Reporting of Emission to Groundwater for the period of June 2024

Operator: CCR Energy Ltd **Form: Groundwater1**

Location: Aberthaw Ash Disposal Site

Permit/Variation Number: DP3432SW

Emission Point	Substance / Parameter	Emission Limit Value	Result [1]	Test Method [2]	Sample Date and Times [3]	Accreditation/ Certification [4]	Uncertainty [5]
BH3B	Aluminium, Dissolved		17.6 µg/L		26/06/2024	Sampling WSP / Testing ALS	
	Antimony, Dissolved		9.35 µg/L				
	Arsenic, Dissolved		162 µg/L				
	Boron, Dissolved		26200 µg/L				
	Cadmium, Dissolved		0.272 µg/L				
	Calcium, Dissolved		431000 µg/L				
	Chromium, Dissolved		<1 µg/L				
	Hexavalent Chromium		<30 µg/L				
	Copper, Dissolved		0.301 µg/L				
	Magnesium, Dissolved		224000 µg/L				
	Manganese. Dissolved		372 µg/L				
	Molybdenum, Dissolved		2040 µg/L				
	Nickel, Dissolved		0.967 µg/L				
	Selenium Dissolved		13.5 µg/L				
	Vanadium, Dissolved		30.8 µg/L				
	Mercury, Dissolved		<0.01 µg/L				
	Alkalinity to pH 4.5 as $CaCO_3$		279000 µg/L				
	Iron, Dissolved		47.2 µg/L				
	Potassium, Dissolved		89000 µg/L				
	Sodium, Dissolved		318000 µg/L				
	Sulphate, Dissolved as SO_4		1600000 µg/L				
	Nitrogen: Total Oxidised as N		161 µg/L				
	Chloride		679000 µg/L				
	Fluoride		<500 µg/L				
	Ammoniacal Nitrogen as N		<200 µg/L				
	Carbon, Organic: Total as C		3300 µg/L				

Emission Point	Substance / Parameter	Emission Limit Value	Result [1]	Test Method [2]	Sample Date and Times [3]	Accreditation/ Certification [4]	Uncertainty [5]
	Electrical conductivity		4755 µS/cm	Field measurements			
	Temperature		14.9 °C				
	Dissolved oxygen		4.95 mg/L				
	pH		7.46				
	Oxidation reduction potential		38 mV				
	Groundwater level		4.28 mAOD				

Emission Point	Substance / Parameter	Emission Limit Value	Result [1]	Test Method [2]	Sample Date and Times [3]	Accreditation/ Certification [4]	Uncertainty [5]
BH5	Aluminium, Dissolved		<10 µg/L		27/06/2024	Sampling WSP / Testing ALS	
	Antimony, Dissolved		<1 µg/L				
	Arsenic, Dissolved		0.641 µg/L				
	Boron, Dissolved		738 µg/L				
	Cadmium, Dissolved		<0.08 µg/L				
	Calcium, Dissolved		257000 µg/L				
	Chromium, Dissolved		<1 µg/L				
	Hexavalent Chromium		<30 µg/L				
	Copper, Dissolved		0.518 µg/L				
	Magnesium, Dissolved		20900 µg/L				
	Manganese. Dissolved		56.3 µg/L				
	Molybdenum, Dissolved		6.14 µg/L				
	Nickel, Dissolved		1.35 µg/L				
	Selenium, Dissolved		<1 µg/L				
	Vanadium, Dissolved		<1 µg/L				
	Mercury, Dissolved		<0.01 µg/L				
	Alkalinity to pH 4.5 as $CaCO_3$		403000 µg/L				
	Iron, Dissolved		212 µg/L				
	Potassium, Dissolved		1480 µg/L				
	Sodium, Dissolved		38200 µg/L				
	Sulphate, Dissolved as SO_4		344000 µg/L				
	Nitrogen: Total Oxidised as N		<100 µg/L				
	Chloride		45200 µg/L				
	Fluoride		<500 µg/L				
	Ammoniacal Nitrogen as N		<200 µg/L				
	Carbon, Organic: Total as C		33900 µg/L				
	Electrical conductivity		1423 µS/cm	Field measurements			
	Temperature		12.3 °C				
	Dissolved oxygen		1.81 mg/L				
	pH		6.66				
	Oxidation reduction potential		-57 mV				

Emission Point	Substance / Parameter	Emission Limit Value	Result [1]	Test Method [2]	Sample Date and Times [3]	Accreditation/ Certification [4]	Uncertainty [5]
	Groundwater level		8.68 mAOD				

Emission Point	Substance / Parameter	Emission Limit Value	Result [1]	Test Method [2]	Sample Date and Times [3]	Accreditation/ Certification [4]	Uncertainty [5]
BH6	Aluminium, Dissolved		<10 µg/L		26/06/2024	Sampling WSP / Testing ALS	
	Antimony, Dissolved		22 µg/L				
	Arsenic, Dissolved		112 µg/L				
	Boron, Dissolved		12600 µg/L				
	Cadmium, Dissolved		0.167 µg/L				
	Calcium, Dissolved		546000 µg/L				
	Chromium, Dissolved		<1 µg/L				
	Hexavalent Chromium		<30 µg/L				
	Copper, Dissolved		<0.3 µg/L				
	Magnesium, Dissolved		153000 µg/L				
	Manganese. Dissolved		79.6 µg/L				
	Molybdenum, Dissolved		2070 µg/L				
	Nickel, Dissolved		2.51 µg/L				
	Selenium Dissolved		138 µg/L				
	Vanadium, Dissolved		259 µg/L				
	Mercury, Dissolved		<0.01 µg/L				
	Alkalinity to pH 4.5 as $CaCO_3$		582000 µg/L				
	Iron, Dissolved		63.2 µg/L				
	Potassium, Dissolved		35300 µg/L				
	Sodium, Dissolved		39100 µg/L				
	Sulphate, Dissolved as SO_4		1500000 µg/L				
	Nitrogen: Total Oxidised as N		533 µg/L				
	Chloride		37100 µg/L				
	Fluoride		<500 µg/L				
	Ammoniacal Nitrogen as N		<200 µg/L				
	Carbon, Organic: Total as C		5610 µg/L				
	Electrical conductivity		3495 µS/cm				

Emission Point	Substance / Parameter	Emission Limit Value	Result [1]	Test Method [2]	Sample Date and Times [3]	Accreditation/ Certification [4]	Uncertainty [5]
	Temperature		19.6 °C	Field measurements			
	Dissolved oxygen		4.97 mg/L				
	pH		7.02				
	Oxidation reduction potential		95 mV				
	Groundwater level		8.03 mAOD				

Emission Point	Substance / Parameter	Emission Limit Value	Result [1]	Test Method [2]	Sample Date and Times [3]	Accreditation/ Certification [4]	Uncertainty [5]
BH7A	Aluminium, Dissolved		<10 µg/L			Sampling WSP / Testing ALS	
	Antimony, Dissolved		<1 µg/L				
	Arsenic, Dissolved		24.2 µg/L				
	Boron, Dissolved		19000 µg/L				
	Cadmium, Dissolved		0.521 µg/L				
	Calcium, Dissolved		629000 µg/L				
	Chromium, Dissolved		<1 µg/L				
	Hexavalent Chromium		<30 µg/L				
	Copper, Dissolved		<0.3 µg/L				
	Magnesium, Dissolved		102000 µg/L				
	Manganese. Dissolved		862 µg/L				
	Molybdenum, Dissolved		2670 µg/L				
	Nickel, Dissolved		<0.4 µg/L				
	Selenium Dissolved		<1 µg/L				
	Vanadium, Dissolved		<1 µg/L				
	Mercury, Dissolved		<0.01 µg/L				
	Alkalinity to pH 4.5 as $CaCO_3$		338000 µg/L				
	Iron, Dissolved		4710 µg/L				
	Potassium, Dissolved		200000 µg/L				
	Sodium, Dissolved		1320000 µg/L				
	Sulphate, Dissolved as SO_4		1560000 µg/L				
	Nitrogen: Total Oxidised as N		<100 µg/L				
	Chloride		2730000 µg/L				
	Fluoride		<500 µg/L				
	Ammoniacal Nitrogen as N		2480 µg/L				
	Carbon, Organic: Total as C		<3000 µg/L				
	Electrical conductivity		10629 µS/cm	Field measurements			
	Temperature		15.5 °C				
	Dissolved oxygen		0.3 mg/L				
	pH		7.03				
	Oxidation reduction potential		-113 mV				

Emission Point	Substance / Parameter	Emission Limit Value	Result [1]	Test Method [2]	Sample Date and Times [3]	Accreditation/ Certification [4]	Uncertainty [5]
	Groundwater level		3.22 mAOD				

Emission Point	Substance / Parameter	Emission Limit Value	Result [1]	Test Method [2]	Sample Date and Times [3]	Accreditation/ Certification [4]	Uncertainty [5]
BH7B	Aluminium, Dissolved		<10 µg/L		27/06/2024	Sampling WSP / Testing ALS	
	Antimony, Dissolved		<1 µg/L				
	Arsenic, Dissolved		27.1 µg/L				
	Boron, Dissolved		21000 µg/L				
	Cadmium, Dissolved		0.579 µg/L				
	Calcium, Dissolved		583000 µg/L				
	Chromium, Dissolved		<1 µg/L				
	Hexavalent Chromium		<30 µg/L				
	Copper, Dissolved		<0.3 µg/L				
	Magnesium, Dissolved		119000 µg/L				
	Manganese. Dissolved		1070 µg/L				
	Molybdenum, Dissolved		3260 µg/L				
	Nickel, Dissolved		0.487 µg/L				
	Selenium Dissolved		<1 µg/L				
	Vanadium, Dissolved		<1 µg/L				
	Mercury, Dissolved		<0.01 µg/L				
	Alkalinity to pH 4.5 as $CaCO_3$		437000 µg/L				
	Iron, Dissolved		7020 µg/L				
	Potassium, Dissolved		201000 µg/L				
	Sodium, Dissolved		1150000 µg/L				
	Sulphate, Dissolved as SO_4		1570000 µg/L				
	Nitrogen: Total Oxidised as N		<100 µg/L				
	Chloride		2400000 µg/L				
	Fluoride		<500 µg/L				
	Ammoniacal Nitrogen as N		2200 µg/L				
	Carbon, Organic: Total as C		3480 µg/L				
	Electrical conductivity		9800 µS/cm				
	Temperature		14.3 °C				

Emission Point	Substance / Parameter	Emission Limit Value	Result [1]	Test Method [2]	Sample Date and Times [3]	Accreditation/ Certification [4]	Uncertainty [5]
	Dissolved oxygen		1.39 mg/L	Field measurements			
	pH		7.07				
	Oxidation reduction potential		-109 mV				
	Groundwater level		3.36 mAOD				

Emission Point	Substance / Parameter	Emission Limit Value	Result [1]	Test Method [2]	Sample Date and Times [3]	Accreditation/ Certification [4]	Uncertainty [5]
BH8A	Aluminium, Dissolved		161 µg/L		26/06/2024	Sampling WSP / Testing ALS	
	Antimony, Dissolved		12.3 µg/L				
	Arsenic, Dissolved		50.4 µg/L				
	Boron, Dissolved		12600 µg/L				
	Cadmium, Dissolved		0.214 µg/L				
	Calcium, Dissolved		609000 µg/L				
	Chromium, Dissolved		<1 µg/L				
	Hexavalent Chromium		<30 µg/L				
	Copper, Dissolved		0.365 µg/L				
	Magnesium, Dissolved		26700 µg/L				
	Manganese. Dissolved		86.2 µg/L				
	Molybdenum, Dissolved		3360 µg/L				
	Nickel, Dissolved		0.706 µg/L				
	Selenium Dissolved		36.2 µg/L				
	Vanadium, Dissolved		123 µg/L				
	Mercury, Dissolved		<0.01 µg/L				
	Alkalinity to pH 4.5 as $CaCO_3$		147000 µg/L				
	Iron, Dissolved		<19 µg/L				
	Potassium, Dissolved		91800 µg/L				
	Sodium, Dissolved		707000 µg/L				
	Sulphate, Dissolved as SO_4		1470000 µg/L				
	Nitrogen: Total Oxidised as N		8950 µg/L				
	Chloride		1630000 µg/L				
	Fluoride		<500 µg/L				
	Ammoniacal Nitrogen as N		1530 µg/L				

Emission Point	Substance / Parameter	Emission Limit Value	Result [1]	Test Method [2]	Sample Date and Times [3]	Accreditation/ Certification [4]	Uncertainty [5]
	Carbon, Organic: Total as C		<3000 µg/L				
	Electrical conductivity		5977 µS/cm	Field measurements			
	Temperature		14.2 °C				
	Dissolved oxygen		0.41 mg/L				
	pH		8.13				
	Oxidation reduction potential		57 mV				
	Groundwater level		7.11 mAOD				

Emission Point	Substance / Parameter	Emission Limit Value	Result [1]	Test Method [2]	Sample Date and Times [3]	Accreditation/ Certification [4]	Uncertainty [5]
BH8B	Aluminium, Dissolved		<10 µg/L		26/06/2024	Sampling WSP / Testing ALS	
	Antimony, Dissolved		2.37 µg/L				
	Arsenic, Dissolved		1.83 µg/L				
	Boron, Dissolved		2040 µg/L				
	Cadmium, Dissolved		<0.08 µg/L				
	Calcium, Dissolved		773000 µg/L				
	Chromium, Dissolved		<1 µg/L				
	Hexavalent Chromium		<30 µg/L				
	Copper, Dissolved		<0.3 µg/L				
	Magnesium, Dissolved		489000 µg/L				
	Manganese. Dissolved		415 µg/L				
	Molybdenum, Dissolved		228 µg/L				
	Nickel, Dissolved		4.82 µg/L				
	Selenium Dissolved		2.39 µg/L				
	Vanadium, Dissolved		<1 µg/L				
	Mercury, Dissolved		<0.01 µg/L				
	Alkalinity to pH 4.5 as $CaCO_3$		388000 µg/L				
	Iron, Dissolved		510 µg/L				
	Potassium, Dissolved		138000 µg/L				
	Sodium, Dissolved		3680000 µg/L				
	Sulphate, Dissolved as SO_4		953000 µg/L				
	Nitrogen: Total Oxidised as N		1660 µg/L				
	Chloride		8610000 µg/L				
	Fluoride		<500 µg/L				
	Ammoniacal Nitrogen as N		5230 µg/L				
	Carbon, Organic: Total as C		6110 µg/L				
	Electrical conductivity		24269 µS/cm	Field measurements			
	Temperature		15.2 °C				
	Dissolved oxygen		0.95 mg/L				
	pH		6.87				
	Oxidation reduction potential		31 mV				

Emission Point	Substance / Parameter	Emission Limit Value	Result [1]	Test Method [2]	Sample Date and Times [3]	Accreditation/ Certification [4]	Uncertainty [5]
	Groundwater level		7.09 mAOD				

Emission Point	Substance / Parameter	Emission Limit Value	Result [1]	Test Method [2]	Sample Date and Times [3]	Accreditation/ Certification [4]	Uncertainty [5]
BH9B	Aluminium, Dissolved		<10 µg/L		27/06/2024	Sampling WSP / Testing ALS	
	Antimony, Dissolved		<1 µg/L				
	Arsenic, Dissolved		<0.5 µg/L				
	Boron, Dissolved		339 µg/L				
	Cadmium, Dissolved		<0.08 µg/L				
	Calcium, Dissolved		175000 µg/L				
	Chromium, Dissolved		<1 µg/L				
	Hexavalent Chromium		<30 µg/L				
	Copper, Dissolved		0.446 µg/L				
	Magnesium, Dissolved		22200 µg/L				
	Manganese. Dissolved		<3 µg/L				
	Molybdenum, Dissolved		8.6 µg/L				
	Nickel, Dissolved		0.589 µg/L				
	Selenium Dissolved		2.22 µg/L				
	Vanadium, Dissolved		<1 µg/L				
	Mercury, Dissolved		<0.01 µg/L				
	Alkalinity to pH 4.5 as $CaCO_3$		292000 µg/L				
	Iron, Dissolved		<19 µg/L				
	Potassium, Dissolved		2250 µg/L				
	Sodium, Dissolved		55500 µg/L				
	Sulphate, Dissolved as SO_4		152000 µg/L				
	Nitrogen: Total Oxidised as N		3160 µg/L				
	Chloride		145000 µg/L				
	Fluoride		<500 µg/L				
	Ammoniacal Nitrogen as N		<200 µg/L				
	Carbon, Organic: Total as C		<3000 µg/L				
	Electrical conductivity		1296 µS/cm				
	Temperature		12.5 °C				

Emission Point	Substance / Parameter	Emission Limit Value	Result [1]	Test Method [2]	Sample Date and Times [3]	Accreditation/ Certification [4]	Uncertainty [5]
	Dissolved oxygen		2.58 mg/L	Field measurements			
	pH		6.94				
	Oxidation reduction potential		73 mV				
	Groundwater level		3.23 mAOD				

Emission Point	Substance / Parameter	Emission Limit Value	Result [1]	Test Method [2]	Sample Date and Times [3]	Accreditation/ Certification [4]	Uncertainty [5]
BH10B	Aluminium, Dissolved		<10 µg/L		26/06/2024	Sampling WSP / Testing ALS	
	Antimony, Dissolved		2.39 µg/L				
	Arsenic, Dissolved		43.2 µg/L				
	Boron, Dissolved		19500 µg/L				
	Cadmium, Dissolved		0.211 µg/L				
	Calcium, Dissolved		421000 µg/L				
	Chromium, Dissolved		<1 µg/L				
	Hexavalent Chromium		<30 µg/L				
	Copper, Dissolved		<0.3 µg/L				
	Magnesium, Dissolved		182000 µg/L				
	Manganese. Dissolved		757 µg/L				
	Molybdenum, Dissolved		2090 µg/L				
	Nickel, Dissolved		3.36 µg/L				
	Selenium Dissolved		12.7 µg/L				
	Vanadium, Dissolved		7.04 µg/L				
	Mercury, Dissolved		<0.01 µg/L				
	Alkalinity to pH 4.5 as $CaCO_3$		653000 µg/L				
	Iron, Dissolved		5130 µg/L				
	Potassium, Dissolved		61800 µg/L				
	Sodium, Dissolved		368000 µg/L				
	Sulphate, Dissolved as SO_4		1250000 µg/L				
	Nitrogen: Total Oxidised as N		352 µg/L				
	Chloride		529000 µg/L				
	Fluoride		<500 µg/L				
	Ammoniacal Nitrogen as N		1210 µg/L				
	Carbon, Organic: Total as C		4890 µg/L				
	Electrical conductivity		4515 µS/cm	Field measurements			
	Temperature		16.3 °C				
	Dissolved oxygen		3.37 mg/L				
	pH		6.95				
	Oxidation reduction potential		-56 mV				

Emission Point	Substance / Parameter	Emission Limit Value	Result [1]	Test Method [2]	Sample Date and Times [3]	Accreditation/ Certification [4]	Uncertainty [5]
	Groundwater level		2.17 mAOD				

Emission Point	Substance / Parameter	Emission Limit Value	Result [1]	Test Method [2]	Sample Date and Times [3]	Accreditation/ Certification [4]	Uncertainty [5]
BH11A	Aluminium, Dissolved		<10 µg/L		26/06/2024	Sampling WSP / Testing ALS	
	Antimony, Dissolved		3.15 µg/L				
	Arsenic, Dissolved		137 µg/L				
	Boron, Dissolved		23000 µg/L				
	Cadmium, Dissolved		0.242 µg/L				
	Calcium, Dissolved		511000 µg/L				
	Chromium, Dissolved		<1 µg/L				
	Hexavalent Chromium		<30 µg/L				
	Copper, Dissolved		0.517 µg/L				
	Magnesium, Dissolved		153000 µg/L				
	Manganese. Dissolved		1200 µg/L				
	Molybdenum, Dissolved		1540 µg/L				
	Nickel, Dissolved		4.57 µg/L				
	Selenium Dissolved		3.79 µg/L				
	Vanadium, Dissolved		13.2 µg/L				
	Mercury, Dissolved		<0.01 µg/L				
	Alkalinity to pH 4.5 as $CaCO_3$		492000 µg/L				
	Iron, Dissolved		6310 µg/L				
	Potassium, Dissolved		55800 µg/L				
	Sodium, Dissolved		133000 µg/L				
	Sulphate, Dissolved as SO_4		1620000 µg/L				
	Nitrogen: Total Oxidised as N		548 µg/L				
	Chloride		143000 µg/L				
	Fluoride		<500 µg/L				
	Ammoniacal Nitrogen as N		1270 µg/L				
	Carbon, Organic: Total as C		5830 µg/L				
	Electrical conductivity		3534 µS/cm				
	Temperature		16.5 °C				

Emission Point	Substance / Parameter	Emission Limit Value	Result [1]	Test Method [2]	Sample Date and Times [3]	Accreditation/ Certification [4]	Uncertainty [5]
	Dissolved oxygen		1.98 mg/L	Field measurements			
	pH		6.83				
	Oxidation reduction potential		-88 mV				
	Groundwater level		9.89 mAOD				

Emission Point	Substance / Parameter	Emission Limit Value	Result [1]	Test Method [2]	Sample Date and Times [3]	Accreditation/ Certification [4]	Uncertainty [5]
BH11B	Aluminium, Dissolved		<10 µg/L		26/06/2024	Sampling WSP / Testing ALS	
	Antimony, Dissolved		1.9 µg/L				
	Arsenic, Dissolved		89.7 µg/L				
	Boron, Dissolved		8260 µg/L				
	Cadmium, Dissolved		<0.08 µg/L				
	Calcium, Dissolved		424000 µg/L				
	Chromium, Dissolved		<1 µg/L				
	Hexavalent Chromium		<30 µg/L				
	Copper, Dissolved		<0.3 µg/L				
	Magnesium, Dissolved		86000 µg/L				
	Manganese. Dissolved		1010 µg/L				
	Molybdenum, Dissolved		1040 µg/L				
	Nickel, Dissolved		1.46 µg/L				
	Selenium Dissolved		1.08 µg/L				
	Vanadium, Dissolved		14.7 µg/L				
	Mercury, Dissolved		<0.01 µg/L				
	Alkalinity to pH 4.5 as $CaCO_3$		416000 µg/L				
	Iron, Dissolved		6690 µg/L				
	Potassium, Dissolved		98900 µg/L				
	Sodium, Dissolved		886000 µg/L				
	Sulphate, Dissolved as SO_4		1190000 µg/L				
	Nitrogen: Total Oxidised as N		<100 µg/L				
	Chloride		2760000 µg/L				
	Fluoride		<500 µg/L				
	Ammoniacal Nitrogen as N		3550 µg/L				
	Carbon, Organic: Total as C		10700 µg/L				
	Electrical conductivity		8936 µS/cm	Field measurements			
	Temperature		22.3 °C				
	Dissolved oxygen		4.19 mg/L				
	pH		6.99				
	Oxidation reduction potential		-103 mV				

Emission Point	Substance / Parameter	Emission Limit Value	Result [1]	Test Method [2]	Sample Date and Times [3]	Accreditation/ Certification [4]	Uncertainty [5]
	Groundwater level		3.97 mAOD				

[1] The result given is the maximum value (or the minimum value in the case of a limit that is expressed as a minimum) obtained during the reporting period, expressed in the same terms as the emission limit value. Where the emission limit value is expressed as a range, the result is given as the 'minimum – maximum' measured values.
[2] Where an internationally recognised standard test method is used the reference number is given. Where another method that has been formally agreed with the Agency is used, then the appropriate identifier is given. In other cases the principal technique is stated, e.g. colorimetry.
[3] For non-continuous measurements the date and time of the sample that produced the result is given. For continuous measurements, or flow/time proportional samples, the percentage of the process operating time covered by the monitoring is given.
[4] The accreditation status of the equipment and/or the monitoring organisation, as appropriate, for the methods used for both sampling and analysis.
[5] The uncertainty associated with the quoted result at the 95% confidence interval, unless otherwise stated.

Sign [redacted]..... Date...15/07/2024.....
(authorised to sign as representative of the Operator)