

RESULTS OF WATER ANALYSIS

9 samples supplied by Ecoteam on 2/03/2023. Lab Job No. N8174 and N8596.
 Samples submitted by Lise Bolton. Your Job: SMC010-Blakebrook WQ- Groundwater- March 2023
 13 Elway Street LISMORE NSW 2480

Parameter	Methods reference	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6	Sample 7	Sample 8	Sample 9
		BQN1-B	BQN1-A	BQN2-B	BQN2-A	BQN2-D	BQS1-S	BQS1-I	BQS1-D	BQN1-D
	Job No.	N8174/1	N8174/2	N8174/3	N8174/4	N8174/5	N8174/6	N8174/7	N8174/8	N8596/1
pH	APHA 4520-H ⁺ -B	7.06	8.70	10.30	7.13	8.72	6.85	8.00	7.74	8.05
Conductivity (EC) (dS/m)	APHA 2510-B	0.997	1.74	0.925	0.394	0.849	0.440	1.28	1.68	1.37
Total Dissolved Salts (mg/L)	** Calculation using EC x 860	678	1,184	629	268	577	299	867	1,145	928
Bicarbonate (Alkalinity) (mg/L CaCO ₃ equivalent)	** Total Alkalinity - APHA 2320	233	250	109	135	342	239	230	111	136
Water Hardness (mg/L CaCO ₃ equivalent)	** Using Ca and Mg calculation	143	556	119	75	10	142	88	40	33
Total Oils and Grease (mg/L)	APHA 5520-D (hexane extractable)	3	2	<2	<2	<2	<2	<2	2	<2
Sodium (mg/L)	APHA 3125 ICPMS ^{10m} 162	173.5	337	181	64.4	219	52.1	258	338	283.6
Potassium (mg/L)	APHA 3125 ICPMS ^{10m} 162	3.8	7.01	6.58	3.95	2.01	3.44	5.05	3.91	2.6
Calcium (mg/L)	APHA 3125 ICPMS ^{10m} 162	27.0	180	37.8	17.6	3.24	32.3	26.7	13.0	10.1
Magnesium (mg/L)	APHA 3125 ICPMS ^{10m} 162	18.4	26.2	5.96	7.52	0.49	14.8	5.18	1.87	1.8
Sodium Absorption Ratio (SAR)	** By calculation	6.3	6.2	7.2	3.2	30.0	1.9	11.9	23.2	21.5
Chloride (mg/L)	APHA 3125 ICPMS ^{10m} 162	217	531	227	49	103	26	289	480	317
Sulfate (mg/L SO ₄ ²⁻)	APHA 3125 ICPMS ^{10m} 162	12	24	25	12	21	<9	11	35	65
Chloride/Sulfate Ratio	** Calculation	18.5	22.1	9.0	4.0	4.9	..	25.3	13.7	4.9
Iron (mg/L)	Total Available - APHA 3125 ICPMS ^{10m} 162	2.136	21.5	0.330	0.171	0.104	4.72	0.128	0.237	2.18
Lead (mg/L)	Total Available - APHA 3125 ICPMS ^{10m} 162	0.001	0.018	0.007	0.005	0.007	0.004	0.002	0.005	0.003
Iron (mg/L)	Dissolved - APHA 3125 ICPMS ^{10m} 162	0.254	0.015	<0.005	<0.005	<0.005	0.041	0.011	0.026	<0.005
Lead (mg/L)	Dissolved - APHA 3125 ICPMS ^{10m} 162	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001
BTEX										
Benzene (µg/L)	Subcontracted: SGS report SE 244252	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Toluene (µg/L)	Subcontracted: SGS report SE 244252	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene (µg/L)	Subcontracted: SGS report SE 244252	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
m,p-xylene (µg/L)	Subcontracted: SGS report SE 244252	<1	<1	<1	<1	<1	<1	<1	<1	<1
o-xylene (µg/L)	Subcontracted: SGS report SE 244252	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Total Xylenes (µg/L)	Subcontracted: SGS report SE 244252	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5
Total BTEX (µg/L)	Subcontracted: SGS report SE 244252	<3	<3	<3	<3	<3	<3	<3	<3	<3
Naphthalene (VOC) (µg/L)	Subcontracted: SGS report SE 244252	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Total Recoverable Hydrocarbons (TRH)										
TRH C6-C9 (µg/L)	Subcontracted: SGS report SE 244252	<40	<40	<40	<40	<40	<40	<40	<40	<40
Benzene (F0) (µg/L)	Subcontracted: SGS report SE 244252	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
TRH C6-C10 (µg/L)	Subcontracted: SGS report SE 244252	<50	<50	<50	<50	<50	<50	<50	<50	<50
TRH C6-C10 minus BTEX (F1) (µg/L)	Subcontracted: SGS report SE 244252	<50	<50	<50	<50	<50	<50	<50	<50	<50
LLTRH C10-C14 (µg/L)	Subcontracted: SGS report SE 244252	<50	<50	<50	<50	<50	<50	<50	160	<50
LLTRH C15-C28 (µg/L)	Subcontracted: SGS report SE 244252	<100	<100	<100	<100	<100	<100	<100	<100	<100
LLTRH C29-C36 (µg/L)	Subcontracted: SGS report SE 244252	<50	<50	<50	<50	<50	<50	<50	68	<50
LLTRH >C10-C16 (µg/L)	Subcontracted: SGS report SE 244252	<50	<50	<50	<50	<50	<50	<50	170	<50
LLTRH >C16-C34 (F3) (µg/L)	Subcontracted: SGS report SE 244252	<100	<100	<100	<100	<100	<100	<100	140	<100
LLTRH >C34-C40 (F4) (µg/L)	Subcontracted: SGS report SE 244252	<100	<100	<100	<100	<100	<100	<100	<100	<100
TRH Sum C10-C36 (µg/L)	Subcontracted: SGS report SE 244252	<100	<100	<100	<100	<100	110	100	320	<100
LLTRH C37-C40 (µg/L)	Subcontracted: SGS report SE 244252	<100	<100	<100	<100	<100	<100	<100	<100	<100
Total Recoverable Hydrocarbons in Silica Gel (TRH)										
TRH C10-C14-Silica (µg/L)	Subcontracted: SGS report SE 244252	..	..	..	..	..	<50	<50	<50	..
TRH C15-C28-Silica (µg/L)	Subcontracted: SGS report SE 244252	..	..	..	..	..	<100	<100	<100	..
TRH C29-C36-Silica (µg/L)	Subcontracted: SGS report SE 244252	..	..	..	..	..	<50	<50	92	..
TRH C37-C40-Silica (µg/L)	Subcontracted: SGS report SE 244252	..	..	..	..	..	<50	<50	<50	..
TRH >C10-C16-Silica (µg/L)	Subcontracted: SGS report SE 244252	..	..	..	..	..	<60	<60	<60	..
TRH >C16-C34-Silica (µg/L)	Subcontracted: SGS report SE 244252	..	..	..	..	..	<500	<500	<500	..
TRH >C34-C40-Silica (µg/L)	Subcontracted: SGS report SE 244252	..	..	..	..	..	<500	<500	<500	..
TRH Sum C10-C40-Silica (µg/L)	Subcontracted: SGS report SE 244252	..	..	..	..	..	<125	<125	160	..

- Notes:
- Total metals - samples digested with nitric acid. Total available (acid soluble/ extractable) metals - samples acidified with nitric acid to pH <2; Dissolved metals - samples filtered through 0.45µm cellulose acetate and then acidified with nitric acid prior to analysis
 - Metals and salts analysed by Inductively Coupled Plasma - Mass Spectrometry (ICP-MS).
 - 1 mg/L (milligram per litre) = 1 ppm (part per million) = 1000 µg/L (micrograms per litre) = 1000 ppb (part per billion).
 - For conductivity 1 dS/m = 1 mS/cm = 1000 µS/cm.
 - Analysis performed according to APHA (2017) 'Standard Methods for the Examination of Water & Wastewater', 23rd Edition, except where stated otherwise.
 - Analysis conducted between sample arrival date and reporting date.
 - ** NATA accreditation does not cover the performance of this service.
 - .. Denotes not requested.
 - This report is not to be reproduced except in full.
 - All services undertaken by EAL are covered by the EAL Laboratory Services Terms and Conditions (refer scu.edu.au/eal or on request).
 - Results relate only to the samples tested.
 - This report was re-issued on 04/05/2023 and replaces the report issued on 27/03/2023. Job reference amended to March 2023 at client request.



BLAKEBROOK QUARRY- GROUNDWATER QUALITY ASSESSMENT

Sampling Observations- March 2023.

Sample Information	Blakebrook Quarry Groundwater Well Sampling Information								
	SOUTH			NORTH 1			NORTH 2		
Site Name	BQS1S	BQS1I	BQS1D	BQN1B	BQN1A	BQN1D	BQN2B	BQN2A	BQN2D
Well Type	Shallow	Intermediate	Deep	Shallow	Intermediate	Deep	Shallow	Intermediate	Deep
Date	02/03/23	02/03/23	02/03/23	02/03/23	02/03/23	02/03/23	02/03/23	02/03/23	02/03/23
Time	10:41 AM	10:05 AM	10:00 AM	12:05 PM	12:50 PM	12:00 PM	8:20 AM	8:30 AM	9:10 AM
Recorded Depth 1	28.97	45.14	80.20	4.56	46.30	100.06	29.07	29.94	87.35
Recorded Depth 2	29.33	45.92	80.20	5.10	46.00	100.10	29.40	30.85	87.42
Level Meter Calibrated	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Battery Level	56%	55%	56%	56%	55%	55%	56%	56%	56%
Memory Level	84%	84%	84%	84%	84%	84%	84%	84%	84%
Sample Method	Bottom filling Bailer from screen zone	Bottom filling Bailer from screen zone	Hydro sleeve Bailer from screen zone	12-volt submersible pump	Bottom filling Bailer from screen zone	Hydro sleeve Bailer from screen zone	Bottom filling Bailer from screen zone	Bottom filling Bailer from screen zone	Hydro sleeve Bailer from screen zone
Odour	Not Present	Not Present	Not Present	Not Present	Not Present	Not Present	Not Present	Not Present	Not Present
Site/Water Observations	Slightly turbid	Clear, some particles	Clear water	Clear water	Clear water	Clear, some particles	Milky colour	Clear water	Clear, some particles
Fresh Water WQOs	Water Quality Observations								
pH	6.85	8.00	7.74	7.06	8.70	8.05	10.30	7.13	8.72
EC μ S/cm	0.440	1.28	1.68	0.997	1.74	1.37	0.925	0.394	0.849
DO (%)	30.76	53.84	68.84	5.80	37.38	45.73	51.39	80.66	37.36
Temperature (°C)	26.72	26.24	26.68	25.26	27.28	27.99	26.54	25.62	26.46
ORP	45.1	35.9	161.4	-59.0	103.3	70.0	114.1	158.4	172.9

RESULTS OF WATER ANALYSIS

9 samples supplied by Ecolam on 7/06/2023. Lab Job No. P1618.
 Samples submitted by Lise Bolton. Your Job: SMC010-Blakebrook WQ - Groundwater June 23

13 Evans Street LUTHERMORE NSW 2480

Parameter	Methods reference	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6	Sample 7	Sample 8	Sample 9
		BQN1-B	BQN1-A	BQN1-D	BQN2-B	BQN2-A	BQN2-D	BQS1-S	BQS1-I	BQS1-D
Job No.		P1618/1	P1618/2	P1618/3	P1618/4	P1618/5	P1618/6	P1618/7	P1618/8	P1618/9
Bicarbonate (Alkalinity) (mg/L CaCO ₃ equivalent)	** Total Alkalinity - APHA 2320	237	139	127	100	168	328	124	199	122
Water Hardness (mg/L CaCO ₃ equivalent)	** Using Ca and Mg calculation	158	225	37	83	111	11	72	94	43
Total Oils and Grease (mg/L)	APHA 5520-D (hexane extractable)	4	5	7	4	<2	4	<2	<2	5
Sodium (mg/L)	APHA 3125 ICPMS ¹⁰⁰⁰⁻¹⁴²	187	341	276	189	86.0	234	42.4	269	375
Potassium (mg/L)	APHA 3125 ICPMS ¹⁰⁰⁰⁻¹⁴²	4.40	8.49	2.99	6.88	5.52	2.91	3.59	5.42	4.01
Calcium (mg/L)	APHA 3125 ICPMS ¹⁰⁰⁰⁻¹⁴²	31.2	75.8	11.4	26.7	30.1	3.63	18.4	28.6	14.2
Magnesium (mg/L)	APHA 3125 ICPMS ¹⁰⁰⁰⁻¹⁴²	19.6	8.60	1.97	3.92	8.79	0.54	6.36	5.36	1.86
Sodium Absorption Ratio (SAR)	** By calculation	6.5	9.9	19.9	9.0	3.5	30.2	2.2	12.1	24.8
Chloride (mg/L)	APHA 3125 ICPMS ¹⁰⁰⁰⁻¹⁴²	237	549	318	259	71	107	24	308	493
Sulfate (mg/L SO ₄ ²⁻)	APHA 3125 ICPMS ¹⁰⁰⁰⁻¹⁴²	<9	23	52	23	13	19	<9	11	31
Chloride/Sulfate Ratio	** Calculation	..	24.3	6.1	11.4	5.4	5.6	..	29.4	15.7
Iron (mg/L)	Total Available - APHA 3125 ICPMS ¹⁰⁰⁰⁻¹⁴²	2.46	1.13	1.47	0.277	0.039	0.132	0.154	0.055	0.060
Lead (mg/L)	Total Available - APHA 3125 ICPMS ¹⁰⁰⁰⁻¹⁴²	0.004	0.008	0.003	0.002	<0.001	0.004	0.002	<0.001	<0.001
Iron (mg/L)	Dissolved - APHA 3125 ICPMS ¹⁰⁰⁰⁻¹⁴²	0.065	<0.005	<0.005	<0.005	<0.005	0.008	0.009	0.015	0.005
Lead (mg/L)	Dissolved - APHA 3125 ICPMS ¹⁰⁰⁰⁻¹⁴²	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
BTEX										
Benzene (µg/L)	Subcontracted: SGS report SE 249128	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Toluene (µg/L)	Subcontracted: SGS report SE 249128	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene (µg/L)	Subcontracted: SGS report SE 249128	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
m/p-xylene (µg/L)	Subcontracted: SGS report SE 249128	<1	<1	<1	<1	<1	<1	<1	<1	<1
o-xylene (µg/L)	Subcontracted: SGS report SE 249128	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Total Xylenes (µg/L)	Subcontracted: SGS report SE 249128	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5
Total BTEX (µg/L)	Subcontracted: SGS report SE 249128	<3	<3	<3	<3	<3	<3	<3	<3	<3
Naphthalene (VOC) (µg/L)	Subcontracted: SGS report SE 249128	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Total Recoverable Hydrocarbons (TRH)										
TRH C6-C9 (µg/L)	Subcontracted: SGS report SE 249128	<40	<40	<40	<40	<40	<40	<40	<40	<40
Benzene (F0) (µg/L)	Subcontracted: SGS report SE 249128	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
TRH C6-C10 (µg/L)	Subcontracted: SGS report SE 249128	<50	<50	<50	<50	<50	<50	<50	<50	<50
TRH C6-C10 minus BTEX (F1) (µg/L)	Subcontracted: SGS report SE 249128	<50	<50	<50	<50	<50	<50	<50	<50	<50
LLTRH C10-C14 (µg/L)	Subcontracted: SGS report SE 249128 and SE 250148	<50	<50	<50	<50	<50	<50	<50	<50	<50
LLTRH C15-C28 (µg/L)	Subcontracted: SGS report SE 249128 and SE 250148	<100	<100	<100	<100	<100	<100	<100	<100	<100
LLTRH C29-C36 (µg/L)	Subcontracted: SGS report SE 249128 and SE 250148	<50	<50	<50	<50	<50	110	<50	<50	<50
LLTRH >C10-C16 (µg/L)	Subcontracted: SGS report SE 249128 and SE 250148	<50	<50	<50	<50	<50	77	<50	<50	<50
LLTRH >C16-C34 (F3) (µg/L)	Subcontracted: SGS report SE 249128 and SE 250148	<100	<100	<100	<100	<100	780	<100	<100	<100
LLTRH >C34-C40 (F4) (µg/L)	Subcontracted: SGS report SE 249128 and SE 250148	<100	<100	<100	<100	<100	<100	<100	<100	<100
TRH Sum C10-C36 (µg/L)	Subcontracted: SGS report SE 249128 and SE 250148	<100	<100	<100	720	<100	890	<100	<100	<100
LLTRH C37-C40 (µg/L)	Subcontracted: SGS report SE 249128 and SE 250148	<100	<100	<100	<100	<100	<100	<100	<100	<100
Total Recoverable Hydrocarbons (TRH) in Silica Gel										
TRH C10-C14-Silica (µg/L)	Subcontracted: SGS report SE 249128	..	..	..	<50	..	<50	..	..	..
TRH C15-C28-Silica (µg/L)	Subcontracted: SGS report SE 249128	..	..	..	<200	..	<200	..	..	..
TRH C29-C36-Silica (µg/L)	Subcontracted: SGS report SE 249128	..	..	..	<200	..	<200	..	..	..
TRH C37-C40-Silica (µg/L)	Subcontracted: SGS report SE 249128	..	..	..	<200	..	<200	..	..	..
TRH >C10-C16-Silica (µg/L)	Subcontracted: SGS report SE 249128	..	..	..	<60	..	<60	..	..	..
TRH >C16-C34-Silica (µg/L)	Subcontracted: SGS report SE 249128	..	..	..	<500	..	<500	..	..	..
TRH >C34-C40-Silica (µg/L)	Subcontracted: SGS report SE 249128	..	..	..	<500	..	<500	..	..	..
TRH Sum C10-C36-Silica (µg/L)	Subcontracted: SGS report SE 249128	..	..	..	<450	..	<450	..	..	..
TRH Sum C10-C40-Silica (µg/L)	Subcontracted: SGS report SE 249128	..	..	..	<650	..	<650	..	..	..

Notes:

- Total metals - samples digested with nitric acid; Total available (acid soluble/ extractable) metals - samples acidified with nitric acid to pH <2; Dissolved metals - samples filtered through 0.45µm cellulose acetate and then acidified with nitric acid prior to analysis
- Metals and salts analysed by Inductively Coupled Plasma - Mass Spectrometry (ICP-MS).
- 1 mg/L (milligram per litre) = 1 ppm (part per million) = 1000 µg/L (micrograms per litre) = 1000 ppb (part per billion).
- For conductivity 1 dS/m = 1 mS/cm = 1000 µS/cm.
- Analysis performed according to APHA (2017) 'Standard Methods for the Examination of Water & Wastewater', 23rd Edition, except where stated otherwise.
- Analysis conducted between sample arrival date and reporting date.
- ** NATA accreditation does not cover the performance of this service.
- .. Denotes not requested.
- This report is not to be reproduced except in full.
- All services undertaken by EAL are covered by the EAL Laboratory Services Terms and Conditions (refer scu.edu.au/eal or on request).
- Results relate only to the samples tested.
- This report was updated on 07/07/2023 and replaces the draft report issued on 04/07/2023. TRH results for sample number 5 are now included.



BLAKEBROOK QUARRY- GROUNDWATER QUALITY ASSESSMENT

Sampling Observations- June 2023.

Sample Information	Blakebrook Quarry Groundwater Well Sampling Information								
	SOUTH			NORTH 1			NORTH 2		
Site Name	BQS1S	BQS1I	BQS1D	BQN1B	BQN1A	BQN1D	BQN2B	BQN2A	BQN2D
Well Type	Shallow	Intermediate	Deep	Shallow	Intermediate	Deep	Shallow	Intermediate	Deep
Date	06/06/23	06/06/23	06/06/23	06/06/23	06/06/23	06/06/23	06/06/23	06/06/23	06/06/23
Time	1:00 PM	1:05 PM	1:25 PM	11:00 AM	11:05 AM	11:00 AM	9:30 AM	10:00 AM	9:30 AM
Recorded Depth 1	25.32	46.63	80.34	5.04	46.00	100.02	29.18	30.15	87.60
Recorded Depth 2	25.72	47.06	80.32	5.70	46.05	100.02	29.55	30.15	87.70
Level Meter Calibrated	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Battery Level	54%	54%	54%	54%	54%	54%	54%	54%	54%
Memory Level	84%	84%	84%	80%	84%	84%	84%	87%	81%
Sample Method	Bottom filling Bailer from screen zone	Bottom filling Bailer from screen zone	Hydro sleeve Bailer from screen zone	12-volt submersible pump	Bottom filling Bailer from screen zone	Hydro sleeve Bailer from screen zone	Bottom filling Bailer from screen zone	Bottom filling Bailer from screen zone	Hydro sleeve Bailer from screen zone
Odour	Not Present	Not Present	Not Present	Not Present	Not Present	Not Present	Not Present	Not Present	Not Present
Site/Water Observations	Clear	Clear, some particles	Clear, large particles	Milky colour	Milky colour	Clear	Clear	Clear	Clear, some particles
Fresh Water WQOs	Water Quality Observations								
pH	6.95	7.90	7.89	7.09	10.68	8.84	10.22	8.03	8.91
EC μS/cm	0.23	1.05	1.40	0.88	1.47	1.00	0.89	0.44	0.75
DO (%)	97.48	60.82	51.44	8.91	75.49	74.01	62.18	60.12	53.66
Temperature (°C)	19.10	19.24	19.89	20.48	20.31	19.96	18.10	19.4	19.79
ORP	119.8	66.8	-84.4	-6.3	23.1	49.1	58.3	56.1	52.3

RESULTS OF WATER ANALYSIS

9 samples supplied by Ecoteam on 4/09/2023. Lab Job No. P4895.
 Samples submitted by Lise Bolton. Your Job: SMC010-BlakebrookWQ-Groundwater_SEPT23
 13 Ewing Street LISMORE NSW 2480

Parameter	Methods reference	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6	Sample 7	Sample 8	Sample 9
		BQN1-B	BQN1-A	BQN1-D	BQN2-B	BQN2-A	BQN2-D	BQS1-S	BQS1-I	BQS1-D
	Job No.	P4895/1	P4895/2	P4895/3	P4895/4	P4895/5	P4895/6	P4895/7	P4895/8	P4895/9
Total Alkalinity (mg/L CaCO ₃ equivalent)	** Total Alkalinity - APHA 2320	245	170	163	180	192	339	145	238	159
Water Hardness (mg/L CaCO ₃ equivalent)	** Using Ca and Mg calculation	150	152	23	81	95	10	68	85	40
Total Oils and Grease (mg/L)	APHA 5520-D (hexane extractable)	7.6	4.3	4.0	4.9	3.2	3.1	<2	<2	6.5
Sodium (mg/L)	APHA 3125 ICPMS ^{7004 182}	178	312	271	223	79.6	221	40.5	268	365
Potassium (mg/L)	APHA 3125 ICPMS ^{7004 182}	3.9	8.9	2.1	6.8	4.5	2.0	3.3	5.0	4.0
Calcium (mg/L)	APHA 3125 ICPMS ^{7004 182}	28.2	55.4	7.8	23.6	22.2	3.3	16.8	25.7	12.7
Magnesium (mg/L)	APHA 3125 ICPMS ^{7004 182}	19.4	3.3	0.9	5.3	9.7	0.5	6.4	5.2	1.9
Sodium Absorption Ratio (SAR)	** By calculation	6.3	11.0	24.4	10.8	3.5	30.2	2.1	12.6	25.2
Chloride (mg/L)	APHA 3125 ICPMS ^{7004 182}	239	503	323	293	71	111	21	325	474
Sulfate (mg/L SO ₄ ²⁻)	APHA 3125 ICPMS ^{7004 182}	10	21	47	26	13	20	<9	10	31
Chloride/Sulfate Ratio	** Calculation	24.1	23.6	6.9	11.2	5.6	5.4	..	32.2	15.1
Iron (mg/L)	Total Available - APHA 3125 ICPMS ^{7004 182}	2.26	0.606	0.483	0.244	0.142	0.185	0.759	0.100	0.225
Lead (mg/L)	Total Available - APHA 3125 ICPMS ^{7004 182}	<0.001	0.004	0.004	0.001	0.003	0.003	0.002	0.001	0.001
Iron (mg/L)	Dissolved - APHA 3125 ICPMS ^{7004 182}	0.856	0.005	0.009	0.007	<0.005	<0.005	<0.005	0.017	0.010
Lead (mg/L)	Dissolved - APHA 3125 ICPMS ^{7004 182}	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
BTEX										
Benzene (µg/L)	Subcontracted: SGS report SE 253461	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Toluene (µg/L)	Subcontracted: SGS report SE 253461	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene (µg/L)	Subcontracted: SGS report SE 253461	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
m/p-xylene (µg/L)	Subcontracted: SGS report SE 253461	<1	<1	<1	<1	<1	<1	<1	<1	<1
o-xylene (µg/L)	Subcontracted: SGS report SE 253461	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Total Xylenes (µg/L)	Subcontracted: SGS report SE 253461	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5
Total BTEX (µg/L)	Subcontracted: SGS report SE 253461	<3	<3	<3	<3	<3	<3	<3	<3	<3
Naphthalene (VOC) (µg/L)	Subcontracted: SGS report SE 253461	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Total Recoverable Hydrocarbons (TRH)										
TRH C6-C9 (µg/L)	Subcontracted: SGS report SE 253461	<40	<40	260	<40	<40	45	<40	140	<40
Benzene (F0) (µg/L)	Subcontracted: SGS report SE 253461	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
TRH C6-C10 (µg/L)	Subcontracted: SGS report SE 253461	<50	<50	300	<50	<50	52	<50	160	<50
TRH C6-C10 minus BTEX (F1) (µg/L)	Subcontracted: SGS report SE 253461	<50	<50	300	<50	<50	52	<50	160	<50
TRH C10-C14 (µg/L)	Subcontracted: SGS report SE 253461	<50	<50	<50	<50	<50	<50	<50	<50	<50
TRH C15-C28 (µg/L)	Subcontracted: SGS report SE 253461	<200	<200	<200	<200	<200	<200	<200	450	<200
TRH C29-C36 (µg/L)	Subcontracted: SGS report SE 253461	<200	<200	<200	<200	<200	<200	<200	<200	<200
TRH C37-C40 (µg/L)	Subcontracted: SGS report SE 253461	<200	<200	<200	<200	<200	<200	<200	<200	<200
TRH >C10-C16 (µg/L)	Subcontracted: SGS report SE 253461	<60	<60	<60	<60	<60	<60	<60	<60	<60
TRH >C10-C16 - Naphthalene (F2) (µg/L)	Subcontracted: SGS report SE 253461	<60	<60	<60	<60	<60	<60	<60	<60	<60
TRH >C16-C34 (F3) (µg/L)	Subcontracted: SGS report SE 253461	<500	<500	<500	<500	<500	<500	<500	<500	<500
TRH >C34-C40 (F4) (µg/L)	Subcontracted: SGS report SE 253461	<500	<500	<500	<500	<500	<500	<500	<500	<500
TRH C10-C40 (µg/L)	Subcontracted: SGS report SE 253461	<320	<320	<320	<320	<320	<320	<320	480	<320

Notes:

- Total metals - samples digested with nitric acid; Total available (acid soluble/ extractable) metals - samples acidified with nitric acid to pH <2.
Dissolved metals - samples filtered through 0.45µm cellulose acetate and then acidified with nitric acid prior to analysis
- Metals and salts analysed by Inductively Coupled Plasma - Mass Spectrometry (ICP-MS).
- 1 mg/L (milligram per litre) = 1 ppm (part per million) = 1000 µg/L (micrograms per litre) = 1000 ppb (part per billion).
- For conductivity 1 dS/m = 1 mS/cm = 1000 µS/cm.
- Analysis performed according to APHA (2017) 'Standard Methods for the Examination of Water & Wastewater', 23rd Edition, except where stated otherwise.
- Analysis conducted between sample arrival date and reporting date.
- ** NATA accreditation does not cover the performance of this service.
- .. Denotes not requested.
- This report is not to be reproduced except in full.
- All services undertaken by EAL are covered by the EAL Laboratory Services Terms and Conditions (refer scu.edu.au/eal or on request).
- Results relate only to the samples tested.
- This report was issued on 18/09/2023.



BLAKEBROOK QUARRY- GROUNDWATER QUALITY ASSESSMENT

Sampling Observations- September 2023.

Sample Information	Blakebrook Quarry Groundwater Well Sampling Information								
	SOUTH			NORTH 1			NORTH 2		
Site Name	BQS1S	BQS1I	BQS1D	BQN1B	BQN1A	BQN1D	BQN2B	BQN2A	BQN2D
Well Type	Shallow	Intermediate	Deep	Shallow	Intermediate	Deep	Shallow	Intermediate	Deep
Date	04/09/23	04/09/23	04/09/23	04/09/23	04/09/23	04/09/23	04/09/23	04/09/23	04/09/23
Time	10:20 AM	9:50 AM	9:40 AM	11:10 AM	12:10 PM	11:10 AM	8:50 AM	8:20 AM	8:15 AM
Recorded Depth 1	30.72	48.10	80.20	7.72	45.96	100.11	29.12	30.10	87.50
Recorded Depth 2	31.13	48.66	80.25	7.70	45.97	100.11	29.48	31.02	87.57
Level Meter Calibrated	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Battery Level	53%	53%	53%	53%	53%	53%	53%	53%	53%
Memory Level	81%	84%	81%	81%	84%	75%	84%	87%	78%
Sample Method	Bottom filling Bailer from screen zone	Bottom filling Bailer from screen zone	Hydro sleeve Bailer from screen zone	12-volt submersible pump	Bottom filling Bailer from screen zone	Hydro sleeve Bailer from screen zone	Bottom filling Bailer from screen zone	Bottom filling Bailer from screen zone	Hydro sleeve Bailer from screen zone
Odour	Not Present	Not Present	Present-Sulfur	Not Present	Not Present	Not Present	Not Present	Not Present	Not Present
Site/Water Observations	Clear	Clear	Clear, large particles	Clear	Milky colour	Clear	Clear	Clear	Clear, some particles
Fresh Water WQOs	Water Quality Observations								
pH	6.83	8.00	8.07	7.10	11.27	8.52	9.00	7.53	8.89
EC μ S/cm	0.22	1.02	1.32	0.85	1.52	1.00	0.91	0.39	0.69
DO (%)	51.77	65.09	48.01	6.18	73.91	75.56	65.06	80.05	58.21
Temperature (°C)	19.52	19.59	20.00	20.44	20.39	20.71	18.83	19.28	19.49
ORP	63.58	-28.64	-115.5	-33.4	4.00	-79.3	55.99	70.01	48.18

RESULTS OF WATER ANALYSIS

9 samples supplied by Ecoteam on 4/12/2023. Lab Job No. P8331.
 Samples submitted by Lise Bolton. Your Job: SMC010- Blakelook WQ - Ground Watyer - DEC23
 13 Ewing Street LISMORE NSW 2480

Parameter	Methods reference	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6	Sample 7	Sample 8	Sample 9
		BQN1-B	BQN1-A	BQN1-D	BQN2-B	BQN2-A	BQN2-D	BQS1-S	BQS1-I	BQS1-D
Job No.		P8331/1	P8331/2	P8331/3	P8331/4	P8331/5	P8331/6	P8331/7	P8331/8	P8331/9
pH	APHA 4500-H ⁺ -B	7.21	11.3	8.54	9.74	7.72	8.78	6.66	8.10	8.06
Conductivity (EC) (dS/m)	APHA 2510-B	1.02	1.85	1.28	0.976	0.553	0.888	0.300	1.24	1.71
Total Dissolved Sats (mg/L)	** Calculation using EC x 680	696	1,255	869	664	376	604	204	843	1,162
Total Alkalinity (mg/L CaCO ₃ equivalent)	** Total Alkalinity - APHA 2320	237	188	125	104	181	349	126	195	123
Water Hardness (mg/L CaCO ₃ equivalent)	** Using Ca and Mg calculation	148	181	25	67	119	10	70	83	39
Total Oils and Grease (mg/L)	APHA 5520-D (hexane extractable)	7.86	8.14	7.71	5.14	5.14	7.00	4.00	6.43	5.57
Sodium (mg/L)	APHA 3125 ICPMS ^{1006 142}	166	282	253	172	76.3	206	37.2	241	324
Potassium (mg/L)	APHA 3125 ICPMS ^{1006 142}	3.65	8.58	2.15	5.68	4.59	1.91	2.99	4.53	3.48
Calcium (mg/L)	APHA 3125 ICPMS ^{1006 142}	29.0	67.3	8.66	21.2	33.1	3.41	17.9	25.7	12.9
Magnesium (mg/L)	APHA 3125 ICPMS ^{1006 142}	18.4	3.02	0.938	3.37	8.85	0.475	6.24	4.50	1.67
Sodium Absorption Ratio (SAR)	** By calculation	5.9	9.1	21.8	9.2	3.0	27.7	1.9	11.5	22.5
Chloride (mg/L)	APHA 3125 ICPMS ^{1006 142}	291	473	313	248	74.7	109	21.8	304	465
Sulfate (mg/L SO ₄ ²⁻)	APHA 3125 ICPMS ^{1006 142}	14	24	57	26	17	23	10	12	40
Chloride/Sulfate Ratio	** Calculation	21.3	19.3	5.5	9.5	4.3	4.7	2.2	25.9	11.7
Iron (mg/L)	Total Available - APHA 3125 ICPMS ^{1006 142}	1.82	0.221	0.625	0.232	0.078	0.088	0.443	0.057	0.043
Lead (mg/L)	Total Available - APHA 3125 ICPMS ^{1006 142}	<0.001	0.002	<0.001	0.001	0.002	0.003	0.002	<0.001	<0.001
Iron (mg/L)	Dissolved - APHA 3125 ICPMS ^{1006 142}	0.499	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.008	<0.005
Lead (mg/L)	Dissolved - APHA 3125 ICPMS ^{1006 142}	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
BTEX										
Benzene (µg/L)	Subcontracted: SGS report SE 257682	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Toluene (µg/L)	Subcontracted: SGS report SE 257682	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene (µg/L)	Subcontracted: SGS report SE 257682	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
m/p-xylene (µg/L)	Subcontracted: SGS report SE 257682	<1	<1	<1	<1	<1	<1	<1	<1	<1
o-xylene (µg/L)	Subcontracted: SGS report SE 257682	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Total Xylenes (µg/L)	Subcontracted: SGS report SE 257682	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5
Total BTEX (µg/L)	Subcontracted: SGS report SE 257682	<3	<3	<3	<3	<3	<3	<3	<3	<3
Naphthalene (VOC) (µg/L)	Subcontracted: SGS report SE 257682	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Total Recoverable Hydrocarbons (TRH)										
TRH C6-C9 (µg/L)	Subcontracted: SGS report SE 257682	<40	<40	<40	<40	<40	<40	<40	<40	<40
Benzene (F0) (µg/L)	Subcontracted: SGS report SE 257682	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
TRH C6-C10 (µg/L)	Subcontracted: SGS report SE 257682	<50	<50	<50	<50	<50	<50	<50	<50	<50
TRH C6-C10 minus BTEX (F1) (µg/L)	Subcontracted: SGS report SE 257682	<50	<50	<50	<50	<50	<50	<50	<50	<50
LLTRH C10-C14 (µg/L)	Subcontracted: SGS report SE 257682	<50	<50	<50	<50	<50	<50	<50	<50	<50
LLTRH C15-C28 (µg/L)	Subcontracted: SGS report SE 257682	<100	<100	<100	<100	<100	<100	<100	<100	<100
LLTRH C29-C36 (µg/L)	Subcontracted: SGS report SE 257682	<50	<50	<50	<50	<50	<50	<50	<50	<50
LLTRH >C10-C16 (µg/L)	Subcontracted: SGS report SE 257682	<50	<50	<50	<50	<50	<50	<50	<50	<50
LLTRH >C16-C34 (F3) (µg/L)	Subcontracted: SGS report SE 257682	<100	<100	<100	<100	<100	<100	<100	<100	<100
LLTRH >C34-C40 (F4) (µg/L)	Subcontracted: SGS report SE 257682	<100	<100	<100	<100	<100	<100	<100	<100	<100
TRH Sum C10-C36 (µg/L)	Subcontracted: SGS report SE 257682	<100	<100	<100	<100	<100	<100	<100	<100	<100
LLTRH C37-C40 (µg/L)	Subcontracted: SGS report SE 257682	<100	<100	<100	<100	<100	<100	<100	<100	<100

Notes:

- Total metals - samples digested with nitric acid; Total available (acid soluble/ extractable) metals - samples acidified with nitric acid to pH <2; Dissolved metals - samples filtered through 0.45µm cellulose acetate and then acidified with nitric acid prior to analysis
- Metals and salts analysed by Inductively Coupled Plasma - Mass Spectrometry (ICP-MS).
- 1 mg/L (milligram per litre) = 1 ppm (part per million) = 1000 µg/L (micrograms per litre) = 1000 ppb (part per billion).
- For conductivity 1 dS/m = 1 mS/cm = 1000 µS/cm.
- Analysis performed according to APHA (2017) 'Standard Methods for the Examination of Water & Wastewater', 23rd Edition, except where stated otherwise.
- Analysis conducted between sample arrival date and reporting date.
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- Results relate only to the samples tested.
- This report was issued on 15/12/2023.



BLAKEBROOK QUARRY- GROUNDWATER QUALITY ASSESSMENT

Sampling Observations- December 2023.

Sample Information	Blakebrook Quarry Groundwater Well Sampling Information								
	SOUTH			NORTH 1			NORTH 2		
Site Name	BQS1S	BQS1I	BQS1D	BQN1B	BQN1A	BQN1D	BQN2B	BQN2A	BQN2D
Well Type	Shallow	Intermediate	Deep	Shallow	Intermediate	Deep	Shallow	Intermediate	Deep
Date	04/12/23	04/12/23	04/12/23	04/12/23	04/12/23	04/12/23	04/12/23	04/12/23	04/12/23
Time	10:30	10:30	11:05	11:40	11:50	12:15	9:15	9:54	9:15
Recorded Depth 1	30.64	48.42	80.10	8.22	46.07	100.06	29.09	29.88	87.50
Recorded Depth 2	30.99	49.00	80.00	8.02	46.01	100.06	29.45	30.90	87.55
Level Meter Calibrated	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Battery Level	51%	51%	51%	52%	51%	51%	52%	52%	52%
Memory Level	78%	78%	78%	78%	81%	81%	84%	84%	84%
Sample Method	Bottom filling Bailer from screen zone	Bottom filling Bailer from screen zone	Hydro sleeve Bailer from screen zone	12-volt submersible pump	Bottom filling Bailer from screen zone	Hydro sleeve Bailer from screen zone	Bottom filling Bailer from screen zone	Bottom filling Bailer from screen zone	Hydro sleeve Bailer from screen zone
Odour	Not Present	Not Present	Present-Sulfur	Not Present	Not Present	Not Present	Not Present	Not Present	Not Present
Site/Water Observations	Clear	Clear	Clear, large particles	Clear	Clear	Clear	Clear	Clear	Clear, some particles
Fresh Water WQOs	Water Quality Observations								
pH	6.57	7.65	8.07	6.96	11.10	8.19	9.50	7.59	8.90
EC μ S/cm	0.25	1.05	1.37	0.82	1.58	1.04	0.79	0.44	0.73
DO (%)	57.14	54.54	36.68	8.79	81.29	52.40	47.61	66.82	98.54
Temperature (°C)	24.07	23.51	24.67	20.59	24.26	23.03	24.66	23.71	23.94
ORP	107.88	65.79	-49.41	-31.40	21.46	39.04	51.74	45.24	57.8