

Permit Reference Number: BU2110IS

Operator: Cabot Carbon Limited

Installation: Barry Silicon-Based Manufacturing Installation

Form Number: A2 / Form Dated 1st February 2006

**Reporting of Emissions to Air for the period from 1<sup>st</sup> January 2023 to 31<sup>st</sup> December 2023**

Emission Point	Substance / Parameter	Emission Limit Value	Result <sup>[1]</sup>	Test Method <sup>[2]</sup>	Sample Date and Times <sup>[3]</sup>	Accreditation/ Certification <sup>[4]</sup>	Uncertainty <sup>[5]</sup>
A1	Oxides of nitrogen as NO <sub>2</sub>	50mg/m <sup>3</sup> <sup>[6]</sup>	4.3	TGN M22	13.11.23 10:00-11:00, 11:01-12:01, 12:02-13:02	MCERTS / UKAS	±8.5 mg/m <sup>3</sup>
A2	Oxides of nitrogen as NO <sub>2</sub>	200mg/m <sup>3</sup> <sup>[7]</sup>	74.6	BS EN 14792	06.11.2023 14:15-15:15	MCERTS / UKAS	±3.5 mg/m <sup>3</sup>
A2	Carbon monoxide	200mg/m <sup>3</sup> <sup>[7]</sup>	1.8	BS EN 15058	06.11.2023 14:15-15:15	MCERTS / UKAS	±0.87 mg/m <sup>3</sup>
A3	Oxides of nitrogen as NO <sub>2</sub>	None	166	BS EN 14792	07.11.2023 08:00-09:00	MCERTS / UKAS	±6.7 mg/m <sup>3</sup>
A3	Carbon monoxide	None	2.7	BS EN 15058	07.11.2023 08:00-09:00	MCERTS / UKAS	±0.87 mg/m <sup>3</sup>
A13 & A24	Formaldehyde	100g/hr <sup>[6]</sup> <sup>[8]</sup>	19.51	BS EN 13649 (Q2) CEN TS 17638 (Q4) <sup>[9]</sup>	04.05.2023 11:00-12:00, 12:05-13:05, 13:10-14:10 08.11.2023 10:14-11:14, 11:38-12:38, 12:55-13:55	MCERTS / UKAS	±0.53 g/hr

[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. Note: Result [1] are average values of sample results (where indicated), being more representative, as agreed with NRW

[1b] Results of site's only operational boiler B. (Sampling period was extended to capture more operational time, but testing was referenced to 3% Oxygen as stated in the Permit).

[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.

[3] For non-continuous measurements the date and time of the sample that produced the result 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. The basis of any other uncertainty figure needs to be stated. Where no figure is available NRW will need to agree an appropriate uncertainty value.

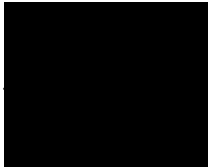
[6] Corrected to 273K, 101.3KPa.

[7] Corrected to 273K, 101.3KPa, 3% oxygen, dry.

[8] Combined mass emission from A13 and A24 emission point corrected 273K, 101.3KPa.

[9] Method changed in Q4 testing window with agreement of NRW

Signed .....



(authorised to sign as representative of Operator)

Date: 26.01.2024

Reference Number: BU2110IS

Operator: Cabot Carbon Limited

Installation: Barry Silicon-Based Manufacturing Installation

Form Number: A3 / Form Dated 1<sup>st</sup> February 2006

**Reporting of Emissions to Air for the period 1<sup>st</sup> October 2023 to 31<sup>st</sup> December 2023**

<b>Emission Point</b>	<b>Substance / Parameter</b>	<b>Emission Limit Value</b> [6]	<b>Result</b> [1] [Note A]	<b>Test Method</b> [2]	<b>Sample Date and Times</b> [3]	<b>Accreditation/ Certification</b> [4]	<b>Uncertainty</b> +/- [5]
A1	Chlorine	10 mg/m <sup>3</sup>	2.1 mg/m <sup>3</sup>	US EPA Method 26A	13.11.23 09:53-10:23, 12:27-10:57, 11:00-11:30, 11:34-12:04, 12:07-12:37	MCERTS / UKAS	±0.21 mg/m <sup>3</sup>
A1	Chlorine	10mg/m <sup>3</sup>	2.72 mg/m <sup>3</sup>	US EPA Method 26A	[7] Annual average of CY23Q1(1.3) CY23Q2(3.3) CY23Q3(4.2) CY23Q4(2.1)	MCERTS / UKAS	±0.92 mg/m <sup>3</sup>
A1	Chloromethanes (as methyl chloride)	50mg/m <sup>3</sup>	9.07 mg/m <sup>3</sup>	BS EN 13649	13.11.23 09:55-10:55, 11:00-12:00, 12:02-13:02	MCERTS / UKAS	±1.16 mg/m <sup>3</sup>
A1	Hydrogen chloride	10mg/m <sup>3</sup>	0.7 mg/m <sup>3</sup>	TGN M22[2]	13.11.23 10:00-11:00, 11:01-12:01, 12:02-13:02	MCERTS / UKAS	±0.86 mg/m <sup>3</sup>

[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.

[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.

[3] For non-continuous measurements the date and time of the sample that produced the result 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.

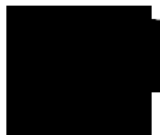
[5] The uncertainty associated with the quoted result at the 95% confidence interval, unless otherwise stated. The basis of any other uncertainty figure needs to be stated. Where no figure is available the Agency will need to agree an appropriate uncertainty value.

[6] Corrected to 273K, 101.3Kpa.

[7] Annual Average reported CY23 Q1-Q4 inclusive

[Note A]: Results are given as averages being more representative, as agreed with NRW.

Signed .....



(authorised to sign as representative of Operator)

Date: 26.01.2024

Installation: Barry Silicon-Based Manufacturing Installation

Form Number: W1 / Form Dated 1<sup>st</sup> February 2006**Reporting of Emissions to Water (other than to Sewer) for the period from 1 October 2023 to 31 December 2023**

<b>Emission Point</b>	<b>Substance / Parameter</b>	<b>Emission Limit Value</b>	<b>Result <sup>[1]</sup></b>	<b>Test Method <sup>[2]</sup></b>	<b>Sample Date and Times <sup>[3]</sup></b>	<b>Accreditation/ Certification <sup>[4]</sup></b>	<b>Uncertainty <sup>[5]</sup></b>
W1	Oil and grease	5mg/l <sup>[6]</sup>	<0.6 mg/l	IR Spectrometry - W-TEC-IR	04.12.2023 09:00	UKAS	+/- 20.0%
	BOD <sub>5</sub>	20mg/l <sup>[6]</sup>	1 mg/l	ISBN 011 7522120	04.12.2023 09:00	UKAS	+/- 23.6%
	pH	>5, <9 <sup>[7]</sup>	7.4	ISBN: 011 7514284	04.12.2023 09:00	UKAS	+/- 20.3%
W2	Oil and grease	5mg/l <sup>[6]</sup>	<0.6 mg/l	IR Spectrometry - W-TEC-IR	04.12.2023 09:20	UKAS	+/- 20.0%
	BOD <sub>5</sub>	20mg/l <sup>[6]</sup>	<1 mg/l	ISBN 011 7522120	04.12.2023 09:20	UKAS	+/- 23.6%
	pH	>5, <9 <sup>[7]</sup>	8.6	ISBN: 011 7514284	04.12.2023 09:20	UKAS	+/- 20.3%
W3	Oil and grease	5mg/l <sup>[6]</sup>	<0.6 mg/l	IR Spectrometry - W-TEC-IR	04.12.2023 16:10	UKAS	+/- 20.0%
	BOD <sub>5</sub>	20mg/l <sup>[6]</sup>	<1 mg/l	ISBN 011 7522120	04.12.2023 16:10	UKAS	+/- 23.6%
	pH	>5, <9 <sup>[7]</sup>	8.5	ISBN: 011 7514284	04.12.2023 16:10	UKAS	+/- 20.3%

[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.

[3] For non-continuous measurements the date and time of the sample that produced the result 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.

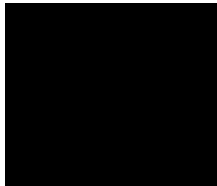
[5] The uncertainty associated with the quoted result at the 95% confidence interval, unless otherwise stated. The basis of any other uncertainty figure needs to be stated. Where no figure is available the Agency will need to agree an appropriate uncertainty value.

[6] The emission limit value for Oil and grease, and BOD<sub>5</sub>, is expressed as a maximum individual value.

[7] The emission limit values for pH are expressed as minimum and maximum individual values.

[8] ALS Environmental has obtained UKAS accreditation for all test method.

Signed .....



(authorised to sign as representative of Operator)

Date: 26.01.2024

Permit Reference Number: BU2110IS

Operator: Cabot Carbon Limited

Installation: Barry Silicon-Based Manufacturing Installation

Form Number: R1 / Form Dated 1st February 2006

**Reporting of Waste Disposal and Recovery for the year 2023 (01/01/2023-31/12/2023)**

Waste Description		Disposal	Recovery
	Route	Tonnes	Tonnes
<b>1) Hazardous Wastes</b>			
Hazardous waste from production and maintenance activities	D09, D15, R09, R13	27.0	13.18
Other hazardous wastes	N/A		
<b>Total hazardous waste</b>		<b>27.0</b>	<b>13.18</b>
<b>2) Non-Hazardous Wastes</b>			
Non-Hazardous silica waste to landfill from production activities (including packaging)	D01	54.57	
Non-Hazardous waste from production and maintenance activities	D01, D15, R01, R03, R04, R13	6.32	128.9
Non-Hazardous waste from construction activities (subsoil and hardcore)			
<b>Total Non-Hazardous waste</b>		<b>60.89</b>	<b>128.9</b>
<b>TOTAL WASTE</b>		<b>87.9</b>	<b>142.0</b>

Trends in Waste Disposal and Recovery			
Year	Parameter	Total Waste	Waste per unit output
	Named Waste		
2010	199.5	199.5	Report on PI1
2011	245.4	245.4	Report on PI1
2012	165.65	165.65	Report on PI1
2013	214.31	214.31	Report on PI1
2014	242.50	242.50	Report on PI1
2015	258.72	258.72	Report on PI1
2016	430.6	430.6	Report on PI1
2017	146.5	146.5	Report on PI1
2018	174.9	174.9	Report on PI1
2019	155.1	155.1	Report on PI1
2020	480.4	480.4	Report on PI1
2021	382.1	382.1	Report on PI1
2022	231.9	231.9	Report on PI1
2023	87.9	87.9	Report on PI1

Operator comments:

Signed 

(authorised to sign as representative of the Operator)

Date: 26.01.2024



Permit Reference Number: BU2110IS

Operator: Cabot Carbon Limited

Installation: Barry Silicon-Based Manufacturing Installation

Form Number: E1 / Form Dated 1st February 2006

**Reporting of Energy Usage for the year 2023 (01/01/2023-31/12/2023)**

Energy source	Energy Usage		
	Quantity	Primary Energy (MWh)	CO <sub>2</sub> Produced (Tonnes)
Electricity	MWh	35,642	5,917
Natural Gas	MWh	38,541	7,319
<b>TOTAL</b>		<b>74,183</b>	<b>13,235</b>

\* Conversion factor for delivered electricity to primary energy = 2.4

\*\* Conversion factor for Electricity CO<sub>2</sub> equivalent metric tonnes = MWh x 0.166

\*\*\* Conversion factor for Gas CO<sub>2</sub> equivalent metric tonnes = MWh x 0.190

Trends in Energy Usage			
Year	Parameter		
	Primary Energy usage	CO <sub>2</sub> produced	CO <sub>2</sub> per unit output
2011	97,179	17,681	Report on PI1
2012	93,540	17,004	Report on PI1
2013	84,074	15,040	Report on PI1
2014	85,449	15,306	Report on PI1
2015	86,454	15,480	Report on PI1
2016	85,907	15,351	Report on PI1
2017	76,211	13,531	Report on PI1
2018	83,219	14,865	Report on PI1
2019	76,066	13,567	Report on PI1
2020	75,863	13,546	Report on PI1
2021	74,516	13,293	Report on PI1
2022	70,965	12,618	Report on PI1
2023	74,183	13,235	Report on PI1

operator comments:

Signed



(authorised to sign as representative of the Operator)

Date: 26.01.2024

Permit Reference Number: BU21101S

Operator: Cabot Carbon Limited

Installation: Barry Silicon-Based Manufacturing Installation

Form Number: PI1 / Form Dated 1<sup>st</sup> February 2006

**Reporting of Performance Indicators for the year 2023 (01/01/2023– 31/12/2023)**

<b>Annual Production/Treatment</b>	
Production of fumed silica	7861 tonnes

**Environmental Performance Indicators**

Parameter	Annual Average	Units	Trends in Environmental Performance							
			Year	Parameter						
			CO	Water	Energy	CO <sub>2</sub>	Waste silica	Chloro-silane	H <sub>2</sub>	
Carbon monoxide	37.24	kg/tonne		kg/t	m <sup>3</sup> /t	kWh/t	t/t	kg/t	t/t	Nm <sup>3</sup> /t
Water use	15.77	m <sup>3</sup> /tonne	2008	29.05	13.2	10,670	1.3855	8.30	2.73	694.81
Energy use	9,437	kWh/tonne	2009	30.61	11.3	10,817	1.3790	4.87	2.60	766.64
Carbon dioxide	0.93	tonne/tonne	2010	40.41	10.2	9,900	1.2640	7.56	2.59	604.20
Waste silica to landfill	6.9	kg/tonne	2012	37.28	13.2	10,356	1.2990	8.63	2.83	628.90
Chlorosilane	2.48	tonne/tonne	2013	21.31	10.80	7,262	0.7401	11.89	2.41	575.30
Hydrogen	611.26	Nm <sup>3</sup> /tonne	2014	21.69	9.04	7,011	0.7282	17.06	2.51	503.51
			2015	20.63	8.98	6,910	0.7143	14.13	2.53	579.39
			2016	22.90	9.41	7,273	0.7309	27.5	2.50	583.30
			2017	21.30	9.58	6,324	0.5782	9.6	2.50	557.63
			2018	27.29	9.62	6,663	0.6926	11.3	2.50	585.94
			2019	24.48	11.40	7,002	0.69	10.2	2.82	583.14
			2020	27.02	12.72	8,363	0.83	9.8	2.5	604.93
			2021	24.95	11.04	7,536	0.74	6.9	2.5	550.08
			2022	24.24	12.34	8,971	0.84	14.1	2.5	583.17
			2023	37.24	15.77	9,437	0.93	6.9	2.48	611.26

Operator's comments.

Signed



(authorised to sign as representative of the Operator)

Date: 26.01.2024