Form Number: Agency Form / BR9685IX / A1 / Form Dated 1st March 2006

Annual Reporting of Emissions to Air for the period from January 1 2018 to December 31 2018

Emission Point	Substance / Parameter	Emission Limit Value	Result [1]	Units	Test Method [2]	Sample Date and Times [3]	Accreditation/ Certification [4]	Uncertainty [5]
A12, A33, A34, A40(10)	Chloromethane	60 000kg/year	**25069.61**	kg/yr	US EPA Method 18	**continuous**	In House GC	A12 = 4% A33 = 24% A34 = 3% A40 = 3.6%
A12, A33, A34, A40(10)	Chloromethane	1000kg/day	**175.47**	kg/day	US EPA Method 18	**Continuous**	In House GC	A12 = 4% A33 = 24% A34 = 3% A40 = 3.6%
A12, A33, A34, A40(10)	Chloromethane	250kg/hour	**149.47**	kg/hr	US EPA Method 18	**Continuous**	In House GC	A12 = 4% A33 = 24% A34 = 3% A40 = 3.6%
A33	Methanol	60kg/hour	**10.12**	kg/hr	US EPA Method 18	**Continuous**	In House GC	42%
A34	Methanol	60kg/hour	**25.66**	kg/hr	US EPA Method 18	**Continuous**	In House GC	1%
A12	Methane [6]	No limit applies	**326.35**	kg/hr	US EPA Method 18	**Continuous**	In House GC	1%
A12	Non-methane hydrocarbons [6]	No limit applies	**169.09**	kg/hr	US EPA Method 18	**Continuous**	In House GC	2%
A40	Silanes [6]	No limit applies	**N/A**	-	Gas chromatography	**n/a**	In House validated Method	3.6%
A40	Silanes [7]	No limit applies	**N/A**	-	Gas chromatography	**n/a**	In House validated Method	3.6%
A41	Particulates	10 mg/m^3	**2.00**	mg/m^3	BS EN 13284	**03/04/2018 13:33**	UKAS & MCERTS	+/- 0.33
A41	Carbon monoxide	50mg/m^3	**1.40**	mg/m^3	ISO 12039	**Annual average**	In House validated Method	13%
A41	Oxides of nitrogen as NO_2	100mg/m^3	**13.04**	mg/m^3	ISO 10849	**Annual average**	In House validated Method	11%
A41	Dioxins and furans	0.1ng/m^3	**0.09**	ng/m^3	BS EN 1948	**Annual average – 7 samples**	UKAS & MCERTS	+/- 0.003
A48	Oxides of nitrogen as NO_2	No limit applies	**123.90**	mg/m^3	ISO 10849	**02/02/2018 12:25**	In House validated Method	11%
A48	Carbon monoxide	No limit applies	**1.40**	mg/m^3	ISO 12039	**02/02/2018 12:25**	In House validated Method	13%

Emission Point	Substance / Parameter	Emission Limit Value	Result [1]	Units	Test Method [2]	Sample Date and Times [3]	Accreditation/ Certification [4]	Uncertainty [5]
A50	Oxides of nitrogen as NO_2	200mg/m^3	**37.60**	mg/m^3	ISO 10849	**09/03/2018 11:05**	In House validated Method	11%
A50	Carbon monoxide	200mg/m^3	**1.50**	mg/m^3	ISO 12039	**09/03/2018 11:05**	In House validated Method	13%
A85	Hydrogen chloride [8]	10mg/m^3	**N/A**	mg/m^3	BS EN 1911:1998	**n/a**		
A26	Class B VOC's [9]	No limit applies	**1.80**	kg/hr	BS EN 13649	**Annual average**	In House validated Method	3.6%
A60	Class B VOC's [9]	5,000 kg/yr (11)	**196.94**	kg	BS EN 13649	**Annual total release**	In House validated Method	3.6%
A68	Class B VOC's [9]	5,000 kg/yr (11)	**693.04**	kg	BS EN 13649	**Annual total release**	In House validated Method	3.6%
A26	Siloxanes [9]	An agreed limit (12)	**0.80**	kg/hr	Gas chromatography	**Annual average**	In House validated Method	3.6%
A65	Siloxanes [9]	An agreed limit (12)	**0.06**	kg/hr	Gas chromatography	**Annual average**	In House validated Method	3.6%
A68	Siloxanes [9]	An agreed limit (12)	**1.33**	kg/hr	Gas chromatography	**Annual average**	In House validated Method	3.6%
A79	Siloxanes [9]	An agreed limit (12)	**0.47**	kg/hr	Gas chromatography	**Annual average**	In House validated Method	3.6%

[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. gas chromatography.
[3] For non-continuous measurements the date and time of the sample that produced the result is given. For continuous measurements the percentage of the process operating time covered by 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.
[6] Maximum kg/h obtained during the reporting period.
[7] Total release during the reporting period.
[8] Reporting only required if phosphonitrile production during reporting year.
[9] Average of quarterly reported values in reporting year.
[10] Based on an agreed emission factor
[11] Emission limit agreed following completion of IP4
[12] Emission limit to be agreed following completion of IP14. This has been deferred for consideration with IP25. No limit was agreed.

Dow Silicones Notes:

(13) There is no routine monitoring frequency required for A40 apart from the requirements listed in Table 2.10.1 under 'other requirements' and a method for such testing has not yet been agreed with the Agency. Dow Silicones has agreed with the Agency to use previously agreed IPC emission factors for silane releases from A40 for PI reporting purposes, as described in IPC improvement item 8.21. Under Improvement item IP3 the Environment Agency agreed to remove the requirement for silane monitoring at A41 when the ERU is not available for periods greater than 6 hrs.
(14) This is no longer made in W307.

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Form Number: Agency Form / BR9685IX / A3 / Form Dated 1st March 2006

Annual Reporting of Emissions to Air for the period from January 1 2018 to December 31 2018

Emission Point	Substance / Parameter	Emission Limit Value	Result [1] Mg/m³	Test Method [2]	Sample Date and Times [3]	Accreditation/ Certification [4]	Uncertainty [5]
A41	Hydrogen chloride	15mg/m³	**1.9661**	US EPA Method 26	**31/01/18 11:28**	UKAS & MCERTS	±36%
			1.0653	US EPA Method 26	**02/02/18 09:12**	UKAS & MCERTS	±36%
			5.7921	US EPA Method 26	**07/03/18 13:13**	UKAS & MCERTS	±36%
			1.9159	US EPA Method 26	**03/04/18 13:33**	UKAS & MCERTS	±36%
			2.3191	US EPA Method 26	**01/05/18 10:15**	UKAS & MCERTS	±36%
			1.1863	US EPA Method 26	**01/06/18 10:30**	UKAS & MCERTS	±36%
			0.7992	US EPA Method 26	**03/07/18 10:40**	UKAS & MCERTS	±36%
			0.5806	US EPA Method 26	**14/08/18 13:03**	UKAS & MCERTS	±36%
			0.7223	US EPA Method 26	**04/09/18 10:43**	UKAS & MCERTS	±36%
			0.1439	US EPA Method 26	**02/10/18 10:35**	UKAS & MCERTS	±36%
			0.4342	US EPA Method 26	**06/11/18 11:55**	UKAS & MCERTS	±36%
			0.4809	US EPA Method 26	**05/12/18 11:26**	UKAS & MCERTS	±36%
		10mg/m³	**1.4505**		**Annual average**		

[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. gas chromatography.
[3] For non-continuous measurements the date and time of the sample that produced the result is given. For continuous measurements the percentage of the process operating time covered by 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.

Dow Silicones Notes:
HCl results are corrected for STP, ref 11% O2, dry

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Form Number: Agency Form / BR9685IX / A4 / Form Dated 1st March 2006

Annual Reporting of Emissions to Air for the period from January 1 2018 to December 31 2018

Emission Point	Substance / Parameter	Emission Limit Value	Result [1] Mg/m^3	Test Method [2]	Sample Date and Times [3]	Accreditation/ Certification [4]	Uncertainty [5]
A41	Chlorine	15mg/m^3	**1.3181**	US EPA Method 26	**16/01/18 11:50**	UKAS & MCERTS	±36%
			3.6330	US EPA Method 26	**02/02/18 10:30**	UKAS & MCERTS	±36%
			0.3797	US EPA Method 26	**09/03/18 08:05**	UKAS & MCERTS	±36%
			2.5123	US EPA Method 26	**04/04/18 11:35**	UKAS & MCERTS	±36%
			7.2075	US EPA Method 26	**01/05/18 11:40**	UKAS & MCERTS	±36%
			1.6964	US EPA Method 26	**01/06/18 11:50**	UKAS & MCERTS	±36%
			1.9808	US EPA Method 26	**03/07/18 12:30**	UKAS & MCERTS	±36%
			3.3228	US EPA Method 26	**14/08/18 14:22**	UKAS & MCERTS	±36%
			0.5887	US EPA Method 26	**04/09/18 12:09**	UKAS & MCERTS	±36%
			0.1933	US EPA Method 26	**02/10/18 11:55**	UKAS & MCERTS	±36%
			0.4202	US EPA Method 26	**06/11/18 10:50**	UKAS & MCERTS	±36%
			1.9994	US EPA Method 26	**05/12/18 13:13**	UKAS & MCERTS	±36%
		10mg/m^3	**1.3181**		**Annual average**		

[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. gas chromatography.
[3] For non-continuous measurements the date and time of the sample that produced the result is given. For continuous measurements the percentage of the process operating time covered by 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.

Dow Silicones Notes:
Chlorine results are corrected for STP, ref 11% O2, dry

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Form Number: Agency Form / BR9685IX / A5 / Form Dated 1st March 2006

Annual Reporting of Emissions to Air for the period from January 1 2018 to December 31 2018

There weren't any transfers of Spent bed into W348 TCS spend bed tank and therefore no potential for associated chloromethane releases in 2018

Emission Point	Substance / Parameter	Emission Limit Value	Result [1]	Test Method [2]	Sample Date and Times [3]	Accreditation/ Certification [4]	Uncertainty [5]
A57	Chloromethane	2kg/h	N/A				

[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. gas chromatography.
[3] For non-continuous measurements the date and time of the sample that produced the result is given. For continuous measurements the percentage of the process operating time covered by 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.

Dow Silicones Notes:
There weren't any transfers of Spent bed into W348 TCS spend bed tank and therefore no potential for associated chloromethane releases in 2018

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Form Number: Agency Form / BR9685IX / E1 / Form Dated 1st March 2006

Reporting of Energy Usage for the year 2018

Energy Source	Energy Usage Quantity	Primary Energy (MWh)	CO_2 Produced (tonnes)
Steam (tonnes)	**730,343**	**620,040**	**117,775**
Electricity *(kWh)	**171,303,446**	**400,958**	**73,877**
Natural Gas (kWh)	**102,090,135**	**102,090**	**19,392**
Gas Oil (tonnes)	**3**	**-**	**9**
TOTAL		**1,123,088**	**211,053**

Trends in Energy Usage Year / Parameter			
Year	**Primary Energy usage**	**CO_2 produced**	**CO_2 per unit output**
2008	**1,101,571**	**207,755**	
2009	1,066,743	183,110	
2010	1,018,415	191,869	
2011	1,040,640	195,636	
2012	1,044,862	197,154	
2013	1,039,643	196,913	
2014	1,080,683	204,686	
2015	1,060,647	200,560	
2016	1,065,704.1	200,195.5	
2017	1,040,379	196,834	
2018	**1,123,088**	**211,053**	

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

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Form Number: Agency Form / BR9685IX / R1 / Form Dated 1st March 2006

Reporting of Waste Disposal and Recovery for the year 2018

Waste Description	Route	Disposal Tonnes	Recovery Tonnes
1) Hazardous Wastes			
Calcium filtercake	Landfill	3733.18	
ClSi - DPR liquid gas (8-6149)	Energy recovery		264.98
ClSi - DPR liquid gas (8-6149)	Incineration	455.7	
Cuprous chloride	Incineration	7.56	
Cuprous chloride	Water Treatment	19.629	
Haz DPR	Recovery		9673.325
Mixed incineration	Incineration	164.0875	
SiH Siloxane & Isoparaffin 8-6856 (tanker - W922)	Incineration	166.86	
Siloxane Hydrocarbons 8-6818 (tanker)	Energy recovery		200.82
Siloxane Hydrocarbons 8-6818 (tanker)	Incineration	9.32	
Solvent siloxane	Energy recovery		729.9885
Spent Bed	Recovery		9323.41
Spent Sulphuric acid	Recovery		7797.27
Toluene/Glycol	Energy recovery		0.9
Contaminated PPE (Tonnes)	Energy recovery		48.5
Interceptor pit cleanout	Incineration	17.138	
Contaminated timber	Incineration	43.54	
Diol vols	Energy recovery		637.1315
Waste gum	Incineration	15.3855	
Packaged - other treatment	Landfill	206.6	132.56
Total Hazardous waste		**4839.00**	**28808.89**
2) Non-Hazardous Wastes			
Alumina RAR Catalyst	Landfill	169.7	
Aluminium cans	Recycling		23.37
Biosludge from SWWT	Water Treatment	2890.924	
Calcium filtercake	Landfill	505.275	

Trends in Waste Disposal and Recovery Year	Parameter		
	Waste	**Total Waste**	**Waste per unit output**
2006	All Wastes	44865 Tonnes	
2007	All Wastes	57243 Tonnes	
2008	All Wastes	60900 Tonnes	
2009	All Wastes	37182 Tonnes	
2010	All Wastes	52749 Tonnes	
2011	All wastes	45659.791 Tonnes	
2012	All wastes	53694.0 Tonnes	
2013	All wastes	50454.257Tonnes	
2014	All wastes	41004.423 tonnes	
2015	All wastes	44431.497 tonnes	
2016	All wastes	50306.351 tonnes	
2017	All wastes	57565.94 tonnes	
2018	**All wastes**	**47066.82 tonnes**	

Waste Description	Route	Disposal Tonnes	Recovery Tonnes
Calcium filtercake	Recycling		21.85
Calcium Slurry	Water Treatment	906.35	
Cardboard	Recycling		142.61
Filter Cartridge material	Landfill	16.86	
Food waste for composting	Composted		5.83
General Waste	Energy recovery		293.6326162
Glass	Recycling		13.776
Gypsum	Landfill	1.84	
Lagging	Energy recovery		23.58
Magnesium Oxide/Calcium Carbonate	Landfill	120.38	
Non Haz White DPR (Q8-6717)	Landfill	6604.635	
Paint Tins	Recycling		6.2
Paper	Recycling		4.98
Plastic	Recycling		62.88
Rubber	Energy recovery		555.18
Scrap metal	Recycling		383.71
Shot Blast	Landfill	117.59	
Silicon Metal	Recycling		46.26
WEEE	Recycling		13.49
Wood	Recycling		239.403
Empty drums (tonnes)	Recycling		149.556
Empty IBC (tonnes)	Recycling		99.072
Total Non Hazardous waste		**11333.554**	**2085.379616**
TOTAL WASTE		**16172.554**	**30894.26462**

Trends in Waste Disposal and Recovery Year	Parameter		

OPERATOR COMMENTS:

- **10,000 tonnes less of Haz DPR this year due to the elimination of the stockpile in 2017.**
- **Calcium filter cake was reclassified as hazardous during the year due to improved water removal.**
- **Waste Chlorosilane shipments low due to unforeseen shutdown of the incinerator**
- **Mixed incineration low due to reduced availability of incineration during 2018**
- **Contaminated waste gum now unable to go to India due the the ban of B3010 materials**
- **Calcium slurry increased during 2018 due to equipment failure**
- **Shot blast increase due to a significant number of painting happening across the site**

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Form Number: Agency Form / BR9685IX / WU1 / Form Dated 1st March 2006

Reporting of Water Usage for the year 2018

Water Source	Usage (m^3)	Specific Usage (m^3/t)
Towns water	**418,725**	
Bigliss well water	**1,267,630**	
Cadoxton river water	**681,722**	
TOTAL WATER USAGE	**2,368,077**	

Trends in Water Usage					
Year	Parameter				
	Towns water	Bigliss well water	Cadoxton river water	Total water usage	Water per unit output
2009	121,193	821,102	899,394	1,851,689	Report on PI1
2010	237,014	986,518	748,770	1,972,302	Report on PI1
2011	273,504	932737	925,974	2,132,215	Report on PI1
2012	187,886	826,251	1,058,541	2,072,658	Report on PI1
2013	230,623	933,912	899,926	2,064,461	Report on PI1
2014	230,189	768,111	551,771	1,550,071	Report on PI1
2015	244,473	785,203	564,798	1,594,474	Report on PI1
2016	276,011	993,693	442,702	1,712,406	Report on PI1
2017	245,697	1,248,673	863,303	2,357,673	Report on PI1
2018	**418,725**	**1,267,630**	**681,722**	**2,368,077**	**Report on PI1**

Operator's comments :
Towns water and Biglis water data obtained from invoices.
River water is measured.
The Biglis water consumption includes the supply to the CHP

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Form Number: Agency Form / BR9685IX / PI1 / Form Dated 1st March 2006

Reporting of Performance Indicators for the period 2018

Annual Production/Treatment		
Polydimethylsiloxane		tonnes

Environmental Performance Indicators

Parameter	Annual Average	Units
Water use		m^3/tonne
Energy use		MWh/tonne
Waste		Kg/tonne
Carbon dioxide		Tonne/tonne

Trends in Environmental Performance Year / Parameter	Water	Energy	Waste	CO_2	W955 NaOH	W955 Nat. gas
	m^3/t	MWh/t	kg/t	t/t	m^3/t	MJ/t
2009					N/A	N/A
2010					N/A	N/A
2011					N/A	N/A
2012					N/A	N/A
2013					N/A	N/A
2014					N/A	N/A
2015					n/a	n/a
2016					n/a	n/a
2017					n/a	n/a
2018					**n/a**	**n/a**

Operator's comments:

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Form Number: Agency Form / BR9685IX / ERU1 / Form Dated 1st March 2006

Annual Reporting of Energy Recovery Unit Availability for the period from January 1 2018 to December 31 2018

Process	Parameter	Month	Result [1], %
Energy Recovery Unit W949	Availability	January	**49.5%**
		February	**47.4%**
		March	**64.4%**
		April	**56.2%**
		May	**61.2%**
		June	**71.7%**
		July	**64.0%**
		August	**74.9%**
		September	**63.3%**
		October	**82.8%**
		November	**81.9%**
		December	**66.4%**
		Reporting year total	**66.1%**

[1] Based on the availability to process 100% of W714 FBR vent. Calculated using feed valve position and positive flows.

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