Pollution Monitoring Data - Holcim Dunloe Sand Quarry (EPL Number 13077)

Facility Address	Pottsville-Mooball Road, MOOBALL, NSW, 2483
Link to EPL on Public Register	https://apps.epa.nsw.gov.au/prpoeoapp/Detail.aspx?instid=13077&id=13077&option=licence&searchrange=licence&range=POEO%20licence&prp=no&status=Issued
Date published	12-Aug-2022

Air Quality Monitoring - Deposition Results

Location	Frequency	Source	Lower Limit	Upper Limit	Unit	Description	Month Sample Date	Annual average (2022)	January 12/01/2022	February 10/02/2022	March 14/03/2022	April 13/04/2022	May 11/05/2022	June 06/09/2022	July 07/11/2022	August 08/11/2022	September 09/12/2022	October 13/10/2022	November 14/11/2022	December 14/12/2022
									Monthly data used for determining Annual average only											
Haul Road	Monthly	EPL	-	4	g/m2/month	Insoluble Solids	Result	**0.3**	0.4	0.7	0.2	0.4	0.4	0.4	0.3	0.2	0.2	0.1	0.1	0.1
Windmill	Monthly	EPL	-	4	g/m2/month	Insoluble Solids	Result	**0.7**	3.7	0.5	Invalidated	0.5	1.2	0.4	0.3	0.2	0.2	0.1	0.2	0.3
Sugar Shed	Monthly	EPL	-	4	g/m2/month	Insoluble Solids	Result	**0.6**	0.9	0.9	2.2	0.3	0.5	0.4	0.3	0.3	0.1	0.1	0.6	0.1
Black Rock	Monthly	EPL	-	4	g/m2/month	Insoluble Solids	Result	**1.3**	3.6	0.4	1	0.4	3.2	1.8	2.8	1.6	0.7	0.1	0.2	0.1
						Laboratory Report Issue Date		N/A	3/2/2022	24/02/2022	24/03/2022	05/05/2022	06/06/2022	22/06/2022	21/07/2022	23/08/2022	29/09/2022	28/10/2022	28/11/2022	23/12/2022

2022 Comments regarding deposition monitoring outcomes	
Comment 1:	Windmill DDG sample invalidated for March - funnel lost and suspected to have been affected by flood water with brown sediment on bottle label and water in bottle showing signs of brown sediment buildup on the bottom
Comment 2:	
Comment 3:	0
Comment 4:	0
Comment 5:	0
Comment 6:	0
Comment 7:	0
Comment 8:	0

Noise Monitoring Results

Location	Frequency	Source	Lower Criteria	Upper Criteria	Unit	Description	Quarter	2022 Q1		2022 Q2		2022 Q3		2022 Q4	
							Sample Date	Time	02/02/2022	Time	19/05/2022	Time	31/08/2022	Time	15/12/2022
NE Boundary Near Overall Road R1	Quarterly (EMP R7.2)	EPL Section L4	-	48	dB(A)	LAeq (15 min) Day	Estimated quarry contribution	-	-	-	-	-	-	-	-
Dwelling Pottsville Road R2	Quarterly (EMP R7.2)	EPL Section L4	-	48	dB(A)	LAeq (15 min) Day	Estimated quarry contribution	-	-	-	-	-	-	-	-
Dwelling Warwick Park Road R3	Quarterly (EMP R7.2)	EPL Section L4	-	48	dB(A)	LAeq (15 min) Day	Estimated quarry contribution	-	-	-	-	-	-	-	-
26 Warwick Park Road R4	Quarterly (EMP R7.2)	EPL Section L4	-	48	dB(A)	LAeq (15 min) Day	Estimated quarry contribution	-	-	-	-	-	-	-	-
157 Warwick Park Road R6	Quarterly (EMP R7.2)	EPL Section L4	-	42	dB(A)	LAeq (15 min) Day	Estimated quarry contribution	14:32	<35	12:50	<35	12:36	<30	7:28	<42
129 Warwick Park Road R7	Quarterly (EMP R7.2)	EPL Section L4	-	48	dB(A)	LAeq (15 min) Day	Estimated quarry contribution	11:42	<35	13:12	<35	13:00	<30	7:45	<48
679 Pottsville Road R8	Quarterly (EMP R7.2)	EPL Section L4	-	41	dB(A)	LAeq (15 min) Day	Estimated quarry contribution	11:59	<35	13:29	<35	13:19	<30	8:09	<41
							Report Issue Date	10/02/2022		30/05/2022					

2022 Comments regarding noise monitoring outcomes	
Comment 1:	
Comment 2:	
Comment 3:	

Surface Water Results

Discharge Surface Water Monitoring Results

Location	Frequency	Source	Lower Criteria	Upper Criteria	Unit	Description	Month	Jan 2022	Feb 2022	Mar 2022	Apr 2022	May 2022	Jun 2022	Jul 2022	Aug 2022	Sep 2022	Oct 2022	Nov 2022	Dec 2022
Point 1 Silt Pond	Within 24 Hours Prior to Discharge & Daily During Each Discharge Event	EPL Section 5	6.5	8.5	pH units	pH	Result	Dry	Dry	6.3	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
			-	-	V = Visible NV = None Visible	Total Oil & Grease	Result	Dry	Dry	-	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
			0	50	mg/L	Suspended Solids	Result	Dry	Dry	5	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
Point 2 Dredge Pond	Within 24 Hours Prior to Discharge & Daily During Each Discharge Event	EPL Section 5	6.5	8.5	pH units	pH	Result	Dry	Dry	6.4	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
			-	-	V = Visible NV = None Visible	Total Oil & Grease	Result	Dry	Dry	-	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
			0	50	mg/L	Suspended Solids	Result	Dry	Dry	28	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
						Laboratory report issue date		NA	NA	04/04/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA

2022 Comments regarding blue green algae monitoring requirements	
Comment 1:	Cations/Anions and metals recorded for due diligence during March 2022 following flood waters impacting the site ponds.
Comment 2:	
Comment 3:	
Comment 4:	
Comment 5:	
Comment 6:	

EMP - Blue Green Algae Monitoring Requirements

Location	Frequency	Source	Lower Criteria	Upper Criteria	Unit	Description	Month	January 2022	January 2022	February 2022	February 2022	March 2022	March 2022	April 2022	April 2022	May 2022	June 2022	July 2022	August 2022	###########	October 2022	October 2022	###########	###########	###########	###########
							Sample Date	1/12/2022	20/01/2022	2/9/2022	21/02/2022	14/03/2022	21/03/2022	13/04/2022	20/04/2022	5/11/2022	6/8/2022	7/11/2022	8/10/2022	9/12/2022	10/12/2022	20/10/2022	14/11/2022	21/11/2022	14/12/2022	21/12/2022
Dredge Pond	Monthly	MP Section 7.4	-	50000	cells/mL	of cells/mL (M.aeruginı	Result	1	1	1	1	420	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			-	4	mm3/L	total biovolume	Result	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Silt Pond	Monthly	MP Section 7.4	-	50000	cells/mL	of cells/mL (M.aeruginı	Result	1	1	1	1	350	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Silt Pond	Monthly	MP Section 7.4	-	4	mm3/L	total biovolume	Result	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
						Laboratory report issue date		01/12/2022	20/01/2022	02/10/2022	22/02/2022	15/03/2022	22/03/2022	14/04/2022	21/04/2022	05/11/2022	06/09/2022	07/12/2022	08/11/2022	14/09/2022	13/10/2022	20/10/2022	15/11/2022	21/11/2022	15/12/2022	22/12/2022

2022 Comments regarding blue green algae monitoring requirements	
Comment 1:	0
Comment 2:	0
Comment 3:	0
Comment 4:	0
Comment 5:	0
Comment 6:	0

EMP - Monthly Surface Water Monitoring Requirements

Location	Frequency	Source	Lower Criteria	Upper Criteria	Unit	Description	Month Sample Date	January 12/1/2022	February 9/2/2022	March 14/03/2022	April 13/04/2022	May 11/5/2022	June 8/6/2022	July 11/7/2022	August 10/8/2022	September 12/9/2022	October 12/10/2022	November 14/11/2022	December 14/12/2022
Pond 1 - Silt Pond	Monthly	EMP Section 6.2	5	8.5	pH units	pH	Result	7.4	6.6	7.3	6.7	4.6	8	6.3	4.3	7.6	8.9	7.1	7.2
			0	5500	µS/cm	Electrical Conductivity	Result	703	558	111	94	98	104	139	114	96	121	131	1213
			4	-	mg/L	Dissolved Oxygen	Result	5.5	5.6	4.4	4.9	6.7	7.7	7.7	7.3	8	5	5.4	5.9
			0	20	NTU	Turbidity	Result	26.8	27.9	242	29.4	47.4	61.2	34.3	22.2	10.9	162	200	266
			5	10	mg/L	Oil & Grease	Result	2.6	5	5	44	5	5	5	5	5	20	5	13
Pond 2 - Dredge Pond	Monthly	EMP Section 6.2	5	8.5	pH units	pH	Result	7.2	6.6	6.8	6.4	6.4	8.3	4.5	3.9	4.6	6.2	5.8	4.4
			0	5500	µS/cm	Electrical Conductivity	Result	652	559	56	65	47	101	100	76	73	88	103	94
			4	-	mg/L	Dissolved Oxygen	Result	5.3	6.5	4.8	4.5	7.5	7.2	6.7	8	8.7	5.5	5.8	6.1
			0	20	NTU	Turbidity	Result	3.1	11.6	257	81.8	81.4	65.2	43.8	16.9	334	4.5	11.6	7.8
			0	10	mg/L	Oil & Grease	Result	6.5	5	5	5	5	5	5	5	5	13	5.4	12
						Laboratory report issue date		02/03/2022	24/02/2022	24/03/2022	05/05/2022	30/05/2022	22/06/2022	21/07/2022	22/08/2022	29/09/2022	28/10/2022	25/11/2022	23/12/2022

2022 Comments regarding monthly surface water monitoring outcomes	
Comment 1:	
Comment 2:	
Comment 3:	
Comment 4:	
Comment 5:	
Comment 6:	

EMP - Quarterly Surface Water Monitoring Requirements

Location	Frequency	Source	Lower Criteria	Upper Criteria	Unit	Description	Month Sample Date	2022 Q1 10/2/2022	2022 Q2 10/05/2022	2023 Q2 11/08/2022	2022 Q4 14/11/2022
SW3 Northern Creek	Quarterly	EMP Section 6.2	5	7.5	pH units	pH	Result	4.3	5.4	6.9	6
			1800	2400	µS/cm	Electrical Conductivity	Result	266	177	12000	1890
			0	25	mg/L	Suspended Solids	Result	9	30	20	8.8
			6	-	mg/L	Dissolved Oxygen	Result	1.8	4.6	4.9	2.3
			0	1	mg/L	Total Nitrogen	Result	1.7	0.2	5.72	1.8
			0	0.08	mg/L	Total Phosphorus	Result	0.01	0.03	0.39	0.11
			-	-	Ebb or flood	Flow direction	Result	Ebbing	Ebbing	Flooding	Flooding
SW4 Northern Creek	Quarterly	EMP Section 6.2	5	7.5	pH units	pH	Result	5.3	5.2	7.1	6.5
			1800	2400	µS/cm	Electrical Conductivity	Result	424	312	16500	4120
			0	25	mg/L	Suspended Solids	Result	16	16	7.9	8.3
			6	-	mg/L	Dissolved Oxygen	Result	1.4	3.9	6.4	4.9
			0	1	mg/L	Total Nitrogen	Result	0.8	0.82	4.22	0.8
			0	0.08	mg/L	Total Phosphorus	Result	0.03	0.03	0.34	0.02
			-	-	Ebb or flood	Flow direction	Result	Ebbing	Ebbing	Flooding	Flooding
SW9 Southern Creek	Quarterly	EMP Section 6.2	5	7.5	pH units	pH	Result	5.9	6	6.8	6.4
			1800	2400	µS/cm	Electrical Conductivity	Result	2010	930	10900	5020
			0	25	mg/L	Suspended Solids	Result	10	15	6.8	96
			6	-	mg/L	Dissolved Oxygen	Result	2.7	3.9	5.3	4.3
			0	1	mg/L	Total Nitrogen	Result	0.58	0.5	1.52	1.4
			0	0.08	mg/L	Total Phosphorus	Result	0.01	0.02	0.33	0.26
			-	-	Ebb or flood	Flow direction	Result	Ebbing	Ebbing	Flooding	Flooding
SW10 Southern Creek	Quarterly	EMP Section 6.2	5	7.5	pH units	pH	Result	5.1	5	5.8	6.9
			1800	2400	µS/cm	Electrical Conductivity	Result	498	261	3560	4250
			0	25	mg/L	Suspended Solids	Result	18	17	13	15
			6	-	mg/L	Dissolved Oxygen	Result	2.8	3.8	5.9	4.1
			0	1	mg/L	Total Nitrogen	Result	0.5	1.3	3.59	0.2
			0	0.08	mg/L	Total Phosphorus	Result	0.03	0.03	0.13	0.01
			-	-	Ebb or flood	Flow direction	Result	Ebbing	Ebbing	Flooding	Flooding
						Laboratory report issue date		24/02/2022	06/06/2022	23/08/2022	28/11/2022

Location	Frequency	Source	Lower Criteria	Upper Criteria	Unit	Description	Month Sample Date	2022 Q1 9/2/2022	2022 Q2 11/5/2022	2022 Q3 10/8/2022	2022 Q4 14/11/2022
Pond 1 - Silt Pond	Quarterly	EMP Section 6.2	0	40	mg/L	Manganese	Result	0.12	0.21	0.24	0.12
			0	100	mg/L	Magnesium	Result	10	1.5	1.8	2
			0	500	mg/L	Sodium	Result	49	5.4	6.8	7.6
			0	40	mg/L	Potassium	Result	4.5	1.6	1.7	1.6
			0	400	mg/L	Bicarbonate	Result	20	380	20	20
			0	1000	mg/L	Chloride	Result	76	8.2	11	33
			0	800	mg/L	Sulfate / Sulphate	Result	210	35	52	58
			0	0.5	mg/L	Aluminium (Soluble)	Result	0.05	0.35	0.86	0.05
			0	0.005	µg/L	Arsenic	Result	0.003	0.001	0.002	0.001
			0	20	mg/L	Ammonium	Result	0.03	0.14	0.04	0.06
			0	20	µg/L	Iron (Soluble)	Result	0.09	0.09	0.19	0.05
			2	10	ug/L	Chlorophyll a	Result	5	5	5	5
			0	1000	Median no./100mL	Feacal coliforms	Result	10	10	10	180
			0	230	Median no./100mL	Enterococci	Result	10	30	20	10
Pond 2 - Dredge Pond	Quarterly	EMP Section 6.2	0	40	mg/L	Manganese	Result	0.11	0.046	0.19	0.17
			0	100	mg/L	Magnesium	Result	9.6	1.3	1.5	1.6
			0	500	mg/L	Sodium	Result	48	5.4	5.8	6.6
			0	40	mg/L	Potassium	Result	4.5	1.4	1.5	1.3
			0	400	mg/L	Bicarbonate	Result	20	290	20	20
			0	1000	mg/L	Chloride	Result	78	7.4	8.2	16
			0	800	mg/L	Sulphate	Result	200	13	32	34
			0	0.5	mg/L	Soluble Aluminium	Result	0.05	0.11	0.5	0.11
			0	0.005	µg/L	Arsenic	Result	0.001	0.001	0.001	0.001
			0	20	mg/L	Ammonium	Result	0.02	0.12	0.3	0.01
			0	20	µg/L	Soluble Iron	Result	0.05	0.14	0.13	0.11
			2	10	ug/L	Chlorophyll a	Result	5	5	5	5
			0	1000	Median no./100mL	Faecal coliforms	Result	10	140	10	10
			0	230	Median no./100mL	Enterococci	Result	10	230	10	10
						Laboratory report issue date		1/02/2022 & 24/02/2022	13/05/2022 & 30/05/2022	2/08/2022 & 22/08/2022	8/11/2022 & 25/11/2022

2022 Comments regarding quarterly surface water monitoring outcomes	
Comment 1:	
Comment 2:	
Comment 3:	

Comment 4:	
Comment 5:	
Comment 6:	

EMP - Quarterly Vertical Profile Monitoring

Location	Frequency	Source	Lower Criteria	Upper Criteria	Unit	Description	Quarter	2022 Q1	2022 Q1	2022 Q1	2022 Q1	2022 Q1	2022 Q1	2022 Q1	2022 Q1	2022 Q1	2022 Q1	2022 Q1	2022 Q1
							Sample Date	10/02/2022	10/02/2022	10/02/2022	10/02/2022	10/02/2022	10/02/2022	10/02/2022	10/02/2022	10/02/2022	10/02/2022	10/02/2022	10/02/2022
							Depth (m)	0	1	1.95	3.05	3.95	5.05	6	7	7.9	9.1	9.95	10.4
d 2 Dredge Pc	Quarterly	2020 EMP	5	8.5	pH units	pH	Result	6.6	6.1	6.1	6	6	5.9	6	6	5.9	5.9	6	5.9
			0	5500	µS/cm	Electrical Conductivity	Result	559	559	559	560	558	557	558	559	559	559	559	559
		Soil and Water Managemnt Plan	4	-	mg/L	Dissolved Oxygen	Result	6.5	6.7	6.5	6.2	6.4	6	6.3	6	5.6	5.9	5.5	5.1
			0	20	NTU	Turbidity	Result	11.6	4.4	4.3	4.2	5.9	11.1	5.5	6.1	5.1	5.7	6.9	6.4
			0	10	mg/L	Oil & Grease	Result	5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
						Laboratory report issue date		24/02/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Location	Frequency	Source	Lower Criteria	Upper Criteria	Unit	Description	Quarter	2022 Q2	2022 Q2	2022 Q2	2022 Q2	2022 Q2	2022 Q2	2022 Q2	2022 Q2	2022 Q2	2022 Q2	2022 Q2	2022 Q2
							Sample Date	08/06/2022	09/06/2022	09/06/2022	09/06/2022	09/06/2022	09/06/2022	09/06/2022	09/06/2022	09/06/2022	09/06/2022	09/06/2022	09/06/2022
							Depth (m)	0	1	2.05	3.05	4.05	5.1	6	7.05	8	8.95	9.45	
d 2 Dredge Pc	Quarterly	2020 EMP	5	8.5	pH units	pH	Result	8.3	7.1	6.6	6	5.8	5.7	5.6	5.5	5.4	5.3	5.3	
			0	5500	µS/cm	Electrical Conductivity	Result	101	54	54	54	54	54	54	54	54	54	54	
		Soil and Water Managemnt Plan	4	-	mg/L	Dissolved Oxygen	Result	7.2	7.8	7.4	7.7	7.7	7.4	7.8	7.6	75	7.7	7.5	
			0	20	NTU	Turbidity	Result	65.2	61.4	62.2	62	61.5	61.1	61	61.4	61.5	60.6	60.1	
			0	10	mg/L	Oil & Grease	Result	5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
						Laboratory report issue date		22/06/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	

Location	Frequency	Source	Lower Criteria	Upper Criteria	Unit	Description	Quarter	2022 Q3	2022 Q3	2022 Q3	2022 Q3	2022 Q3	2022 Q3	2022 Q3	2022 Q3	2022 Q3	2022 Q3	2022 Q3
							Sample Date	2/09/2022 & 13/09/2022	13/09/2022	13/09/2022	13/09/2022	13/09/2022	13/09/2022	13/09/2022	13/09/2022	13/09/2022	13/09/2022	13/09/2022
							Depth (m)	0	1.1	2.05	2.95	3.9	5.05	5.95	6.9	8	8.95	10.05
d 2 Dredge Pc	Quarterly	2020 EMP	5	8.5	pH units	pH	Result	4.6	4.3	4	4.1	3.7	3.4	3.2	3.2	3.2	3.1	3.1
			0	5500	µS/cm	Electrical Conductivity	Result	73	69	68	68	68	69	69	69	69	69	69
		Soil and Water Managemnt Plan	4	-	mg/L	Dissolved Oxygen	Result	8.7	9.4	9.2	8.6	9.6	9.1	8.9	8.6	8.6	7.9	7.9
			0	20	NTU	Turbidity	Result	334	2.8	2.9	3.3	7.1	6.4	3.9	3.8	3.4	3.8	3.3
			0	10	mg/L	Oil & Grease	Result	5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
						Laboratory report issue date		29/09/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Location	Frequency	Source	Lower Criteria	Upper Criteria	Unit	Description	Quarter	2022 Q4	2022 Q4	2022 Q4	2022 Q4	2022 Q4	2022 Q4	2022 Q4	2022 Q4	2022 Q4	2022 Q4	2022 Q4
							Sample Date	14/12/2022	15/12/2022	15/12/2022	15/12/2022	15/12/2022	15/12/2022	15/12/2022	15/12/2022	15/12/2022	15/12/2022	15/12/2022
							Depth (m)	0	0.95	2.05	3	3.95	4.95	6.05	7.1	7.95	8.95	10
d 2 Dredge Pc	Quarterly	2020 EMP	5	8.5	pH units	pH	Result	4.4	4.3	4	3.8	3.6	3.3	3.3	3.5	3.5	5.9	5.4
			0	5500	µS/cm	Electrical Conductivity	Result	945	99	99	99	99	100	100	98	95	76	82
		Soil and Water Managemnt Plan	4	-	mg/L	Dissolved Oxygen	Result	6.1	6.1	5.8	6.2	6.1	5.9	5.8	5.7	4.8	0.2	0.1
			0	20	NTU	Turbidity	Result	7.8	1.9	1.8	1.9	2	3.3	4.6	2.5	1.4	1.6	0.7
			0	10	mg/L	Oil & Grease	Result	12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
						Laboratory report issue date		23/12/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Ground Water Results

EPL - Annual Groundwater Water Monitoring Requirements

Location	Frequency	Source	Lower Limit	Upper Limit	Unit	Description	Year	2022
							Sample Date	09/02/2022
EPL Point 3	Yearly	EPL Section M2	-	-	mAHD	Standing Water Level	Result	0.86
			-	-	pH units	pH	Result	5
Ground Water Monitoring Bore			-	-	mg/L	Ammonia	Result	0.04
			-	-	mg/L	Chloride	Result	44
			-	-	µS/cm	Conductivity	Result	73
			-	-	mg/L	Total Oil & Grease	Result	10
DLP1			-	-	mg/L	Sulfate	Result	39
EPL Point 4	Yearly	EPL Section M2	-	-	mAHD	Standing Water Level	Result	0.86
			-	-	pH units	pH	Result	5.6
Ground Water Monitoring Bore			-	-	mg/L	Ammonia	Result	3.2
			-	-	mg/L	Chloride	Result	2500
			-	-	µS/cm	Conductivity	Result	8660
			-	-	mg/L	Total Oil & Grease	Result	10
DLP3			-	-	mg/L	Sulfate	Result	190
EPL Point 5	Yearly	EPL Section M2	-	-	mAHD	Standing Water Level	Result	0.74
			-	-	pH units	pH	Result	5
Ground Water Monitoring Bore			-	-	mg/L	Ammonia	Result	0.17
			-	-	mg/L	Chloride	Result	110
			-	-	µS/cm	Conductivity	Result	405
			-	-	mg/L	Total Oil & Grease	Result	10
DLP5			-	-	mg/L	Sulfate	Result	28
EPL Point 6	Yearly	EPL Section M2	-	-	mAHD	Standing Water Level	Result	1.04
			-	-	pH units	pH		4.8
Ground Water Monitoring Bore			-	-	mg/L	Ammonia	Result	0.62
			-	-	mg/L	Chloride	Result	21
			-	-	µS/cm	Conductivity	Result	109
			-	-	mg/L	Total Oil & Grease	Result	10
DLP6			-	-	mg/L	Sulfate	Result	41
EPL Point 7	Yearly	EPL Section M2	-	-	mAHD	Standing Water Level	Result	1.01
			-	-	pH units	pH	Result	6.7
Ground Water Monitoring Bore			-	-	mg/L	Ammonia	Result	2.6
			-	-	mg/L	Chloride	Result	660
			-	-	µS/cm	Conductivity	Result	3470
			-	-	mg/L	Total Oil & Grease	Result	53
DLP7			-	-	mg/L	Sulfate	Result	270

2022 Comments regarding annual groundwater monitoring outcomes	
Comment 1:	0
Comment 2:	0
Comment 3:	0

EMP - Monthly Groundwater Monitoring Requirements

Location	Frequency	Source	Lower Limit	Upper Limit	Unit	Description	Month	January	February	March	April	May	June	July	August	September	October	November	December
							Sample Date	12/1/2022	9/2/2022	14/3/2022	13/4/2022	11/5/2022	9/6/2022	7/11/2022	08/10/2022	13/9/2022	13/10/2022	14/11/2022	14/12/2022
Ground Water Monitoring Bore	Monthly	P Section 7.4.	-	-	mAHD	Standing Water Level	Result	0.65	0.86	0.96	1.07	1.1	0.98	0.67	0.69	0.54	0.73	0.57	0.52
			4.2	7	pH units	pH	Result	5.2	5	6.4	7.2	7.5	7.4	7.8	7.4	7.6	7.3	7.3	7.4
			0	2000	µS/cm	Electrical Conductivity	Result	96	73	353	1590	1800	1830	1790	1540	1570	1680	1620	1650
			1.5	-	mg/L	Dissolved Oxygen	Result	1.7	1.1	0.3	0	0	0	0	0.2	0.1	1	0.1	0.3
DLP1			0	10	mg/L	REDOX Potential	Result	165	204	79	-90	-142	-167	-163	-106	-146	-148	-105	-146
Ground Water Monitoring			-	-	mAHD	Standing Water Level	Result	0.72	0.86	0.83	0.84	0.94	0.66	0.54	0.45	0.49	0.62	0.48	0.51
			4.2	7	pH units	pH	Result	5.8	5.6	5.9	5.9	6.1	5.8	6.2	6.3	6.1	6	6.2	6.2

Bore	Monthly	P Section 7.4.	0	2000	µS/cm	Electrical Conductivity	Result	7770	8660	8720	8550	7480	8380	7930	7510	7370	7170	6810	6610
			1.5	-	mg/L	Dissolved Oxygen	Result	0.3	0	0	0.2	0.4	0.4	0.28	1.9	0.5	0.8	0.1	0.2
DLP3			0	10	mg/L	REDOX Potential	Result	-13	14	30	-3	32	-6	7	11	30	58	100	65
Ground Water Monitoring Bore	Monthly	P Section 7.4.	-	-	mAHD	Standing Water Level	Result	0.63	0.74	0.72	0.72	0.78	0.56	0.56	0.4	0.38	0.51	0.43	0.49
			4.2	7	pH units	pH	Result	5	5	5	4.4	4.7	4.4	4	3.7	3.7	3.9	4.9	4.5
			0	2000	µS/cm	Electrical Conductivity	Result	487	405	1930	2660	2570	4650	2370	2460	2580	2160	1700	1720
DLP5			1.5	-	mg/L	Dissolved Oxygen	Result	0.4	0	0	0	0.3	0.3	1.58	0.6	0.2	0.4	0.4	0.3
			0	10	mg/L	REDOX Potential	Result	64	51	95	25	108	68	327	270	393	194	81	78
Ground Water Monitoring Bore	Monthly	P Section 7.4.	-	-	mAHD	Standing Water Level	Result	0.94	1.04	1.46	1.43	1.38	1.32	1.14	1.03	0.92	1.04	0.93	0.98
			4.2	7	pH units	pH	Result	4.6	4.8	6.1	5.8	5.5	4.8	4.6	4.4	4	5.7	5.7	5.5
			0	2000	µS/cm	Electrical Conductivity	Result	139	109	109	175	162	139	157	133	113	134	116	92
DLP6			1.5	-	mg/L	Dissolved Oxygen	Result	0.5	0	0	0	0	0.2	0.6	0	0	0.1	0.1	0.1
			0	10	mg/L	REDOX Potential	Result	36	35	-24	-97	4	21	147	131	184	-61	-62	-49
Ground Water Monitoring Bore	Monthly	P Section 7.4.	-	-	mAHD	Standing Water Level	Result	0.89	1.01	1.04	1.01	1.13	0.98	0.93	0.69	0.73	0.83	0.68	0.68
			4.2	7	pH units	pH	Result	6.9	6.7	7	6.9	7	6.8	7.1	6.8	7.1	6.8	7.3	7.3
			0	2000	µS/cm	Electrical Conductivity	Result	3180	3470	3250	3370	3080	3060	2990	2880	2890	2890	2910	2400
DLP7			1.5	-	mg/L	Dissolved Oxygen	Result	0.2	0.1	0	0	0.2	0	0.3	1.2	0	0.1	0.1	0.1
			0	10	mg/L	REDOX Potential	Result	-85	-51	-67	-76	-60	-113	-56	-10	-57	-71	-29	-73

2022 Comments regarding monthly groundwater monitoring outcoms	
Comment 1:	0
Comment 2:	
Comment 3:	
Comment 4:	
Comment 5:	
Comment 6:	

EMP - Quarterly Groundwater Water Monitoring Requirements

Location	Frequency	Source	Lower Limit	Upper Limit	Unit	Description	Quarter	2022 Q1	2022 Q2	2022 Q3	
							Sample Date	09/02/2022	11/05/2022	10/08/2022	14/11/2022
Ground Water Monitoring Bore DLP1	Quarterly	EMP Section 7.4.10	-	-	mg/L	Ammonia	Result	0.04	3	2.6	2
			0	0.005	µg/L	Arsenic	Result	0.001	0.001	0.001	0.001
			0	400	mg/L	Bicarbonate	Result	78	690	640	500
			0	55	mg/L	Calcium	Result	11	81	77	72
			0	1000	mg/L	Chloride	Result	44	250	210	240
			0	100	mg/L	Magnesium	Result	5.7	39	35	33
			0	0.15	mg/L	Manganese	Result	0.087	0.33	0.33	0.23
			0	40	mg/L	Potassium	Result	3.4	14	12	12
			0	500	mg/L	Sodium	Result	47	280	250	280
			0	0.5	mg/L	Soluble Aluminium	Result	0.09	0.05	0.05	0.05
			0	7.5	µg/L	Soluble Iron	Result	0.08	3.5	4.2	2.5
			0	800	mg/L	Sulphate	Result	39	190	170	150
			-	-	mg/L	Oil & Grease	Result	10	10	10	26
Ground Water Monitoring Bore DLP3	Quarterly	EMP Section 7.4.10	-	-	mg/L	Ammonia	Result	3.2	3.1	2.6	1.5
			0	0.005	µg/L	Arsenic	Result	0.001	0.001	0.001	0.001
			0	400	mg/L	Bicarbonate	Result	170	220	190	180
			0	55	mg/L	Calcium	Result	72	81	98	73
			0	1000	mg/L	Chloride	Result	2500	2000	2100	2600
			0	100	mg/L	Magnesium	Result	130	120	110	120
			0	0.15	mg/L	Manganese	Result	0.62	0.74	0.7	0.53
			0	40	mg/L	Potassium	Result	50	46	40	40
			0	500	mg/L	Sodium	Result	1400	1300	1100	1300
			0	0.5	mg/L	Soluble Aluminium	Result	0.07	0.08	0.1	0.05
			0	7.5	µg/L	Soluble Iron	Result	10	12	14	4.1
			0	800	mg/L	Sulphate	Result	190	160	140	180
			-	-	mg/L	Oil & Grease	Result	10	10	10	17
Ground Water Monitoring Bore DLP5	Quarterly	EMP Section 7.4.10	-	-	mg/L	Ammonia	Result	0.17	0.86	0.54	0.59
			0	0.005	µg/L	Arsenic	Result	0.001	0.001	0.001	0.001
			0	400	mg/L	Bicarbonate	Result	20	20	20	580
			0	55	mg/L	Calcium	Result	1	22	25	13
			0	1000	mg/L	Chloride	Result	110	1200	810	610
			0	100	mg/L	Magnesium	Result	2.3	77	53	29
			0	0.15	mg/L	Manganese	Result	0.024	0.54	0.38	0.18
			0	40	mg/L	Potassium	Result	3.8	17	11	6.8
			0	500	mg/L	Sodium	Result	77	600	390	280
			0	0.5	mg/L	Soluble Aluminium	Result	0.2	2.3	1.8	0.78
			0	7.5	µg/L	Soluble Iron	Result	0.71	14	15	12
			0	800	mg/L	Sulphate	Result	28	110	42	37
			-	-	mg/L	Oil & Grease	Result	10	10	10	10
Ground Water Monitoring Bore DLP6	Quarterly	EMP Section 7.4.10	-	-	mg/L	Ammonia	Result	0.62	0.71	0.56	1
			0	0.005	µg/L	Arsenic	Result	0.001	0.001	0.001	0.001
			0	400	mg/L	Bicarbonate	Result	20	20	20	20
			0	55	mg/L	Calcium	Result	2.1	4.4	4.2	2.1
			0	1000	mg/L	Chloride	Result	21	19	36	25
			0	100	mg/L	Magnesium	Result	1.4	2.3	2.3	1
			0	0.15	mg/L	Manganese	Result	0.084	0.21	0.16	0.07
			0	40	mg/L	Potassium	Result	3.1	2.7	3	2.2
			0	500	mg/L	Sodium	Result	13	10	10	9.2
			0	0.5	mg/L	Soluble Aluminium	Result	0.47	0.14	0.57	0.12
			0	7.5	µg/L	Soluble Iron	Result	2.6	19	24	13
			0	800	mg/L	Sulphate	Result	41	46	43	26
			-	-	mg/L	Oil & Grease	Result	10	10	10	19
Ground Water Monitoring Bore DLP7	Quarterly	EMP Section 7.4.10	-	-	mg/L	Ammonia	Result	2.6	2.6	2.2	0.21
			0	0.005	µg/L	Arsenic	Result	0.001	0.01	0.001	0.001
			0	400	mg/L	Bicarbonate	Result	440	580	540	460
			0	55	mg/L	Calcium	Result	14	17	15	15
			0	1000	mg/L	Chloride	Result	660	680	650	700
			0	100	mg/L	Magnesium	Result	33	35	30	28
			0	0.15	mg/L	Manganese	Result	0.062	0.065	0.064	0.043
			0	40	mg/L	Potassium	Result	26	25	22	20
			0	500	mg/L	Sodium	Result	620	620	530	550
			0	0.5	mg/L	Soluble Aluminium	Result	0.3	0.5	0.33	0.23
			0	7.5	µg/L	Soluble Iron	Result	1.4	1.6	1.7	0.67
			0	800	mg/L	Sulphate	Result	270	240	220	260
			-	-	mg/L	Oil & Grease	Result	53	10	10	22
						Laboratory report issue date:		24/02/2022	26/05/2022	22/08/2022	29/11/2022

2022 Comments regarding quarterly groundwater monitoring outcomes	
Comment 1:	Arsenic result for DLP7 in Q2 exceeds the trigger value as the lab were unable to obtain an LOR for this sample lower than <0.01 mg/L due to interference in the sample. DLP7 resampled on 9/06/2022 also obtained a result of <0.01 mg/L
Comment 2:	
Comment 3:	
Comment 4:	
Comment 5:	
Comment 6:	