

ANALYTICAL REPORT



CLIENT DETAILS

LABORATORY DETAILS .

Contact Client

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Order Number Samples

Mungindi Discharge Event Monitoring

(Not specified)

3

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SGS Reference

BE008776 R0 Report Number 0000028314

Date Reported 16 Apr 2014 04 Apr 2014

Date Received

COMMENTS

Accredited for compliance with ISO/IEC 17025, NATA accredited laboratory 2562(20707/1706).

The holding times for nutrient analysis were greater than 48 hours & Organics greater than 7 Days old at the time of receipt by SGS Environmental. The results of our analyses may not be truly representative of the water quality at the time of sampling. OP:Some OP LCS recoveries were reported below acceptance criteria. No significant levels of these analytes were detected. OCOP:At least 2 of the 3 surrogates passes acceptance criteria.

Total Nitrogen/Phosphorus subcontracted to SGS Sydney, Unit 16 33 Maddox St Alexandria NSW 2015, NATA Accreditation Number: 2562, Site Number: 4354, SE126625 R0.

SIGNATORIES

Jeremy Truong **Business Manager** Leanne Orsmond Inorganics Supervisor Michael Morrison Senior Organic Chemist



ANALYTICAL REPORT

BE008776 R0

Parameter	s	mple Numbe sample Matri Sample Dat Sample Nam LOR	x Water e 27 Mar 2014	BE008776.002 Water 27 Mar 2014 MG Site 4 Sedimentation Pond E Module	BE008776,00 Water 27 Mar 2014 MG Site 5 Sedimentation Pond W Modul
pH in water Method: AN101					
pH**	pH Units	0,1	6.8	6.8	6.8
Conductivity and TDS by Calculation - Water Method: AN106					
Conductivity @ 25 C	μS/cm	5	150	92	84
Total and Volatile Suspended Solids (TSS / VSS) Method: AN	114				
Total Suspended Solids Dried at 103-105°C	mg/L	1	180	88	100
OC Pesticides in Water Method: AN400/AN420					
Alpha BHC	μg/L	0,1	<0.1	<0.1	<0.1
Hexachlorobenzene (HCB)	μg/L	0,1	<0.1	<0.1	<0.1
Bela BHC	μg/L	0,1	<0.1	<0.1	<0.1
Lindane (gamma BHC)	µg/L	0.1	<0.1	<0.1	<0.1
Delta BHC	μg/L	0,1	<0.1	<0.1	<0.1
Heptachlor	µg/L µg/L	0,1	<0.1	<0.1	<0.1
Ndrin	µg/L	0,1	<0.1	<0.1	<0.1
deptachlor epoxide	µg/L	0,1	<0.1	<0.1	<0.1
sodrin		0,1	<0.1	<0.1	<0.1
Samma Chlordane	µg/L µg/L	0.1	<0.1	<0.1	<0.1
Upha Chlordane		0.1	<0.1	<0.1	<0.1
Jpha Endosulfan	µg/L	0.1	<0.1	<0.1	<0.1
,p'-DDE	µg/L	0.1	<0.1	<0.1	<0.1
)ieldrin	µg/L	0.1	<0.1	<0.1	<0.1
neidin	µg/L				
eta Endosulfan	µg/L	0,1	<0.1	<0.1	<0.1
p-p-DDD	µg/L	0.1	<0.1	<0.1	<0.1
Endosulfan sulphate	µg/L	0,1	<0.1	<0.1	<0.1
	µg/L	0,1	<0.1	<0.1	<0.1
p-DDT	µg/L	_			
	µg/L	0,1	<0.1	<0.1	<0.1
Methoxychlor	μg/L	0.1	<0.1	<0.1	<0.1
Mirex	µg/L	0.1	<0.1	<0.1	<0.1
Surrogates 114-p-terphenyl (Surrogate)	%	40	110	110	110
2-fluoroblphenyl (Surrogate)	%	*:	110	110	110
d5-nitrobenzene (Surrogate)	%		120	130	130
OP Pesticides in Water Method: AN400/AN420				1	
N. I.		T . 1			
Dichlorvos	μg/L	1	<1	<1	<1
himethoate	µg/L	1	<1	<1	<1
Olazinon (Dimpylate)	μg/L	0.5	<0.5	<0.5	<0.5
entrothion	µg/L	0.2	<0.2	<0.2	<0.2
Malathion	μg/L	0.2	<0.2	<0.2	<0.2
Chlorpyrifos (Chlorpyrifos Ethyl)	µg/L	0,2	<0.2	<0.2	<0.2
Parathion-elhyl (Parathion)	µg/L	0.2	<0.2	<0.2	<0.2
Iromophos Ethyl	µg/L	0.2	<0.2	<0.2	<0.2
Methidathion	μg/L	0.5	<0.5	<0.5	<0.5
Ihion	μg/L	0.2	<0.2	<0.2	<0.2
vzinphos-methyl	μg/L	0.2	<0.2	<0,2	<0.2
Surrogates					
14-p-terphenyl (Surrogate)	%	-	110	110	110
5-nitrobenzene (Surrogate)	%	*	110	110	110
2-fluorobiphenyl (Surrogate)	%	*:	120	130	130



ANALYTICAL REPORT

BE008776 R0

Parameter	Units	Sample Number Sample Matrix Sample Date Sample Name LOR	Water 27 Mar 2014	BE008776.002 Water 27 Mar 2014 MG Site 4 Sedimentation Pond E Module	BE008776,003 Water 27 Mar 2014 MG Site 5 Sedimentation Pond W Module
Other SVOC Analytes in Water Method: AN420					
Carbophenothion	μg/L	0,5	<0,5	<0.5	<0,5
Chlorpyrifos-methyl	µg/L	0.5	<0,5	<0,5	<0,5
Dichlofenthion	μg/L	0,5	<0,5	<0.5	<0.5
Dioxathion	µg/L	2	<2	<2	<2
Famphur (Famophos)	μg/L	0.5	<0,5	<0.5	<0,5
Fonophos	μg/L	0,5	<0,5	<0.5	<0.5
Terbufos	µg/L	0,5	<0,5	<0.5	<0,5
other SVOCs					
Thionazin	µg/L	1	<1	<1	<1
TKN Kjeldahl Digestion by Discrete Analyser Method: AN28	1/AN292				
Total Nitrogen (calc)	mg/L	0.05	2.5	2.8	2.5
Total Phosphorus by Kjeldahl Digestion DA in Water Method	d: AN279/AN	293			
Total Phosphorus (Kjeldahi Digestlon)	mg/L	0,01	0.85	0.74	0.57



QC SUMMARY

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

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

Parameter:	QC	Units	LOR	MB	DUP %RPD	LCS
	Reference					%Recovery
Conductivity @ 25 C	LB013798	μS/cm	5	<5	0%	99 - 100%

OC Pesticides in Water Method: ME-(AU)-[ENV]AN400/AN420

Parameter	QC Reference	Units	LOR	МВ	LCS %Recovery
Alpha BHC	LB013773	μg/L	0.1	<0.1	551 N.S.
Hexachlorobenzene (HCB)	LB013773	μg/L	0,1	<0.1	\$ 10 July 1
Beta BHC	LB013773	µg/L	0.1	<0.1	100000
Lindane (gamma BHC)	LB013773	μg/L	0.1	<0.1	102%
Della BHC	LB013773	μg/L	0.1	<0.1	1 6
Heptachlor	LB013773	µg/L	0,1	<0,1	89%
Aldrin	LB013773	μg/L	0.1	<0.1	99%
Heptachlor epoxide	LB013773	μg/L	0.1	<0.1	
Isodrin	LB013773	μg/L	0.1	<0.1	101%
Gamma Chlordane	LB013773	µg/L	0,1	<0,1	98%
Alpha Chlordane	LB013773	µg/L	0.1	<0.1	
Alpha Endosulfan	LB013773	µg/L	0.1	<0.1	
p,p'-DDE	LB013773	µg/L	0,1	<0.1	NA
Dieldrin	LB013773	µg/L	0.1	<0.1	101%
Endrin	LB013773	μg/L	0.1	<0.1	102%
Beta Endosulían	LB013773	μg/L	0.1	<0.1	COLUMN TO BE
p,p'-DDD	LB013773	μg/L	0.1	<0.1	F3 11 201
Endosulfan sulphate	LB013773	μg/L	0.1	<0.1	174 31 5
p,p'-DDT	LB013773	μg/L	0,1	<0.1	11. 83
Endrin ketone	LB013773	μg/L	0,1	<0.1	WY TO A
Methoxychlor	LB013773	μg/L	0.1	<0.1	100 mm
Mirex	LB013773	μg/L	0.1	<0.1	103%

Surrogates

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
d14-p-terphenyl (Surrogale)	LB013773	%		120%	120%
2-fluorobiphenyi (Surrogale)	LB013773	%		26%	120%
d5-nitrobenzene (Surrogate)	LB013773	%	- 4	150%	140%



QC SUMMARY

MB blank results are compared to the Limit of Reporting

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

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

OP Pesticides in Water Method: ME-(AU)-[ENV]AN400/AN420

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
Dichlorvos	LB013773	μg/L	1	<1	
Dimethoate	LB013773	μg/L	1	<1	
DlazInon (Dimpylate)	LB013773	μg/L	0,5	<0,5	42%
Fenitrothion	LB013773	µg/L	0.2	<0.2	
Malathion	LB013773	μg/L	0.2	<0.2	THE RESERVE
Chlorpyrifos (Chlorpyrifos Ethyl)	LB013773	μg/L	0,2	<0.2	93%
Parathlon-ethyl (Parathion)	LB013773	μg/L	0.2	<0.2	81%
Bromophos Ethyl	LB013773	µg/L	0.2	<0.2	
Methidathlon	LB013773	μg/L	0.5	<0.5	78%
Ethion	LB013773	µg/L	0.2	<0.2	THE REAL PROPERTY.
Azinphos-methyl	LB013773	μg/L	0,2	<0.2	i i so

Surrogates

Parameter	QC Reference	Units	LOR	WB	LCS %Recovery
d14-p-terphenyl (Surrogate)	LB013773	%		120%	120%
d5-nitrobenzene (Surrogate)	LB013773	%		130%	120%
2-fluorobiphenyl (Surrogate)	LB013773	%		140%	140%

Other SVOC Analytes in Water Method: ME-(AU)-[ENV]AN420

OPs

Parameter	QC Reference	Units	LOR	MB
Carbophenothion	LB013773	µg/L	0.5	<0.5
Chlorpyrifos-methyl	LB013773	μg/L	0.5	<0.5
Dichlofenthion	LB013773	μg/L	0.5	<0.5
Dioxathion	LB013773	μg/L	2	<2
Famphur (Famophos)	LB013773	µg/L	0.5	<0.5
Fonophos	LB013773	µg/L	0.5	<0.5
Terbufos	LB013773	μg/L	0.5	<0.5

olher SVOCs

Parameter	QC Reference	Units	LOR	МВ
Thionazin	LB013773	µg/L	1	<1





QC SUMMARY

MB blank results are compared to the Limit of Reporting

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

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

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

Parameter	QC	Units	LOR	MB	DUP %RPD	LCS
	Reference		THE RESERVE		THE REAL PROPERTY.	%Recovery
pH**	LB013797	pH Units	0.1	5.6 - 5.8	0%	100%

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

Parameter	QC Reference	Units	LOR	WB	DUP %RPD	LCS %Recovery
Total Suspended Solids Dried at 103-105°C	LB013893	mg/L	1	<1	0 - 2%	101%



METHOD SUMMARY

METHOD -	METHODOLOGY SUMMARY
AN083	Separatory funnels are used for aqueous samples and extracted by transferring an appropriate volume (mass) of liquid into a separatory funnel and adding 3 serial aliquots of dichloromethane, Samples receive a single extraction at pH 7 to recover base / neutral analytes and two extractions at pH < 2 to recover acidic analytes. QC samples are prepared by spiking organic free water with target analytes and extracting as per samples.
AN101	pH in Soil Studge Sediment and Water: pH is measured electrometrically using a combination electrode (glass plus reference electrode) and is calibrated against 3 buffers purchased commercially. For soils, an extract with water is made at a ratio of 1:5 and the pH determined and reported on the extract. Reference APHA 4500-H+.
AN106	Conductivity and TDS by Calculation: Conductivity is measured by meter with temperature compensation and is calibrated against a standard solution of potassium chloride. Conductivity is generally reported as µmhos/cm or µS/cm @ 25°C, For soils, an extract with water is made at a ratio of 1:5 and the EC determined and reported on the extract, or calculated back to the as-received sample. Total Dissolved Salts can be estimated from conductivity using a conversion factor, which for natural waters, is in the range 0.55 to 0.75. SGS use 0.6. Reference APHA 2520 B.
AN114	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
AN245	Anions by Ion Chromatography: A water sample is injected into an eluent stream that passes through the ion chromatographic system where the anions of interest ie Br, Cl, NO2, NO3 and SO4 are separated on their relative affinities for the active sites on the column packing material. Changes to the conductivity and the UV-visible absorbance of the eluent enable identification and quantitation of the anions based on their retention time and peak height or area. APHA 4110 B
AN277/WC250.312	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.
AN279/AN293	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.
AN281	An unfiltered water or soil sample is first digested in a block digestor with sulphuric 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.
AN400	OC and OP Pesticides by GC-ECD: The determination of organochlorine (OC) and organophosphorus (OP) pesticides and polychlorinated biphenyls (PCBs) in soils, sludges and groundwater. (Based on USEPA methods 3510, 3550, 8140 and 8080.)
AN420	SVOC Compounds: Semi-Volatile Organic Compounds (SVOCs) including OC, OP, PCB, Herbicides, PAH, Phthalates and Speciated Phenols (etc) in soils, sediments and waters are determined by GCMS/ECD technique following appropriate solvent extraction process (Based on USEPA 3500C and 8270D).
AN420	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).



FOOTNOTES :

IS Insufficient sample for analysis.

LNR Sample listed, but not received.

This analysis is not covered by the scope of accreditation.

** Indicative data, theoretical holding time exceeded.

^ Performed by outside laboratory.

LOR Limit of Reporting

↑↓ Raised or Lowered Limit of Reporting
QFH QC result is above the upper tolerance
QFL QC result is below the lower tolerance

- The sample was not analysed for this analyte

NVL Not Validated

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

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

The QC criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here: http://www.sgs.com.au.pv.sgsv3/~/media/Local/Australia/Documents/Technical%20Documents/MP-AU-ENV-QU-022%20QA%20QC%20Plan.pdf

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BE008776

BE008776

TKN Kjeldahl Digestion by Discr Total Nitrogen (calc) mg/L

Total Phosphorus by Kjeldahl Di Total Phosphorus (K mg/L

Project Mungindi Discharge Event Monitoring

Description MG Site 3 Drainac MG Site 4 Sedime MG Site 5 Sedimentation Pond W Module Yard Sample Date 27/3/2014 27/3/2014 27/3/2014 Matrix Water Water Water Job Number Method Name Analyte Name Units Reporting Limit Result Result Result BE008776 р**Н**** pH in water pH Units 0.1 6.8 6.8 6.8 BE008776 Conductivity and TDS by Calcul; Conductivity @ 25 C uS/cm 150 5 92 64 BE008776 Total and Volatile Suspended Sc Total Suspended Sol mg/L 160 88 100 BE008776 OC Pesticides in Water Alpha BHC μg/L 0.1 < 0.1 < 0.1 < 0.1 BE008776 OC Pesticides in Water Hexachlorobenzene μg/L 0.1 < 0.1 <0.1 <0.1 BE008776 OC Pesticides in Water Beta BHC 0.1 < 0.1 <0.1 <0.1 µg/L BE008776 OC Pesticides in Water Lindane (gamma BH µg/L 0.1 < 0.1 <0.1 < 0.1 BE008776 OC Pesticides in Water Delta BHC 0.1 < 0.1 <0.1 <0.1 μg/L BE008776 OC Pesticides in Water Heptachlor µg/L 0,1 <0,1 <0.1 <0.1 BE008776 OC Pesticides in Water Aldrin 0.1 < 0.1 <0.1 μg/L <0.1 Heptachlor epoxide BE008776 OC Pesticides in Water 0.1 < 0.1 μg/L <0.1 <0.1 BE008776 0.1 < 0.1 OC Pesticides in Water Isodrin μg/L <0.1 <0.1 BE008776 OC Pesticides in Water Gamma Chlordane 0.1 < 0.1 <0.1 <0.1 μg/L BE008776 OC Pesticides in Water Alpha Chlordane 0.1 < 0.1 <0.1 <0.1 µg/L BE008776 OC Pesticides in Water Alpha Endosulfan 0.1 < 0.1 <0.1 <0.1 µg/L BE008776 OC Pesticides in Water p,p'-DDE 0.1 < 0.1 <0.1 µg/L < 0.1 BE008776 Dieldrin 0.1 < 0.1 OC Pesticides in Water <0.1 < 0.1 ua/L BE008776 OC Pesticides in Water 0.1 < 0.1 Endrin <0.1 < 0.1 μg/L BE008776 OC Pesticides in Water 0.1 < 0.1 Beta Endosulfan µg/L < 0.1 < 0.1 BE008776 OC Pesticides in Water p.p'-DDD 0.1 < 0.1 μg/L < 0.1 < 0.1 BE008776 Endosulfan sulphate µg/L OC Pesticides in Water 0.1 < 0.1 < 0.1 < 0.1 0.1 < 0.1 BF008776 OC Pesticides in Water p.p'-DDT μg/L < 0.1 < 0.1 BE008776 OC Pesticides in Water Endrin ketone μg/L 0.1 < 0.1 < 0.1 < 0.1 BE008776 OC Pesticides in Water Methoxychlor μg/L 0.1 < 0.1 < 0.1 < 0.1 BE008776 OC Pesticides in Water Mirex μg/L 0.1 < 0.1 <0.1 <0.1 BE008776 OC Pesticides in Water d14-p-terphenyl (Sur % 0 110 110 110 BE008776 OC Pesticides in Water 2-fluorobiphenyl (Sur % ٥ 110 110 110 BE008776 OC Pesticides in Water d5-nitrobenzene (Sur % 0 120 130 130 BE008776 OP Pesticides in Water Dichlorvos 1 <1 <1 <1 BE008776 OP Pesticides in Water Dimethoate µg/L 1 <1 BE008776 OP Pesticides in Water Diazinon (Dimpylate) µg/L 0.5 < 0.5 <0.5 <0.5 BE008776 OP Pesticides in Water Fenitrothion 0.2 < 0.2 μg/L <0.2 <0.2 BE008776 OP Pesticides in Water 0.2 < 0.2 Malathion μg/L <0.2 <0.2 BE008776 OP Pesticides in Water 0.2 < 0.2 Chlorpyrifos (Chlorpy µg/L <0.2 <0.2 BE008776 OP Pesticides in Water Parathion-ethyl (Para µg/L 0.2 < 0.2 <0.2 <0.2 BE008776 OP Pesticides in Water Bromophos Ethyl 0.2 < 0.2 <0.2 < 0.2 µg/L BE008776 OP Pesticides in Water Methidathion 0.5 < 0.5 <0.5 <0.5 µg/L BE008776 OP Pesticides in Water Ethion µg/L 0.2 < 0.2 <0.2 <0.2 BE008776 OP Pesticides in Water Azinphos-methyl 0.2 < 0.2 μg/L <0.2 <0.2 BE008776 OP Pesticides in Water d14-p-terphenyl (Sur % 110 110 0 110 OP Pesticides in Water BE008776 d5-nitrobenzene (Sui % 0 110 110 110 BE008776 OP Pesticides in Water 2-fluorobiphenyl (Sur % 0 120 130 130 0.5 < 0.5 Other SVOC Analytes in Water BE008776 Carbophenothion < 0.5 <0.5 μg/L BE008776 Other SVOC Analytes in Water Chlorpyrifos-methyl 0.5 < 0.5 µg/L < 0.5 < 0.5 0.5 < 0.5 BE008776 Other SVOC Analytes in Water Dichlofenthion µg/L < 0.5 < 0.5 BE008776 Other SVOC Analytes in Water Dioxathion ua/L 2 <2 <2 <2 BE008776 Other SVOC Analytes in Water Famphur (Famophos µg/L 0.5 < 0.5 < 0.5 < 0.5 BE008776 Other SVOC Analytes in Water Fonophos μg/L 0.5 < 0.5 < 0.5 < 0.5 BE008776 Other SVOC Analytes in Water Terbufos µg/L 0.5 < 0.5 <0.5 < 0.5 <1 BE008776 Other SVOC Analytes in Water Thionazin μg/L 1 <1 <1

0.05

0.01

2.5

0.65

2.8

0.74

2.5

0.57

BE008776.002

Sample Name BE008776,001

BE008776.003