

CLIENT DETAILS

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Project **44600**
 Order Number **44600**
 Samples 2

LABORATORY DETAILS

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SGS Reference **SE192558 R0**
 Date Received 09 May 2019
 Date Reported 16 May 2019

COMMENTS

Accredited for compliance with ISO/IEC 17025 - Testing. NATA accredited laboratory 2562(4354).

SIGNATORIES



Ly Kim Ha
 Organic Section Head



Shane McDermott
 Inorganic/Metals Chemist

	Sample Number	SE192558.001	SE192558.002
	Sample Matrix	Water	Water
	Sample Date	04 May 2019	04 May 2019
	Sample Name	Drainage 5	Sedimentation 6
Parameter	Units	LOR	

OC Pesticides in Water Method: AN420 Tested: 10/5/2019

Hexachlorobenzene (HCB)	µg/L	0.1	<0.1	<0.1
Alpha BHC	µg/L	0.1	<0.1	<0.1
Lindane (gamma BHC)	µg/L	0.1	<0.1	<0.1
Heptachlor	µg/L	0.1	<0.1	<0.1
Aldrin	µg/L	0.1	<0.1	<0.1
Beta BHC	µg/L	0.1	<0.1	<0.1
Delta BHC	µg/L	0.1	<0.1	<0.1
Heptachlor epoxide	µg/L	0.1	<0.1	<0.1
o,p'-DDE	µg/L	0.1	<0.1	<0.1
Alpha Endosulfan	µg/L	0.1	<0.1	<0.1
Gamma Chlordane	µg/L	0.1	<0.1	<0.1
Alpha Chlordane	µg/L	0.1	<0.1	<0.1
trans-Nonachlor	µg/L	0.1	<0.1	<0.1
p,p'-DDE	µg/L	0.1	<0.1	<0.1
Dieldrin	µg/L	0.1	<0.1	<0.1
Endrin	µg/L	0.1	<0.1	<0.1
o,p'-DDD	µg/L	0.1	<0.1	<0.1
o,p'-DDT	µg/L	0.1	<0.1	<0.1
Beta Endosulfan	µg/L	0.1	<0.1	<0.1
p,p'-DDD	µg/L	0.1	<0.1	<0.1
p,p'-DDT	µg/L	0.1	<0.1	<0.1
Endosulfan sulphate	µg/L	0.1	<0.1	<0.1
Endrin aldehyde	µg/L	0.1	<0.1	<0.1
Methoxychlor	µg/L	0.1	<0.1	<0.1
Endrin ketone	µg/L	0.1	<0.1	<0.1
Isodrin	µg/L	0.1	<0.1	<0.1
Mirex	µg/L	0.1	<0.1	<0.1

Surrogates

Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-	69	66
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OP Pesticides in Water Method: AN420 Tested: 10/5/2019

Dichlorvos	µg/L	0.5	<0.5	<0.5
Dimethoate	µg/L	0.5	<0.5	<0.5
Diazinon (Dimpylate)	µg/L	0.5	<0.5	<0.5
Fenitrothion	µg/L	0.2	<0.2	<0.2
Malathion	µg/L	0.2	<0.2	<0.2
Chlorpyrifos (Chlorpyrifos Ethyl)	µg/L	0.2	<0.2	<0.2
Parathion-ethyl (Parathion)	µg/L	0.2	<0.2	<0.2
Bromophos Ethyl	µg/L	0.2	<0.2	<0.2
Methodathion	µg/L	0.5	<0.5	<0.5
Ethion	µg/L	0.2	<0.2	<0.2
Azinphos-methyl	µg/L	0.2	<0.2	<0.2

Surrogates

2-fluorobiphenyl (Surrogate)	%	-	62	66
d14-p-terphenyl (Surrogate)	%	-	80	88

Parameter	Units	LOR
Sample Number	SE192558.001	SE192558.002
Sample Matrix	Water	Water
Sample Date	04 May 2019	04 May 2019
Sample Name	Drainage 5	Sedimentation 6

Anions by Ion Chromatography in Water Method: AN245 Tested: 10/5/2019

Nitrate Nitrogen, NO3-N	mg/L	0.005	0.87	0.89
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Nitrite in Water Method: AN277 Tested: 10/5/2019

Nitrite Nitrogen, NO2 as N	mg/L	0.005	0.016	0.018
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TKN Kjeldahl Digestion by Discrete Analyser Method: AN281/AN292(Sydney only) Tested: 15/5/2019

Total Kjeldahl Nitrogen	mg/L	0.05	1.6	1.9
Total Nitrogen (calc)	mg/L	0.05	2.5	2.8

Total Phosphorus by Kjeldahl Digestion DA in Water Method: AN279/AN293(Sydney only) Tested: 15/5/2019

Total Phosphorus (Kjeldahl Digestion) as P	mg/L	0.02	0.24	0.21
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Total and Volatile Suspended Solids (TSS / VSS) Method: AN114 Tested: 10/5/2019

Total Suspended Solids Dried at 103-105°C	mg/L	5	220	210
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Oil and Grease in Water Method: AN185 Tested: 10/5/2019

Oil and Grease	mg/L	5	<5	<5
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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.

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

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
Nitrate Nitrogen, NO3-N	LB173397	mg/L	0.005	<0.005	0 - 22%	94%

Nitrite in Water Method: ME-(AU)-[ENV]AN277

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Nitrite Nitrogen, NO2 as N	LB173415	mg/L	0.005	<0.005	0%	98%	90%

OC Pesticides in Water Method: ME-(AU)-[ENV]AN420

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
Hexachlorobenzene (HCB)	LB173402	µg/L	0.1	<0.1	NA
Alpha BHC	LB173402	µg/L	0.1	<0.1	NA
Lindane (gamma BHC)	LB173402	µg/L	0.1	<0.1	NA
Heptachlor	LB173402	µg/L	0.1	<0.1	100%
Aldrin	LB173402	µg/L	0.1	<0.1	80%
Beta BHC	LB173402	µg/L	0.1	<0.1	NA
Delta BHC	LB173402	µg/L	0.1	<0.1	103%
Heptachlor epoxide	LB173402	µg/L	0.1	<0.1	NA
o,p'-DDE	LB173402	µg/L	0.1	<0.1	NA
Alpha Endosulfan	LB173402	µg/L	0.1	<0.1	NA
Gamma Chlordane	LB173402	µg/L	0.1	<0.1	NA
Alpha Chlordane	LB173402	µg/L	0.1	<0.1	NA
trans-Nonachlor	LB173402	µg/L	0.1	<0.1	NA
p,p'-DDE	LB173402	µg/L	0.1	<0.1	NA
Dieldrin	LB173402	µg/L	0.1	<0.1	109%
Endrin	LB173402	µg/L	0.1	<0.1	111%
o,p'-DDD	LB173402	µg/L	0.1	<0.1	NA
o,p'-DDT	LB173402	µg/L	0.1	<0.1	NA
Beta Endosulfan	LB173402	µg/L	0.1	<0.1	NA
p,p'-DDD	LB173402	µg/L	0.1	<0.1	NA
p,p'-DDT	LB173402	µg/L	0.1	<0.1	104%
Endosulfan sulphate	LB173402	µg/L	0.1	<0.1	NA
Endrin aldehyde	LB173402	µg/L	0.1	<0.1	NA
Methoxychlor	LB173402	µg/L	0.1	<0.1	NA
Endrin ketone	LB173402	µg/L	0.1	<0.1	NA
Isodrin	LB173402	µg/L	0.1	<0.1	NA
Mirex	LB173402	µg/L	0.1	<0.1	NA

Surrogates

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
Tetrachloro-m-xylene (TCMX) (Surrogate)	LB173402	%	-	81%	52%

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 to 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.

Oil and Grease in Water Method: ME-(AU)-[ENV]AN185

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
Oil and Grease	LB173408	mg/L	5	<5	92%

OP Pesticides in Water Method: ME-(AU)-[ENV]AN420

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
Dichlorvos	LB173402	µg/L	0.5	<0.5	105%
Dimethoate	LB173402	µg/L	0.5	<0.5	NA
Diazinon (Dimpylate)	LB173402	µg/L	0.5	<0.5	107%
Fenitrothion	LB173402	µg/L	0.2	<0.2	NA
Malathion	LB173402	µg/L	0.2	<0.2	NA
Chlorpyrifos (Chlorpyrifos Ethyl)	LB173402	µg/L	0.2	<0.2	107%
Parathion-ethyl (Parathion)	LB173402	µg/L	0.2	<0.2	NA
Bromophos Ethyl	LB173402	µg/L	0.2	<0.2	NA
Methidathion	LB173402	µg/L	0.5	<0.5	NA
Ethion	LB173402	µg/L	0.2	<0.2	100%
Azinphos-methyl	LB173402	µg/L	0.2	<0.2	NA

Surrogates

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
2-fluorobiphenyl (Surrogate)	LB173402	%	-	66%	68%
d14-p-terphenyl (Surrogate)	LB173402	%	-	68%	74%

TKN Kjeldahl Digestion by Discrete Analyser Method: ME-(AU)-[ENV]AN281/AN292(Sydney only)

Parameter	QC Reference	Units	LOR	DUP %RPD	MS %Recovery
Total Kjeldahl Nitrogen	LB173740	mg/L	0.05	5%	106%
Total Nitrogen (calc)	LB173740	mg/L	0.05		NA

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.

Total and Volatile Suspended Solids (TSS / VSS) Method: ME-(AU)-[ENV]AN114

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
Total Suspended Solids Dried at 103-105°C	LB173395	mg/L	5	<5	11%	100%

Total Phosphorus by Kjeldahl Digestion DA in Water Method: ME-(AU)-[ENV]AN279/AN293(Sydney only)

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Total Phosphorus (Kjeldahl Digestion) as P	LB173740	mg/L	0.02	<0.02	0%	101%	98%

METHOD

METHODOLOGY SUMMARY

AN114	<p>Total Suspended and Volatile Suspended Solids: The sample is homogenised by shaking and a known volume is filtered through a pre-weighed GF/C filter paper and washed well with deionised water. The filter paper is dried and reweighed. The TSS is the residue retained by the filter per unit volume of sample. Reference APHA 2540 D. Internal Reference AN114</p>
AN185	<p>Gravimetric Oil & Grease and Hydrocarbons: A known volume of sample is extracted using an organic solvent and the solvent layer with dissolved oils and greases is transferred to a pre-weighed beaker. The solvent is evaporated over low heating and the beaker reweighed. The concentration of oil and grease is determined by the increase in mass of the collection beaker per volume of sample extracted. O&G is suitable for lubricating oils and other high boiling point products but is not suitable for volatiles. Reference to APHA 5520 B and USEPA 1664 Revision B.. Internal Reference AN185</p>
AN245	<p>Anions by Ion Chromatography: A water sample is injected into an eluent stream that passes through the ion chromatographic system where the anions of interest ie Br, Cl, NO₂, NO₃ and SO₄ are separated on their relative affinities for the active sites on the column packing material. Changes to the conductivity and the UV-visible absorbance of the eluent enable identification and quantitation of the anions based on their retention time and peak height or area. APHA 4110 B</p>
AN277/WC250.312	<p>Nitrite ions, when reacted with a reagent containing sulphanilamide and N-(1-naphthyl)-ethylenediamine dihydrochloride produce a highly coloured azo dye that is measured photometrically at 540nm.</p>
AN279/AN293(Sydney)	<p>The sample is digested with Sulphuric acid, K₂SO₄ and CuSO₄. All forms of phosphorus are converted into orthophosphate. The digest is cooled and placed on the discrete analyser for colorimetric analysis.</p>
AN281	<p>An unfiltered water or soil sample is first digested in a block digester with sulfuric acid, K₂SO₄ and CuSO₄. The ammonia produced following digestion is then measured colourimetrically using the Aquakem 250 Discrete Analyser. A portion of the digested sample is buffered to an alkaline pH, and interfering cations are complexed. The ammonia then reacts with salicylate and hypochlorite to give a blue colour whose absorbance is measured at 660nm and compared with calibration standards. This is proportional to the concentration of Total Kjeldahl Nitrogen in the original sample.</p>
AN420	<p>SVOC Compounds: Semi-Volatile Organic Compounds (SVOCs) including OC, OP, PCB, Herbicides, PAH, Phthalates and Speciated Phenols in soils, sediments and waters are determined by GCMS/ECD technique following appropriate solvent extraction process (Based on USEPA 3500C and 8270D).</p>

FOOTNOTES

IS	Insufficient sample for analysis.	LOR	Limit of Reporting
LNR	Sample listed, but not received.	↑↓	Raised or Lowered Limit of Reporting
*	NATA accreditation does not cover the performance of this service.	QFH	QC result is above the upper tolerance
**	Indicative data, theoretical holding time exceeded.	QFL	QC result is below the lower tolerance
		-	The sample was not analysed for this analyte
		NVL	Not Validated

Unless it is reported that sampling has been performed by SGS, the samples have been analysed as received. Solid samples expressed on a dry weight basis.

Where "Total" analyte groups are reported (for example, Total PAHs, Total OC Pesticides) the total will be calculated as the sum of the individual analytes, with those analytes that are reported as <LOR being assumed to be zero. The summed (Total) limit of reporting is calculated by summing the individual analyte LORs and dividing by two. For example, where 16 individual analytes are being summed and each has an LOR of 0.1 mg/kg, the "Totals" LOR will be 1.6 / 2 (0.8 mg/kg). Where only 2 analytes are being summed, the "Total" LOR will be the sum of those two LORs.

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

If reported, measurement uncertainty follow the ± sign after the analytical result and is expressed as the expanded uncertainty calculated using a coverage factor of 2, providing a level of confidence of approximately 95%, unless stated otherwise in the comments section of this report.

Results reported for samples tested under test methods with codes starting with ARS-SOP, radionuclide or gross radioactivity concentrations are expressed in becquerel (Bq) per unit of mass or volume or per wipe as stated on the report. Becquerel is the SI unit for activity and equals one nuclear transformation per second.

Note that in terms of units of radioactivity:

- a. 1 Bq is equivalent to 27 pCi
- b. 37 MBq is equivalent to 1 mCi

For results reported for samples tested under test methods with codes starting with ARS-SOP, less than (<) values indicate the detection limit for each radionuclide or parameter for the measurement system used. The respective detection limits have been calculated in accordance with ISO 11929.

The QC and MU criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here: www.sgs.com.au/pv.sgsvr/en-gb/environment.

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