



CITY COUNCIL OF BROKEN HILL
ATTN: Council of Broken Hill Generic Inbox
PO BOX 448
BROKEN HILL
NSW 2880 AUSTRALIA

05/01/2024

Dear Council of Broken Hill

Please find attached the Final Analytical Report for

Customer Service Request: 120503-2023-CSR-1
Account: 120503
Project: AWQC-188436 City Council of Broken Hill - Bore Program - Routine 23/24

This report has also been sent to: Kathy Graham

AWQC Sample Receipt hours are Monday and Tuesday 8:30am to 8pm and Wednesday, Thursday and Friday 8:30am to 4:30pm.

Yours sincerely,

Scott Kraft
Customer Services Officer
Scott.Kraft@sawater.com.au
+61 8 7424 1250



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FINAL REPORT: 375913

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Report Information

Project Name	AWQC-188436
Customer	CITY COUNCIL OF BROKEN HILL
CSR_ID	120503-2023-CSR-1

Analytical Results

Sampling Point	90144-City Council of Broken Hill - Bore Hole 3
Sampled Date	19/12/2023 6:40:00AM
Sample Received Date	21/12/2023 1:51:25PM
Sample Analysis Completed	4/01/2024 11:40:28AM
Sample ID	*2023-008-7973
Status	Endorsed
Collection Type	Customer Collected

Inorganic Chemistry - Metals	LOR	Result	Test Start Date
<i>Sample temperature at time of receipt 20.3°C</i>			
Cadmium - Total TIC-006(ADEL)			02/01/2024
Cadmium - Total	0.0001	0.0005 mg/L	
Calcium TIC-006(ADEL)			27/12/2023
Calcium	0.05	115 mg/L	
Lead - Total TIC-006(ADEL)			27/12/2023
Lead - Total	0.0001	0.0056 mg/L	
Magnesium TIC-006(ADEL)			03/01/2024
Magnesium	0.05	163 mg/L	
Potassium TIC-006(ADEL)			27/12/2023
Potassium	0.05	34.3 mg/L	
Sodium Adsorption Ratio TMZ-M06(ADEL)			21/12/2023
Sodium Adsorption Ratio - Calculation		24.2	
Sodium TIC-006(ADEL)			27/12/2023
Sodium	0.1	1720 mg/L	
Sulphur TIC-006(ADEL)			03/01/2024
Sulphate	0.6	1360 mg/L	
Sulphur	0.2	454 mg/L	
Total Hardness as CaCO3 TMZ-M06(ADEL)			21/12/2023
Total Hardness as CaCO3	2.0	958 mg/L	

Inorganic Chemistry - Nutrients	LOR	Result	Test Start Date
<i>Sample temperature at time of receipt 20.3°C</i>			
Ammonia as N T0100-01(ADEL)			22/12/2023





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Status	Endorsed
Collection Type	Customer Collected

Ammonia as N T0100-01(ADEL)			22/12/2023
Ammonia as N	0.005	0.230 mg/L	
Chloride T0104-02(ADEL)			29/12/2023
Chloride	4.0	1730 mg/L	
Nitrate + Nitrite as N T0161-01(ADEL)			03/01/2024
Nitrate + Nitrite as N	0.003	19.0 mg/L	
Nitrogen - Total TMZ-M06(ADEL)			21/12/2023
Nitrogen - Total		19.49 mg/L	
TKN as N T0112-01(ADEL)			27/12/2023
TKN as Nitrogen	0.05	0.49 mg/L	

Organic Chemistry	LOR	Result	Test Start Date
Sample temperature at time of receipt 20.3°C			
Total Organic Carbon T0158-07(ADEL)			29/12/2023
Total Organic Carbon	1	5.7 mg/L	

Inorganic Chemistry - Physical	LOR	Result	Test Start Date
Sample temperature at time of receipt 20.3°C			
Conductivity & Total Dissolved Solids T0016-01(ADEL)			22/12/2023
Conductivity	2	8070 µS/cm	
Note		Conductivity measurement is corrected to 25°C	
Total Dissolved Solids (by EC)	1	4650 mg/L	
pH T0010-01(ADEL)			22/12/2023
pH		7.8 pH units	
Temperature at which pH is measured		22.1 °C	

SGS Australia Pty Ltd (NSW)	LOR	Result	Test Start Date
Sample temperature at time of receipt 20.3°C			
Phenols T0030-01			





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Analytical Results

Sampling Point	90144-City Council of Broken Hill - Bore Hole 3
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Sample Received Date	21/12/2023 1:51:25PM
Sample Analysis Completed	4/01/2024 11:40:28AM
Sample ID	*2023-008-7973
Status	Endorsed
Collection Type	Customer Collected

Phenols T0030-01

!External Lab Report No.	SE258575
Phenols	0.01 <0.05 mg/L





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Analytical Results

Sampling Point	90143-City Council of Broken Hill - Bore Hole 2
Sampled Date	19/12/2023 6:55:00AM
Sample Received Date	21/12/2023 1:51:13PM
Sample Analysis Completed	4/01/2024 11:40:28AM
Sample ID	*2023-008-7972
Status	Endorsed
Collection Type	Customer Collected

Inorganic Chemistry - Metals	LOR	Result	Test Start Date
<i>Sample temperature at time of receipt 20.3°C</i>			
Cadmium - Total TIC-006(ADEL)			02/01/2024
Cadmium - Total	0.0001	0.0001 mg/L	
Calcium TIC-006(ADEL)			27/12/2023
Calcium	0.05	104 mg/L	
Lead - Total TIC-006(ADEL)			27/12/2023
Lead - Total	0.0001	0.0030 mg/L	
Magnesium TIC-006(ADEL)			03/01/2024
Magnesium	0.05	130 mg/L	
Potassium TIC-006(ADEL)			27/12/2023
Potassium	0.05	25.0 mg/L	
Sodium Adsorption Ratio TMZ-M06(ADEL)			21/12/2023
Sodium Adsorption Ratio - Calculation		20.1	
Sodium TIC-006(ADEL)			27/12/2023
Sodium	0.1	1300 mg/L	
Sulphur TIC-006(ADEL)			03/01/2024
Sulphate	0.6	873 mg/L	
Sulphur	0.2	291 mg/L	
Total Hardness as CaCO3 TMZ-M06(ADEL)			21/12/2023
Total Hardness as CaCO3	2.0	795 mg/L	

Inorganic Chemistry - Nutrients	LOR	Result	Test Start Date
<i>Sample temperature at time of receipt 20.3°C</i>			
Ammonia as N T0100-01(ADEL)			22/12/2023
Ammonia as N	0.005	0.043 mg/L	
Chloride T0104-02(ADEL)			29/12/2023
Chloride	4.0	1450 mg/L	
Nitrate + Nitrite as N T0161-01(ADEL)			03/01/2024
Nitrate + Nitrite as N	0.003	10.6 mg/L	





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Analytical Results

Sampling Point	90143-City Council of Broken Hill - Bore Hole 2
Sampled Date	19/12/2023 6:55:00AM
Sample Received Date	21/12/2023 1:51:13PM
Sample Analysis Completed	4/01/2024 11:40:28AM
Sample ID	*2023-008-7972
Status	Endorsed
Collection Type	Customer Collected

Nitrogen - Total TMZ-M06(ADEL)		21/12/2023
Nitrogen - Total	11.63 mg/L	
TKN as N T0112-01(ADEL)		27/12/2023
TKN as Nitrogen	0.05 1.03 mg/L	

Organic Chemistry	LOR	Result	Test Start Date
Sample temperature at time of receipt 20.3°C			
Total Organic Carbon T0158-07(ADEL)			29/12/2023
Total Organic Carbon	1	9.9 mg/L	

Inorganic Chemistry - Physical	LOR	Result	Test Start Date
Sample temperature at time of receipt 20.3°C			
Conductivity & Total Dissolved Solids T0016-01(ADEL)			22/12/2023
Conductivity	2	6320 µS/cm	
Note		Conductivity measurement is corrected to 25°C	
Total Dissolved Solids (by EC)	1	3610 mg/L	
pH T0010-01(ADEL)			22/12/2023
pH		8.0 pH units	
Temperature at which pH is measured		22.1 °C	

SGS Australia Pty Ltd (NSW)	LOR	Result	Test Start Date
Sample temperature at time of receipt 20.3°C			
Phenols T0030-01			
!External Lab Report No.			
Phenols	0.01	SE258575 <0.05 mg/L	



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Analytical Results

Sampling Point	90142-City Council of Broken Hill - Bore Hole 1
Sampled Date	19/12/2023 7:15:00AM
Sample Received Date	21/12/2023 1:50:58PM
Sample Analysis Completed	4/01/2024 10:40:54AM
Sample ID	*2023-008-7971
Status	Endorsed
Collection Type	Customer Collected

Inorganic Chemistry - Metals	LOR	Result	Test Start Date
<i>Sample temperature at time of receipt 20.3°C</i>			
Cadmium - Total TIC-006(ADEL)			22/12/2023
Cadmium - Total	0.0001	0.0005 mg/L	
Calcium TIC-006(ADEL)			27/12/2023
Calcium	0.05	403 mg/L	
Lead - Total TIC-006(ADEL)			22/12/2023
Lead - Total	0.0001	0.0069 mg/L	
Magnesium TIC-006(ADEL)			22/12/2023
Magnesium	0.05	291 mg/L	
Potassium TIC-006(ADEL)			22/12/2023
Potassium	0.05	45.4 mg/L	
Sodium Adsorption Ratio TMZ-M06(ADEL)			21/12/2023
Sodium Adsorption Ratio - Calculation		18.9	
Sodium TIC-006(ADEL)			22/12/2023
Sodium	0.1	2040 mg/L	
Sulphur TIC-006(ADEL)			03/01/2024
Sulphate	0.6	1540 mg/L	
Sulphur	0.2	514 mg/L	
Total Hardness as CaCO3 TMZ-M06(ADEL)			21/12/2023
Total Hardness as CaCO3	2.0	2200 mg/L	

Inorganic Chemistry - Nutrients	LOR	Result	Test Start Date
<i>Sample temperature at time of receipt 20.3°C</i>			
Ammonia as N T0100-01(ADEL)			22/12/2023
Ammonia as N	0.005	0.364 mg/L	
Chloride T0104-02(ADEL)			29/12/2023
Chloride	4.0	2930 mg/L	
Nitrate + Nitrite as N T0161-01(ADEL)			03/01/2024
Nitrate + Nitrite as N	0.003	24.8 mg/L	





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Analytical Results

Sampling Point	90142-City Council of Broken Hill - Bore Hole 1
Sampled Date	19/12/2023 7:15:00AM
Sample Received Date	21/12/2023 1:50:58PM
Sample Analysis Completed	4/01/2024 10:40:54AM
Sample ID	*2023-008-7971
Status	Endorsed
Collection Type	Customer Collected

Nitrogen - Total TMZ-M06(ADEL)		21/12/2023
Nitrogen - Total	28.71 mg/L	
TKN as N T0112-01(ADEL)		27/12/2023
TKN as Nitrogen	0.05 3.91 mg/L	

Organic Chemistry	LOR	Result	Test Start Date
Sample temperature at time of receipt 20.3°C			
Total Organic Carbon T0158-07(ADEL)			29/12/2023
Total Organic Carbon	1	30.8 mg/L	

Inorganic Chemistry - Physical	LOR	Result	Test Start Date
Sample temperature at time of receipt 20.3°C			
Conductivity & Total Dissolved Solids T0016-01(ADEL)			22/12/2023
Conductivity	2	12300 µS/cm	
Note		Conductivity measurement is corrected to 25°C	
Total Dissolved Solids (by EC)	1	7240 mg/L	
pH T0010-01(ADEL)			22/12/2023
pH		7.0 pH units	
Temperature at which pH is measured		22.1 °C	

SGS Australia Pty Ltd (NSW)	LOR	Result	Test Start Date
Sample temperature at time of receipt 20.3°C			
Phenols T0030-01			
!External Lab Report No.			
Phenols	0.01	SE258575 <0.05 mg/L	





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AWQC Signatories

Dzung Bui - Supervisor Metals and Physical

Ivana Cech - Technical Officer Chemistry

Van Le Hoang - Technical Officer Chemistry

Kerrie Jooste - Manager Chemistry Services

John Martini - Method Development Specialist

Gayle Polley - Supervisor Nutrients and Waste



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Incidents

Sample ID	S.Point	Description	Sampled Date	Analysis (where Applicable)	Incident Description
2023-008-7971	90142	City Council of Broken Hill - Bore Hole 1	19/12/2023	pH	Test not processed within holding time
2023-008-7971	90142	City Council of Broken Hill - Bore Hole 1	19/12/2023	Total Organic Carbon	Test not processed within holding time
2023-008-7971	90142	City Council of Broken Hill - Bore Hole 1	19/12/2023	Sulphur	Test not processed within holding time
2023-008-7972	90143	City Council of Broken Hill - Bore Hole 2	19/12/2023	pH	Test not processed within holding time
2023-008-7972	90143	City Council of Broken Hill - Bore Hole 2	19/12/2023	Total Organic Carbon	Test not processed within holding time
2023-008-7972	90143	City Council of Broken Hill - Bore Hole 2	19/12/2023	Magnesium	Test not processed within holding time
2023-008-7972	90143	City Council of Broken Hill - Bore Hole 2	19/12/2023	Sulphur	Test not processed within holding time
2023-008-7973	90144	City Council of Broken Hill - Bore Hole 3	19/12/2023	pH	Test not processed within holding time
2023-008-7973	90144	City Council of Broken Hill - Bore Hole 3	19/12/2023	Total Organic Carbon	Test not processed within holding time
2023-008-7973	90144	City Council of Broken Hill - Bore Hole 3	19/12/2023	Magnesium	Test not processed within holding time
2023-008-7973	90144	City Council of Broken Hill - Bore Hole 3	19/12/2023	Sulphur	Test not processed within holding time

Analytical Method

Analytical Method Code	Description	Reference Method
T0010-01	Determination of pH	AP4500HB
T0016-01	Determination of Conductivity - Corrected to 25C	AP2510B
T0030-01	Determination of Phenols	AP5530BC
T0100-01	Ammonia/Ammonium - Automated Flow Colorimetry	AP4500NH3G
T0104-02	Chloride - Discrete Analyser	AP4500CLE
T0112-01	Nitrogen- Total Kjeldahl by discrete analyser	AP4500NORGA
T0158-07	Total and Dissolved Organic Carbon (OI Analytical)	SM5310C
T0161-01	Nitrate + Nitrate (NOx) - Automated Flow Colorimetry	AP4500NO3I
TIC-006	Elemental Analysis By ICP- MS	EPA200.8
TMZ-M06	Derived Results and Data Checks	
TMZ-M06	Derived Results and Data Checks	AP4500NORGA
TMZ-M06	Derived Results and Data Checks	APHA2340B
W-052	Preparation of Samples for Metal Analysis	AP3030AD



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Sampling Method

Sampling Method Code	Description
W09-023	Sampling Method for Chemical Analyses Sampling point and date sampled are provided when collected by customers. Validity of results are based on information and samples supplied by customers. Unless it is reported that sampling has been performed by AWQC, the samples have been analysed as received.

Laboratory Information

Laboratory	NATA accreditation ID
Inorganic Chemistry - Physical	1115
Inorganic Chemistry - Nutrients	1115
SGS Australia Pty Ltd (NSW)	2562
Organic Chemistry	1115
Inorganic Chemistry - Metals	1115
Customer Service Unit	-



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- Notes
1. The last figure of the result value is a significant figure.
 2. # determination of the component is not covered by NATA Accreditation.
 3. ^ indicates result is out of specification according to the reference guideline. Refer to report footer.
 4. * indicates an incident has been recorded against the sample. Refer to report footer.
 5. & Indicates the results have changed since the last issued report.
 6. Where a result is required to meet compliance limits the associated measurement uncertainty must be considered. Measurement uncertainty is available at <https://www.awqc.com.au/our-services/Water-quality-testing-and-analysis/measurement-uncertainty>
 7. Uncertainty of Measurement is reported with a coverage factor of 2 providing approximately 95% confidence interval
 8. The Limit of Reporting (LOR) is the lowest concentration of analyte which is reported at the AWQC and is based on the LOQ rounded up to a more readily used value. The Limit of Quantitation (LOQ) is the lowest concentration of analyte for which quantitative results may be obtained within a specified degree of confidence.
 9. Where collection type is AWQC Collect, NATA has confirmed that due to a robust system in place for maintaining the temperature integrity for samples collected by AWQC's Field Laboratory Services, the recording of temperature when samples arrive at the AWQC is out of scope.
 10. If pH has been tested then the pH will be outside of its holding time unless measured in the field.
 11. (ADEL) indicates analysed in Adelaide, (MELB) indicates analysed in Melbourne.
 12. AWQC Melbourne Laboratory are only NATA accredited for sampling of potable waters by inhouse method W09-023.