

ENVIRONMENT PROTECTION LICENCE 20350 MONITORING DATA

Licence Holder:	Santos NSW (Eastern) Pty Ltd
Premises:	Narrabri Gas Field X-Line Road, Narrabri NSW 2390
Licence No:	20350
EPL LINK:	http://www.epa.nsw.gov.au/prpoeoapp/ViewPOEOLicence.aspx?DOCID=33816&SYSUID=1&LICID=20350
EPL Period:	May 1st 2019 to April 30th 2020
Reporting Period:	Quarter 2 - August to October 2019
Published Date:	Nov-19
Monitoring Location:	Refer to Table 1
Scheduled Activity:	Coal seam gas exploration, assessment and production
General Notes:	Monitoring Point 14 - only standing water level result was able to be obtained due to obstruction. Actions being conducted to rectify obstruction. Monitoring Point 80, 81 & 82 - no sample required in accordance with EPL20350 Condition M2.7 Monitoring Point 77 - no sample required in accordance with EPL20350 Condition M2.7 Monitoring Point 69 & 70 - no required taken in accordance with EPL20350 Condition M2.6 Monitoring Point 83, 84, 85 & 86 - no sample required in accordance with EPL20350 Condition M2.7

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	LWWTPDM1	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

TABLE 2: GROUNDWATER QUALITY MONITORING

		EPA Identification No	7	8	9	10	11	12	13	14
		Location	BWD27PRLPS02	BWD27PRLPS03	BWD26PRUPS01	BWD26PRLPS02	DWH14PRUPS01	DWH14PRLPS02	DWH14PRPUR03	DWH3PRUPS01
		Date	28/10/2019	28/10/2019	28/10/2019	28/10/2019	18/10/2019	18/10/2019	18/10/2019	1/10/2019
		Sample Method	in situ	in situ	in situ	in situ	in situ	in situ	No sample - obstruction	in situ
	Units	LOR	RESULT	RESULT	RESULT	RESULT	RESULT	RESULT	RESULT	RESULT
Dissolved Oxygen	mg/L	-	6.88	2.57	0.86	0.92	1.4	2.36		2.36
Electrical Conductivity	µS/cm	-	138	212	74	138	216.9	185.6		120
pH	pH Unit	-	5.26	5.83	5.25	5.66	5.50	4.97		5.1
Redox Potential	mV	-	158	11	136	12	160.3	137.4		194
Standing Water Level	mTOC	-	38.89	38.4	29.66	29.07	53.39	54.09	53.50	67.47

		EPA Identification No	15	16	17	18	20	21	22	23
		Location	DWH3PRLPS02	NYOPRORA01	NYOPRUPS02	BWD27PRORA01	BHN14PRORA01	BHN14PRUPS02	TULPRNAP01	TULPRDGY02
		Date	1/10/2019	17/10/2019	17/10/2019	28/10/2019	30/10/2019	30/10/2019	18/10/2019	18/10/2019
		Sample Method	in situ	in situ	in situ	No sample - dry	in situ	in situ	in situ	in situ
	Units	LOR	RESULT	RESULT	RESULT	RESULT	RESULT	RESULT	RESULT	RESULT
Dissolved Oxygen	mg/L	-	1.31	1.30	3.58		2.92	0.99	3.09	3.66
Electrical Conductivity	µS/cm	-	134	1306	1291		489	476	7281	8597
pH	pH Unit	-	5.1	8.08	8.34		7.17	7.04	6.95	6.85
Redox Potential	mV	-	223	-162.4	-77.4		-99	-101	-132.3	-134.5
Standing Water Level	mTOC	-	67.67	0	0		26.49	15.30	88.98	74.04

		EPA Identification No	24	25	26	27	28	29	30	31
		Location	BWDMW13D	BWDMW13S	BWDMW12S	BWDMW12D	BWDMW12I	BWDMW2	BWDMW3	BWDMW4D
		Date	18/09/2019	18/09/2019	17/09/2019	17/09/2019	17/09/2019	18/09/2019	18/09/2019	18/09/2019
		Sample Method	Grab Sample	No sample - dry	No sample - dry	Grab Sample	Grab Sample	No sample - insufficient liquid	Grab Sample	Grab Sample
	Units	LOR	RESULT	RESULT	RESULT	RESULT	RESULT	RESULT	RESULT	RESULT
Aluminium	mg/L	0.01	< 0.01			0.16	< 0.01		< 0.01	0.06
Ammonia	mg/L	0.01	< 0.01			0.01	< 0.01		0.02	0.05
Arsenic	mg/L	0.001	< 0.001			< 0.001	< 0.001		< 0.001	< 0.001
Barium	mg/L	0.001	0.446			1.83	8.51		0.174	0.046
Beryllium	mg/L	0.001	< 0.001			< 0.001	< 0.001		< 0.001	< 0.001
Bicarbonate	mg/L	1	56			2820	5560		52	28
Boron	mg/L	0.05	< 0.05			< 0.05	< 0.05		< 0.05	< 0.05
Bromide	mg/L	0.01	0.661*			3.22	< 0.500		0.664*	0.094
Cadmium	mg/L	0.0001	< 0.0001			< 0.0001	< 0.0001		< 0.0001	< 0.0001
Calcium	mg/L	1	6			19	4		6	< 1
Carbonate	mg/L	1	< 1			< 1	< 1		< 1	< 1
Chloride	mg/L	1	392			1080	1830		314	39
Chromium	mg/L	0.001	< 0.001			< 0.001	0.002		< 0.001	< 0.001
Cobalt	mg/L	0.001	0.014			< 0.001	0.008		0.006	< 0.001
Copper	mg/L	0.001	< 0.001			< 0.001	< 0.001		< 0.001	< 0.001
Dissolved Oxygen	mg/L	-	1.75			3.52	3.71		0.73	2.45
Electrical Conductivity	µS/cm	-	1200			7276	13748		1156	246
Fluoride	mg/L	0.1	< 0.1			0.8	1.1		< 0.1	< 0.1
Iron	mg/L	0.05	0.70			0.08	< 0.05		4.06	1.34
Lead	mg/L	0.001	< 0.001			< 0.001	< 0.001		< 0.001	< 0.001
Magnesium	mg/L	1	32			266	564		19	3
Manganese	mg/L	0.001	0.084			0.004	0.007		0.363	0.011
Mercury	mg/L	0.0001	< 0.0001			< 0.0001	< 0.0001		< 0.0001	< 0.0001
Methane	mg/L	0.01	< 0.01			< 0.01	< 0.01		0.012	< 0.01
Molybdenum	mg/L	0.001	< 0.001			0.002	0.002		< 0.001	< 0.001
Nickel	mg/L	0.001	0.015			0.003	0.003		0.010	0.001
Nitrate	mg/L	0.01	0.04			0.13	0.31		0.13	0.19
Nitrite	mg/L	0.01	< 0.01			< 0.01	< 0.01		< 0.01	< 0.01
pH	pH Unit	-	5.8			7.24	7.24		5.5	5.64
Potassium	mg/L	1	16			41	48		13	5
Reactive Phosphorus	mg/L	0.01	< 0.01			< 0.01	0.07		< 0.01	< 0.01
Redox Potential	mV	-	129			43	59		116	90
Selenium	mg/L	0.01	< 0.01			0.01	< 0.01		< 0.01	< 0.01
Sodium	mg/L	1	162			1530	2960		180	38
Standing Water Level	mTOC	-	30.70			30.94	21.23	20.21	30.95	30.20
Strontium	mg/L	0.001	0.098			0.673	0.233		0.104	0.009
Sulfate	mg/L	1	19			59	< 1		83	16
Total Dissolved Solids	mg/L	10	623			4480	8360		676	338
Uranium	mg/L	0.001	< 0.001			0.027	< 0.100		< 0.001	< 0.001
Vanadium	mg/L	0.01	< 0.01			< 0.01	0.04		< 0.01	< 0.01
Zinc	mg/L	0.005	2.04			0.009	0.006		0.006	< 0.005

		EPA Identification No	32	33	34	35	36	37	38	39
		Location	BWDMW4	BWDMW15S	BWDMW15D	BWDMW16S	BWDMW16D	LWDMW1D	LWDMW1S	LWDMW1I
		Date	18/09/2019	18/09/2019	18/09/2019	18/09/2019	18/09/2019	9/10/2019	10/09/2019	10/09/2019
		Sample Method	No sample - insufficient liquid	No sample - dry	Grab Sample	No sample - insufficient liquid	Grab Sample	Grab Sample	No sample - dry	No sample - dry
	Units	LOR	RESULT	RESULT	RESULT	RESULT	RESULT	RESULT	RESULT	RESULT
Aluminium	mg/L	0.01			0.03		0.01	< 0.01		
Ammonia	mg/L	0.01			0.04		< 0.01	< 0.01		
Arsenic	mg/L	0.001			< 0.001		< 0.001	< 0.001		
Barium	mg/L	0.001			0.045		0.071	0.387		
Beryllium	mg/L	0.001			< 0.001		< 0.001	< 0.001		
Bicarbonate	mg/L	1			18		3	179		
Boron	mg/L	0.05			< 0.05		< 0.05	0.13		
Bromide	mg/L	0.01			0.165*		0.152*	1.18		
Cadmium	mg/L	0.0001			< 0.0001		< 0.0001	< 0.0001		
Calcium	mg/L	1			1		< 1	6		
Carbonate	mg/L	1			< 1		< 1	< 1		
Chloride	mg/L	1			87		103	606		
Chromium	mg/L	0.001			< 0.001		< 0.001	0.002		
Cobalt	mg/L	0.001			< 0.001		< 0.001	< 0.001		
Copper	mg/L	0.001			< 0.001		0.002	0.003		
Dissolved Oxygen	mg/L	-			3.15		4.68	0.52		
Electrical Conductivity	µS/cm	-			409		346	2228		
Fluoride	mg/L	0.1			< 0.1		< 0.1	0.3		
Iron	mg/L	0.05			0.19		< 0.05	< 0.05		
Lead	mg/L	0.001			< 0.001		< 0.001	< 0.001		
Magnesium	mg/L	1			4		2	12		
Manganese	mg/L	0.001			0.009		0.007	0.005		
Mercury	mg/L	0.0001			< 0.0001		< 0.0001	< 0.0001		
Methane	mg/L	0.01			< 0.01		< 0.01	< 0.01		
Molybdenum	mg/L	0.001			< 0.001		< 0.001	0.001		
Nickel	mg/L	0.001			0.002		0.003	0.004		
Nitrate	mg/L	0.01			0.44		0.19	1.77*		
Nitrite	mg/L	0.01			< 0.01		< 0.01	< 0.01		
pH	pH Unit	-			6.14		5.72	6.76		
Potassium	mg/L	1			6		6	12		
Reactive Phosphorus	mg/L	0.01			< 0.01		0.02	0.07		
Redox Potential	mV	-			95		162	-85.7		
Selenium	mg/L	0.01			< 0.01		< 0.01	< 0.01		
Sodium	mg/L	1			65		55	431		
Standing Water Level	mTOC	-	20.55		30.40	22.45	30.20	29.94		
Strontium	mg/L	0.001			0.012		0.008	0.108		
Sulfate	mg/L	1			28		1	15		
Total Dissolved Solids	mg/L	10			252		222	1200		
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			0.009		0.007	< 0.005		

*Limit of reporting raised due to sample matrix as per Australian Laboratory Services (ALS) certificate of analysis (COA).

		EPA Identification No	40	41	42	43	50	51	52	53
		Location	LWDMW2S	LWDMW2D	LWDMW3D	LWDMW3S	WPKMW1	WPKMW1D	WPKMW2	WPKMW4
		Date	10/09/2019	31/10/2019	10/09/2019	10/09/2019	24/09/2019	24/09/2019	24/09/2019	31/10/2019
		Sample Method	No sample - dry	Grab Sample	Grab Sample	No sample - dry	Grab Sample	Grab Sample	Grab Sample	Grab Sample
	Units	LOR	RESULT	RESULT	RESULT	RESULT	RESULT	RESULT	RESULT	RESULT
Aluminium	mg/L	0.01		<0.01	< 0.01		< 0.01	< 0.01	< 0.01	<0.01
Ammonia	mg/L	0.01		<0.01	0.02		0.02	0.19	0.04	<0.01
Arsenic	mg/L	0.001		0.001	0.002		0.002	0.004	0.003	0.004
Barium	mg/L	0.001		0.464	0.069		0.024	0.106	0.060	0.03
Beryllium	mg/L	0.001		<0.001	< 0.001		< 0.001	< 0.001	< 0.001	<0.001
Bicarbonate	mg/L	1		439	98		597	538	1240	1060
Boron	mg/L	0.05		0.11	0.09		0.22	0.21	0.28	0.32
Bromide	mg/L	0.01		0.636	0.324		< 0.100*	< 0.100*	0.970*	0.584
Cadmium	mg/L	0.0001		< 0.0001	< 0.0001		< 0.0001	< 0.0001	< 0.0001	<0.0001
Calcium	mg/L	1		17	2		3	8	5	2
Carbonate	mg/L	1		<1	< 1		< 1	< 1	< 1	<1
Chloride	mg/L	1		413	258		118	60	515	228
Chromium	mg/L	0.001		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	<0.001
Copper	mg/L	0.001		<0.001	< 0.001		< 0.001	< 0.001	< 0.001	<0.001
Dissolved Oxygen	mg/L	-		0.75	0.83		1.46	1.14	1.35	0.88
Electrical Conductivity	µS/cm	-		2041	952		1499	1191	3686	2370
Fluoride	mg/L	0.1		0.4	0.2		0.7	0.8	0.7	1
Iron	mg/L	0.05		0.12	0.56		< 0.05	< 0.05	< 0.05	<0.05
Lead	mg/L	0.001		<0.001	< 0.001		< 0.001	< 0.001	< 0.001	<0.001
Magnesium	mg/L	1		23	4		< 1	2	2	<1
Manganese	mg/L	0.001		0.049	0.007		< 0.001	0.105	0.004	0.002
Mercury	mg/L	0.0001		< 0.0001	< 0.0001		< 0.0001	< 0.0001	< 0.0001	<0.0001
Methane	mg/L	0.01		< 0.01*	0.019		< 0.01	0.069	< 0.01	<0.010
Molybdenum	mg/L	0.001		0.004	< 0.001		< 0.001	< 0.001	0.002	0.002
Nickel	mg/L	0.001		0.01	0.003		< 0.001	< 0.001	< 0.001	<0.001
Nitrate	mg/L	0.01		0.05	< 0.01		0.09	< 0.01	0.02	0.07
Nitrite	mg/L	0.01		<0.01	< 0.01		< 0.01	< 0.01	< 0.01	<0.01
pH	pH Unit	-		7.08	6.29		7.78	7.8	7.86	8.28
Potassium	mg/L	1		24	9		4	3	9	6
Reactive Phosphorus	mg/L	0.01		0.12	0.06		0.44	0.11	0.62	0.57
Redox Potential	mV	-		-72.3	47.8		96	96	110	-78.2
Selenium	mg/L	0.01		< 0.01	< 0.01		< 0.01	< 0.01	< 0.01	<0.01
Sodium	mg/L	1		346	178		356	283	892	542
Standing Water Level	mTOC	-		25.98	21.09		16.46	16.19	15.55	16.25
Strontium	mg/L	0.001		0.234	0.022		0.032	0.057	0.079	0.032
Sulfate	mg/L	1		20	5		< 1	< 1	< 5*	<1
Total Dissolved Solids	mg/L	10		1090	528		906	680	2060	1460
Uranium	mg/L	0.001		0.002	< 0.001		< 0.001	< 0.001	0.003	0.002
Vanadium	mg/L	0.01		< 0.01	< 0.01		< 0.01	< 0.01	0.01	0.01
Zinc	mg/L	0.005		0.009	< 0.005		< 0.005	< 0.005	< 0.005	<0.005

*Limit of reporting raised due to sample matrix as per Australian Laboratory Services (ALS) certificate of analysis (COA).

		EPA Identification No	55	56	57	58	59	60	61	62
		Location	WPKMW8	WPKMW9D	WPKMW9S	WPKMW12S	WPKMW13I	WPKMW13S	WPKMW14D	WPKMW14S
		Date	24/09/2019	24/09/2019	24/09/2019	24/09/2019	24/09/2019	24/09/2019	24/09/2019	24/09/2019
		Sample Method	Grab Sample	Grab Sample	Grab Sample	No sample - dry	Grab Sample	Grab Sample	Grab Sample	No sample - dry
	Units	LOR	RESULT	RESULT	RESULT	RESULT	RESULT	RESULT	RESULT	RESULT
Aluminium	mg/L	0.01	< 0.01	< 0.01	< 0.01		< 0.01	< 0.01	< 0.01	
Ammonia	mg/L	0.01	< 0.01	0.06	0.04		0.02	< 0.01	0.08	
Arsenic	mg/L	0.001	0.002	0.004	0.002		0.002	0.002	0.002	
Barium	mg/L	0.001	0.032	0.092	0.289		0.043	0.105	0.299	
Beryllium	mg/L	0.001	< 0.001	< 0.001	< 0.001		< 0.001	< 0.001	< 0.001	
Bicarbonate	mg/L	1	878	514	1700		553	1120	528	
Boron	mg/L	0.05	0.26	0.20	0.38		0.21	0.32	0.19	
Bromide	mg/L	0.01	0.571*	< 0.100*	< 0.200*		< 0.100*	0.886*	0.255*	
Cadmium	mg/L	0.0001	< 0.0001	< 0.0001	< 0.0001		< 0.0001	< 0.0001	< 0.0001	
Calcium	mg/L	1	4	5	13		4	5	8	
Carbonate	mg/L	1	< 1	26	21		10	< 1	< 1	
Chloride	mg/L	1	309	60	439		68	468	59	
Chromium	mg/L	0.001	< 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	< 0.001	
Copper	mg/L	0.001	< 0.001	< 0.001	< 0.001		< 0.001	< 0.001	< 0.001	
Dissolved Oxygen	mg/L	-	2.42	0.48	0.36		1.12	0.82	1.12	
Electrical Conductivity	µS/cm	-	2499	1210	4468		1290	3348	1120	
Fluoride	mg/L	0.1	0.7	0.9	0.8		0.8	0.6	0.7	
Iron	mg/L	0.05	< 0.05	< 0.05	0.06		< 0.05	< 0.05	< 0.05	
Lead	mg/L	0.001	< 0.001	< 0.001	< 0.001		< 0.001	< 0.001	< 0.001	
Magnesium	mg/L	1	1	1	4		< 1	2	2	
Manganese	mg/L	0.001	< 0.001	0.112	0.073		0.008	0.007	0.020	
Mercury	mg/L	0.0001	< 0.0001	< 0.0001	< 0.0001		< 0.0001	< 0.0001	< 0.0001	
Methane	mg/L	0.01	< 0.01	0.077	< 0.01		< 0.01	< 0.01	< 0.01	
Molybdenum	mg/L	0.001	0.002	0.001	0.003		< 0.001	0.003	0.001	
Nickel	mg/L	0.001	< 0.001	< 0.001	< 0.001		< 0.001	< 0.001	< 0.001	
Nitrate	mg/L	0.01	0.30	< 0.01	< 0.01		< 0.01	< 0.01	< 0.01	
Nitrite	mg/L	0.01	< 0.01	< 0.01	< 0.01		< 0.01	< 0.01	< 0.01	
pH	pH Unit	-	7.71	8.14	7.78		8.16	7.50	8.15	
Potassium	mg/L	1	8	3	11		4	10	5	
Reactive Phosphorus	mg/L	0.01	0.40	0.28	0.37		0.28	0.28	0.22	
Redox Potential	mV	-	72	5.1	-31		54	57.8	87	
Selenium	mg/L	0.01	< 0.01	< 0.01	< 0.01		< 0.01	< 0.01	< 0.01	
Sodium	mg/L	1	605	297	1150		308	808	280	
Standing Water Level	mTOC	-	16.87	15.73	15.95		17.04	17.11	21.03	
Strontium	mg/L	0.001	0.043	0.056	0.140		0.018	0.048	0.040	
Sulfate	mg/L	1	< 5*	< 1	112		2	3	< 1	
Total Dissolved Solids	mg/L	10	1380	674	2650		757	1860	691	
Uranium	mg/L	0.001	0.001	< 0.001	0.008		< 0.001	0.002	< 0.001	
Vanadium	mg/L	0.01	< 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	< 0.005	

*Limit of reporting raised due to sample matrix as per Australian Laboratory Services (ALS) certificate of analysis (COA).

		EPA Identification No	63	64	65	66	67	68	78	79
		Location	WPKMW15D	WPKMW15S	WPKMW16D	WPKMW16S	WPKMW17D	WPKMW17S	WPKMW18S	WPKMW18I
		Date	24/09/2019	31/10/2019	24/09/2019	24/09/2019	24/09/2019	24/09/2019	24/09/2019	24/09/2019
		Sample Method	Grab Sample	Grab Sample	Grab Sample	No sample - dry	Grab Sample	No sample - dry	No sample - insufficient liquid	Grab Sample
	Units	LOR	RESULT	RESULT	RESULT	RESULT	RESULT	RESULT	RESULT	RESULT
Aluminium	mg/L	0.01	< 0.01	<0.01	< 0.01		< 0.01			< 0.01
Ammonia	mg/L	0.01	0.05	<0.01	< 0.01		0.08			0.04
Arsenic	mg/L	0.001	0.003	0.004	0.002		0.002			0.001
Barium	mg/L	0.001	0.366	2.16	0.189		0.127			0.081
Beryllium	mg/L	0.001	< 0.001	<0.001	< 0.001		< 0.001			< 0.001
Bicarbonate	mg/L	1	574	4400	531		482			513
Boron	mg/L	0.05	0.15	0.72	0.07		< 0.05			0.19
Bromide	mg/L	0.01	0.298	2.69	< 0.050		< 0.050			< 0.050
Cadmium	mg/L	0.0001	< 0.0001	<0.0001	< 0.0001		< 0.0001			< 0.0001
Calcium	mg/L	1	7	8	7		3			1
Carbonate	mg/L	1	< 1	<1	< 1		< 1			< 1
Chloride	mg/L	1	62	948	68		61			56
Chromium	mg/L	0.001	< 0.001	0.008	< 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	-	0.79	2.17	0.79		0.45			1.06
Electrical Conductivity	µS/cm	-	1314	8870	1239		1130			1160
Fluoride	mg/L	0.1	0.5	1	0.6		0.9			0.7
Iron	mg/L	0.05	0.15	<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	2	14	2		1			< 1
Manganese	mg/L	0.001	0.068	0.016	0.043		0.034			< 0.001
Mercury	mg/L	0.0001	< 0.0001	<0.0001	< 0.0001		< 0.0001			< 0.0001
Methane	mg/L	0.01	0.268	<0.010	< 0.01		< 0.01			< 0.01
Molybdenum	mg/L	0.001	0.013	0.006	0.006		0.008			0.003
Nickel	mg/L	0.001	0.001	<0.001	0.004		< 0.001			< 0.001
Nitrate	mg/L	0.01	< 0.01	0.44	< 0.01		< 0.01			1.52
Nitrite	mg/L	0.01	< 0.01	<0.01	< 0.01		< 0.01			< 0.01
pH	pH Unit	-	7.97	8.14	7.77		7.52			7.89
Potassium	mg/L	1	8	34	11		6			4
Reactive Phosphorus	mg/L	0.01	0.32	0.6	0.28		0.10			0.34
Redox Potential	mV	-	-100	-60.1	112		91			100
Selenium	mg/L	0.01	< 0.01	<0.01	< 0.01		< 0.01			< 0.01
Sodium	mg/L	1	304	2270	291		263			278
Standing Water Level	mTOC	-	22.27	22.50	26.61		19.00		16.97	16.44
Strontium	mg/L	0.001	0.052	0.28	0.051		0.018			0.012
Sulfate	mg/L	1	14	9	11		< 1			< 1
Total Dissolved Solids	mg/L	10	923	5790	750		674			670
Uranium	mg/L	0.001	< 0.001	0.002	0.004		0.001			< 0.001
Vanadium	mg/L	0.01	< 0.01	0.02	< 0.01		< 0.01			< 0.01
Zinc	mg/L	0.005	< 0.005	<0.005	< 0.005		< 0.005			< 0.005

		EPA Identification No	80	81	82
		Location	LWDMW4	LWDMW5	LWDMW6
		Date	Sep-19	Sep-19	Sep-19
		Sample Method	No sample - no irrigation	No sample - no irrigation	No sample - no irrigation
	Units	LOR	RESULT	RESULT	RESULT
Aluminium	mg/L	0.01			
Ammonia	mg/L	0.01			
Arsenic	mg/L	0.001			
Barium	mg/L	0.001			
Beryllium	mg/L	0.001			
Bicarbonate	mg/L	1			
Boron	mg/L	0.05			
Bromide	mg/L	0.01			
Cadmium	mg/L	0.0001			
Calcium	mg/L	1			
Carbonate	mg/L	1			
Chloride	mg/L	1			
Chromium	mg/L	0.001			
Cobalt	mg/L	0.001			
Copper	mg/L	0.001			
Dissolved Oxygen	mg/L	-			
Electrical Conductivity	µS/cm	-			
Fluoride	mg/L	0.1			
Iron	mg/L	0.05			
Lead	mg/L	0.001			
Magnesium	mg/L	1			
Manganese	mg/L	0.001			
Mercury	mg/L	0.0001			
Methane	mg/L	0.01			
Molybdenum	mg/L	0.001			
Nickel	mg/L	0.001			
Nitrate	mg/L	0.01			
Nitrite	mg/L	0.01			
pH	pH Unit	-			
Potassium	mg/L	1			
Reactive Phosphorus	mg/L	0.01			
Redox Potential	mV	-			
Selenium	mg/L	0.01			
Sodium	mg/L	1			
Standing Water Level	mTOC	-			
Strontium	mg/L	0.001			
Sulfate	mg/L	1			
Total Dissolved Solids	mg/L	10			
Uranium	mg/L	0.001			
Vanadium	mg/L	0.01			
Zinc	mg/L	0.005			

TABLE 3: TREATED WATER QUALITY MONITORING

		EPA Identification No	77	77	77
		Location	LWWTPDM1	LWWTPDM1	LWWTPDM1
		Date	Aug-19	Sep-19	Oct-19
		Sample Method	No sample - plant not operating	No sample - plant not operating	No sample - plant not operating
	Units	LOR	RESULT	RESULT	RESULT
Ammonia	mg/L	0.01			
Bicarbonate	mg/L	1			
Boron	mg/L	0.05			
Calcium	mg/L	1			
Carbonate	mg/L	1			
Chloride	mg/L	1			
Electrical Conductivity	µS/cm	-			
Fluoride	mg/L	0.1			
Magnesium	mg/L	1			
Nitrate	mg/L	0.01			
Nitrite	mg/L	0.01			
pH	pH Unit	-			
Potassium	mg/L	1			
Silica	mg/L				
Sodium	mg/L	1			
Sodium Adsorption Ratio	-	0.01			
Sulfate	mg/L	1			
Total Alkalinity (as CaCO ₃)	mg/L	1			
Total Dissolved Solids	mg/L	10			
Total Hardness (as CaCO ₃)	mg/L	1			
Total Nitrogen (as N)	mg/L	0.1			
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	76
		Location	BWDPD2	BWDPD3	LWDPD1CELL4	LWDPD1CELL3	LWDPD1CELL2	LWDPD1CELL1	TFDPD1	TFDPD2
		Date	Sep-19	Sep-19	11/09/2019	11/09/2019	11/09/2019	11/09/2019	Sep-19	Sep-19
		Sample Method	No produced water	No produced water	Grab Sample	Grab Sample	Grab Sample	Grab Sample	No produced water	Insufficient liquid
	Units	LOR	RESULT	RESULT	RESULT	RESULT	RESULT	RESULT	RESULT	RESULT
Aluminium	mg/L	0.01			< 0.20*	< 0.10	< 0.10	< 0.10		
Ammonia	mg/L	0.01			< 0.10	< 0.10	< 0.10	1.10		
Arsenic	mg/L	0.001			0.037*	< 0.010	< 0.010	< 0.010		
Barium	mg/L	0.001			18.3	0.856	11.2	8.41		
Beryllium	mg/L	0.001			< 0.020*	< 0.010	< 0.010	< 0.010		
Bicarbonate	mg/L	1			25400	7740	16100	11400		
Boron	mg/L	0.05			12.3*	1.94	4.60	2.84		
Bromide	mg/L	0.01			46.1*	< 1.00	< 2.00*	< 2.00*		
Cadmium	mg/L	0.0001			< 0.0020*	< 0.0010	< 0.0010	< 0.0010		
Calcium	mg/L	1			26*	< 10	19	13		
Carbonate	mg/L	1			70300	8270	29200	13100		
Chloride	mg/L	1			18500	1890	6060	4440		
Chromium	mg/L	0.001			< 0.020*	< 0.010	< 0.010	< 0.010		
Cobalt	mg/L	0.001			< 0.020*	< 0.010	< 0.010	< 0.010		
Copper	mg/L	0.001			0.052*	0.016	0.036	0.030		
Dissolved Oxygen	mg/L	-			2.21	7.49	7.32	6.92		
Electrical Conductivity	µS/cm	-			109417	26263	58933	38999		
Iron	mg/L	0.05			0.32*	< 0.10	< 0.10	< 0.10		
Lead	mg/L	0.001			< 0.020*	< 0.010	< 0.010	< 0.010		
Magnesium	mg/L	1			69*	< 10	27	< 10		
Manganese	mg/L	0.001			0.080*	< 0.010	0.048	< 0.010		
Mercury	mg/L	0.0001			< 0.0010	< 0.0010	< 0.0010	< 0.0010		
Molybdenum	mg/L	0.001			0.030*	< 0.010	< 0.010	< 0.010		
Nickel	mg/L	0.001			< 0.020*	< 0.010	< 0.010	< 0.010		
Nitrate	mg/L	0.01			< 0.1	< 0.1	< 0.1	< 0.1		
Nitrite	mg/L	0.01			< 0.01	< 0.01	< 0.01	< 0.01		
pH	pH Unit	-			9.59	9.45	9.66	9.45		
Potassium	mg/L	1			1430*	75	297	272		
Redox Potential	mV	-			78	56	66	59		
Selenium	mg/L	0.01			< 0.20*	< 0.10	< 0.10	< 0.10		
Sodium	mg/L	1			63500	8920	23900	13800		
Sodium Adsorption Ratio	-	0.01			1480*	2130	826	1020		
Strontium	mg/L	0.001			6.12*	0.674	3.29	1.90		
Sulfate	mg/L	1			< 50	< 50	< 50	< 50		
Total Dissolved Solids	mg/L	10			146000	19900	57900	35000		
Total Organic Carbon (Storages)	mg/L	1			< 20	< 20	< 20	< 20		
Total Phosphorus (as P)	mg/L	0.01			41.5*	< 0.05	2.22*	0.25		
Uranium	mg/L	0.001			< 0.020*	< 0.010	< 0.010	< 0.010		
Vanadium	mg/L	0.01			< 0.20*	< 0.10	< 0.10	< 0.10		
Zinc	mg/L	0.005			< 0.100*	< 0.050	< 0.050	< 0.050		

*Limit of reporting raised due to sample matrix as per Australian Laboratory Services (ALS) certificate of analysis (COA).

TABLE 5: SOIL QUALITY MONITORING

		EPA Identification No	83	83	83	83	83	83
		Location	LWDSMP1	LWDSMP1	LWDSMP1	LWDSMP1	LWDSMP1	LWDSMP1
		Depth (mm)	0-250	250-500	500-750	750-1000	1000-2000	2000-3000
		Date						
		Sample Method	Not required within reported period	Not required within reported period	Not required within reported period	Not required within reported period	Not required within reported period	Not required within reported period
	Units	LOR	RESULT	RESULT	RESULT	RESULT	RESULT	RESULT
Aluminium	mg/kg	0.01						
Boron	mg/kg	0.05						
Calcium	mg/kg	1						
Cation Exchange Capacity (CEC)	cmol(+)/kg							
Chloride	mg/kg	1						
Copper	mg/kg	0.001						
Electrical Conductivity	µS/cm	-						
Hydraulic Conductivity	m/sec ⁻¹							
Iron	mg/kg	0.05						
Magnesium	mg/kg	1						
Manganese	mg/kg	0.001						
Nitrogen (nitrate)	mg/kg							
Organic Carbon	%							
pH	pH Unit	-						
Phosphorus	mg/kg							
Phosphorus (Available)	mg/kg							
Potassium	mg/kg	1						
Sodium	mg/kg	0.01						
Sodium Adsorption Ratio	-	0.01						
Sodium (Exchangeable Percentage)	%							
Sulfate	mg/kg	1						
Zinc	mg/kg	0.005						

		EPA Identification No	84	84	84	84	84	84
		Location	LWDSMP2	LWDSMP2	LWDSMP2	LWDSMP2	LWDSMP2	LWDSMP2
		Depth (mm)	0-250	250-500	500-750	750-1000	1000-2000	2000-3000
		Date						
		Sample Method	Not required within reported period	Not required within reported period	Not required within reported period	Not required within reported period	Not required within reported period	Not required within reported period
	Units	LOR	RESULT	RESULT	RESULT	RESULT	RESULT	RESULT
Aluminium	mg/kg	0.01						
Boron	mg/kg	0.05						
Calcium	mg/kg	1						
Cation Exchange Capacity (CEC)	cmol(+)/kg							
Chloride	mg/kg	1						
Copper	mg/kg	0.001						
Electrical Conductivity	µS/cm	-						
Hydraulic Conductivity	m/sec ⁻¹							
Iron	mg/kg	0.05						
Magnesium	mg/kg	1						
Manganese	mg/kg	0.001						
Nitrogen (nitrate)	mg/kg							
Organic Carbon	%							
pH	pH Unit	-						
Phosphorus	mg/kg							
Phosphorus (Available)	mg/kg							
Potassium	mg/kg	1						
Sodium	mg/kg	0.01						
Sodium Adsorption Ratio	-	0.01						
Sodium (Exchangeable Percentage)	%							
Sulfate	mg/kg	1						
Zinc	mg/kg	0.005						

		EPA Identification No	85	85	85	85	85	85
		Location	LWDSMP3	LWDSMP3	LWDSMP3	LWDSMP3	LWDSMP3	LWDSMP3
		Depth (mm)	0-250	250-500	500-750	750-1000	1000-2000	2000-3000
		Date						
		Sample Method	Not required within reported period	Not required within reported period	Not required within reported period	Not required within reported period	Not required within reported period	Not required within reported period
	Units	LOR	RESULT	RESULT	RESULT	RESULT	RESULT	RESULT
Aluminium	mg/kg	0.01						
Boron	mg/kg	0.05						
Calcium	mg/kg	1						
Cation Exchange Capacity (CEC)	cmol(+)/kg							
Chloride	mg/kg	1						
Copper	mg/kg	0.001						
Electrical Conductivity	µS/cm	-						
Hydraulic Conductivity	m/sec ⁻¹							
Iron	mg/kg	0.05						
Magnesium	mg/kg	1						
Manganese	mg/kg	0.001						
Nitrogen (nitrate)	mg/kg							
Organic Carbon	%							
pH	pH Unit	-						
Phosphorus	mg/kg							
Phosphorus (Available)	mg/kg							
Potassium	mg/kg	1						
Sodium	mg/kg	0.01						
Sodium Adsorption Ratio	-	0.01						
Sodium (Exchangeable Percentage)	%							
Sulfate	mg/kg	1						
Zinc	mg/kg	0.005						

		EPA Identification No	86	86	86	86	86	86
		Location	LWDSMP4	LWDSMP4	LWDSMP4	LWDSMP4	LWDSMP4	LWDSMP4
		Depth (mm)	0-250	250-500	500-750	750-1000	1000-2000	2000-3000
		Date						
		Sample Method	Not required within reported period	Not required within reported period	Not required within reported period	Not required within reported period	Not required within reported period	Not required within reported period
	Units	LOR	RESULT	RESULT	RESULT	RESULT	RESULT	RESULT
Aluminium	mg/kg	0.01						
Boron	mg/kg	0.05						
Calcium	mg/kg	1						
Cation Exchange Capacity (CEC)	cmol(+)/kg							
Chloride	mg/kg	1						
Copper	mg/kg	0.001						
Electrical Conductivity	µS/cm	-						
Hydraulic Conductivity	m/sec ⁻¹							
Iron	mg/kg	0.05						
Magnesium	mg/kg	1						
Manganese	mg/kg	0.001						
Nitrogen (nitrate)	mg/kg							
Organic Carbon	%							
pH	pH Unit	-						
Phosphorus	mg/kg							
Phosphorus (Available)	mg/kg							
Potassium	mg/kg	1						
Sodium	mg/kg	0.01						
Sodium Adsorption Ratio	-	0.01						
Sodium (Exchangeable Percentage)	%							
Sulfate	mg/kg	1						
Zinc	mg/kg	0.005						

TABLE 6: GROUNDWATER LEVEL MONITORING

EPA Identification No	44	45	46	47	48	49
Location	Dewhurst 8A-1	Dewhurst 8A-2	Dewhurst 8A-3	Biblewindi 28A	Biblewindi 28B	Biblewindi 28C
	(DWH8AQGDGY01)	(DWH8AQGARK)	(DWH8AQGPOR03)	(BWD28QGUPS01)	(BWD28QGLPS01)	(BWD28QGPUR01)
Start Date	1/08/2019	1/08/2019	1/08/2019	1/08/2019	1/08/2019	1/08/2019
End Date	31/10/2019	31/10/2019	31/10/2019	31/10/2019	31/10/2019	31/10/2019
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	16.6	-67.4	11.8	3.8	14.7
Mean of sample	-35.7	16.9	-67.2	11.8	3.85	15.3
Highest sample value	-35.4	17.3	-67	11.8	4.5	15.4