

### CLIENT DETAILS

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Project **Mungindi Discharge Event Monitoring**  
Order Number **(Not specified)**  
Samples **3**

### LABORATORY DETAILS

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SGS Reference **BE015837 R0**  
Date Received **05 Feb 2016**  
Date Reported **14 Feb 2016**

### COMMENTS

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

### SIGNATORIES



**Caroline McDermid**  
Inorganics Supervisor



ANALYTICAL REPORT

BE015837 R0

	Sample Number	BE015837.001	BE015837.002	BE015837.003
	Sample Matrix	Water	Water	Water
	Sample Date	28 Jan 2016	28 Jan 2016	28 Jan 2016
	Sample Name	Mg Site 3	Mg Site 4	Mg Site 5
		Drainage Channel	Sedimentation	Sedimentation
Parameter	Units	LOR	NE of N Module	Pond E Module
			Pond W Module	

pH in water Method: AN101 Tested: 5/2/2016

pH**	pH Units	0.1	6.4	6.4	6.4
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Conductivity and TDS by Calculation - Water Method: AN106 Tested: 5/2/2016

Conductivity @ 25 C	µS/cm	5	100	100	100
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Total and Volatile Suspended Solids (TSS / VSS) Method: AN114 Tested: 9/2/2016

Total Suspended Solids Dried at 103-105°C	mg/L	1	480	200	140
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Total Phosphorus by Kjeldahl Digestion DA in Water Method: AN279/AN293 Tested: 9/2/2016

Total Phosphorus (Kjeldahl Digestion)	mg/L	0.01	0.37	0.54	0.59
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Calculated Nitrogen Forms - TN, organic N, inorganic N Method: AN281/292 Tested: 14/2/2016

Total Nitrogen (calc)	mg/L	0.05	2.0	2.0	2.2
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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.

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

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
Conductivity @ 25 C	LB023854	µS/cm	5	<5	0%	103%

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

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
pH**	LB023854	pH Units	0.1	0.1	0%	100%

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	LB023915	mg/L	1	<1	0 - 9%	97 - 104%

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

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Total Phosphorus (Kjeldahl Digestion)	LB023884	mg/L	0.01	<0.01	0 - 3%	87 - 94%	111 - 113%

METHOD	METHODOLOGY SUMMARY
AN101	<p>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+.</p>
AN106	<p>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 <math>\mu\text{mhos/cm}</math> or <math>\mu\text{S/cm @ 25}^\circ\text{C}</math>. 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 2510 B.</p>
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>
AN258	<p>Nitrate and Nitrite by FIA: In an acidic medium, nitrate is reduced quantitatively to nitrite by cadmium metal. This nitrite plus any original nitrite is determined as an intense red-pink azo dye at 540 nm following diazotisation with sulphanilamide and subsequent coupling with N-(1-naphthyl) ethylenediamine dihydrochloride. Without the cadmium reduction only the original nitrite is determined. Reference APHA 4500-NO3- F.</p>
AN279/AN293	<p>The sample is digested with Sulphuric acid, <math>\text{K}_2\text{SO}_4</math> and <math>\text{CuSO}_4</math>. 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, <math>\text{K}_2\text{SO}_4</math> and <math>\text{CuSO}_4</math>. 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>
AN281/292	<p>Calculation of total nitrogen and organic nitrogen.</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

Samples 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 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/~media/Local/Australia/Documents/Technical Documents/MP-AU-ENV-QU-022\\_QA\\_QC\\_Plan.pdf](http://www.sgs.com.au/~media/Local/Australia/Documents/Technical Documents/MP-AU-ENV-QU-022_QA_QC_Plan.pdf)

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**Order**

Mungindi Discharge Event Monitoring

**Project**

**Sample Name** BE015837.001 BE015837.002 BE015837.003  
Mg Site 3 Mg Site 4 Mg Site 5  
Drainage Channel Sedimentation Sedimentation  
NE of N Module Pond E Module Pond W Module  
Yard Yard Yard  
**Description** Yard  
**Sample Date** 28/1/2016 28/1/2016 28/1/2016  
**Matrix** Water Water Water  
**Reporting Limit** Result Result Result  
0.1 6.4 6.4  
5 100 100  
1 480 200  
0.01 0.37 0.54  
0.05 2.0 2.0

Job Number	Method Name	Analyte Name	Units	Reporting Limit	Result	Result
BE015837	pH in water	pH**	pH Units	0.1	6.4	6.4
BE015837	Conductivity and TDS by Calculation - Water	Conductivity @ 25 C	µS/cm	5	100	100
BE015837	Total and Volatile Suspended Solids (TSS / VSS)	Total Suspended Solids Dried at 103-105°C	mg/L	1	480	140
BE015837	Total Phosphorus by Kjeldahl Digestion DA in Water	Total Phosphorus (Kjeldahl Digestion)	mg/L	0.01	0.37	0.59
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