

## ENVIRONMENT PROTECTION LICENCE 20350 MONITORING DATA

<b>Licence Holder:</b>	Santos NSW (Eastern) Pty Ltd
<b>Premises:</b>	Narrabri Gas Field X-Line Road, Narrabri, NSW 2390
<b>Licence No:</b>	20350
<b>EPL LINK:</b>	<a href="https://apps.epa.nsw.gov.au/prpoeoapp/Detail.aspx?instid=20350&amp;id=20350&amp;option=licence&amp;searchrange=licence&amp;range=POEO%20lice">https://apps.epa.nsw.gov.au/prpoeoapp/Detail.aspx?instid=20350&amp;id=20350&amp;option=licence&amp;searchrange=licence&amp;range=POEO%20lice</a> Version 11 APRIL 2021
<b>EPL Period:</b>	May 1st 2022 to April 30th 2023
<b>Reporting Period:</b>	<b>Quarter 1 May 2022 - July 2022</b>
<b>Published Date:</b>	<b>Aug 2022</b> Version 1 <b>May 2023</b> Version 2 Data Update “This report was updated on the 11 May 2023 to correct data transcription errors discovered in the initial publication of the monitoring data. The corrected values are not significantly different from the initially published data, and neither the initial or corrected values indicate any effects on the environment due to CSG activities.”
<b>Monitoring Location:</b>	Refer to Table 1
<b>Scheduled Activity:</b>	Coal seam gas exploration, assessment and production
<b>General Notes:</b>	Monitoring points removed in accordance with Environmental Protection Licence (EPL) 23050 ammended 11th April 2021 (16, 17, 22, 23, 24, 25, 29, 30, 31, 32, 33, 34, 35, 36, 50, 51, 52, 53, 55, 58, 67 and 68) Monitoring Point 80, 81 & 82 - no sample required in accordance with EPL20350 Condition M2.11 Monitoring Point 77 - no sample required in accordance with EPL20350 Condition M2.7 Monitoring Point 69, 70, 75 & 76 - no sample required in accordance with EPL20350 Condition M2.8 and M2.9 Monitoring Point 83, 84, 85 & 86 - no sample required in accordance with EPL20350 Condition M2.11 Monitoring points visited with insufficient recharge to collect a lab sample: 18 Monitoring points visited and reported dry : 26,28,38,39,40,43,62,66 and 78. Monitoring points 47, 48 and 49: no water level results available. Repairs and maintenance being investigated

**Table 1: EPL20350 Water Monitoring Locations**

EPA Identification No.	Monitoring type	Location	Easting	Northing
7	Groundwater quality monitoring	BWD27PRUPS02	755433.048	6604684.807
8	Groundwater quality monitoring	BWD27PRLPS03	755436.361	6604699.035
9	Groundwater quality monitoring	BWD26PRUPS01	749372.75	6609376.69
10	Groundwater quality monitoring	BWD26PRLPS02	749364.45	6609363.35
11	Groundwater quality monitoring	DWH14PRUPS01	764703.313	6617145.443
12	Groundwater quality monitoring	DWH14PRLPS02	764689.147	6617119.109
13	Groundwater quality monitoring	DWH14PRPUR03	764696.211	6617132.298
14	Groundwater quality monitoring	DWH3PRUPS01	762239.68	6605589.32
15	Groundwater quality monitoring	DWH3PRLPS02	762251.05	6605598.98
16	Groundwater quality monitoring	NYOPRORA01	736293.46	6643110.4
17	Groundwater quality monitoring	NYOPRUPS02	736308.8	6643107.84
18	Groundwater quality monitoring	BWD27PRORA01	755429.176	6604670.682
20	Groundwater quality monitoring	BHN14PRORA01	747158.13	6626109.12
21	Groundwater quality monitoring	BHN14PRUPS02	747152.71	6626123.91
22	Groundwater quality monitoring	TULPRNAP01	774464.07	6612048.13
23	Groundwater quality monitoring	TULPRDGY02	774466.48	6612032.98
24	Groundwater quality monitoring	BWDMW13D	753863.3	6608108.51
25	Groundwater quality monitoring	BWDMW13S	753864.82	6608109.3
26	Groundwater quality monitoring	BWDMW12S	753830.65	6608202.74
27	Groundwater quality monitoring	BWDMW12D	753831.91	6608203.71
28	Groundwater quality monitoring	BWDMW12I	753832.68	6608202.25
29	Groundwater quality monitoring	BWDMW2	753912.83	6608241.35
30	Groundwater quality monitoring	BWDMW3	753935.87	6608254.02
31	Groundwater quality monitoring	BWDMW4D	753980.81	6608285.74
32	Groundwater quality monitoring	BWDMW4	753984.14	6608288.04
33	Groundwater quality monitoring	BWDMW15S	753868.09	6608258.34
34	Groundwater quality monitoring	BWDMW15D	753867.1	6608256.75
35	Groundwater quality monitoring	BWDMW16S	753858.95	6608316.49
36	Groundwater quality monitoring	BWDMW16D	753856.98	6608315.57
37	Groundwater quality monitoring	LWDMW1D	751387.93	6623862.96
38	Groundwater quality monitoring	LWDMW1S	751388.92	6623862.46
39	Groundwater quality monitoring	LWDMW1I	751390.64	6623861.85
40	Groundwater quality monitoring	LWDMW2S	751102.84	6622293.02
41	Groundwater quality monitoring	LWDMW2D	751101.81	6622293.15
42	Groundwater quality monitoring	LWDMW3D	751876.16	6622163.76
43	Groundwater quality monitoring	LWDMW3S	751876.47	6622164.93
44	Groundwater level monitoring	DWH8AGMB1	765546.74	6616987.99
45	Groundwater level monitoring	DWH8AGMB2	765546.74	6616987.99
46	Groundwater level monitoring	DWH8AGMB3	765546.74	6616987.99

EPA Identification No.	Monitoring type	Location	Easting	Northing
47	Groundwater level monitoring	BWD28QGUPS01	752949.898	6604219.732
48	Groundwater level monitoring	BWD28QGLPS01	752949.898	6604219.732
49	Groundwater level monitoring	BWD28QGPUR01	752949.898	6604219.732
50	Groundwater quality monitoring	WPKMW01	755684.14	6638105.31
51	Groundwater quality monitoring	WPKMW01D	755689.75	6638097.35
52	Groundwater quality monitoring	WPKMW02	755671.2	6638034.29
53	Groundwater quality monitoring	WPKMW04	755632.5	6637993.07
55	Groundwater quality monitoring	WPKMW08	755634.11	6638166.87
56	Groundwater quality monitoring	WPKMW09D	755663.98	6637988.2
57	Groundwater quality monitoring	WPKMW09S	755664.4	6637990.54
58	Groundwater quality monitoring	WPKMW12S	755456.18	6638228.91
59	Groundwater quality monitoring	WPKMW13I	755552.65	6638189.56
60	Groundwater quality monitoring	WPKMW13S	755554.88	6638189.05
61	Groundwater quality monitoring	WPKMW14D	755364.51	6638049.06
62	Groundwater quality monitoring	WPKMW14S	755364.77	6638048.26
63	Groundwater quality monitoring	WPKMW15D	755365.48	6638233.36
64	Groundwater quality monitoring	WPKMW15S	755365.5	6638230.74
65	Groundwater quality monitoring	WPKMW16D	755051.03	6637988.5
66	Groundwater quality monitoring	WPKMW16S	755050.53	6637986.64
67	Groundwater quality monitoring	WPKMW17D	756151.06	6638128.32
68	Groundwater quality monitoring	WPKMW17S	756149.54	6638128.05
69	Produced water storage dam	BWDPD2	753875.87	6607995.06
70	Produced water storage dam	BWDPD3	753992.17	6608125.97
71	Produced water storage dam	LWDPD1CELL4	751473.349	6623513.252
72	Produced water storage dam	LWDPD1CELL3	751460.723	6623323.85
73	Produced water storage dam	LWDPD1CELL2	751428.103	6623124.978
74	Produced water storage dam	LWDPD1CELL1	751390.223	6622935.575
75	Produced water storage dam	TFDPD1	755611.6	6638072.85
76	Produced water storage dam	TFDPD2	755480.11	6638099.04
77	Treated water quality monitoring	LWWTDM1	751648.02	6622508.31
78	Groundwater quality monitoring	WPKMW18S	755944.01	6638100.84
79	Groundwater quality monitoring	WPKMW18I	755945.07	6638105.04
80	Groundwater quality monitoring	LWDMW4	752080.54	6623038.94
81	Groundwater quality monitoring	LWDMW5	752491.08	6623301.16
82	Groundwater quality monitoring	LWDMW6	752667.55	6623165.03
83	Soil quality monitoring	LWDSMP1	751942.34	6622941.21
84	Soil quality monitoring	LWDSMP2	752164.06	6623143.83
85	Soil quality monitoring	LWDSMP3	752572.6	6623126.32
86	Soil quality monitoring	LWDSMP4	752457.14	6622764.26

Spatial Reference: GDA94 MGA Zone 55

**Note:** Monitoring points removed in accordance with Environmental Protection Licence (EPL) 23050 amended 11th April 2021: (16, 17, 22, 23, 24, 25, 29, 30, 31, 32, 33, 34, 35, 36, 50, 51, 52, 53, 55, 58, 67 and 68)

**TABLE 2: GROUNDWATER QUALITY MONITORING (In situ - Quarterly)**

		EPA Identification No	7	8	9	10	11	12
		Location	BWD27PRUPS02	BWD27PRLPS03	BWD26PRUPS01	BWD26PRLPS02	DWH14PRUPS01	DWH14PRLPS02
		Date	22/06/2022	22/06/2022	22/06/2022	22/06/2022	21/06/2022	21/06/2022
		Sample Method	in situ	in situ	in situ	in situ	in situ	in situ
Parameter	Units	LOR	RESULT	RESULT	RESULT	RESULT	RESULT	RESULT
Dissolved Oxygen	mg/L	-	3.7	0.78	4.3	1.1	0.29	1.72
Electrical Conductivity	µS/cm	-	137	216	77	137	220	181
pH	pH Unit	-	5.38	5.83	5.63	6.03	5.7	5.38
Redox Potential	mV	-	3	-55	5	-45	-68	-7
Standing Water Level	mTOC	-	38.99	38.5	29.7	29.15	53.46	54.21

		EPA Identification No	13	14	15	18	20	21
		Location	DWH14PRPUR03	DWH3PRUPS01	DWH3PRLPS02	BWD27PRORA01	BHN14PRORA01	BHN14PRUPS02
		Date	21/06/2022	21/06/2022	21/06/2022	22/06/2022	22/06/2022	21/06/2022
		Sample Method	in situ	in situ	in situ	Insufficient Recharge	in situ	in situ
Parameter	Units	LOR	RESULT	RESULT	RESULT	RESULT	RESULT	RESULT
Dissolved Oxygen	mg/L	-	0.63	1.81	0.5	-	0.99	0.81
Electrical Conductivity	µS/cm	-	728	122	135	-	517	457
pH	pH Unit	-	7.13	5.11	5.32	-	6.65	7.07
Redox Potential	mV	-	-150	-9	-28	-	-77	-56
Standing Water Level	mTOC	-	53.58	67.5	68.68	-	26.44	15.14

TABLE 2: GROUNDWATER QUALITY MONITORING

		EPA Identification No	7	8	9	10	11	12	13
		Location	BWD27PRUPS02	BWD27PRLPS03	BWD26PRUPS01	BWD26PRLPS02	DWH14PRUPS01	DWH14PRLPS02	DWH14PRPUR03
		Date	22/06/2022	22/06/2022	22/06/2022	22/06/2022	21/06/2022	21/06/2022	21/06/2022
		Sample Method	Grab Sample	Grab Sample	Grab Sample	Grab Sample	Grab Sample	Grab Sample	Grab Sample
Parameter	Units	LOR	RESULT	RESULT	RESULT	RESULT	RESULT	RESULT	RESULT
Aluminium	mg/L	0.01	< 0.01	< 0.01	< 0.01	0.01	< 0.01	< 0.01	0.01
Ammonia as N	mg/L	0.01	< 0.01	< 0.01	0.04	0.09	< 0.01	< 0.01	2.74
Arsenic	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Barium	mg/L	0.001	0.174	0.112	0.29	0.737	0.226	0.066	0.514
Beryllium	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Bicarbonate Alkalinity as CaCO3	mg/L	1	11	44	29	33	47	27	297
Boron	mg/L	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.06
Bromide	mg/L	0.01	0.097	0.113	0.019	0.061	0.114	0.11	0.091
Cadmium	mg/L	0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Calcium	mg/L	1	< 1	1	1	2	2	2	36
Carbonate Alkalinity as CaCO3	mg/L	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Chloride	mg/L	1	28	36	6	19	37	36	36
Chromium	mg/L	0.001	0.013	0.002	< 0.001	< 0.001	< 0.001	0.003	0.002
Cobalt	mg/L	0.001	0.008	0.001	0.003	0.014	0.004	0.005	< 0.001
Copper	mg/L	0.001	0.019	< 0.001	0.003	< 0.001	0.006	0.006	< 0.001
Dissolved Oxygen	mg/L	-	3.7	0.78	4.3	1.1	0.29	1.72	0.63
Electrical Conductivity	µS/cm	-	137	216	77	137	220	181	728
pH	pH Unit	-	5.38	5.83	5.63	6.03	5.7	5.38	7.13
Redox Potential	mV	-	3	-55	5	-45	-68	-7	-150
Standing Water Level	mTOC	-	38.99	38.5	29.7	29.15	53.46	54.21	53.58
Fluoride	mg/L	0.1	< 0.1	< 0.1	< 0.1	0.1	< 0.1	< 0.1	0.4
Iron	mg/L	0.05	< 0.05	0.55	< 0.05	< 0.05	< 0.05	< 0.05	1.33
Lead	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Magnesium	mg/L	1	2	3	2	2	5	2	1
Manganese	mg/L	0.001	0.066	0.03	0.042	0.047	0.07	0.051	0.16
Mercury	mg/L	0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Methane	mg/L	0.01	< 0.010	0.212	< 0.010	< 0.010	0.02	< 0.010	7.18
Molybdenum	mg/L	0.001	< 0.001	0.003	< 0.001	< 0.001	< 0.001	0.003	0.005
Nickel	mg/L	0.001	0.292	0.062	0.132	0.014	0.32	0.152	0.002
Nitrate as N	mg/L	0.01	0.19	0.01	< 0.01	0.04	0.13	< 0.01	< 0.01
Nitrite as N	mg/L	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
pH	pH Unit	0.01	5.98	6.67	6.5	6.58	6.39	6.03	7.57
Potassium	mg/L	1	6	5	7	13	8	4	23
Reactive Phosphorus	mg/L	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.2
Selenium	mg/L	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Sodium	mg/L	1	19	34	8	16	30	28	110
Strontium (Dissolved)	mg/L	0.001	0.027	0.029	0.035	0.062	0.05	0.019	0.953
Sulfate as SO4 2-	mg/L	1	6	< 1	1	5	< 1	1	< 10*
Total Dissolved Solids @180°C	mg/L	10	92	121	72	79	111	93	456
Uranium	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Vanadium	mg/L	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Zinc	mg/L	0.005	0.006	0.02	0.021	0.009	0.011	0.012	< 0.005

\*Limit of reporting (LOR) has been adjusted due to matrix interference as per Australian Laboratory Services (ALS) certificate of analysis (COA) ES2221039

TABLE 2: GROUNDWATER QUALITY MONITORING

		EPA Identification No	14	15	18	20	21	26	27
		Location	DWH3PRUPS01	DWH3PRLPS02	BWD27PRORA01	BHN14PRORA01	BHN14PRUPS02	BWDMW12S	BWDMW12D
		Date	21/06/2022	21/06/2022	22/06/2022	22/06/2022	21/06/2022	20/06/2022	20/06/2022
		Sample Method	Grab Sample	Grab Sample	Insufficient Recharge	Grab Sample	Grab Sample	No sample - dry	Grab Sample
Parameter	Units	LOR	RESULT	RESULT		RESULT	RESULT	RESULT	RESULT
Aluminium	mg/L	0.01	< 0.01	< 0.01	-	< 0.01	< 0.01	-	< 0.01
Ammonia as N	mg/L	0.01	< 0.01	< 0.01	-	0.06	0.06	-	0.03
Arsenic	mg/L	0.001	< 0.001	< 0.001	-	< 0.001	0.002	-	< 0.001
Barium	mg/L	0.001	0.036	0.053	-	0.631	0.482	-	0.966
Beryllium	mg/L	0.001	< 0.001	< 0.001	-	< 0.001	< 0.001	-	< 0.001
Bicarbonate Alkalinity as CaCO3	mg/L	1	16	31	-	204	216	-	1600
Boron	mg/L	0.05	< 0.05	< 0.05	-	0.06	< 0.05	-	< 0.05
Bromide	mg/L	0.01	0.062	0.062	-	0.107	0.054	-	3.16
Cadmium	mg/L	0.0001	< 0.0001	< 0.0001	-	< 0.0001	< 0.0001	-	< 0.0001
Calcium	mg/L	1	< 1	< 1	-	38	45	-	17
Carbonate Alkalinity as CaCO3	mg/L	1	< 1	< 1	-	< 1	< 1	-	< 1
Chloride	mg/L	1	23	22	-	36	19	-	803
Chromium	mg/L	0.001	0.012	< 0.001	-	< 0.001	< 0.001	-	< 0.001
Cobalt	mg/L	0.001	0.005	0.002	-	0.002	< 0.001	-	0.004
Copper	mg/L	0.001	0.007	0.009	-	< 0.001	< 0.001	-	< 0.001
Dissolved Oxygen	mg/L	-	1.81	0.5	-	0.99	0.81	-	3.01
Electrical Conductivity	µS/cm	-	122	135	-	517	457	-	5139
pH	pH Unit	-	5.11	5.32	-	6.65	7.07	-	6.85
Redox Potential	mV	-	-9	-28	-	-77	-56	-	-1
Standing Water Level	mTOC	-	67.5	68.68	-	26.44	15.14	-	30.97
Fluoride	mg/L	0.1	< 0.1	< 0.1	-	0.2	0.2	-	0.6
Iron	mg/L	0.05	< 0.05	< 0.05	-	0.09	1.97	-	0.53
Lead	mg/L	0.001	< 0.001	< 0.001	-	< 0.001	< 0.001	-	< 0.001
Magnesium	mg/L	1	2	1	-	10	9	-	157
Manganese	mg/L	0.001	0.036	0.028	-	0.224	0.08	-	0.036
Mercury	mg/L	0.0001	< 0.0001	< 0.0001	-	< 0.0001	< 0.0001	-	< 0.0001
Methane	mg/L	0.01	< 0.010	< 0.010	-	0.032	1.45	-	< 0.010
Molybdenum	mg/L	0.001	< 0.001	< 0.001	-	0.002	0.006	-	< 0.001
Nickel	mg/L	0.001	0.137	0.086	-	0.12	0.002	-	0.002
Nitrate as N	mg/L	0.01	0.08	0.01	-	< 0.01	0.05	-	0.16
Nitrite as N	mg/L	0.01	< 0.01	< 0.01	-	< 0.01	< 0.01	-	< 0.01
pH	pH Unit	0.01	5.94	6.1	-	7.19	7.57	-	7.68
Potassium	mg/L	1	2	2	-	4	6	-	35
Reactive Phosphorus	mg/L	0.01	< 0.01	< 0.01	-	< 0.01	< 0.01	-	< 0.01
Selenium	mg/L	0.01	< 0.01	< 0.01	-	< 0.01	< 0.01	-	0.01
Sodium	mg/L	1	20	23	-	58	50	-	993
Strontium (Dissolved)	mg/L	0.001	0.006	0.014	-	0.531	0.481	-	0.444
Sulfate as SO4 2-	mg/L	1	2	2	-	4	< 10*	-	68
Total Dissolved Solids @180°C	mg/L	10	88	99	-	328	309	-	3040
Uranium	mg/L	0.001	< 0.001	< 0.001	-	< 0.001	< 0.001	-	0.011
Vanadium	mg/L	0.01	< 0.01	< 0.01	-	< 0.01	< 0.01	-	< 0.01
Zinc	mg/L	0.005	0.007	0.005	-	< 0.005	0.008	-	< 0.005

\*Limit of reporting (LOR) has been adjusted due to matrix interference as per Australian Laboratory Services (ALS) certificate of analysis (COA) ES2221039

TABLE 2: GROUNDWATER QUALITY MONITORING

		EPA Identification No	28	37	38	39	40	41	42
		Location	BWDMW12I	LWDMW1D	LWDMW1S	LWDMW1I	LWDMW2S	LWDMW2D	LWDMW3D
		Date	20/06/2022	15/06/2022	15/06/2022	15/06/2022	15/06/2022	15/06/2022	15/06/2022
		Sample Method	No sample - dry	Grab Sample	No sample - dry	No sample - dry	No sample - dry	Grab Sample	Grab Sample
Parameter	Units	LOR	RESULT	RESULT	RESULT	RESULT	RESULT	RESULT	RESULT
Aluminium	mg/L	0.01	-	< 0.01	-	-	-	< 0.01	< 0.01
Ammonia as N	mg/L	0.01	-	0.04	-	-	-	0.15	0.84
Arsenic	mg/L	0.001	-	< 0.001	-	-	-	0.001	0.001
Barium	mg/L	0.001	-	0.41	-	-	-	0.597	0.074
Beryllium	mg/L	0.001	-	< 0.001	-	-	-	< 0.001	< 0.001
Bicarbonate Alkalinity as CaCO3	mg/L	1	-	184	-	-	-	427	117
Boron	mg/L	0.05	-	0.15	-	-	-	0.11	0.09
Bromide	mg/L	0.01	-	1.28	-	-	-	0.78	0.448
Cadmium	mg/L	0.0001	-	< 0.0001	-	-	-	< 0.0001	< 0.0001
Calcium	mg/L	1	-	7	-	-	-	19	2
Carbonate Alkalinity as CaCO3	mg/L	1	-	< 1	-	-	-	< 1	< 1
Chloride	mg/L	1	-	684	-	-	-	480	273
Chromium	mg/L	0.001	-	< 0.001	-	-	-	0.001	< 0.001
Cobalt	mg/L	0.001	-	< 0.001	-	-	-	< 0.001	< 0.001
Copper	mg/L	0.001	-	< 0.001	-	-	-	< 0.001	< 0.001
Dissolved Oxygen	mg/L	-	-	1.32	-	-	-	0.4	0.52
Electrical Conductivity	µS/cm	-	-	2281	-	-	-	2048	955
pH	pH Unit	-	-	6.34	-	-	-	6.74	6.24
Redox Potential	mV	-	-	-12	-	-	-	-47	-133
Standing Water Level	mTOC	-	-	30	-	-	-	25.98	21.08
Fluoride	mg/L	0.1	-	0.3	-	-	-	0.4	0.2
Iron	mg/L	0.05	-	< 0.05	-	-	-	0.26	0.69
Lead	mg/L	0.001	-	< 0.001	-	-	-	< 0.001	< 0.001
Magnesium	mg/L	1	-	14	-	-	-	25	4
Manganese	mg/L	0.001	-	0.003	-	-	-	0.042	0.008
Mercury	mg/L	0.0001	-	< 0.0001	-	-	-	< 0.0001	< 0.0001
Methane	mg/L	0.01	-	< 0.010	-	-	-	< 0.010	0.771
Molybdenum	mg/L	0.001	-	< 0.001	-	-	-	0.003	< 0.001
Nickel	mg/L	0.001	-	< 0.001	-	-	-	0.004	0.001
Nitrate as N	mg/L	0.01	-	0.09	-	-	-	0.01	0.02
Nitrite as N	mg/L	0.01	-	< 0.01	-	-	-	< 0.01	< 0.01
pH	pH Unit	0.01	-	6.86	-	-	-	7.62	7.07
Potassium	mg/L	1	-	13	-	-	-	26	10
Reactive Phosphorus	mg/L	0.01	-	0.07	-	-	-	0.11	0.34
Selenium	mg/L	0.01	-	< 0.01	-	-	-	< 0.01	< 0.01
Sodium	mg/L	1	-	414	-	-	-	369	170
Strontium (Dissolved)	mg/L	0.001	-	0.118	-	-	-	0.225	0.024
Sulfate as SO4 2-	mg/L	1	-	15	-	-	-	12	3
Total Dissolved Solids @180°C	mg/L	10	-	1320	-	-	-	1180	630
Uranium	mg/L	0.001	-	< 0.001	-	-	-	0.001	< 0.001
Vanadium	mg/L	0.01	-	< 0.01	-	-	-	< 0.01	< 0.01
Zinc	mg/L	0.005	-	< 0.005	-	-	-	< 0.005	< 0.005

\*Limit of reporting (LOR) has been adjusted due to matrix interference as per Australian Laboratory Services (ALS) certificate of analysis (COA) ES2221039

TABLE 2: GROUNDWATER QUALITY MONITORING

		EPA Identification No	43	56	57	59	60	61	62
		Location	LWDMW3S	WPKMW9D	WPKMW9S	WPKMW13I	WPKMW13S	WPKMW14D	WPKMW14S
		Date	15/06/2022	14/06/2022	14/06/2022	14/06/2022	14/06/2022	14/06/2022	14/06/2022
		Sample Method	No sample - dry	Grab Sample	Grab Sample	Grab Sample	Grab Sample	Grab Sample	No sample - dry
Parameter	Units	LOR	RESULT	RESULT	RESULT	RESULT	RESULT	RESULT	RESULT
Aluminium	mg/L	0.01	-	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	-
Ammonia as N	mg/L	0.01	-	0.22	1.02	0.01	0.01	0.01	-
Arsenic	mg/L	0.001	-	0.004	0.004	0.001	0.002	0.002	-
Barium	mg/L	0.001	-	0.084	0.19	0.042	0.106	0.325	-
Beryllium	mg/L	0.001	-	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	-
Bicarbonate Alkalinity as CaCO3	mg/L	1	-	541	1480	573	1120	543	-
Boron	mg/L	0.05	-	0.21	0.36	0.22	0.32	0.2	-
Bromide	mg/L	0.01	-	0.165	1.1	0.2	< 0.050*	0.164	-
Cadmium	mg/L	0.0001	-	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	-
Calcium	mg/L	1	-	4	8	4	4	7	-
Carbonate Alkalinity as CaCO3	mg/L	1	-	< 1	< 1	< 1	< 1	< 1	-
Chloride	mg/L	1	-	64	370	82	478	63	-
Chromium	mg/L	0.001	-	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	-
Cobalt	mg/L	0.001	-	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	-
Copper	mg/L	0.001	-	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	-
Dissolved Oxygen	mg/L	-	-	0.35	0.26	0.46	0.65	0.66	-
Electrical Conductivity	µS/cm	-	-	1230	3727	1299	3259	1050	-
pH	pH Unit	-	-	8.3	7.7	7.87	7.38	8	-
Redox Potential	mV	-	-	-82	-22	-26	-22	-19.8	-
Standing Water Level	mTOC	-	-	15.42	15.72	16.8	16.98	20.92	-
Fluoride	mg/L	0.1	-	0.8	0.7	0.6	0.8	0.5	-
Iron	mg/L	0.05	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-
Lead	mg/L	0.001	-	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	-
Magnesium	mg/L	1	-	1	3	< 1	1	2	-
Manganese	mg/L	0.001	-	0.01	0.057	0.004	0.011	0.007	-
Mercury	mg/L	0.0001	-	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	-
Methane	mg/L	0.01	-	< 0.010	0.42	< 0.010	< 0.010	< 0.010	-
Molybdenum	mg/L	0.001	-	0.001	< 0.001	< 0.001	0.003	< 0.001	-
Nickel	mg/L	0.001	-	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	-
Nitrate as N	mg/L	0.01	-	0.02	< 0.01	0.03	< 0.01	0.04	-
Nitrite as N	mg/L	0.01	-	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	-
pH	pH Unit	0.01	-	8.2	8.27	8.12	8.08	8.06	-
Potassium	mg/L	1	-	3	9	4	9	4	-
Reactive Phosphorus	mg/L	0.01	-	0.25	0.63	0.28	0.26	0.2	-
Selenium	mg/L	0.01	-	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	-
Sodium	mg/L	1	-	280	880	294	720	260	-
Strontium (Dissolved)	mg/L	0.001	-	0.056	0.099	0.02	0.047	0.042	-
Sulfate as SO4 2-	mg/L	1	-	< 1	30	< 1	< 10*	< 1	-
Total Dissolved Solids @180°C	mg/L	10	-	814	2340	817	2000	774	-
Uranium	mg/L	0.001	-	< 0.001	0.003	< 0.001	0.001	< 0.001	-
Vanadium	mg/L	0.01	-	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	-
Zinc	mg/L	0.005	-	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	-

\*Limit of reporting (LOR) has been adjusted due to matrix interference as per Australian Laboratory Services (ALS) certificate of analysis (COA) ES2221039

TABLE 2: GROUNDWATER QUALITY MONITORING

		EPA Identification No	63	64	65	66	78	79
		Location	WPKMW15D	WPKMW15S	WPKMW16D	WPKMW16S	WPKMW18S	WPKMW18I
		Date	14/06/2022	14/06/2022	14/06/2022	14/06/2022	14/06/2022	14/06/2022
		Sample Method	Grab Sample	Grab Sample	Grab Sample	No sample - dry	No sample - dry	Grab Sample
Parameter	Units	LOR	RESULT	RESULT	RESULT	RESULT	RESULT	RESULT
Aluminium	mg/L	0.01	< 0.01	0.07	< 0.01	-	-	< 0.01
Ammonia as N	mg/L	0.01	0.07	< 0.01	0.02	-	-	0.08
Arsenic	mg/L	0.001	0.003	0.003	0.002	-	-	0.001
Barium	mg/L	0.001	0.387	2.1	0.202	-	-	0.089
Beryllium	mg/L	0.001	< 0.001	< 0.001	< 0.001	-	-	< 0.001
Bicarbonate Alkalinity as CaCO3	mg/L	1	627	4000	546	-	-	586
Boron	mg/L	0.05	0.16	0.69	0.09	-	-	0.2
Bromide	mg/L	0.01	0.174	< 0.100*	0.187	-	-	0.155
Cadmium	mg/L	0.0001	< 0.0001	< 0.0001	< 0.0001	-	-	< 0.0001
Calcium	mg/L	1	6	7	6	-	-	2
Carbonate Alkalinity as CaCO3	mg/L	1	< 1	< 1	< 1	-	-	< 1
Chloride	mg/L	1	65	963	73	-	-	63
Chromium	mg/L	0.001	< 0.001	0.013	< 0.001	-	-	< 0.001
Cobalt	mg/L	0.001	< 0.001	< 0.001	< 0.001	-	-	< 0.001
Copper	mg/L	0.001	< 0.001	< 0.001	< 0.001	-	-	< 0.001
Dissolved Oxygen	mg/L	-	0.63	2.31	0.94	-	-	1.08
Electrical Conductivity	µS/cm	-	1292	8835	966	-	-	1204
pH	pH Unit	-	7.79	7.7	7.8	-	-	7.89
Redox Potential	mV	-	-51	-18	-47	-	-	-41
Standing Water Level	mTOC	-	22.18	22.44	26.54	-	-	16.04
Fluoride	mg/L	0.1	0.4	1.1	0.5	-	-	0.6
Iron	mg/L	0.05	0.18	< 0.05	< 0.05	-	-	< 0.05
Lead	mg/L	0.001	< 0.001	< 0.001	< 0.001	-	-	< 0.001
Magnesium	mg/L	1	2	12	2	-	-	< 1
Manganese	mg/L	0.001	0.057	< 0.001	0.05	-	-	0.002
Mercury	mg/L	0.0001	< 0.0001	< 0.0001	< 0.0001	-	-	< 0.0001
Methane	mg/L	0.01	0.264	< 0.010	0.015	-	-	< 0.010
Molybdenum	mg/L	0.001	0.008	0.003	0.005	-	-	0.002
Nickel	mg/L	0.001	0.002	0.001	0.001	-	-	< 0.001
Nitrate as N	mg/L	0.01	< 0.01	0.44	< 0.01	-	-	0.86
Nitrite as N	mg/L	0.01	< 0.01	< 0.01	< 0.01	-	-	< 0.01
pH	pH Unit	0.01	8.08	8.2	8.23	-	-	8.14
Potassium	mg/L	1	8	31	11	-	-	4
Reactive Phosphorus	mg/L	0.01	0.3	0.6	0.26	-	-	0.34
Selenium	mg/L	0.01	< 0.01	< 0.01	< 0.01	-	-	< 0.01
Sodium	mg/L	1	283	2120	280	-	-	275
Strontium (Dissolved)	mg/L	0.001	0.049	0.268	0.053	-	-	0.014
Sulfate as SO4 2-	mg/L	1	11	< 1	7	-	-	< 1
Total Dissolved Solids @180°C	mg/L	10	918	5980	822	-	-	746
Uranium	mg/L	0.001	< 0.001	0.003	0.004	-	-	< 0.001
Vanadium	mg/L	0.01	< 0.01	0.02	< 0.01	-	-	< 0.01
Zinc	mg/L	0.005	0.012	< 0.005	< 0.005	-	-	< 0.005

\*Limit of reporting (LOR) has been adjusted due to matrix interference as per Australian Laboratory Services (ALS) certificate of analysis (COA) ES2221039



**TABLE 3: TREATED WATER QUALITY MONITORING**

		EPA Identification No		77	77	77
		Location		LWWTPDM1	LWWTPDM1	LWWTPDM1
		Date		May-22	Jun-22	Jul-22
		Sample Method		No sample - plant not operating	No sample - plant not operating	No sample - plant not operating
Parameter	Units	LOR	RESULT	RESULT	RESULT	
Ammonia as N	mg/L	0.01	-	-	-	
Bicarbonate Alkalinity as CaCO3	mg/L	1	-	-	-	
Boron	mg/L	0.05	-	-	-	
Calcium	mg/L	1	-	-	-	
Carbonate Alkalinity as CaCO3	mg/L	1	-	-	-	
Chloride	mg/L	1	-	-	-	
Electrical Conductivity	µS/cm	-	-	-	-	
Fluoride	mg/L	0.1	-	-	-	
Magnesium	mg/L	1	-	-	-	
Nitrate as N	mg/L	0.01	-	-	-	
Nitrite as N	mg/L	0.01	-	-	-	
pH	pH Unit	-	-	-	-	
Potassium	mg/L	1	-	-	-	
Reactive Silica	mg/L	1	-	-	-	
Sodium Adsorption Ratio	-	0.01	-	-	-	
Sodium	mg/L	1	-	-	-	
Sulfate as SO4 2-	mg/L	1	-	-	-	
Total Alkalinity (as CaCO3)	mg/L	1	-	-	-	
Total Dissolved Solids @180°C	mg/L	10	-	-	-	
Total Hardness (as CaCO3)	mg/L	1	-	-	-	
Total Nitrogen (as N)	mg/L	0.5	-	-	-	
Total Phosphorus (as P)	mg/L	0.01	-	-	-	
Total Residual Chlorine	mg/L		-	-	-	
Turbidity	NTU	0.1	-	-	-	

**TABLE 4: PRODUCED WATER STORAGE QUALITY MONITORING**

		EPA Identification No	69	70	71	72	73	74	75
		Location	BWDPD2	BWDPD3	LWDPD1CELL4	LWDPD1CELL3	LWDPD1CELL2	LWDPD1CELL1	TFDPD1
		Date			15/06/2022	15/06/2022	15/06/2022	15/06/2022	14/06/2022
		Sample Method	No produced water	No produced water	Grab Sample	Grab Sample	Grab Sample	Grab Sample	Grab Sample
Parameter	Units	LOR	RESULT	RESULT	RESULT	RESULT	RESULT	RESULT	RESULT
Aluminium	mg/L	0.1	-	-	< 0.10	< 0.10	< 0.10	< 0.10	0.15
Ammonia as N	mg/L	0.01	-	-	< 0.10	0.16	0.15	1.96	< 0.10
Arsenic	mg/L	0.01	-	-	0.012	< 0.010	< 0.010	< 0.010	< 0.010
Barium	mg/L	0.01	-	-	0.425	0.832	2.55	8.19	0.632
Beryllium	mg/L	0.01	-	-	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Bicarbonate Alkalinity as CaCO3	mg/L	1	-	-	9000	8500	10500	9000	200
Boron	mg/L	0.1	-	-	5.93	1.33	1.71	1.68	0.18
Bromide	mg/L	0.01	-	-	51.2	4.65	7.84	15.4	6.92
Cadmium	mg/L	0.001	-	-	< 0.001	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Calcium	mg/L	1	-	-	6	8	13	17	3
Carbonate Alkalinity as CaCO3	mg/L	1	-	-	58000	11600	13000	15000	7000
Chloride	mg/L	1	-	-	12200	2430	3220	4110	1870
Chromium	mg/L	0.01	-	-	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Cobalt	mg/L	0.01	-	-	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Copper	mg/L	0.01	-	-	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Dissolved Oxygen	mg/L	-	-	-	4.34	5.44	6.2	7.49	6.89
Electrical Conductivity	µS/cm	-	-	-	83440	30150	36346	38183	16392
Iron	mg/L	0.1	-	-	0.12	< 0.10	0.25	0.32	< 0.10
Lead	mg/L	0.01	-	-	< 0.01	< 0.010	< 0.010	< 0.010	< 0.010
Magnesium	mg/L	1	-	-	13	12	16	12	< 1
Manganese	mg/L	0.01	-	-	0.019	< 0.010	0.018	0.02	< 0.010
Mercury	mg/L	0.001	-	-	< 0.0005*	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Molybdenum	mg/L	0.01	-	-	0.022	< 0.010	< 0.010	< 0.010	< 0.010
Nickel	mg/L	0.01	-	-	< 0.01	< 0.010	< 0.010	< 0.010	< 0.010
Nitrate as N	mg/L	0.1	-	-	0.08	< 0.1*	0.04	0.04	< 0.01
Nitrite as N	mg/L	0.01	-	-	< 0.01	< 0.1*	< 0.01	< 0.01	< 0.01
pH	pH Unit	-	-	-	10.09	9.66	9.72	9.71	10.1
Potassium	mg/L	1	-	-	864	89	139	268	65
Redox potential	mV	-	-	-	-34	-32	-31	-30	-43
Selenium	mg/L	0.1	-	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Sodium Adsorption Ratio	-	0.1	-	-	1950	517	544	581	625
Sodium	mg/L	1	-	-	37100	9900	12400	12800	4440
Strontium	mg/L	0.01	-	-	0.659	0.794	1.36	1.96	0.267
Sulfate as SO4 2-	mg/L	1	-	-	< 10*	< 10*	150	214	46
Total Dissolved Solids @180°C	mg/L	10	-	-	94900	27400	34300	35200	10700
Total Organic Carbon	mg/L	1	-	-	57	8	28	29	21
Total Phosphorus as P	mg/L	0.1	-	-	3.31	< 0.10	0.13	0.61	0.10*
Uranium	mg/L	0.01	-	-	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Vanadium	mg/L	0.1	-	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Zinc	mg/L	0.05	-	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05

**Note:** \*Limit of reporting (LOR) has been adjusted due to the min matrix interference as per Australian Laboratory Services (ALS) certificate of analysis (COA) ES2221041

**TABLE 6: GROUNDWATER LEVEL MONITORING**

EPA Identification No	44	45	46	47	48	49
Location	Dewhurst 8A-1 (DWH8AQGDGY01)	Dewhurst 8A-2 (DWH8AQGARK02)	Dewhurst 8A-3 (DWH8AQGPOR03)	Biblewindi 28A (BWD28QGUPS01)	Biblewindi 28B (BWD28QGLPS01)	Bilbbewindi 28C (BWD28QGPUR01)
Start Date	1/05/2022	1/05/2022	1/05/2022	1/05/2022	1/05/2022	1/05/2022
End Date	31/07/2022	31/07/2022	31/07/2022	31/07/2022	31/07/2022	31/07/2022
Sample Obtained	Standing Water Level	Standing Water Level	Standing Water Level	Standing Water Level	Standing Water Level	Standing Water Level
Number of Samples Required	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous
Lowest sample value	-36.496	16.273	-49.512	-	-	-
Mean of sample	-36.451	16.354	-48.318	-	-	-
Highest sample value	-36.394	16.457	-47.387	-	-	-

**Note:** Monitoring points 47,48 and 49: Sensor is faulty and data not available since 21 April 2021