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 1st January 2018 to 31st December 2018

Emission Point	Substance / Parameter	Emission Limit Value	Result [1]	Test Method [2]	Sample Date and Times [3]	Accreditation/ Certification [4]	Uncertainty [5]
A1	Oxides of nitrogen as NO_2	50mg/m^3 [6]	17.1	TGN M22	13.12.18 0845-0945,0947-1047,1050-1150hrs	MCERTS / UKAS	±1.7 mg/m3
A2	Oxides of nitrogen as NO_2	200mg/m^3[7]	30.10	BS EN 14792	10.12.18 1513-1613hrs	MCERTS / UKAS	± 2.8 mg/m3
A2	Carbon monoxide	200mg/m^3 [7]	17.8	BS EN 15058	10.12.18 1513-1613hrs	MCERTS / UKAS	± 3.2 mg/m3
A3	Oxides of nitrogen as NO_2	None	129 (b)	BS EN 14792	10.12.18 1435-1439 hrs	MCERTS / UKAS	± 6.5 mg/m3
A3	Carbon monoxide	None	105 (b)	BS EN 15058	10.12.18 1435-1439 hrs	MCERTS / UKAS	± 4.3mg/m3
A13 & A24	Formaldehyde	100g/hr [6] [8]	4.92	BS EN 13649	05.06.18 1125-1225,1230-1330,1340-1440 hrs. 06.06.18 0844-0944, 0948-1048, 1055-1155. 11.12.18 0855-0955,1000-1100,1105-1205, 1215-1315,1320-1420,1425-1525	MCERTS / UKAS	± 31% mg/m3

[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 (during the sampling period the boiler was only operating for 4 min as it is now typically only on standby 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.

Signed .....

(authorised to sign as representative of Operator)

Date: 30th January 2019

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 2018 (01/01/18 – 31/12/18)

Waste Description	Disposal		Recovery
	Route	Tonnes	Tonnes
1) Hazardous Wastes			
Hazardous waste from production and maintenance activities	D09, D15, R09, R13	30.5	7.5
Other hazardous wastes	N/A	N/A	
Total hazardous waste		38.0	
2) Non-Hazardous Wastes			
Non-Hazardous silica waste to landfill from production activities (including packaging)	D01	141.1	
Non-Hazardous waste from production and maintenance activities	D01, D15, R01, R03, R04, R13	3.3	291.31
Non-Hazardous waste from construction activities (subsoil and hardcore)			20.7
Total Non-Hazardous waste		144.4	312.0
TOTAL WASTE		174.9	319.5

Trends in Waste Disposal and Recovery			
Year	Parameter		
	Named Waste	Total Waste	Waste per unit output
2008	456.2	464.7	Report on PI1
2009	154.8	162.8	Report on PI1
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

Operator comments: An increase on 2018 hazardous waste recovered

Signed (authorised to sign as representative of the Operator) Date 30th January 2019

Permit Reference Number: BU2110IS

Operator: Cabot Carbon Limited

Installation: Barry Silicon-Based Manufacturing Installation

Form Number: WU1 / Form Dated 1st February 2006

Reporting of Water Usage for the year 2018 (01/01/18 – 31/12/18)

Water Source	Usage (m^3)	Specific Usage (m^3/t)
Mains water	69,695	5.58
Dow Corning	50,490	4.04
TOTAL WATER USAGE	120,185	9.62

Trends in Water Usage				
Year	Parameter			
	Mains water	Dow Corning	Total water usage	Water per unit output
2006	103,892	94,047	197,939	Report on PI1
2007	92,671	87,424	180,096	Report on PI1
2008	49,805	73,734	123,539	Report on PI1
2009	52,229	47,656	99,885	Report on PI1
2010	58,643	43,664	102,307	Report on PI1
2011	73,172	44,154	117,326	Report on PI1
2012	76,828	42,204	119,032	Report on PI1
2013	76,004	49,040	125,044	Report on PI1
2014	68,392	41,828	110,220	Report on PI1
2015	74,320	38,023	112,343	Report on PI1
2016	78,272	32,911	111,182	Report on PI1
2017	76,512	38,898	115,410	Report on PI1
2018	69,695	50,490	120,185	Report on PI1

Signed

(authorised to sign as representative of the Operator)

Date 30th January 2019

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 2018 (01/01/18 – 31/12/18)

Energy Source	Energy Usage		CO_2 Produced (Tonnes)
	Quantity	Primary Energy (MWh)	
Electricity	MWh	39,262	6518
Natural Gas	MWh	43,957	7,727
TOTAL		83,219	14,865

* Conversion factor for delivered electricity to primary energy = 2.4

** Conversion factor for Electricity CO2 equivalent metric tonnes = MWh x 0.166

*** Conversion factor for Gas CO2 equivalent metric tonnes = MWh x 0.190

Trends in Energy Usage			
Year	Parameter		
	Primary Energy usage	CO_2 produced	CO_2 per unit output
2006	108,936	19,884	Report on PI1
2007	107,011	19,531	Report on PI1
2008	99,904	18,219	Report on PI1
2009	95,570	17,445	Report on PI1
2010	99,165	18,055	Report on PI1
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	15480	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

Operator comments:

Signed (authorised to sign as representative of the Operator) Date 30th January 2019

Permit Reference Number: BU2110IS

Operator: Cabot Carbon Limited

Installation: Barry Silicon-Based Manufacturing Installation

Form Number: PI1 / Form Dated 1st February 2006

Reporting of Performance Indicators for the year 2015 (01/01/18– 31/12/18)

Annual Production/Treatment	
Production of fumed silica	12490 tonnes

Environmental Performance Indicators

Parameter	Annual Average	Units
Carbon monoxide	27.3	kg/tonne
Water use	9.62	m^3/tonne
Energy use	6,663	kWh/tonne
Carbon dioxide	0.69	tonne/tonne
Waste silica to landfill	11.3	kg/tonne
Chlorosilane	2.50	tonne/tonne
Hydrogen	585.94	Nm^3/tonne

Trends in Environmental Performance							
Year	Parameter						
	CO	Water	Energy	CO_2	Waste silica	Chloro-silane	H_2
	kg/t	m^3/t	kWh/t	t/t	kg/t	t/t	Nm^3/t
2006	22.75	17.3	9,500	1.5523	4.16	2.65	580.14
2007	25.26	15.8	9,390	1.2285	8.31	2.57	571.87
2008	29.05	13.2	10,670	1.3855	8.30	2.73	694.81
2009	30.61	11.3	10,817	1.3790	4.87	2.60	766.64
2010	40.41	10.2	9,900	1.2640	7.56	2.59	604.20
2012	37.28	13.2	10,356	1.2990	8.63	2.83	628.90
2013	21.31	10.80	7,262	0.7401	11.89	2.41	575.30
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

Operator's comments: produced 400MT more fumed silica than in 2017. Waste silica to landfill Was in the main aged stock with 70MT off quality/out of shelf life stock diverted from landfill and used by a 3rd party in a polymeric roofing compound. OQ record low levels for the site through improvement of the process and quality systems.

Signed (authorised to sign as representative of the Operator) 30th January 2019