (VIC)
Mele Singh	Senior Analyst-Organic (VIC)

Glenn Jackson

National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Uncertainty data is available on request

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