

CLIENT DETAILS

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Project **10638 / MB - 74198**
Order Number (Not specified)
Samples 1

LABORATORY DETAILS

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SGS Reference PE052926 R0
Report Number 0000008034
Date Reported 18 Oct 2010

COMMENTS

The document is issued in accordance with NATA's accreditation requirements.
Accredited for compliance with ISO/IEC 17025. NATA accredited laboratory 2562(898).

SIGNATORIES



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Inorganic Team Leader - Soils



Lee-Anne Pedrick
Metals Team Leader



Said Hirad
Laboratory Manager

		Sample Number	PE052926.001
		Sample Matrix	Soil
		Sample Date	04 Oct 2010
		Sample Name	74198
Parameter	Units	LOR	

Moisture Content Method: AN234

% Moisture	%	0.5	-
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TCLP (Toxicity Characteristic Leaching Procedure) Method: AN006

pH 1:20	pH Units	-	8.6
pH 1:20 plus HCL	pH Units	-	2.1
pH TCLP after 18 hours	pH Units	-	5.0
Solution Used	No unit	-	1

Mercury in Soil by TCLP Extract Method: AN311

Mercury	mg/L	0.0005	<0.0005
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Metals in Soil (TCLP) by ICPOES Method: AN321

Arsenic, As	mg/L	0.02	0.036
Cadmium, Cd	mg/L	0.001	0.001
Chromium, Cr	mg/L	0.005	<0.005
Copper, Cu	mg/L	0.005	0.69
Iron, Fe	mg/L	0.02	2.6
Lead, Pb	mg/L	0.005	<0.005
Manganese, Mn	mg/L	0.005	13
Nickel, Ni	mg/L	0.005	0.058
Zinc, Zn	mg/L	0.01	0.87

Net Acid Generation Potential (NAGP) Method: AN215

Total Oxidisable Sulphur	kg H ₂ SO ₄ /T	0.25	3.5
Net Acid Production Potential	kg H ₂ SO ₄ /T	-	<0

Single Addition Net Acid Generation (NAG) Method: AN216

pHox (NAG pH)	No unit	-	6.4
ECox (NAG Conductivity)	µS/cm	1	110
NAG as kg H ₂ SO ₄ /tonne to pH 4.5	kg H ₂ SO ₄ /T	0.5	<0.5
NAG as kg H ₂ SO ₄ /tonne to pH 7	kg H ₂ SO ₄ /T	0.5	<0.5
NAG as kg CaCO ₃ /tonne to pH 4.5	kg CaCO ₃ /T	1	<1.0
NAG as kg CaCO ₃ /tonne to pH 7	kg CaCO ₃ /T	1	<1.0

Acid Neutralising Capacity or Neutralisation Potential(ANC/NP) Method: AN212

ANC as % CaCO ₃	% CaCO ₃	0.1	1.1
ANC as % CaMg(CO ₃) ₂	%w/w	0.1	1.2
Acid Neutralisation Capacity/Neutralisation Potential	kg CaCO ₃ /T	1	11
Acid Neutralisation Capacity/Neutralisation Potential kg	kg H ₂ SO ₄ /T	1	11
Acid Neutralisation Capacity/Neutralisation Potential	kg CaCO ₃ /T	1	11
Acid Neutralisation Capacity/Neutralisation Potential kg	kg H ₂ SO ₄ /T	1	11

Total Carbon/Sulphur in soil by LECO Method: CSA06V

Sulphur*	%	0.005	0.121
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ANALYTICAL REPORT

PE052926 R0

		Sample Number	PE052926.001
		Sample Matrix	Soil
		Sample Date	04 Oct 2010
		Sample Name	74198
Parameter	Units	LOR	

pH in soil Method: AN101

pH	No unit	-	8.1
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Conductivity and TDS by Calculation - Soil Method: AN106

Conductivity	µS/cm	1	68
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HCl Extractable S, Ca and Mg in Soil ICP OES Method: AN014

Acid Soluble Sulphur (SHCl)*	%w/w	0.005	0.007
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MB blank results are compared to the Limit of Reporting

LCS and MS spike recoveries are measured as the percentage of analyte recovered from the sample compared the the amount of analyte spiked into the sample.

DUP and MSD relative percent differences are measured against their original counterpart samples according to the formula: *the absolute difference of the two results divided by the average of the two results as a percentage*. Where the DUP RPD is 'NA', the results are less than the LOR and thus the RPD is not applicable.

Acid Neutralising Capacity or Neutralisation Potential(ANC/NP) Method: ME-(AU)-[ENV]AN212

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
ANC as % CaCO ₃	LB007422	% CaCO ₃	0.1	<0.1		
ANC as % CaMg(CO ₃) ₂	LB007422	%w/w	0.1	<0.1		
Acid Neutralisation Capacity/Neutralisation Potential	LB007422	kg	1	<1.0	1%	NA
Acid Neutralisation Capacity/Neutralisation Potential kg H ₂ SO ₄ /t	LB007422	kg	1	<1.0	1%	NA
Acid Neutralisation Capacity/Neutralisation Potential Siderite	LB007422	kg	1	<1.0	1%	NA
Acid Neutralisation Capacity/Neutralisation Potential kg H ₂ SO ₄ /t	LB007422	kg	1	<1.0	1%	NA

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

Parameter	QC Reference	Units	LOR	MB	DUP %RPD
Conductivity	LB007414	µS/cm	1	<1	0%

HCl Extractable S, Ca and Mg in Soil ICP OES Method: ME-(AU)-[ENV]AN014

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
Acid Soluble Sulphur (SHCl)*	LB007445	%w/w	0.005	<0.005	3%	NA

Mercury in Soil by TCLP Extract Method: ME-(AU)-[ENV]AN311

Parameter	QC Reference	Units	LOR	MB	DUP %RPD
Mercury	LB007435	mg/L	0.0005	<0.0005	0%

Metals in Soil (TCLP) by ICPOES Method: ME-(AU)-[ENV]AN321

Parameter	QC Reference	Units	LOR	MB	DUP %RPD
Arsenic, As	LB007434	mg/L	0.02	<0.020	9%
Cadmium, Cd	LB007434	mg/L	0.001	<0.001	13%
Chromium, Cr	LB007434	mg/L	0.005	<0.005	0%
Copper, Cu	LB007434	mg/L	0.005	<0.005	10%
Iron, Fe	LB007434	mg/L	0.02	<0.02	14%
Lead, Pb	LB007434	mg/L	0.005	<0.005	0%
Manganese, Mn	LB007434	mg/L	0.005	<0.005	13%
Nickel, Ni	LB007434	mg/L	0.005	<0.005	7%
Zinc, Zn	LB007434	mg/L	0.01	<0.01	5%

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

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
pH	LB007413	No unit	-	6.3	0%	100%

Single Addition Net Acid Generation (NAG) Method: ME-(AU)-[ENV]AN216

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
pHox (NAG pH)	LB007423	No unit	-	5.4	3%	NA
ECox (NAG Conductivity)	LB007423	µS/cm	1	24	8%	NA
NAG as kg H ₂ SO ₄ /tonne to pH 4.5	LB007423	kg	0.5	<0.5		
NAG as kg H ₂ SO ₄ /tonne to pH 7	LB007423	kg	0.5	<0.5		
NAG as kg CaCO ₃ /tonne to pH 4.5	LB007423	kg	1	<1.0		
NAG as kg CaCO ₃ /tonne to pH 7	LB007423	kg	1	<1.0		

MB blank results are compared to the Limit of Reporting

LCS and MS spike recoveries are measured as the percentage of analyte recovered from the sample compared the the amount of analyte spiked into the sample.

DUP and MSD relative percent differences are measured against their original counterpart samples according to the formula: *the absolute difference of the two results divided by the average of the two results as a percentage*. Where the DUP RPD is 'NA' , the results are less than the LOR and thus the RPD is not applicable.

TCLP (Toxicity Characteristic Leaching Procedure) Method: ME-(AU)-[ENV]AN006

Parameter	QC Reference	Units	LOR	DUP %RPD
pH 1:20	LB007431	pH Units	-	0%
pH 1:20 plus HCL	LB007431	pH Units	-	0%
pH TCLP after 18 hours	LB007431	pH Units	-	0%
Solution Used	LB007431	No unit	-	0%

METHOD

METHODOLOGY SUMMARY

AN101	pH in Soil Sludge Sediment and Water: pH is measured electrometrically using a combination electrode (glass plus reference electrode) and is calibrated against 3 buffers purchased commercially. For soils, an extract with water is made at a ratio of 1:5 and the pH determined and reported on the extract. Reference APHA 4500-H+.
AN106	Conductivity and TDS by Calculation: Conductivity is measured by meter with temperature compensation and is calibrated against a standard solution of potassium chloride. Conductivity is generally reported as $\mu\text{mhos/cm}$ or $\mu\text{S/cm}$ @ 25°C. For soils, an extract with water is made at a ratio of 1:5 and the EC determined and reported on the extract, or calculated back to the as-received sample. Salinity can be estimated from conductivity using a conversion factor, which for natural waters, is in the range 0.55 to 0.75. Reference APHA 2520 B.
AN215	This is purely a calculation based on results obtained from Total Sulphur, Sulphate Method, and Acid Neutralisation Capacity Method (ME-(AU)-[ENV]AN214).
AN234	The test is carried out by drying (at either 40°C or 105°C) a known mass of sample in a weighed evaporating basin. After fully dry the sample is re-weighed. Samples such as sludge and sediment having high percentages of moisture will take some time in a drying oven for complete removal of water.

FOOTNOTES

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

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

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

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