



Annual Performance Report 2022

Permit No. P0446/14A/V1

Full Circle Generation Ltd

Energy From Waste Plant

Full Circle Generation Ltd

Year: 2022

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Prepared by: Chris Macartney Position: QHSE Manager

Approved by: H Lockhart Position: Senior General Manager

Approved by: Position:

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Version Control		
Section	Information	Date
1	Draft	28/01/2023
2	Final	31/01/2023

Distribution		
Copy	Name, Role	No.
1	Harry Lockhart, FCG - Senior General Manager	1
2	Steven Castles, NIEA - Pollution Inspector	1

This report is required under the Industrial Emissions Directive's Article 55(2) requirements on reporting and public information on waste incineration plants and co-incineration plants, which require the operator to produce an annual report on the functioning and monitoring of the plant and make it available to the public.

Plant Description and Design

The plant is located in the Belfast Harbour Estate, adjacent sites are Spirit Aerospace and Calor Gas.

Plant Overview / Configuration:

- Three process streams incorporating 3 gasifiers/boilers, each 20.8MW net thermal
- Two steam turbines: 4.87 and 9.98 MWe
- Two identical package boiler islands feed one 10mw for private wire to Bombardier
- A third identical package boiler island feeds second 5 mw machine direct to the grid connection
- RDF crane is fully automated
- RDF NCV range: 11.5-16.5 MJ/kg
- A flue gas scrubbing system consists of SNCR (urea) and dry abatement (lime & PAC) with bag filters
- Design throughput of each line is 5.4 t/h of RDF. A total of 16.2 t/h for the plant as a whole.

Summary of Operational Processes and Procedures

The plant has a comprehensive set of Standard Operating Procedures (SOPs) covering site activities including:

- Waste reception, waste handling, waste quarantine, waste sampling
- Residue handling, storage and transport
- All process-related systems including for fuel metering, operation of gasifier, boiler, filtration, RDF and ash systems, water-steam cycle
- Functional safety test procedures
- Start up and shutdown procedures
- Maintenance procedures
- Building management procedures
- Statutory inspections, tests and checking.
- CEMS monitoring and calibration
- EH&S related procedures

The plant also has critical Emergency Operating Procedures (EOPs) covering:

- Fire procedures
- Gas release procedure
- Grid blackout
- Neighbouring site emergency
- Boiler leak
- Liquid spillage
- Steam turbine emergency

SOPs are reviewed periodically.

Operational Data

Plant Size	144,000	tonnes pa	21	MWth	15	MWe
No. of combustion lines	3	No. of Turbines:		2		

Waste types received	Unit	Q1	Q2	Q3	Q4	Year Total	%
Household / Local Authority	tonnes					-	-
Commercial & Industrial						-	-
Hazardous						-	-
Clinical						-	-
Waste wood (biomass)						-	-
Refuse Derived Fuel * - H'hold/LA		22619	28801	14196	33,377	98,993	100.0%
Refuse Derived Fuel * - C&I						-	-
Other [Please specify]						-	-
Other [Please specify]							
Other [Please specify]							
Total waste combusted		22619	28801	14196	33,377	98,993	100.0%
Rejected Waste						-	-
Unprocessed waste transferred out						-	-

Energy Usage / Export	Unit	Q1	Q2	Q3	Q4	Year Total	KWh/te
Power Generated	MWh	10,953	16,232	7,387	18,978	53,549	541
Power Exported		8,542	12,080	5,724	14,704	41,051	415
Power Used on site						-	-
Power Imported		830	115	731	64	1,740	18
Parasitic Load	%	27.5%	26.1%	29.5%	22.8%	25.8%	
Thermal Energy Produced **	MWh					-	-
Thermal Energy Exported **						-	-
R1 value							Design

Waste Disposal & Recovery	Unit	Q1	Q2	Q3	Q4	Year Total	% inputs
APC Residues - produced	tonnes	688	919	493	1,149	3,249	3.3%
IBA - produced		2,421	3,031	1,551	3,416	10,418	10.5%
Metals recycling						-	-
Boiler Ash		225	112	76	82	496	0.5%
UGC Ash		226	320	183	297	1,026	1.0%
Other Hazardous Waste (Filter Bags)		0	0	4	0	4	0.0%

Raw Material Usage	Unit	Q1	Q2	Q3	Q4	Year Total	kg or Ltr /te
Mains Water	ltrs	136,909	139,570	87,025	130,243	493,747	4.99
Other Water	ltrs					-	-
Ammonia	kgs					-	-
Urea (32% solution)	Ltrs	22,102	46,870	11,627	21,210	101,809	1.03
Activated Carbon	kgs	40,000	54,500	20,000	84,000	198,500	2.01
Lime / hydrated lime	kgs	350,580	387,440	216,680	463,660	1,418,360	14.33
Fuel oil	ltrs	1,434	23,864	6,775	1,168	33,241	0.34
Gas	M3	128,847	149,791	160,568	63,296	502,502	
Other		-	-	-	-	-	

Summary	Line/Unit	Q1	Q2	Q3	Q4	Year Total	
Availability of waste combustion by line, hrs	1	1,671	1,914	1,354	2,072	7,011	80.0%
	2	1,179	2,002	1,009	2,091	6,282	71.7%
	3	1,538	1,979	657	2,070	6,245	71.3%
	4	-	-	-	-	-	x %
	5	-	-	-	-	-	x %
Overall Availability, mean avg. of all lines, hrs		1,463	1,965	1,007	2,078	3,908	x %
Hours of turbine operations, hrs	1	1,175	1,970	1,226	2,174	6,545	x %
Hours of turbine operations, hrs	2	1,473	1,896	574	1,993	5,936	x %
Hours of heat / steam export		-	-	-	-	-	n/a
Net Calorific Value of waste	MJ/kg	12.0	11.7	13.3	10.3	11.8	-
Abnormal Events	qty.	-	-	-	1	1	yes
Abnormal operation	hours	-	-	-	-	-	0.00%
Permit Breaches	qty.	-	-	-	-	-	no

Summary of Plant Operations and Maintenance during the reporting year

The plant is in commercial operation.

A fire broke out in the Fuel Hall, 28 June 2022. Root cause deemed to be exothermic reaction. NIFRS mobilised.

There was one planned outage in the period (July 2022), this was a statutory and rectifications outage.

The plant has been running extensive trials on dioxins and furans to establish trends and identify a programmes of rectifications to mitigate against exceedances. Subsequently, schedule 1 notifications have been issued where results have indicated a breach of the permit limit.

Summary of Residue Handling for the reporting year

There are 4 residue sources at the plant:

- A non-hazardous Incineration Bottom Ash (IBA) from the grate. Non-Haz
- A hazardous Undergrate and Combustor ash (UGC)
- Hazardous Boiler Ash
- Hazardous APCr filter ash

Tonnages are indicated on previous page.

IBA is collected in a common silo (from all three boilers), and discharged on trailers (covered) and taken to Riverridge site at Craigmore where it is disposed of to landfill or washed and recovered for use as an aggregate.

UGC is collected in bags (separately from each stream), transported off-site and disposed of to landfill at Augean.

Boiler ash is collected in bags (separately from each stream), transported off-site and disposed of to landfill at OCO's Wingmoor Farm site near Avonmouth.

APCr filter ash is collected in two silos (from all three boilers), discharged in tankers, and transported to OCO's Leeds facility and recovered for use in construction products.

2022 Annual Reporting Performance Form 1

Permit No. P0446/14A/V1

Operator: 0

Facility: Full Circle Generation Ltd

Form: Performance 1

Reporting Period from:

01 January 2022

to:

31 December 2022

2022 Annual Reporting of Waste Disposal and Recovery

Waste Description	Disposal Route(s)	Disposal Tonnes	Recovery Tonnes	% / tonne of waste incinerated
1) Hazardous Wastes				
APC Residues	OCO		3,248.6	3.3%
IBA				-
UGC	Augean	1,026.4		1.0%
Boiler	OCO	496.0		0.5%
APCR Bag Filter	OCO	4.0		0.0%
Total Hazardous Waste		1,526.4	3,248.6	4.8%
2) Non-Hazardous Wastes				
IBA	RR	10,418.3		10.5%
Ferrous Metal				-
Process Water	Effluent - Sewage	329,164.7		332.5%
				-
				-
Total Non-Hazardous Waste		339,583.0	0.0	343.0%
TOTAL WASTE		341,109.4	3,248.6	347.9%

Operator's comments :

2022 Annual Reporting of Water and Other Raw Material Usage

Raw Material	Usage	Unit	Specific Usage	Unit
Mains Water	493,747	m ³	4.99	m ³ /te
Total Water	493,747	m ³	4.99	m ³ /te
Urea	101,809	kg	1.03	kg/te
Activated Carbon	198,500	kg	2.01	kg/te
Lime	1,418,360	kg	14.33	kg/te

Operator's comments :

2022 Annual Reporting of other performance indicators

Parameter	Results by Line					Turbine 1	Turbine 2
	A1	A2	A3	A4	A5		
Operating hours for the year, hours	7011.4	6281.5	6244.8				
Number of periods of abnormal operation, qty.			1				
Cumulative hours of abnormal operation for this year, hours			0				

Operator's comments :

NS Deleted

Signed: pp Chris Macartney

Date: 31/01/2023

2022 Annual Reporting of Energy Usage/Export

Permit No. P0446/14A/V1

Operator: Full Circle Generation Ltd

Facility: Full Circle Generation Ltd

Form: Energy 1

Reporting Period from: 01 January 2022 to: 31 December 2022

Energy Source	Energy Usage	Unit	Specific Useage (KWh/tonne incinerated)
Electricity Produced	53,549	MWh	541
Electricity Imported	1,740	MWh	18
Electricity Exported	41,051	MWh	415
Natural gas	502,502	Nm3	5,793
Steam/hot water exported	0	GWh	-

Operator's comments :

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Signed: pp Chris Macartney

Date: 31/01/2023

Summary of Permit Compliance

Compliance with permit limits for continuously monitored pollutants

The plant met its emission limits as shown in the table below:

Substance	Percentage time compliant during operation	
	*97% or 100% Half-hourly limit	Daily limit
Particulates	100.00%	100.00%
Oxides of nitrogen	100.00%	100.00%
Sulphur dioxide	100.00%	100.00%
Total organic carbon	100.00%	100.00%
Hydrogen chloride	100.00%	100.00%
Hydrogen fluoride	100.00%	100.00%
Carbon monoxide	99.91%	100.00%

Summary of any notifications or non-compliances under the permit

Date	Summary of notification or non-compliance [including Line/Reference]	Reason	Measures taken to prevent reoccurrence
	Refer to all Sch 1 in the Appendix.		

Summary of any complaints received and actions to taken to resolve them.

Date	Summary of complaint [including Line/Reference]	Reason *	Measures taken to prevent reoccurrence



DD Chris Macartnev

* including whether substantiated by the operator or the NIEA

Summary of Plant Improvements**Summary of any efficiency improvements that have been completed within the year.**

1. 4th SPG fitted to each stream
2. ID fan silencer replacement to each stream
3. Gasifier slide valve install on each stream for tramp air reduction
4. Implementation of Cardox technology to reduce flue gas path blockages on each stream

Summary of any permit improvement conditions that have been completed within the year and the environmental benefits.**Mechanical upgrades:**

1. Upgrade of fuel hall tanking to mitigate against leeching
2. Additional ACO drains fitted plant perimeter to mitigate against leeching

Software upgrades – improvements for environmental benefits

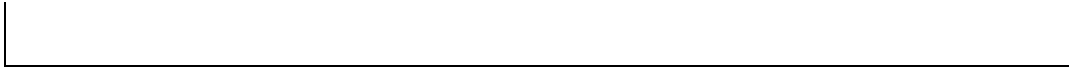
1. Fuel Hall crane software modification to reduce risk of exothermic reactions

Summary of any changes to the plant or operating techniques which required a variation to the permit of the resulting environmental impact.

None

Summary of any other improvements made to the plant or planned to be made and a summary of environmental benefits.

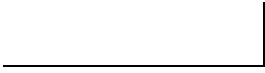
1. New Gatehouse operational and linked to site access control system and weighbridge



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Permit and a summary

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Details of Public & Stakeholder Liasion

Summary of events held during the reporting year.	
Date	Description

List of events planned for next year	
Date	Description

If you wish to be involved in the public liasion programme, please contact
hlockhart@equitix.co.uk

Residue Quality Monitoring Requirements

Summary of monitoring undertaken and compliance	
IBA ash (non-Haz)	Quality monitoring: monthly lab samples. No issues.
UGC and Boiler ash (Haz)	Quality monitoring: monthly lab samples. No issues.
APCr ash (Haz).	Quality monitoring: monthly lab samples. No issues.

Commentary on any specific events	
Date & Event	Description
	None

Residue Quality Monitoring Results			
Parameter (unit)	Limit	Normal Operation	
		Bottom ash	APC Residues
Loss on Ignition (average %)	<5%	3.11	
Total Organic Carbon (average %)	<3%	2.02	
No. of Assessments Undertaken	---	11	
No. of Hazardous Results	---	0	

Comments :
1 set of samples tested per month with exception of July outage

Emissions to Water

Summary of monitoring undertaken and compliance
Emissions to Ground water: Exceedance of suspended solids to ground water run off, Q1 2022. Schedule 1 issued and remedial action taken. Fire June 2022 - fire water run off went to gully traps, interceptors present in drainage system. Water samples taken and proved satisfactory. Investigated by NIEA and no further action taken.
Emissions to Sewage: Auto diverter valve fault allowed fire water to pass. Contaminated process water line has interceptor and pen stock. Water samples taken and proved satisfactory. Investigated by NIEA and no further action taken.

Commentary on any specific events	
Date & Event	Description
	None

Emissions to Sewer

Parameter	Monitoring Frequency	Limit	Min	Max	Avg
BOD (ATU)	Quarterly		2.86	7.51	4.73
COD (Total)	Quarterly	500	29.00	80.80	50.93
pH	Quarterly	5-10	7.17	8.27	7.55
Suspended Solids	Quarterly	300	21.00	35.00	30.25
Temperature (Deg C)	Quarterly	<43	17.00	21.60	19.13
Visible Oil & Grease	Quarterly	None Visible	<1	<1	<1

Emissions to Air (periodically monitored)**Summary of monitoring undertaken, standards used and compliance**

A1 Testing Duration :

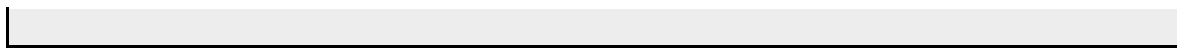
A2 Testing Duration :

A3 Testing Duration :

Results of emissions to air that are periodically monitored

Substance	Ref. Period	Emission Limit Value
Hydrogen fluoride	1 hr	2 mg/m ³
Cd and Tl and their compounds	6-8hrs	0.05 mg/m ³
Hg and its compounds	6-8hrs	0.05 mg/m ³
Sb, As, Pb, Cr, Co, Cu, Mn, Ni, V and their compounds	6-8hrs	0.5 mg/m ³
Dioxins & Furans (I-TEQ)	6-8hrs	0.1 ng/m ³
PCBs (WHO-TEQ Humans / Mammals)	6-8hrs	None set ng/m ³
PCBs (WHO-TEQ Fish)	6-8hrs	None set ng/m ³
PCBs (WHO-TEQ Birds)	6-8hrs	None set ng/m ³
Dioxins & Furans (WHO-TEQ Humans / Mammals)	6-8hrs	None set ng/m ³
Dioxins & Furans (WHO-TEQ Fish)	6-8hrs	None set ng/m ³
Dioxins & Furans (WHO-TEQ Birds)	6-8hrs	None set ng/m ³
Particulates	6-8hrs	30 mg/Nm ³
Ammonia	6-8hrs	None set µg/m ³
TOC	6-8hrs	20 mg/Nm ³
Oxides of Nitrogen	6-8hrs	400 mg/Nm ³
Sulphur Dioxide	6-8hrs	200 mg/Nm ³
Carbon Monoxide	6-8hrs	100 mg/Nm ³
Hydrogen Chloride	6-8hrs	60 mg/Nm ³
Anthanthrene	6-8hrs	None set µg/m ³
Benzo(a)anthracene	6-8hrs	None set µg/m ³
Benzo(a)pyrene	6-8hrs	None set µg/m ³
Benzo(b)fluoranthene	6-8hrs	None set µg/m ³
Benzo(b)naphtho(2,1-d) thiophene	6-8hrs	None set µg/m ³
Benzo(c)phenanthrene	6-8hrs	None set µg/m ³
Benzo(ghi)perylene	6-8hrs	None set µg/m ³
Benzo(k)fluoranthene	6-8hrs	None set µg/m ³
Cholanthrene	6-8hrs	None set µg/m ³
Chrysene	6-8hrs	None set µg/m ³
Cyclopenta(cd)pyrene	6-8hrs	None set µg/m ³
Dibenzo(ai)pyrene	6-8hrs	None set µg/m ³
Dibenzo(ah)anthracene	6-8hrs	None set µg/m ³
Fluoranthene	6-8hrs	None set µg/m ³
Indeno(123-cd) pyrene	6-8hrs	None set µg/m ⁴
Naphthalene	6-8hrs	None set µg/m ⁵

Comments :



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Signed

pp Chris Macartney



e Generation Ltd

Notes:

Template may require bespoke monitoring and permit.

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*User to add additional
necessary, depending
quarterly or bi-annual*



Date 31/01/2023

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the reporting is

Emissions to Air (periodically monitored)

Summary of monitoring undertaken, standards used and compliance		
A1 Testing Duration :		
A2 Testing Duration :		
A3 Testing Duration :		

Results of emissions to air that are periodically monitored		
Substance	Ref. Period	Emission Limit Value
Hydrogen fluoride	1 hr	2 mg/m ³
Cd and Tl and their compounds	6-8hrs	0.05 mg/m ³
Hg and its compounds	6-8hrs	0.05 mg/m ³
Sb, As, Pb, Cr, Co, Cu, Mn, Ni, V and their compounds	6-8hrs	0.5 mg/m ³
Dioxins & Furans (I-TEQ)	6-8hrs	0.1 ng/m ³
PCBs (WHO-TEQ Humans / Mammals)	6-8hrs	None set ng/m ³
PCBs (WHO-TEQ Fish)	6-8hrs	None set ng/m ³
PCBs (WHO-TEQ Birds)	6-8hrs	None set ng/m ³
Dioxins & Furans (WHO-TEQ Humans / Mammals)	6-8hrs	None set ng/m ³
Dioxins & Furans (WHO-TEQ Fish)	6-8hrs	None set ng/m ³
Dioxins & Furans (WHO-TEQ Birds)	6-8hrs	None set ng/m ³
Particulates	6-8hrs	30 mg/Nm ³
Ammonia	6-8hrs	None set µg/m ³
TOC	6-8hrs	20 mg/Nm ³
Oxides of Nitrogen	6-8hrs	400 mg/Nm ³
Sulphur Dioxide	6-8hrs	200 mg/Nm ³
Carbon Monoxide	6-8hrs	100 mg/Nm ³
Hydrogen Chloride	6-8hrs	60 mg/Nm ³
Anthracene	6-8hrs	None set µg/m ³
Benzo(a)anthracene	6-8hrs	None set µg/m ³
Benzo(a)pyrene	6-8hrs	None set µg/m ³
Benzo(b)fluoranthene	6-8hrs	None set µg/m ³
Benzo(b)naptho(2,1-d) thiophene	6-8hrs	None set µg/m ³
Benzo(c)phenanthrene	6-8hrs	None set µg/m ³
Benzo(ghi)perylene	6-8hrs	None set µg/m ³
Benzo(k)fluoranthene	6-8hrs	None set µg/m ³
Cholanthrene	6-8hrs	None set µg/m ³
Chrysene	6-8hrs	None set µg/m ³
Cyclopenta(cd)pyrene	6-8hrs	None set µg/m ³
Dibenzo(ai)pyrene	6-8hrs	None set µg/m ³
Dibenzo(ah)anthracene	6-8hrs	None set µg/m ³
Fluoranthene	6-8hrs	None set µg/m ³
Indeno(123-cd) pyrene	6-8hrs	None set µg/m ⁴
Naphthalene	6-8hrs	None set µg/m ⁵
Comments :		



Signed

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Notes:

Template may require any bespoke monitor permit.

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User to add additional
necessary, depending
quarterly or bi-annual



Date 31/01/2023

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Emissions to Air (continuously monitored)

Summary of monitoring undertaken, standards used and compliance											

Results of emissions to air that are continuously monitored (maximum and average values for each line)											
Substance	Reference Period	Emission Limit Value	A1		A2		A3		A4		A5
			Max.	Avg.	Max.	Avg.	Max.	Avg.	Max.	Avg.	
Oxides of nitrogen	Daily mean	170 mg/m ³	111.10	63.44	123.40	66.78	154.30	97.16			
	*(100%) ½ hourly mean	400 mg/m ³	139.50	63.39	144.30	66.80	182.60	97.23			
	*(97%) ½ hourly mean	200 mg/m ³	N/A	N/A	N/A	N/A	N/A	N/A			
Particulates	Daily mean	10 mg/m ³	3.30	0.31	0.40	0.03	2.20	0.09			
	*(100%) ½ hourly mean	30 mg/m ³	4.00	0.33	0.10	-0.02	9.40	0.13			
	*(97%) ½ hourly mean	10mg/m ³	N/A	N/A	N/A	N/A	N/A	N/A			
Total Organic Carbon	Daily mean	10 mg/m ³	1.10	0.22	0.50	0.03	4.60	0.35			
	*(100%) ½ hourly mean	20 mg/m ³	10.30	0.27	9.60	0.07	71.80	0.40			
	*(97%) ½ hourly mean	10 mg/m ³	N/A	N/A	N/A	N/A	N/A	N/A			
Hydrogen chloride	Daily mean	10 mg/m ³	8.00	6.56	8.10	6.54	9.50	6.81			
	(100%) ½ hourly mean	60 mg/m ³	33.20	6.60	24.00	6.59	45.60	6.85			
	*(97%) ½ hourly mean	10 mg/m ³	N/A	N/A	N/A	N/A	N/A	N/A			
Sulphur dioxide	Daily mean	50 mg/m ³	5.20	3.15	7.20	3.98	8.40	4.32			
	(100%) ½ hourly mean	200 mg/m ³	34.90	3.20	134.30	4.03	88.30	4.36			
	(97%) ½ hourly mean	50 mg/m ³	N/A	N/A	N/A	N/A	N/A	N/A			

Carbon monoxide	Daily mean	50 mg/m ³	4.50	1.50	7.50	1.03	5.60	1.58			
	½ hourly mean *	100 mg/m ³ *	N/A	N/A	N/A	N/A	N/A	N/A			
	95%ile 10-min avg *	150 mg/m ³ *	8.90	1.53	14.60	1.07	35.80	1.63			
Ammonia	Daily mean	No limit set	1.90	0.12	8.10	0.01	1.00	0.19			

* = delete or amend as
appropriate

Comments :

45
Avg.

Monitoring of Hydrogen Chloride emissions

Whole Installation

See Notes in Cell Q3

mg/Nm ³	1/2 Hourly Reference Periods			Daily Reference Periods		
2022	(100%) 1/2 hourly HCl ELV	Monthly 1/2 hourly mean	Highest 1/2 hourly maximum	Daily HCl ELV	Monthly daily mean	Highest daily maximum
Jan	60	7.2	12.7	10	7.2	7.5
Feb	60	7.4	22.3	10	7.3	8.2
Mar	60	7.3	13.9	10	7.3	8.0
Apr	60	7.3	15.7	10	7.3	7.7
May	60	7.3	15.9	10	7.2	7.7
Jun	60	7.3	18.4	10	7.3	7.9
Jul	60	2.6	5.1	10	2.5	2.6
Aug	60	4.7	10.4	10	4.7	4.9
Sep	60	7.3	16.3	10	7.2	7.7
Oct	60	7.3	19.7	10	7.3	8.0
Nov	60	7.2	22.7	10	7.2	7.9
Dec	60	7.3	31.0	10	7.2	8.1

Concentration mg/Nm³70
60
50
40
30
20
10
0

Jan

Feb

Mar

Apr

May

Jun

Jul

Aug

Sep

Oct

Nov

Dec

- (100%) 1/2 hourly HCl ELV
- Monthly 1/2 hourly mean
- Highest 1/2 hourly maximum
- Daily HCl ELV
- Monthly daily mean
- ▲ Highest daily maximum

60

60

60

60

60

60

60

60

60

60

60

60

60

7.2

7.4

7.3

7.3

7.3

7.3

2.6

4.7

7.3

7.3

7.2

7.3

7.2

7.3

12.7

22.3

13.9

15.7

15.9

18.4

5.1

10.4

16.3

19.7

22.7

31.0

10

10

10

10

10

10

10

10

10

10

10

10

10

7.2

7.3

7.3

7.3

7.2

7.3

2.5

4.7

7.2

7.3

7.2

7.2

7.2

7.5

8.2

8.0

7.7

7.7

7.9

2.6

4.9

7.7

8.0

7.9

8.1

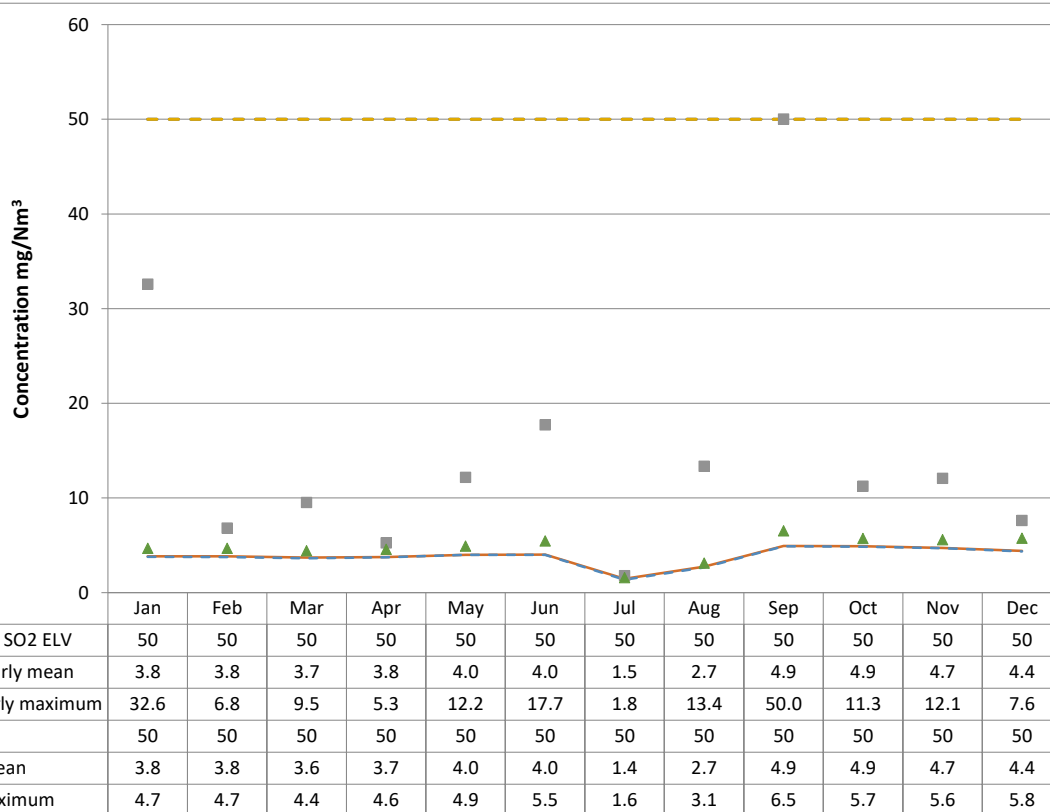
Comments :

Monitoring of Sulphur dioxide emissions

Whole Installation

See Notes in Cell Q3

mg/Nm ³	1/2 Hourly Reference Periods			Daily Reference Periods		
2022	(97%) 1/2 hourly SO2 ELV	Monthly 1/2 hourly mean	Highest 1/2 hourly maximum	Daily SO2 ELV	Monthly daily mean	Highest daily maximum
Jan	50	3.8	32.6	50	3.8	4.7
Feb	50	3.8	6.8	50	3.8	4.7
Mar	50	3.7	9.5	50	3.6	4.4
Apr	50	3.8	5.3	50	3.7	4.6
May	50	4.0	12.2	50	4.0	4.9
Jun	50	4.0	17.7	50	4.0	5.5
Jul	50	1.5	1.8	50	1.4	1.6
Aug	50	2.7	13.4	50	2.7	3.1
Sep	50	4.9	50.0	50	4.9	6.5
Oct	50	4.9	11.3	50	4.9	5.7
Nov	50	4.7	12.1	50	4.7	5.6
Dec	50	4.4	7.6	50	4.4	5.8



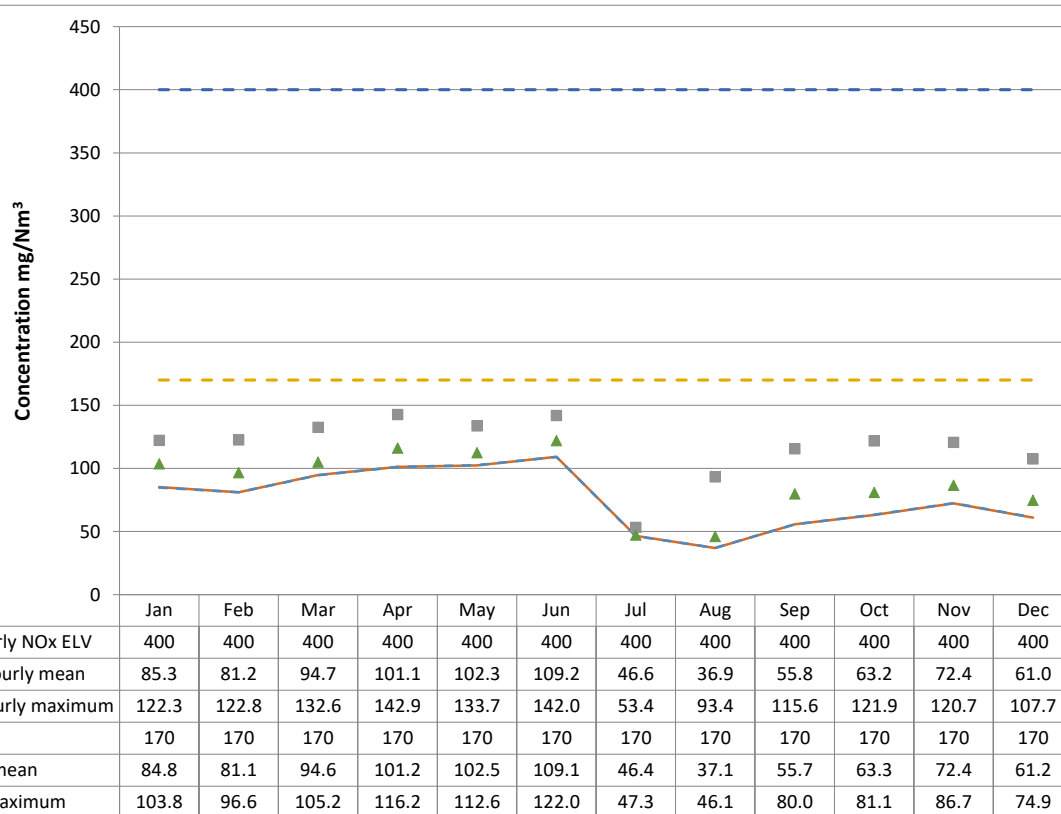
Comments :

Monitoring of Oxides of Nitrogen emissions

Whole Installation

See Notes in Cell Q3

mg/Nm ³	1/2 Hourly Reference Periods			Daily Reference Periods		
2022	(100%)1/2 hourly NOx ELV	Monthly 1/2 hourly mean	Highest 1/2 hourly maximum	Daily NOx ELV	Monthly daily mean	Highest daily maximum
Jan	400	85.3	122.3	170	84.8	103.8
Feb	400	81.2	122.8	170	81.1	96.6
Mar	400	94.7	132.6	170	94.6	105.2
Apr	400	101.1	142.9	170	101.2	116.2
May	400	102.3	133.7	170	102.5	112.6
Jun	400	109.2	142.0	170	109.1	122.0
Jul	400	46.6	53.4	170	46.4	47.3
Aug	400	36.9	93.4	170	37.1	46.1
Sep	400	55.8	115.6	170	55.7	80.0
Oct	400	63.2	121.9	170	63.3	81.1
Nov	400	72.4	120.7	170	72.4	86.7
Dec	400	61.0	107.7	170	61.2	74.9



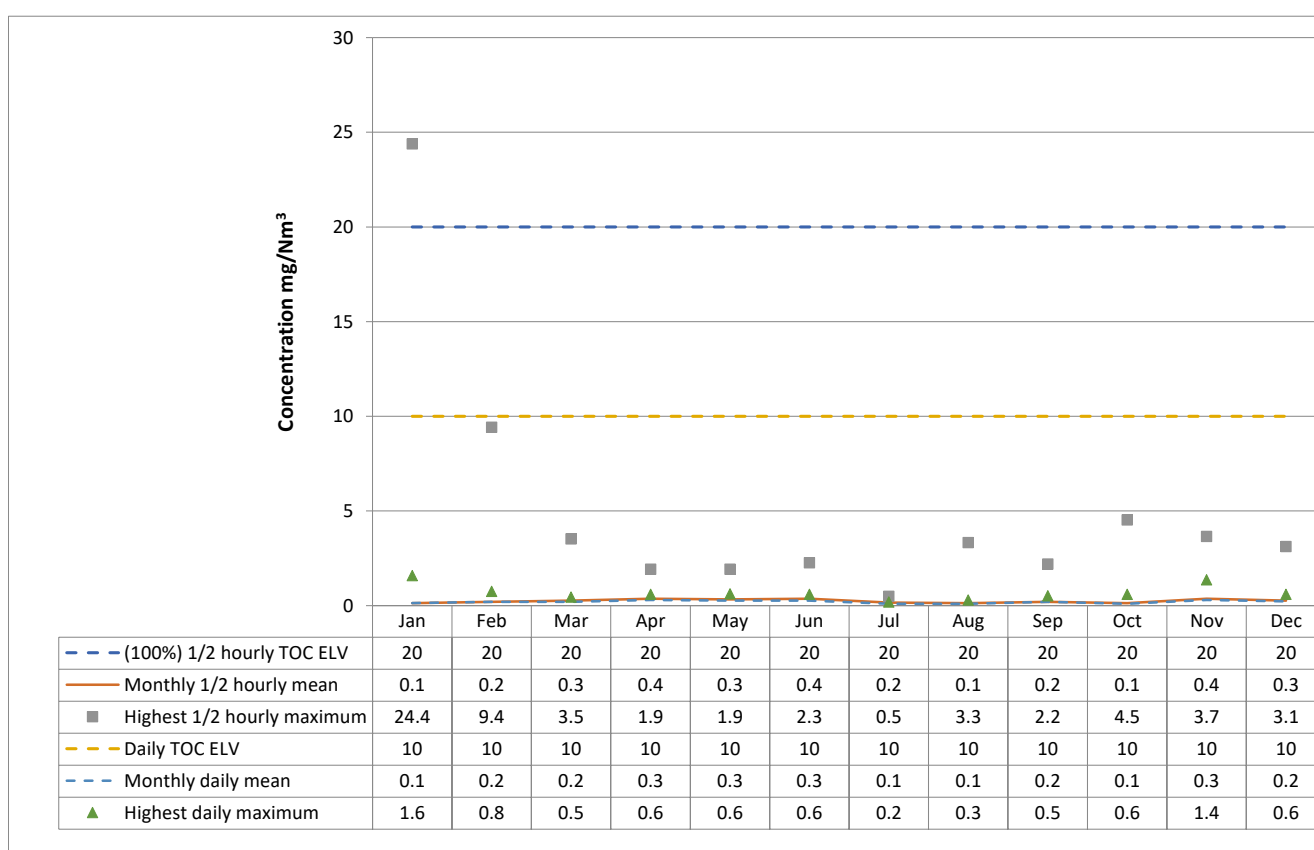
Comments :

Monitoring of Total organic carbon emissions

Whole Installation

See Notes in Cell Q3

mg/Nm ³	1/2 Hourly Reference Periods			Daily Reference Periods		
2022	(100%) 1/2 hourly TOC ELV	Monthly 1/2 hourly mean	Highest 1/2 hourly maximum	Daily TOC ELV	Monthly daily mean	Highest daily maximum
Jan	20	0.1	24.4	10	0.1	1.6
Feb	20	0.2	9.4	10	0.2	0.8
Mar	20	0.3	3.5	10	0.2	0.5
Apr	20	0.4	1.9	10	0.3	0.6
May	20	0.3	1.9	10	0.3	0.6
Jun	20	0.4	2.3	10	0.3	0.6
Jul	20	0.2	0.5	10	0.1	0.2
Aug	20	0.1	3.3	10	0.1	0.3
Sep	20	0.2	2.2	10	0.2	0.5
Oct	20	0.1	4.5	10	0.1	0.6
Nov	20	0.4	3.7	10	0.3	1.4
Dec	20	0.3	3.1	10	0.2	0.6



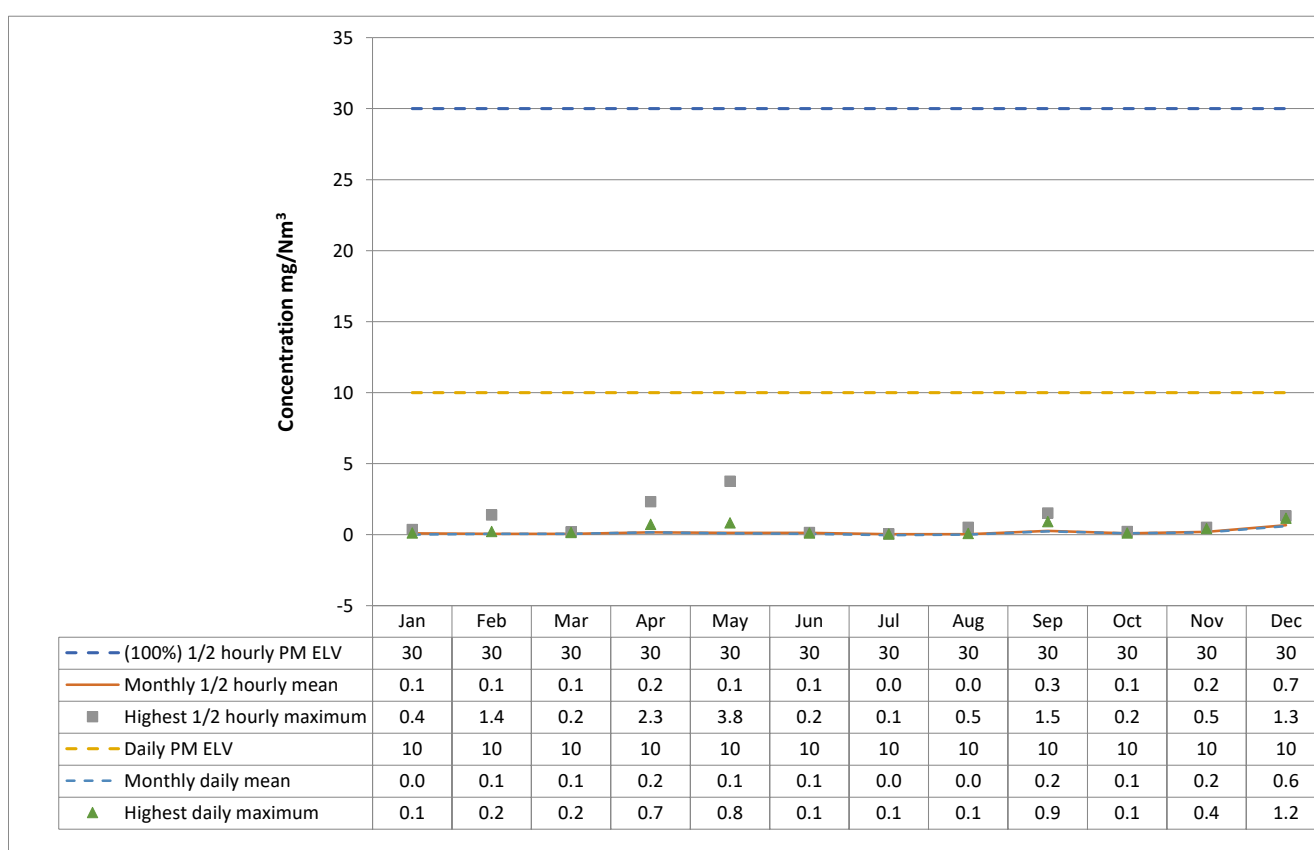
Comments :

Monitoring of Particulate matter emissions

Whole Installation

See Notes in Cell Q3

mg/Nm ³	1/2 Hourly Reference Periods			Daily Reference Periods		
2022	(100%) 1/2 hourly PM ELV	Monthly 1/2 hourly mean	Highest 1/2 hourly maximum	Daily PM ELV	Monthly daily mean	Highest daily maximum
Jan	30	0.1	0.4	10	0.0	0.1
Feb	30	0.1	1.4	10	0.1	0.2
Mar	30	0.1	0.2	10	0.1	0.2
Apr	30	0.2	2.3	10	0.2	0.7
May	30	0.1	3.8	10	0.1	0.8
Jun	30	0.1	0.2	10	0.1	0.1
Jul	30	0.0	0.1	10	0.0	0.1
Aug	30	0.0	0.5	10	0.0	0.1
Sep	30	0.3	1.5	10	0.2	0.9
Oct	30	0.1	0.2	10	0.1	0.1
Nov	30	0.2	0.5	10	0.2	0.4
Dec	30	0.7	1.3	10	0.6	1.2



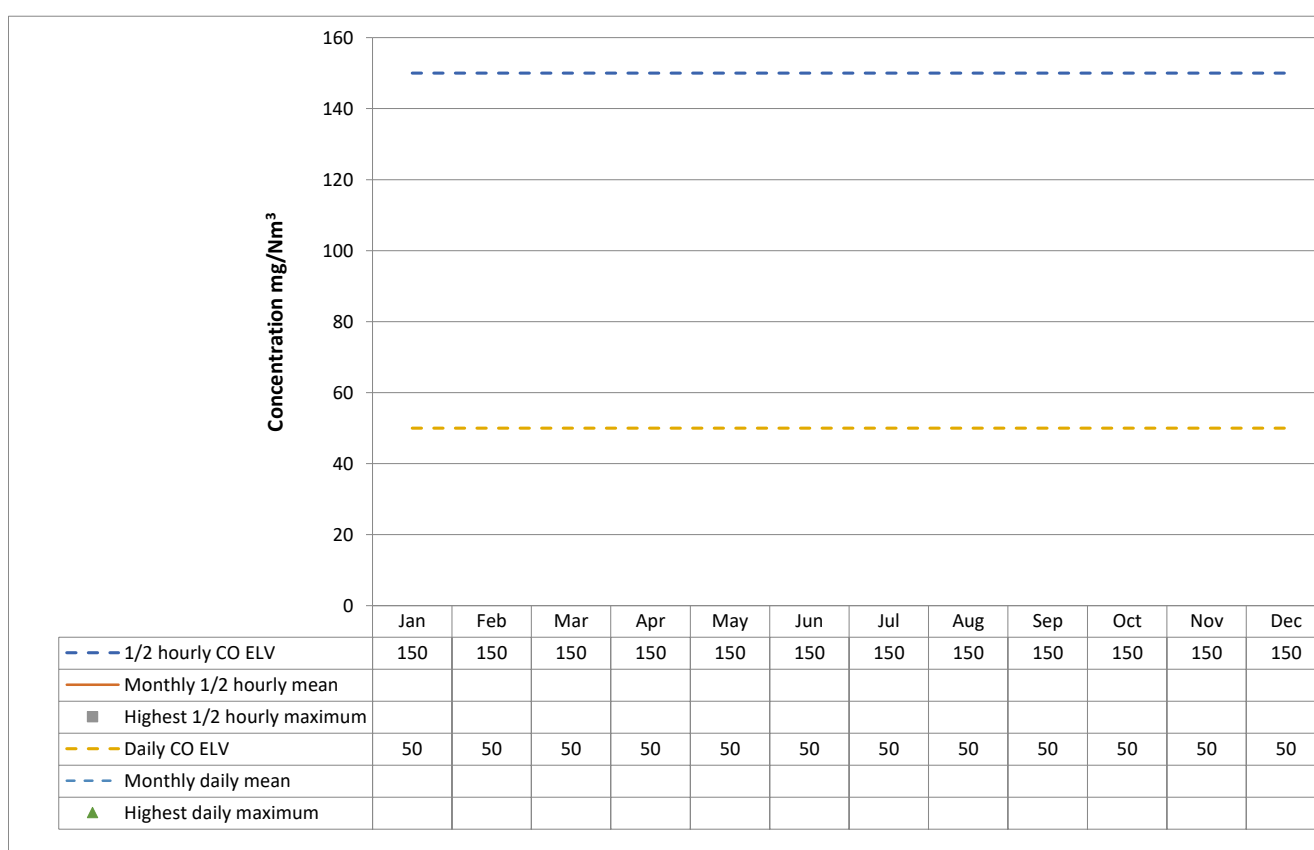
Comments :

Monitoring of Carbon Monoxide (half hourly)

Whole Installation

See Notes in Cell Q3

mg/Nm ³	1/2 Hourly Reference Periods			Daily Reference Periods		
2022	1/2 hourly CO ELV	Monthly 1/2 hourly mean	Highest 1/2 hourly maximum	Daily CO ELV	Monthly daily mean	Highest daily maximum
Jan	150			50		
Feb	150			50		
Mar	150			50		
Apr	150			50		
May	150			50		
Jun	150			50		
Jul	150			50		
Aug	150			50		
Sep	150			50		
Oct	150			50		
Nov	150			50		
Dec	150			50		



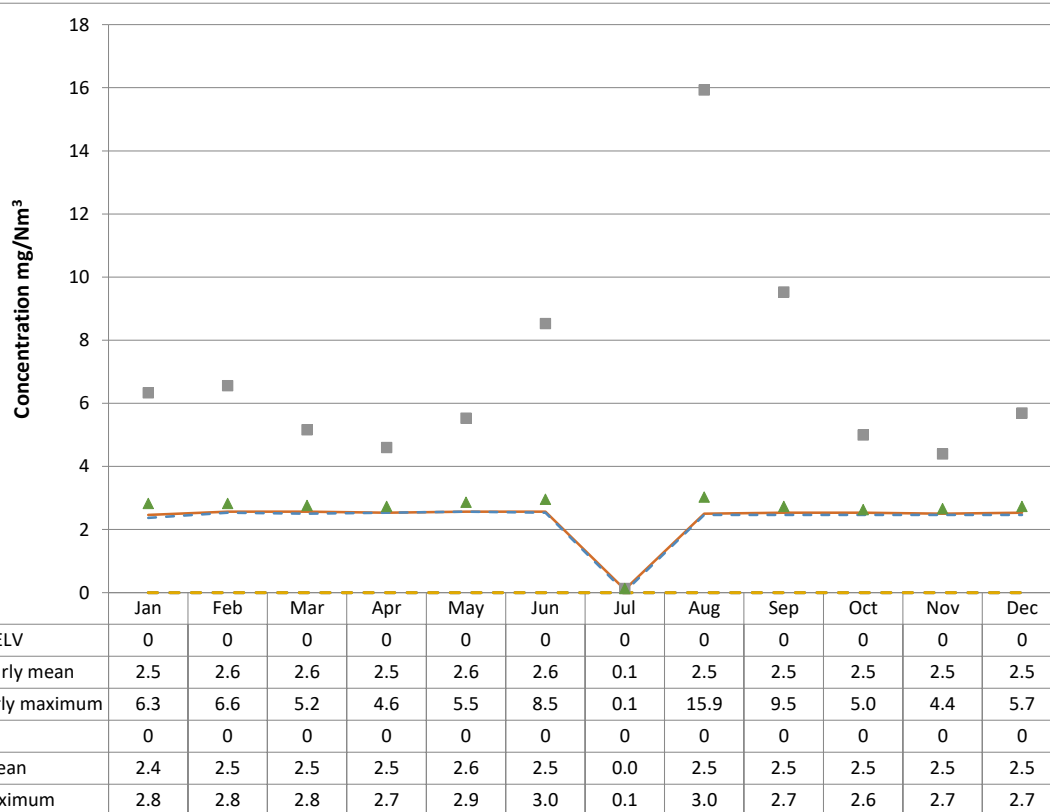
Comments :

Monitoring of Ammonia emissions

Whole Installation

See Notes in Cell Q3

mg/Nm ³	1/2 Hourly Reference Periods			Daily Reference Periods		
2022	1/2 hourly NH3 ELV	Monthly 1/2 hourly mean	Highest 1/2 hourly maximum	Daily NH3 ELV	Monthly daily mean	Highest daily maximum
Jan	/	2.5	6.3	/	2.4	2.8
Feb	/	2.6	6.6	/	2.5	2.8
Mar	/	2.6	5.2	/	2.5	2.8
Apr	/	2.5	4.6	/	2.5	2.7
May	/	2.6	5.5	/	2.6	2.9
Jun	/	2.6	8.5	/	2.5	3.0
Jul	/	0.1	0.1	/	0.0	0.1
Aug	/	2.5	15.9	/	2.5	3.0
Sep	/	2.5	9.5	/	2.5	2.7
Oct	/	2.5	5.0	/	2.5	2.6
Nov	/	2.5	4.4	/	2.5	2.7
Dec	/	2.5	5.7	/	2.5	2.7



Comments :

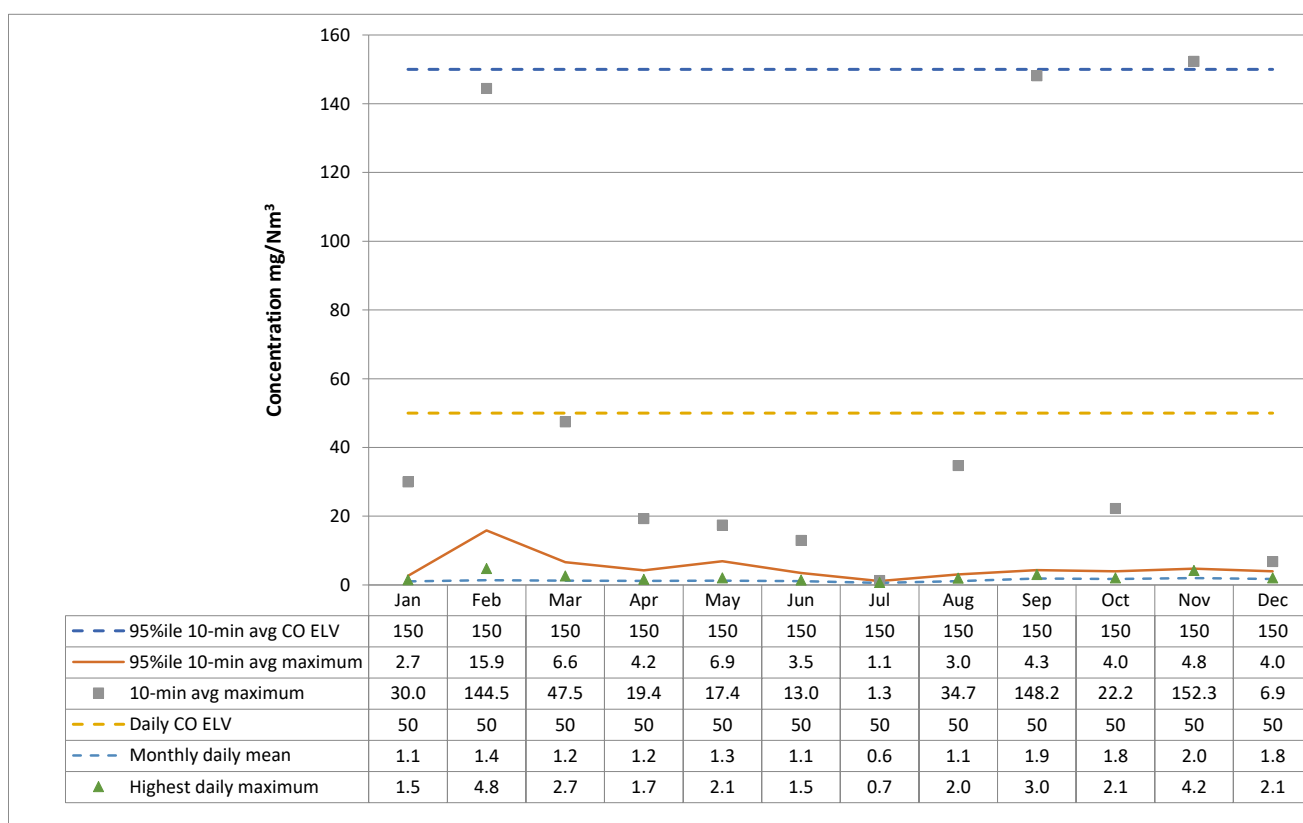
An indicated ELV value of zero in the table above means that no ammonia limit is set in the permit.

Monitoring of Carbon Monoxide (10-minute avg)

Whole Installation

See Notes in Cell S3

mg/Nm ³	10-minute Reference Periods				Daily Reference Periods		
2022	95%ile 10-min avg CO ELV	95%ile 10-min avg maximum	Monthly CO 10-min avg mean	10-min avg maximum	Daily CO ELV	Monthly daily mean	Highest daily maximum
Jan	150	2.7	1.1	30.0	50	1.1	1.5
Feb	150	15.9	1.4	144.5	50	1.4	4.8
Mar	150	6.6	1.3	47.5	50	1.2	2.7
Apr	150	4.2	1.2	19.4	50	1.2	1.7
May	150	6.9	1.3	17.4	50	1.3	2.1
Jun	150	3.5	1.2	13.0	50	1.1	1.5
Jul	150	1.1	0.7	1.3	50	0.6	0.7
Aug	150	3.0	1.2	34.7	50	1.1	2.0
Sep	150	4.3	1.9	148.2	50	1.9	3.0
Oct	150	4.0	1.8	22.2	50	1.8	2.1
Nov	150	4.8	2.0	152.3	50	2.0	4.2
Dec	150	4.0	1.8	6.9	50	1.8	2.1



Comments :

Environment Agency explanatory note: The 10-minute average ELV is based on the "95th percentile". In this case this means that 95% of the 10 minute averages in the relevant 24-hour period (i.e. 137) must be below 150 mg/Nm³, and 5% (i.e. 7) are allowed to be any value above 150 mg/Nm³. Whilst we expect operators to minimise CO emissions at all times, it is perfectly acceptable for the value of the maximum 10-minute average to be above 150 mg/Nm³, provided the 95th percentile ELV has been met for that period.

Schedule 1 Notifications

Schedule 1 Notifications						Year:								2022			
						Sch 1		60-hrs Counter		Auto - Calculations							
						Duration				NIEA Reporting				Concentrations - max value shown (mg/Nm3)			
No.	Boiler / Parameter		Period			Daily ¹⁾	97% 30-min ¹⁾	100% 30-min ⁴⁾	95% 10-min ¹⁾	Str 1 60-hrs Counter ⁴⁾	Str 2 60-hrs Counter ⁴⁾	Str 3 60-hrs Counter ⁴⁾	Breaches Counter ¹⁾	Daily	97% 30-min	100% 30-min	95% 10-min
Sch 1 No.	Line	Parameter	Date	Start Time	Reference Period												
10	Daisy Beacon	Suspended Solids (Run off water)	10/01/2022	0800-1200	N/A					0	0	0	0	N/A			
11	N/A	Fuel Hall Fire / Run off water	23/06/2022	0015 – 1030	N/A					0	0	0	0	N/A			
12	1	Dioxins & Furans (NATO I-TEQ)	09/02/2023	08:23 - 11:23	180 minutes					0	0	0	0	N/A			
13	2	Dioxins & Furans (NATO I-TEQ)	10/02/2023	08:06 - 11:06	180 minutes					0	0	0	0	N/A			
14	2	Dioxins & Furans (NATO I-TEQ)	09/02/2023	11:58 - 14:58	180 minutes					0	0	0	0	N/A			
15	3	TOC	23/10/2022	1000 - 2200	N/A					0	0	0	0				
16	3	Dioxins & Furans (NATO I-TEQ)	08/02/2023	08:51 - 11:51	180 minutes					0	0	0	0	N/A			
17	3	Dioxins & Furans (NATO I-TEQ)	10/02/2023	11:43 - 14:43	180 minutes					0	0	0	0	N/A			
18	1	Dioxins & Furans (NATO I-TEQ)	01/02/2023	13:21 - 16:21	180 minutes					0	0	0	0	N/A			
19	2	Dioxins & Furans (NATO I-TEQ)	01/02/2023	08:23 - 11:23	180 minutes					0	0	0	0	N/A			
20	3	Dioxins & Furans (NATO I-TEQ)	02/02/2023	15:27 - 18:27	180 minutes					0	0	0	0	N/A			
21	2	Dioxins & Furans (NATO I-TEQ)	03/02/2023	08:21 - 11:21	180 minutes					0	0	0	0	N/A			
22	2	Dioxins & Furans (NATO I-TEQ)	10/03/2022	08:50 - 14:58	360 minutes					0	0	0	0	N/A			
23	xx	Dioxins & Furans (NATO I-TEQ)	08/03/2022	10:20 - 16:20	360 minutes					0	0	0	0	N/A			
24	2	Dioxins & Furans (NATO I-TEQ)	09/03/2022	08:56 - 13:10	240 minutes					0	0	0	0	N/A			
25	3	Dioxins & Furans (NATO I-TEQ)	09/03/2022	14:13 - 17:17	180 minutes					0	0	0	0	N/A			
26	3	Dioxins & Furans (NATO I-TEQ)	10/03/2022	09:25 - 15:40	360 minutes					0	0	0	0	N/A			
27	1	Dioxins & Furans (NATO I-TEQ)	09/08/2022	09:07 - 15:07	180 minutes					0	0	0	0	N/A			
28	2	Dioxins & Furans (NATO I-TEQ)	17/08/2022	08:07 - 14:07	360 minutes					#REF!	#REF!	#REF!	0	N/A			
29	1	Dioxins & Furans (NATO I-TEQ)	02/11/2022	12:29 - 13:27	58 minutes					0	0	0	0	N/A			
30	2	Dioxins & Furans (NATO I-TEQ)	08/11/2022	09:55 - 15:55	360 minutes					0	0	0	0	N/A			
31	1	Dioxins & Furans (NATO I-TEQ)	09/11/2022	08:45 - 14:45	360 minutes					0	0	0	0	N/A			
32	2	Dioxins & Furans (NATO I-TEQ)	09/11/2022	08:40 - 14:40	360 minutes					0	0	0	0	N/A			
33	1	Dioxins & Furans (NATO I-TEQ)	10/11/2022	08:13 - 14:13	360 minutes					0	0	0	0	N/A			
34	2	Dioxins & Furans (NATO I-TEQ)	10/11/2022	08:10 - 14:10	360 minutes					0	0	0	0	N/A			
35	1	Dioxins & Furans (NATO I-TEQ)	22/11/2022	08:46 - 14:46	360 minutes					0	0	0	0	N/A			
36	2	Dioxins & Furans (NATO I-TEQ)	22/11/2022	08:45 - 14:45	360 minutes					0	0	0	0	N/A			
37	1	Dioxins & Furans (NATO I-TEQ)	23/11/2022	08:16 - 14:16	360 minutes					0	0	0	0	N/A			
38	2	Dioxins & Furans (NATO I-TEQ)	23/11/2022	08:16 - 14:16	360 minutes					0	0	0	0	N/A			
39	1	Dioxins & Furans (NATO I-TEQ)	24/11/2022	06:28 - 12:28	360 minutes					0	0	0	0	N/A			
40	2	Dioxins & Furans (NATO I-TEQ)	24/11/2022	06:26 - 12:26	360 minutes					0	0	0	0	N/A			
41	3	Dioxins & Furans (NATO I-TEQ)	29/11/2022	07:34 - 13:34	360 minutes					0	0	0	0	N/A			
42	3	Dioxins & Furans (NATO I-TEQ)	30/11/2022	14:03 - 20:03	360 minutes					0	0	0	0	N/A			
										0	0	0	0	N/A			
Sch 1 Counter						Total of Dailies:	Total of 97% 30-mins	Total of 100% 30-mins	Total of 95% 10-mins	Total Str 1 (60-hrs Counter):	Total Str 2 (60-hrs Counter):	Total Str 3 (60-hrs Counter):	Total No of Breaches				
33						No 0	Hours 0	Hours 0	Hours 0.0	Hours 0.0	Hours 0.0	Hours 0.0	No 0				

Annual limit is 60hrs.

pp Chris Macartney

Signed

31/01/2023

Date

NOTE: