

Water quality objectives to protect the aquatic ecosystem environmental values for Fractured Rock groundwater aquifer zones in the Queensland Murray-Darling Basin.

Zone	Percentile	Notes: 1. The ANZECC Guidelines (ANZECC/ARMCANZ, 2000) recommend that the highest level of protection should be provided to underground aquatic ecosystems, given their high conservation value. The management intent is to maintain the existing water quality distribution (20th, 50th and 80th percentiles). 2. ID: Insufficient data.																											
		Na		Ca		Mg		HCO ₃		Cl		SO ₄		NO ₃		Electrical Conductivity (µS/cm)	Hardness (mg/L)	pH	Alkalinity (mg/L)	SiO ₂ (mg/L)	F (mg/L)	Fe (mg/L)	Mn (mg/L)	Zn (mg/L)	Cu (mg/L)	SAR (meq/L)	Total Nitrogen mg/L	Total Phosphorous mg/L	
		mg/L	%	mg/L	%	mg/L	%	mg/L	%	mg/L	%	mg/L	%	mg/L	%														
s2. Fractured Rock																													
1. Upper Condamine basalts	20th	50	18	22	10	21	21	317	57	49	16	0.0	0	0.00	0	687	151	7.6	263.5	23.0	0.10	0.000	0.000	0.005	0.000	1.00	0.000	0.000	
	50th	76	27	47	20	70	48	513	71	99	26	3.3	1	3.55	0	1040	417	7.9	426.0	35.0	0.20	0.020	0.010	0.020	0.010	1.50	0.543	0.000	
	80th	114	62	72	28	115	60	651	82	205	40	9.6	2	25.00	3	1493	635	8.3	540.0	45.1	0.30	0.100	0.010	0.065	0.035	4.76	5.000	0.087	
2. Toowoomba region basalts	20th	66	22	16	10	7	8	180	32	88	32	3.4	1	0.50	0	660	85	7.5	150.0	20.0	0.10	0.000	0.000	0.005	0.010	1.30	0.087	0.000	
	50th	97	35	52	21	59	40	350	49	184	47	10.0	2	5.00	1	1200	390	7.9	291.0	34.0	0.20	0.020	0.010	0.005	0.015	2.20	1.054	0.000	
	80th	147	79	100	29	116	53	530	64	356	63	22.0	4	33.00	4	1750	708	8.2	443.0	47.0	0.30	0.050	0.020	0.025	0.015	6.20	7.391	0.000	
3. Lower Condamine basalts	20th	92	34	18	9	14	11	257	30	100	30	6.0	1	0.10	0	790	114	7.6	220.0	30.0	0.20	0.000	0.000	0.000	0.000	2.10	0.000	0.000	
	50th	158	49	55	19	56	30	445	49	220	47	14.4	2	1.00	0	1400	380	7.9	376.0	48.0	0.30	0.010	0.010	0.003	0.018	3.80	0.130	0.000	
	80th	308	79	105	28	102	42	592	66	596	67	35.6	5	16.90	1	2568	643	8.3	494.5	60.0	0.50	0.050	0.020	0.040	0.030	8.19	3.793	0.000	
4. Eastern Basement With Basalt Remnants	20th	157	46	10	3	4	3	361	25	102	25	11.6	2	0.00	0	1033	49	8.0	308.1	18.0	0.10	0.000	0.000	0.010	0.010	3.68	0.000	0.005	
	50th	225	68	32	7	52	21	519	50	275	44	30.0	4	0.30	0	1500	331	8.3	431.5	25.0	0.29	0.010	0.010	0.010	0.010	9.65	0.065	0.033	
	80th	668	93	109	18	129	39	719	71	933	67	130.5	8	3.33	0	2922	750	8.5	596.3	55.7	0.41	0.138	0.070	0.027	0.023	20.76	0.724	0.082	
5. Main Range	20th	72	30	15	6	13	12	302	48	35	12	4.0	1	0.40	0	688	104	7.5	247.5	25.0	0.12	0.000	0.000	0.005	0.001	1.69	0.087	0.000	

Draft Water Quality Objectives for Queensland Murray-Darling Basin – Fractured Rock Aquifer Zone

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		mg/L	%	mg/L	%	mg/L	%	mg/L	%	mg/L	%	mg/L	%	mg/L	%														
s2. Fractured Rock																													
Volcanics	50th	122	46	38	15	44	33	460	72	80	23	12.0	3	2.55	0	1032	291	8.0	383.0	45.0	0.26	0.020	0.010	0.010	0.005	3.20	0.554	0.082	
	80th	237	78	68	28	80	44	602	85	245	43	45.9	7	20.12	2	1866	489	8.3	500.0	61.0	0.49	0.050	0.020	0.040	0.015	9.04	4.374	0.082	
6. Border Rivers Headwaters	20th	75	42	17	9	13	16	164	19	92	42	9.1	2	0.00	0	648	104	7.0	138.8	20.1	0.20	0.000	0.000	0.007	0.003	2.60	0.000	ID	
	50th	189	57	67	20	45	22	351	37	305	56	36.0	6	1.00	0	1550	366	7.7	294.5	30.0	0.33	0.010	0.020	0.039	0.015	4.40	0.109	ID	
	80th	437	70	127	27	115	30	602	51	1033	72	145.2	11	9.10	1	4212	772	8.2	497.1	39.9	0.59	0.093	0.086	0.097	0.019	7.84	0.652	ID	
7. Glenlyon	20th	26	32	11	22	6	20	65	30	15	16	4.2	3	0.45	0	230	50	7.0	50.5	33.6	0.20	0.005	0.000	0.005	0.000	1.27	0.000	ID	
	50th	117	43	113	35	57	25	345	46	109	25	220.0	32	2.40	0	2014	498	7.4	119.5	37	0.23	0.041	0.01	0.01	0.015	2.39	0.272	ID	
	80th	191	60	159	37	69	29	568	67	174	43	330.5	50	9.35	6	2125	723	8.0	445.5	42.2	0.52	0.130	0.085	0.058	0.015	2.86	0.950	ID	
8. New England Granite	20th	32	44	6	10	3	9	20	5	30	34	3.2	1	0.21	0	273	45	6.6	16.0	33.9	0.20	0.003	0.010	0.030	0.010	1.80	0.034	ID	
	50th	65	64	23	18	9	14	74	37	78	51	12.0	4	1.00	0	600	106	7.1	60.5	52.0	1.36	0.010	0.110	0.925	0.015	3.10	0.217	ID	
	80th	173	78	48	39	25	21	175	53	321	85	25.4	11	13.30	4	1225	244	7.7	146.0	65.7	3.00	0.125	0.663	2.583	0.043	6.12	4.489	ID	

References:

McNeil, V.H., Raymond, M.A.A., Bennett, L. & McGregor, G.B. (2018), *Regional groundwater chemistry zones: Queensland Murray-Darling Basin*, Department of Environment and Science, Queensland Government.