

**RELEASES TO AIR
QUARTERLY RETURN
MONTHLY MEAN, MAXIMUM DAILY MEAN AND ANNUAL PERCENTILE CONCENTRATIONS
OPERATING MODE:**

Operator: Dow Silicones UK Ltd

Form: IED CON 2 (Gas Turbines)

Location: Barry Cogeneration Plant

Version/date: V.3.1 31 Dec 2015

Permit/Variation Number: EPR/JP3632ZH/V004

Year: 2022	A1 / LCP 60					
	NOx (mg/m3)			CO (mg/m3)		
Month	Monthly Mean	Max Daily Mean	Part Load Max Daily Mean	Monthly Mean	Max Daily Mean	Part Load Max Daily Mean
January	-	-		-	-	
February	-	-		-	-	
March	113.11	118.57		3.8	7.0	
April	115.32	115.32		4.4	4.4	
May	-	-		-	-	
June	-	-		-	-	
July	-	-		-	-	
August	109.43	114.18		4.2	7.2	
September	-	-		-	-	
October	86.27	112.38		3.2	9.6	
November	90.10	99.50		6.4	17.2	
December	93.72	98.24		4.6	10.0	
Monthly ELV / Daily ELV (f)	75.	80.		80.	80.	
Annual 95th Percentile (h)	111.77(46)			12.0(46)		
Annual Percentile ELV (g)	125.			80.		

NOTES:

(a) All data based on validated hourly average concentrations, excluding start-up and shut-down and periods of malfunction or breakdown of abatement equipment, at 15% O₂, dry, 273.15K, 101.325 kPa

(b) Annual percentiles are submitted with the final return (Quarter 4)

(c) Extend report to cover the required number of LCP on each site and repeat report for each separately regulated Operating Mode as required, e.g., Combined Cycle, Open Cycle, Supplementary firing, Auxiliary firing

(d) Averages determined at loads in the range 70% < Load ≤ 100% ISO base load and above

(e) Averages determined at loads in the range MSUL* < Load = 100% ISO base load and above (* For a 3 parameter approach, from the point of Start-Up to the point of Shut-down)

(f) Leave the Daily ELV blank if this is applied as a 95th percentile ELV within the Permit

(g) For each pollutant, report the Annual 95th percentile ELV for hourly averages in the first column and, if applicable, the Annual 95th percentile ELV for daily means in the second column

(h) For each pollutant, report the Annual 95th percentile of hourly averages in the first column and, if applicable, the Annual 95th percentile of daily means in the second column

Signed on behalf of the Operator by:

[Redacted Signature]

Environmental Specialist

Date of return:

27/01/2023

No confidence adjustment

**RELEASES TO AIR
QUARTERLY RETURN
MONTHLY MEAN, MAXIMUM DAILY MEAN AND ANNUAL PERCENTILE CONCENTRATIONS
OPERATING MODE:**

Operator: **Dow Silicones UK Ltd** Form: IED CON 2 (Gas Turbines)
Location: **Barry Cogeneration Plant** Version/date: **V.3.1 31 Dec 2015**
Permit/Variation Number: **EPR/JP3632ZH/V004**

Year: 2022	A2 / LCP60					
	NOx (mg/m3)			CO (mg/m3)		
Month	Monthly Mean	Max Daily Mean	Part Load Max Daily Mean	Monthly Mean	Max Daily Mean	Part Load Max Daily Mean
January	-	-		-	-	
February	-	-		-	-	
March	53.75	53.75		7.1	7.1	
April	57.93	63.15		10.1	20.2	
May	57.93	63.25		9.0	13.6	
June	59.11	62.36		8.8	13.1	
July	56.67	60.69		9.1	13.8	
August	57.03	62.56		8.5	13.2	
September	59.31	59.38		6.6	6.6	
October	-	-		-	-	
November	-	-		-	-	
December	-	-		-	-	
Monthly ELV / Daily ELV (f)	100	110		100	110	
Annual 95th Percentile (h)	62.13(116)			15.2(116)		
Annual Percentile ELV (g)	200			200		

NOTES:

- (a) All data based on validated hourly average concentrations, excluding start-up and shut-down and periods of malfunction or breakdown of abatement equipment, at 15% O₂, dry, 273.15K, 101.325 kPa
- (b) Annual percentiles are submitted with the final return (Quarter 4)
- (c) Extend report to cover the required number of LCP on each site and repeat report for each separately regulated Operating Mode as required, e.g., Combined Cycle, Open Cycle, Supplementary firing, Auxiliary firing
- (d) Averages determined at loads in the range 70% < Load ≤ 100% ISO base load and above
- (e) Averages determined at loads in the range MSUL* < Load = 100% ISO base load and above (* For a 3 parameter approach, from the point of Start-Up to the point of Shut-down)
- (f) Leave the Daily ELV blank if this is applied as a 95th percentile ELV within the Permit
- (g) For each pollutant, report the Annual 95th percentile ELV for hourly averages in the first column and, if applicable, the Annual 95th percentile ELV for daily means in the second column
- (h) For each pollutant, report the Annual 95th percentile of hourly averages in the first column and, if applicable, the Annual 95th percentile of daily means in the second column

Signed on behalf of the Operator by:

[Redacted Signature]

Environmental Specialist

Date of return:

27/01/2023

No confidence adjustment

**RELEASES TO AIR
QUARTERLY RETURN
MONTHLY MEAN, MAXIMUM DAILY MEAN AND ANNUAL PERCENTILE CONCENTRATIONS
OPERATING MODE:**

Operator: Dow Silicones UK Ltd

Form: IED CON 2 (Gas Turbines)

Location: Barry Cogeneration Plant

Version/date: V.3.1 31 Dec 2015

Permit/Variation Number: EPR/JP3632ZH/V004

Year: 2022	A3 / LCP60					
	NOx (mg/m3)			CO (mg/m3)		
Month	Monthly Mean	Max Daily Mean	Part Load Max Daily Mean	Monthly Mean	Max Daily Mean	Part Load Max Daily Mean
January	26.38	29.93		3.8	13.0	
February	28.66	31.38		1.0	6.8	
March	49.24	75.02		9.5	23.6	
April	72.57	80.82		12.4	23.1	
May	70.10	78.15		11.7	20.2	
June	77.25	85.97		0.8	15.7	
July	69.95	76.80		0.1	1.2	
August	68.37	75.38		0.3	1.3	
September	-	-		-	-	
October	64.31	68.41		0.1	0.6	
November	67.73	73.20		4.6	22.1	
December	65.81	69.87		4.4	13.7	
Monthly ELV / Daily ELV (f)	75.	80.		80.	80.	
Annual 95th Percentile (h)	80.95(315)			20.6(315)		
Annual Percentile ELV (g)	125.			80.		

NOTES:

(a) All data based on validated hourly average concentrations, excluding start-up and shut-down and periods of malfunction or breakdown of abatement equipment, at 15% O₂, dry, 273.15K, 101.325 kPa

(b) Annual percentiles are submitted with the final return (Quarter 4)

(c) Extend report to cover the required number of LCP on each site and repeat report for each separately regulated Operating Mode as required, e.g., Combined Cycle, Open Cycle, Supplementary firing, Auxiliary firing

(d) Averages determined at loads in the range 70% < Load ≤ 100% ISO base load and above

(e) Averages determined at loads in the range MSUL* < Load = 100% ISO base load and above (* For a 3 parameter approach, from the point of Start-Up to the point of Shut-down)

(f) Leave the Daily ELV blank if this is applied as a 95th percentile ELV within the Permit

(g) For each pollutant, report the Annual 95th percentile ELV for hourly averages in the first column and, if applicable, the Annual 95th percentile ELV for daily means in the second column

(h) For each pollutant, report the Annual 95th percentile of hourly averages in the first column and, if applicable, the Annual 95th percentile of daily means in the second column

Signed on behalf of the Operator by:

[Redacted Signature]

Environmental Specialist

Date of return:

27/01/2023

No confidence adjustment

**RELEASES TO AIR
QUARTERLY RETURN** **2022** **Q4**
CUMULATIVE ROLLING MALFUNCTION AND BREAKDOWN HOURS (12 MONTH PERIOD)(a), (b)
OPERATING MODE:

Operator: DOW
Location: Barry Cogeneration Plant
Permit/Variation Number: EPR/JP3632ZH/V004

Form:
Version/date:

IED/LCPBREF BD1
V.3.1 31 Dec 2015

Year: 2022	A1 / LCP 60			
	NOx (mg/m3)		CO (mg/m3)	
Month	Malfunction (hours)	Breakdown (hours)	Malfunction (hours)	Breakdown (hours)
January	-	-	-	-
February	-	-	-	-
March	-	-	-	-
April	-	-	-	-
May	-	-	-	-
June	-	-	-	-
July	-	-	-	-
August	-	-	-	-
September	-	-	-	-
October	-	-	-	-
November	-	-	-	-
December	-	-	-	-
Annual total (hours)	-	-	-	-
Annual cap (hours)	120.	120.	120.	120.

NOTES:

- (a) Cumulative rolling malfunction and breakdown hours (12 month period) updated monthly
- (b) Data Acquisition and Handling Systems without the capability to report Black Start hours separately may incorporate Black Start hours on this form provided that a
- (c) Insert the relevant months for the preceding 12 month period, e.g., starting with March 2016
- (d) Gas turbines with CO abatement only (columns may be deleted for other plant types)
- (e) Plants with HCl abatement only (columns may be deleted for other plant types)

Signed on behalf of the Operator by:



Date of return:

 Environmental Specialist
 27/01/2023

No confidence adjustment

RELEASES TO AIR
 QUARTERLY RETURN **2022** **Q4**
 CUMULATIVE ROLLING MALFUNCTION AND BREAKDOWN HOURS (12 MONTH PERIOD)(a), (b)
 OPERATING MODE:

Operator: **DOW**
 Location: **Barry Cogeneration Plant**
 Permit/Variation Number: **EPR/JP3632ZH/V004**

Form:
 Version/date:

IED/LCPBREF BD1
V.3.1 31 Dec 2015

Year: 2022	A2 / LCP 60			
	NOx (mg/m3)		CO (mg/m3)	
Month	Malfunction (hours)	Breakdown (hours)	Malfunction (hours)	Breakdown (hours)
January	-	-	-	-
February	-	-	-	-
March	-	-	-	-
April	-	-	-	-
May	-	-	-	-
June	-	-	-	-
July	-	-	-	-
August	-	-	-	-
September	-	-	-	-
October	-	-	-	-
November	-	-	-	-
December	-	-	-	-
Annual total (hours)	-	-	-	-
Annual cap (hours)	120.	120.	120.	120.

NOTES:

- (a) Cumulative rolling malfunction and breakdown hours (12 month period) updated monthly
- (b) Data Acquisition and Handling Systems without the capability to report Black Start hours separately may incorporate Black Start hours on this form provided that a
- (c) Insert the relevant months for the preceding 12 month period, e.g., starting with March 2016
- (d) Gas turbines with CO abatement only (columns may be deleted for other plant types)
- (e) Plants with HCl abatement only (columns may be deleted for other plant types)

Signed on behalf of the Operator by:



Date of return:

 Environmental Specialist
 27/01/2023

No confidence adjustment

RELEASES TO AIR
 QUARTERLY RETURN **2022** **Q4**
 CUMULATIVE ROLLING MALFUNCTION AND BREAKDOWN HOURS (12 MONTH PERIOD)(a), (b)
 OPERATING MODE:

Operator: **DOW**
 Location: **Barry Cogeneration Plant**
 Permit/Variation Number: **EPR/JP3632ZH/V004**

Form:
 Version/date:

IED/LCPBREF BD1
V.3.1 31 Dec 2015

Year: 2022	A3 / LCP 60			
	NOx (mg/m3)		CO (mg/m3)	
Month	Malfunction (hours)	Breakdown (hours)	Malfunction (hours)	Breakdown (hours)
January	-	-	-	-
February	-	-	-	-
March	-	-	-	-
April	-	-	-	-
May	-	-	-	-
June	-	-	-	-
July	-	-	-	-
August	-	-	-	-
September	-	-	-	-
October	-	-	-	-
November	-	-	-	-
December	-	-	-	-
Annual total (hours)	-	-	-	-
Annual cap (hours)	120.	120.	120.	120.

NOTES:

- (a) Cumulative rolling malfunction and breakdown hours (12 month period) updated monthly
- (b) Data Acquisition and Handling Systems without the capability to report Black Start hours separately may incorporate Black Start hours on this form provided that a
- (c) Insert the relevant months for the preceding 12 month period, e.g., starting with March 2016
- (d) Gas turbines with CO abatement only (columns may be deleted for other plant types)
- (e) Plants with HCl abatement only (columns may be deleted for other plant types)

Signed on behalf of the Operator by:

[Redacted Signature]

Environmental Specialist

Date of return:

27/01/2023

No confidence adjustment

RELEASES TO AIR
RETURN OF DISCONTINUOUS MONITORING RESULTS

Operator: Dow Silicones UK Ltd
 Location: Barry Cogeneration Plant
 Permit/Variation Number: EPR/JP3632ZH/V004

Form: IED PM1
 Version: V.11 Mar 2016

Year - 2022	LCP 60 (A1 & A3 HR-001A & B)				
Six months to -31/12/22					
Measurement approach	NO _x	SO ₂	CO	Hg	Dust
Time					
Date					
Measurement 1 (mg/m ³) ^(b)					
Measurement 2 (mg/m ³) ^(b)					
Measurement 3 (mg/m ³) ^(b)					
Alternative approach ^(c)					
Method ^(d)		FS			DF
Calculation (mg/m ³)		0.24			0
Operational data ^(a)					
Load (%MCR)					
Fuel 1 Natural Gas (%)		100			100
Fuel 2 name (%)					
Fuel 3 name (%)					
Daily Emission Limit Value					
(mg/m ³)					

NOTES:

- (a) Operational data for the test period (measurement approach) or the six month period to date (Alternative approach)
 (b) Reference conditions for mg/m³ are 15% O₂ CCGT, 6% O₂ solid fuels, 3% O₂ for oil and gas, dry, 0°C, 101.325 kPa
 (c) Alternative approach to discontinuous monitoring by agreement with the Competent Authority
 (d) Use abbreviation: NF for agreed NO_x factor, FS for fuel sulphur content, CS for agreed CO factor, DF for agreed dust factor

Signed on behalf of the Operator by: [REDACTED], Environmental Specialist [REDACTED]

Date of return: 27/01/2023

RELEASES TO AIR

RETURN OF DISCONTINUOUS MONITORING RESULTS

Operator: Dow Silicones UK Ltd
 Location: Barry Cogeneration Plant
 Permit/Variation Number: EPR/JP3632ZH/V004

Form: IED PM1
 Version: V.11 Mar 2016

Year - 2022	LCP 60 (A2 FB-001)				
Six months to -31/12/22					
Measurement approach	NO _x	SO ₂	CO	Hg	Dust
Time					
Date					
Measurement 1 (mg/m ³) ^(b)					
Measurement 2 (mg/m ³) ^(b)					
Measurement 3 (mg/m ³) ^(b)					
Alternative approach ^(c)					
Method ^(d)		FS			DF
Calculation (mg/m ³)		0.72			0
Operational data ^(a)					
Load (%MCR)					
Fuel 1 Natural Gas (%)		100			100
Fuel 2 name (%)					
Fuel 3 name (%)					
Daily Emission Limit Value					
(mg/m ³)					

NOTES:

- (a) Operational data for the test period (measurement approach) or the six month period to date (Alternative approach)
 (b) Reference conditions for mg/m³ are 15% O₂ CCGT, 6% O₂ solid fuels, 3% O₂ for oil and gas, dry, 0°C, 101.325 kPa
 (c) Alternative approach to discontinuous monitoring by agreement with the Competent Authority
 (d) Use abbreviation: NF for agreed NO_x factor, FS for fuel sulphur content, CS for agreed CO factor, DF for agreed dust factor

Signed on behalf of the Operator by: [Redacted] Environmental Specialist [Redacted]

Date of return: 27/01/2023

RELEASES TO AIR
RETURN OF DISCONTINUOUS MONITORING RESULTS

Operator: Dow Silicones UK Ltd
 Location: Barry Cogeneration Plant
 Permit/Variation Number: EPR/JP3632ZH/V004

Form: IED PM1
 Version: V.11 Mar 2016

Year - 2022	LCP 60 (A4 FB-002A)				
Six months to -31/12/22					
Measurement approach	NO _x	SO ₂	CO	Hg	Dust
Time	10:00		10:00		
Date	08/11/2022		08/11/2022		
Measurement 1 (mg/m ³) ^(b)	92.47		1.06		
Measurement 2 (mg/m ³) ^(b)					
Measurement 3 (mg/m ³) ^(b)					
Alternative approach ^(c)					
Method ^(d)		FS			DF
Calculation (mg/m ³)		0.72			0
Operational data ^(a)					
Load (%MCR)					
Fuel 1 Natural Gas (%)	100	100	100		100
Fuel 2 name (%)					
Fuel 3 name (%)					
Daily Emission Limit Value					
(mg/m ³)	110	38.5	100		5.5

NOTES:

- (a) Operational data for the test period (measurement approach) or the six month period to date (Alternative approach)
 (b) Reference conditions for mg/m³ are 15% O₂ CCGT, 6% O₂ solid fuels, 3% O₂ for oil and gas, dry, 0°C, 101.325 kPa
 (c) Alternative approach to discontinuous monitoring by agreement with the Competent Authority
 (d) Use abbreviation: NF for agreed NO_x factor, FS for fuel sulphur content, CS for agreed CO factor, DF for agreed dust factor

Signed on behalf of the Operator by: [Redacted] Environmental Specialist [Redacted]

Date of return: 27/01/2023

RELEASES TO AIR
RETURN OF DISCONTINUOUS MONITORING RESULTS

Operator: Dow Silicones UK Ltd
Location: Barry Cogeneration Plant
Permit/Variation Number: EPR/JP3632ZH/V004

Form: IED PM1
Version: V.11 Mar 2016

Year - 2022	LCP 60 (A5 FB-002B)				
Six months to -31/12/22					
Measurement approach	NO _x	SO ₂	CO	Hg	Dust
Time	10:10		10:10		
Date	08/11/2022		08/11/2022		
Measurement 1 (mg/m ³) ^(b)	94.35		1.29		
Measurement 2 (mg/m ³) ^(b)					
Measurement 3 (mg/m ³) ^(b)					
Alternative approach ^(c)					
Method ^(d)		FS			DF
Calculation (mg/m ³)		0.72			0
Operational data ^(a)					
Load (%MCR)					
Fuel 1 Natural Gas (%)	100	100	100		100
Fuel 2 name (%)					
Fuel 3 name (%)					
Daily Emission Limit Value					
(mg/m ³)	110	38.5	100		5.5

NOTES:

- (a) Operational data for the test period (measurement approach) or the six month period to date (Alternative approach)
 (b) Reference conditions for mg/m³ are 15% O₂ CCGT, 6% O₂ solid fuels, 3% O₂ for oil and gas, dry, 0°C, 101.325 kPa
 (c) Alternative approach to discontinuous monitoring by agreement with the Competent Authority
 (d) Use abbreviation: NF for agreed NO_x factor, FS for fuel sulphur content, CS for agreed CO factor, DF for agreed dust factor

Signed on behalf of the Operator by: [Redacted] Environmental Specialist [Redacted]

Date of return: 27/01/2023

IED AR1

V.3.1 Dec 2015

IED Reporting - Energy Usage & Emissions for the year:

Q4

Operator:

Dow Silicones UK Ltd

Site Location:

Barry Cogeneration Plant

Permit/Variation number:

EPR/JP3632ZH/V004

LCP:

60.

LCP Net Rated Thermal Input Capacity (MW):

Parameter	TOTAL	By Fuel							
		Coal	Lignite	Peat	Biomass	Other solid fuels	Liquid fuels	Natural gas	Other gases
Annual energy input (TJ)	2001.03							2001.03	
Total Annual SO2 emission (tonnes)									
Total Annual NOx emission (tonnes)	52.76								
Total Annual Dust (PM) emission (tonnes)									

Signed on behalf of the Operator

Environmental Specialist

Date

27/01/2023

NOTES:

- (a) Annual energy input must be reported in TJ to 1 decimal places
- (b) Annual emissions to air must be reported to 2 decimal places and exclude start-up and shut-down
- (c) All forms must be saved in the format IED AR1—DEFRA IED LCP Number - Inventory Year i.e. IED AR1-XXX-2013
- (d) No PDF documents shall be accepted
- (e) Upload Forms held on GOV.UK will be accepted other variants of the forms will be automatically rejected which may impact their statutory obligations to report on time

**RELEASES TO AIR
ANNUAL RETURN
OPERATING HOURS**

Operator:

**Dow Silicones UK Ltd
Barry Cogeneration Plant
EPR/JP3632ZH/V004**

Form:

IED HR1

Location:

Version/date:

V.3.1 31 Dec 2015

Permit/Variation Number:

Year: 2022	A1 (hours)	Bypass (hours)	A2 (hours)	Bypass (hours)	A3 (hours)	Bypass (hours)	LCP4 (hours)	Bypass (hours)
Annual Operating Hours (a), (b)	1139.976537	11.49933094	0		7126.879273	17.22019952	906.5	1608
Cumulative Operating Hours (c), (d)								
Derogated Annual Hours (e)								
Five year rolling average (f)								

NOTES:

(a) Annual operating hours for every LCP from 1-Jan in calendar year. (For gas turbines with a Bypass stack, include the Bypass stack operating hours during normal operation even though these are reported separately).

(b) For gas turbines with a Bypass stack, report Bypass operating hours from 1-Jan in calendar year, excluding Start-Up and Shut-down, in the adjacent column (labelled Bypass) which may be deleted if not applicable.

(c) Cumulative operating hours from 1-Jan-2016 for LCP subject to a Limited Lifetime Derogation or a 10,000h monitoring derogation. (For gas turbines with a Bypass stack, include the Bypass stack operating hours during normal operation even though these are reported separately).

(d) For gas turbines with a Bypass stack, report Bypass Cumulative operating hours from 1-Jan-2016 if subject to a separate 10,000h monitoring derogation, in the adjacent column (labelled Bypass).

(e) Annual operating hours in calendar year from entry date (in first year as applicable) or from 1-Jan in calendar year, for each 1,500h ELV derogated Unit/LCP only.

(f) Five year running average from entry date for each 1,500h derogated Unit/LCP only.

(g) General note: hours are reported as a decimal number to two decimal places.

Signed on behalf of the Operator by:

[Redacted Signature]

ntal Specialist

Date of return:

27/01/2023