

Add company logo

Add photo

**Annual Performance Report 2023**

**Permit EPR/AB3790ZB**

**Barry Energy Production Facility**

**Biomass UK No.2 Ltd**

Year: 2023

Address: Woodham Road, Barry, Vale of Glamorgan, CF63 4JE

Tel: 01179 372 811

Email:

Prepared by: [REDACTED] Position: Consultant

Approved by: [REDACTED] Position: Technical Manager

Version: 1

Issue Date: 31/01/2024

<b>Contents</b>		
<b>Section</b>	<b>Subject</b>	<b>Page</b>
	Facility Information	
	Operational Data	
	Operational Summary	
	Performance Form 1	
	Energy Form 1	
	Permit Compliance	
	Improvements	
	Public Liasion	
	Carbon dioxide and nitrous oxide emissions	
	Residue Quality	
	Emissions to Water	
	Emissions to Air (periodically monitored)	
	Emissions to Air (continuously monitored)	
	Hydrogen Chloride emissions	
	Sulphur Dioxide emissions	
	Oxides of Nitrogen emissions	
	Total Organic Carbon emissions	
	Particulate Matter emissions	
	Carbon Monoxide emissions	
	Ammonia emissions	

<b>Version Control</b>		
<b>Section</b>	<b>Information</b>	<b>Date</b>

<b>Distribution</b>		
<b>Copy</b>	<b>Name, Role</b>	<b>No.</b>

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 Barry Energy Production Facility is a renewable energy generation facility which has been designed to recover energy from pre-prepared mixed waste wood feedstocks using gasification. The gasification facility is an Advanced Thermal Treatment (ATT) process that will produce a combustible synthesis gas, which is then used to raise steam and generate electricity, through steam cycle turbine generation.

The Advanced Thermal Treatment (ATT) plant is designed to process shredded mixed waste wood feedstocks to produce heat to raise steam in a conventional tube boiler for utilisation in a steam turbine for the production of renewable electricity with an export capacity up to 10MWe (notionally 9.95MWe).

The Installation has been designed to process approximately 86,400 tonnes of pre-processed non-hazardous mixed waste wood per annum.

The site has not been operational for the entirety of the year. As such no waste has been received or processed onsite.

**Summary of Operational Processes and Procedures**

The principle components of the process comprise the following:

**Waste Acceptance and Reception:** All waste wood is delivered directly into the fuel storage building via electrically operated roller shutter doors. When required, the waste is discharged onto the feedstock feed system, which delivers the waste into the gasification building. All waste is accepted in accordance to the sites waste acceptance procedures.

**Gasification:** The feedstock feed system delivers the waste into the fluidised bed gasification system where the waste is combusted to produce a synthetic gas (syngas). The syngas is then combusted to produce a high temperature flue-gas. A steam boiler then recovers the heat from the combustion gases through the conversion into superheated steam.

**Electricity Generation:** The superheated steam then passes to a Steam Turbine and Generator, which will export 10MWe (net) of renewable electricity onto the Local Distribution Network.

**Flue-Gas Cleaning:** Flue gas cleaning and pollution control consists of urea injection for De-NOx, lime injection for acid gas neutralisation and activated carbon powder injection for absorption and removal of heavy metals, dioxins, VOCs and other harmful substances. The stream has a baghouse system, which is designed to have the capacity to remove submicron dust particles within anticipated emission limit values (ELV's) stipulated by Chapter IV of the Industrial Emissions Directive (IED).

The plant is operated in accordance with its Environmental Management System which is designed to meet the requirements of ISO14001:2004.

**Operational Data**

Plant Size		tonnes pa		MWth		MWe
No. of combustion lines	1		No. of Turbines:	1		

<b>Waste types received</b>	Unit	Q1	Q2	Q3	Q4	Year Total	%
Household / Local Authority	tonnes					-	-
Commercial & Industrial						-	-
Hazardous						-	-
Clinical						-	-
Waste wood (biomass)						-	-
Refuse Derived Fuel * - H'hold/LA						-	-
Refuse Derived Fuel * - C&I						-	-
Other [Please specify]						-	-
Other [Please specify]						-	-
Other [Please specify]						-	-
<b>Total waste received</b>			-	-	-	-	-
Rejected Waste						-	-
Unprocessed waste transferred out						-	-
<b>Total waste combusted</b>		-	-	-	-	-	-

<b>Energy Usage / Export</b>	Unit	Q1	Q2	Q3	Q4	Year Total	KWh/te
Power Generated	MWh					-	-
Power Exported						-	-
Power Used on site						-	-
Power Imported		585	489	535	492	<b>2,101</b>	#DIV/0!
Parasitic Load	%	-	-	-	-	-	-
Thermal Energy Produced **	MWh					-	-
Thermal Energy Exported **						-	-
R1 value (if applicable)							

<b>Waste Disposal &amp; Recovery</b>	Unit	Q1	Q2	Q3	Q4	Year Total	% inputs
APC Residues - produced	tonnes					-	-
IBA - produced						-	-
Metals recycling						-	-
Recycling		-	0	-	-	<b>0</b>	#DIV/0!
Other		-	-	-	-	-	-
Other		-	-	-	-	-	-

<b>Raw Material Usage</b>	Unit	Q1	Q2	Q3	Q4	Year Total	kg or Ltr /te
Mains Water	m3	509	451	170	759	<b>1,889</b>	#DIV/0!
Other Water	ltrs					-	-
Ammonia	kgs					-	-
Urea	kgs					-	-
Activated Carbon	kgs					-	-
Lime / hydrated lime	kgs					-	-
Fuel oil	ltrs					-	-
Gas	cf	-	-	-	-	-	-
Other		-	-	-	-	-	-

<b>Summary</b>	<b>Line/Unit</b>	<b>Q1</b>	<b>Q2</b>	<b>Q3</b>	<b>Q4</b>	<b>Year Total</b>	
	1					-	x %
	2					-	x %
Availability of waste combustion	3					-	x %
by line, hrs	4					-	x %
	5					-	x %
Overall Availability, mean avg. of all lines, hrs						-	<b>x %</b>
Hours of turbine operations, hrs	1					-	x %
Hours of turbine operations, hrs	2					-	x %
Hours of heat / steam export						-	n/a
Net Calorific Value of waste	MJ/kg						-
Abnormal Events	qty.					-	no
Abnormal operation	hours					-	0.00%
Permit Breaches	qty.					-	no

**Summary of Plant Operations and Maintenance during the reporting year**

The facility has been non-operational during 2023 and will come online once clarity around the planning regularisation is assured by the Welsh Government.

As a result of the above, the site did not process any wastes during 2023 and all fuel storage and reception areas have remained empty.

**Summary of Residue Handling for the reporting year**

N/A

**2023 Annual Reporting Performance Form 1**

Permit EPR/AB3790ZB Operator: 0  
 Facility: Barry Energy Production Facility Form: Performance 1  
 Reporting Period from: 01 January 2023 to: 01 December 2023

**2023 Annual Reporting of Waste Disposal and Recovery**

Waste Description	Disposal Route(s)	Disposal Tonnes	Recovery Tonnes	% / tonne of waste incinerated
<b>1) Hazardous Wastes</b>				
APC Residues				-
IBA				-
				-
				-
Total Hazardous Waste		0.0	0.0	-
<b>2) Non-Hazardous Wastes</b>				
IBA				-
Ferrous Metal				-
Process Water				-
				-
				-
Total Non-Hazardous Waste		0.0	0.0	-
<b>TOTAL WASTE</b>		<b>0.0</b>	<b>0.0</b>	-

**Operator's comments :**

**2023 Annual Reporting of Water and Other Raw Material Usage**

Raw Material	Usage	Unit	Specific Useage	Unit
Mains Water	1889	m <sup>3</sup>	#DIV/0!	m <sup>3</sup> /te
Total Water	1889	m <sup>3</sup>	#DIV/0!	m <sup>3</sup> /te
Urea / Ammonia	0	kg	-	kg/te
Activated Carbon	0	kg	-	kg/te
Lime / hydrated lime / Sodium Bicarb.	0	kg	-	kg/te

**Operator's comments :**

**2023 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							
Number of periods of abnormal operation, qty.							
Cumulative hours of abnormal operation for this year, hours							

**Operator's comments :**

Signed: \_\_\_\_\_

Date: \_\_\_\_\_

**2023 Annual Reporting of Energy Usage/Export**

Permit EPR/AB3790ZB Operator: 0

Facility: Barry Energy Production Facility Form: Energy 1

Reporting Period from: 01 January 2023 to: 01 December 2023

Energy Source	Energy Usage	Unit	Specific Useage (KWh/tonne incinerated)
Electricity Produced	0	MWh	-
Electricity Imported	2101	MWh	#DIV/0!
Electricity Exported	0	MWh	-
Gas Oil		tonnes	
Steam/hot water exported	0	GWh	-

**Operator's comments :**

Signed: \_\_\_\_\_

Date: \_\_\_\_\_

**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	
	Half-hourly limit	Daily limit
Particulates	xx.xx %	xx.xx %
Oxides of nitrogen	xx.xx %	xx.xx %
Sulphur dioxide	xx.xx %	xx.xx %
Carbon monoxide	xx.xx % or xx.xx% 95% of 10-min averages	xx.xx %
Total organic carbon	xx.xx %	xx.xx %
Hydrogen chloride	xx.xx %	xx.xx %
Hydrogen fluoride	xx.xx %	xx.xx %
	xx.xx %	xx.xx %

**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
	N/A		

**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
	N/A		

\* including whether substantiated by the operator or the EA

**Summary of Plant Improvements**

<b>Summary of any efficiency improvements that have been completed within the year.</b>
N/A

<b>Summary of any permit improvement conditions that have been completed within the year and the resulting environmental benefits.</b>
N/A

<b>Summary of any changes to the plant or operating techniques which required a variation to the permit and a summary of the resulting environmental impact.</b>
N/A

<b>Summary of any other improvements made to the plant or planned to be made and a summary of the resulting environmental benefits.</b>
N/A

**Details of Public & Stakeholder Liasion**

<b>Summary of events held during the reporting year.</b>	
<b>Date</b>	<b>Description</b>
2023	None

<b>List of events planned for next year</b>	
<b>Date</b>	<b>Description</b>
2024	Not yet planned

If you wish to be involved in the public liasion programme, please contact \_\_\_\_\_

Annual Performance Report 2023

**Carbon dioxide emissions and biogenic content of waste**

<b>Carbon dioxide emissions</b> (all types of plant)	
Annual mass of carbon dioxide released	x tonnes
Annual mass of carbon dioxide released per tonne of waste burned	x tonnes
Annual mass of carbon dioxide released per MWh of energy exported	x tonnes
Description of how annual carbon dioxide mass emission has been calculated	

<b>Nitrous oxide emissions</b> (only plants which use ammonium)	
Annual mass emissions of nitrous oxide	x tonnes
Description of how annual nitrous oxide mass emission has been calculated	
Total annual carbon dioxide and nitrous oxide emissions as carbon dioxide equivalent (whereby 1 t nitrous oxide is equivalent to 298 t carbon dioxide)	x tonnes CO <sub>2</sub> e

<b>Biogenic fraction of the waste and biogenic CO<sub>2</sub> emissions</b> (municipal waste, refuse derived fuel or solid recovered fuel)	
Yearly average biogenic percentage of the waste by net calorific value (NCV)	x %
Description of how biogenic NCV percentage has been calculated or estimated	
Percentage of total carbon dioxide emissions arising from biogenic	x %

Description of how percentage biogenic carbon dioxide emissions have been calculated	
--	--

**Comments:**

The site did not process any wastes during 2023 and so no monitoring
--

Barry Energy Production Facility

**aste inputs**


ia or urea to abate NOx emissions)


**ssions** (only plants burning residual  
el)




ing was undertaken.

**Residue Quality Monitoring Requirements**

<b>Summary of monitoring undertaken and compliance</b>
The site did not process any wastes during 2023 and so no monitoring was undertaken.

<b>Commentary on any specific events</b>	
<b>Date &amp; Event</b>	<b>Description</b>

<b>Residue Quality Monitoring Results</b>			
Parameter (unit)	Limit	Normal Operation	
		Bottom ash	APC Residues
Loss on Ignition (average %)	<5%	N/A	<del> </del>
Total Organic Carbon (average %)	<3%	N/A	<del> </del>
No. of Assessments Undertaken	---		
No. of Hazardous Results	---		<del> </del>

<b>Comments :</b>

**Emissions to Water**

<b>Summary of monitoring undertaken and compliance</b>	
N/A	

<b>Commentary on any specific events</b>	
<b>Date &amp; Event</b>	<b>Description</b>

<b>Emissions to Water / Sewer</b>					
<b>Parameter</b>	<b>Monitoring Frequency</b>	<b>Limit</b>	<b>Target</b>	<b>Max.</b>	<b>Average</b>

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

The site did not process any wastes during 2023 and so no monitoring was undertaken.

**Results of emissions to air that are periodically monitored**

Substance	Ref. Period	Emission Limit Value	Average				
			A1	A2	A3	A4	A5
Hydrogen fluoride	1 hr	2 mg/m <sup>3</sup>					
Cd and Th and their compounds	6-8hrs	0.05 mg/m <sup>3</sup>					
Hg and its compounds	6-8hrs	0.05 mg/m <sup>3</sup>					
Sb, As, Pb, Cr, Co, Cu, Mn, Ni, V and their compounds	6-8hrs	0.5 mg/m <sup>3</sup>					
Dioxins & Furans (I-TEQ)	6-8hrs	0.1 ng/m <sup>3</sup>					
PCBs (WHO-TEQ Humans / Mammals)	6-8hrs	None set ng/m <sup>3</sup>					
PCBs (WHO-TEQ Fish)	6-8hrs	None set ng/m <sup>3</sup>					
PCBs (WHO-TEQ Birds)	6-8hrs	None set ng/m <sup>3</sup>					
Dioxins & Furans (WHO-TEQ Humans / Mammals)	6-8hrs	None set ng/m <sup>3</sup>					
Dioxins & Furans (WHO-TEQ Fish)	6-8hrs	None set ng/m <sup>3</sup>					
Dioxins & Furans (WHO-TEQ Birds)	6-8hrs	None set ng/m <sup>3</sup>					
Anthanthrene	6-8hrs	None set µg/m <sup>3</sup>					
Benzo(a)anthracene	6-8hrs	None set µg/m <sup>3</sup>					
Benzo(a)pyrene	6-8hrs	None set µg/m <sup>3</sup>					
Benzo(b)fluoranthene	6-8hrs	None set µg/m <sup>3</sup>					
Benzo(b)naphtho(2,1-d)thiophene	6-8hrs	None set µg/m <sup>3</sup>					
Benzo(c)phenanthrene	6-8hrs	None set µg/m <sup>3</sup>					
Benzo(ghi)perylene	6-8hrs	None set µg/m <sup>3</sup>					
Benzo(k)fluoranthene	6-8hrs	None set µg/m <sup>3</sup>					
Cholanthrene	6-8hrs	None set µg/m <sup>3</sup>					
Chrysene	6-8hrs	None set µg/m <sup>3</sup>					
Cyclopenta(cd)pyrene	6-8hrs	None set µg/m <sup>3</sup>					
Dibenzo(ai)pyrene	6-8hrs	None set µg/m <sup>3</sup>					
Dibenzo(ah)anthracene	6-8hrs	None set µg/m <sup>3</sup>					
Fluoranthene	6-8hrs	None set µg/m <sup>3</sup>					
Indeno(123-cd) pyrene	6-8hrs	None set µg/m <sup>3</sup>					
Naphthalene	6-8hrs	None set µg/m <sup>3</sup>					
<b>Comments :</b>							

**Emissions to Air (continuously monitored)**

<b>Summary of monitoring undertaken, standards used and compliance</b>												
The site did not process any wastes during 2023 and so no monitoring was undertaken.												

<b>Results of emissions to air that are continuously monitored (maximum and average values for each line)</b>												
Substance	Reference Period	Emission Limit Value	A1		A2		A3		A4		A5	
			Max.	Avg.	Max.	Avg.	Max.	Avg.	Max.	Avg.	Max.	Avg.
Oxides of nitrogen	Daily mean	200 mg/m <sup>3</sup>										
	½ hourly mean	400 mg/m <sup>3</sup>										
Particulates	Daily mean	10 mg/m <sup>3</sup>										
	½ hourly mean	30 mg/m <sup>3</sup>										
Total Organic Carbon	Daily mean	10 mg/m <sup>3</sup>										
	½ hourly mean	20 mg/m <sup>3</sup>										
Hydrogen chloride	Daily mean	10 mg/m <sup>3</sup>										
	½ hourly mean	60 mg/m <sup>3</sup>										
Sulphur dioxide	Daily mean	50 mg/m <sup>3</sup>										
	½ hourly mean	200 mg/m <sup>3</sup>										
Carbon monoxide	Daily mean	50 mg/m <sup>3</sup>										
	½ hourly mean *	100 mg/m <sup>3</sup> *										
	95%ile 10-min avg *	150 mg/m <sup>3</sup> *										
Ammonia	Daily mean	No limit set										

\* = delete or amend as appropriate

<b>Comments :</b>												

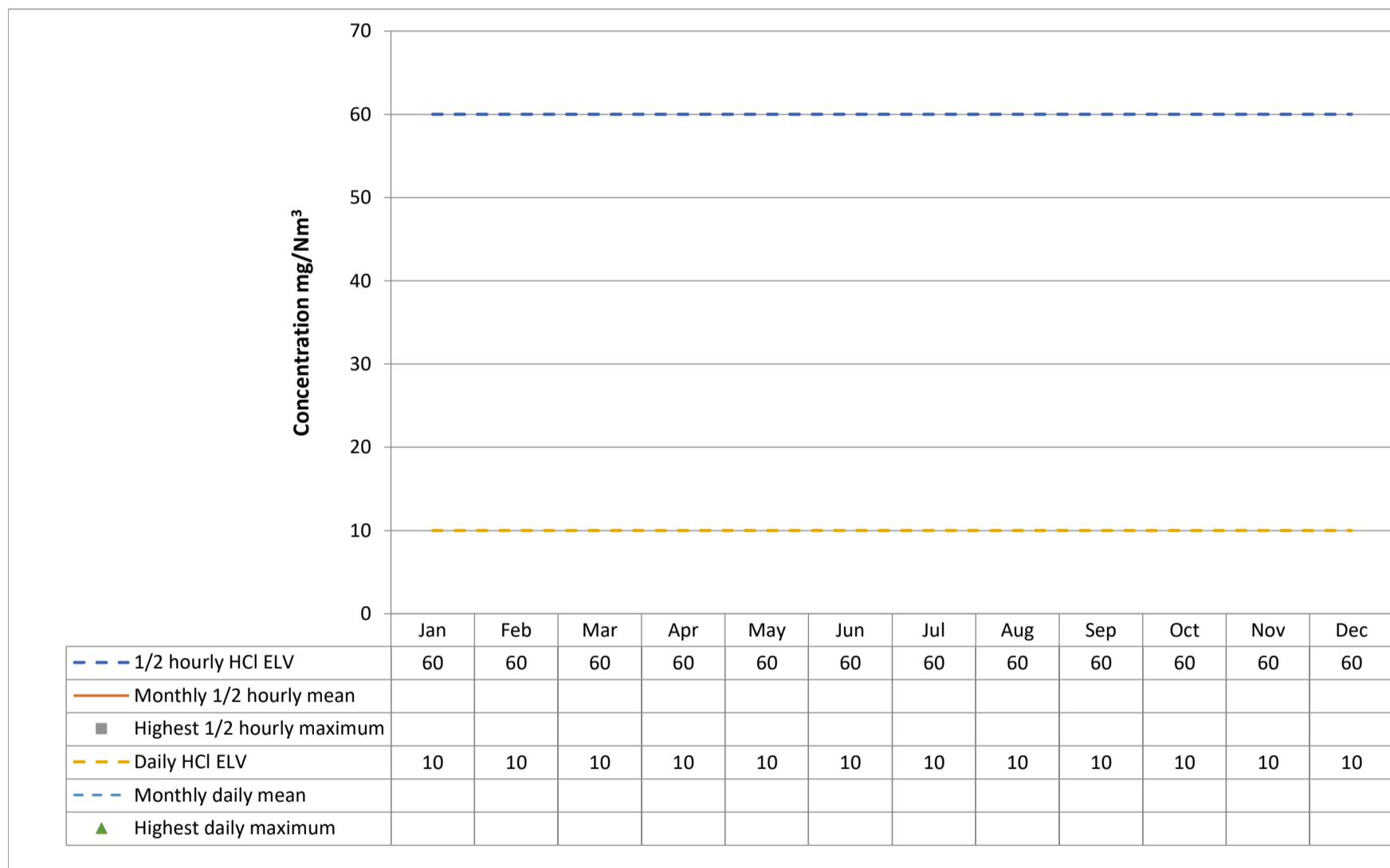


Monitoring of Hydrogen Chloride emissions

Whole Installation

See Notes in Cell Q3

mg/Nm <sup>3</sup>	1/2 Hourly Reference Periods			Daily Reference Periods		
	1/2 hourly HCl ELV	Monthly 1/2 hourly mean	Highest 1/2 hourly maximum	Daily HCl ELV	Monthly daily mean	Highest daily maximum
2023						
Jan	60			10		
Feb	60			10		
Mar	60			10		
Apr	60			10		
May	60			10		
Jun	60			10		
Jul	60			10		
Aug	60			10		
Sep	60			10		
Oct	60			10		
Nov	60			10		
Dec	60			10		



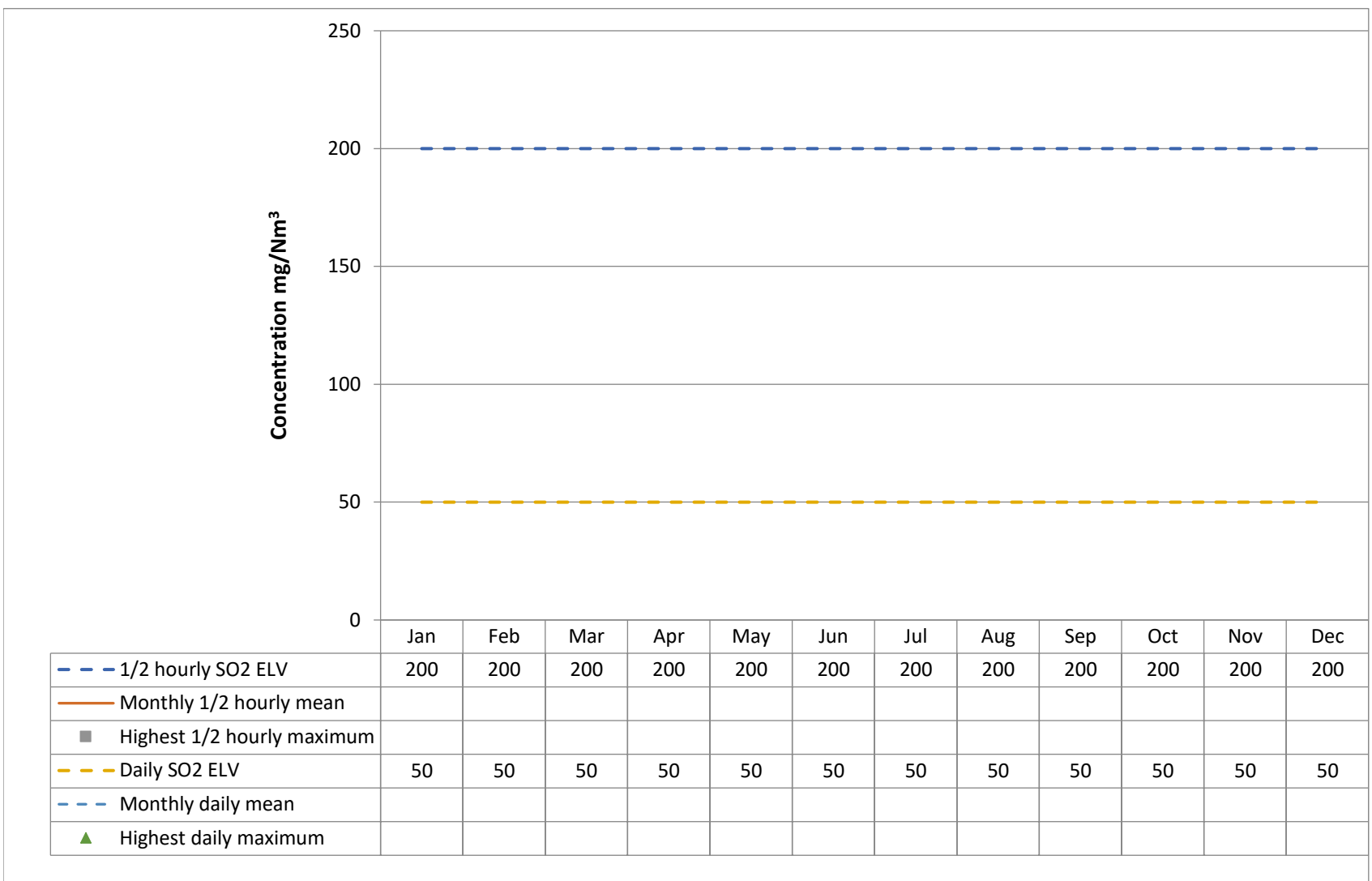
**Comments :**  
 The site did not process any wastes during 2023 and so no monitoring was undertaken.

Monitoring of Sulphur dioxide emissions

Whole Installation

See Notes in Cell Q3

mg/Nm <sup>3</sup>	1/2 Hourly Reference Periods			Daily Reference Periods		
	1/2 hourly SO2 ELV	Monthly 1/2 hourly mean	Highest 1/2 hourly maximum	Daily SO2 ELV	Monthly daily mean	Highest daily maximum
2023						
Jan	200			50		
Feb	200			50		
Mar	200			50		
Apr	200			50		
May	200			50		
Jun	200			50		
Jul	200			50		
Aug	200			50		
Sep	200			50		
Oct	200			50		
Nov	200			50		
Dec	200			50		



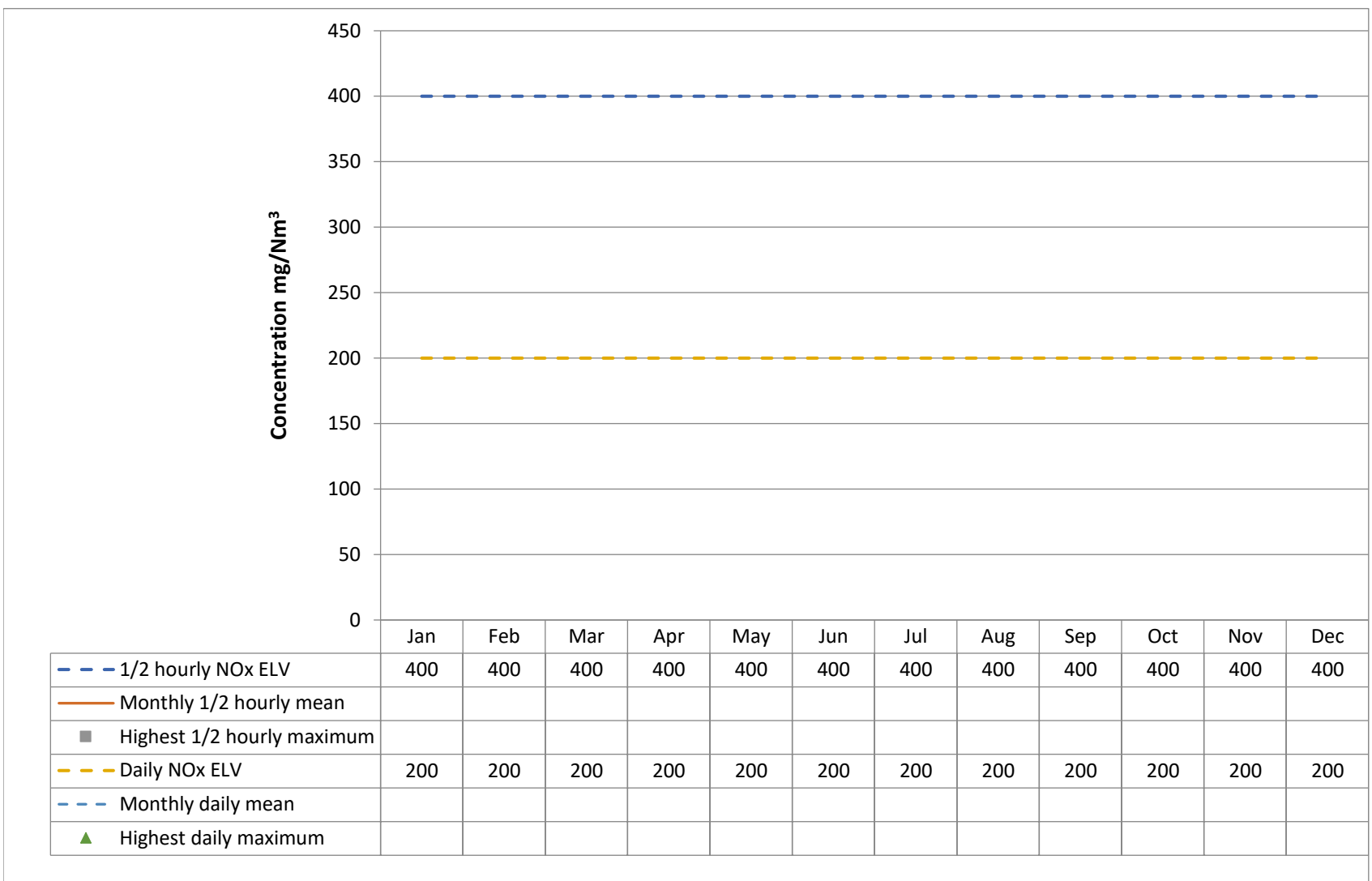
**Comments :**  
 The site did not process any wastes during 2023 and so no monitoring was undertaken.

Monitoring of Oxides of Nitrogen emissions

Whole Installation

See Notes in Cell Q3

mg/Nm <sup>3</sup>	1/2 Hourly Reference Periods			Daily Reference Periods		
	1/2 hourly NOx ELV	Monthly 1/2 hourly mean	Highest 1/2 hourly maximum	Daily NOx ELV	Monthly daily mean	Highest daily maximum
2023						
Jan	400			200		
Feb	400			200		
Mar	400			200		
Apr	400			200		
May	400			200		
Jun	400			200		
Jul	400			200		
Aug	400			200		
Sep	400			200		
Oct	400			200		
Nov	400			200		
Dec	400			200		

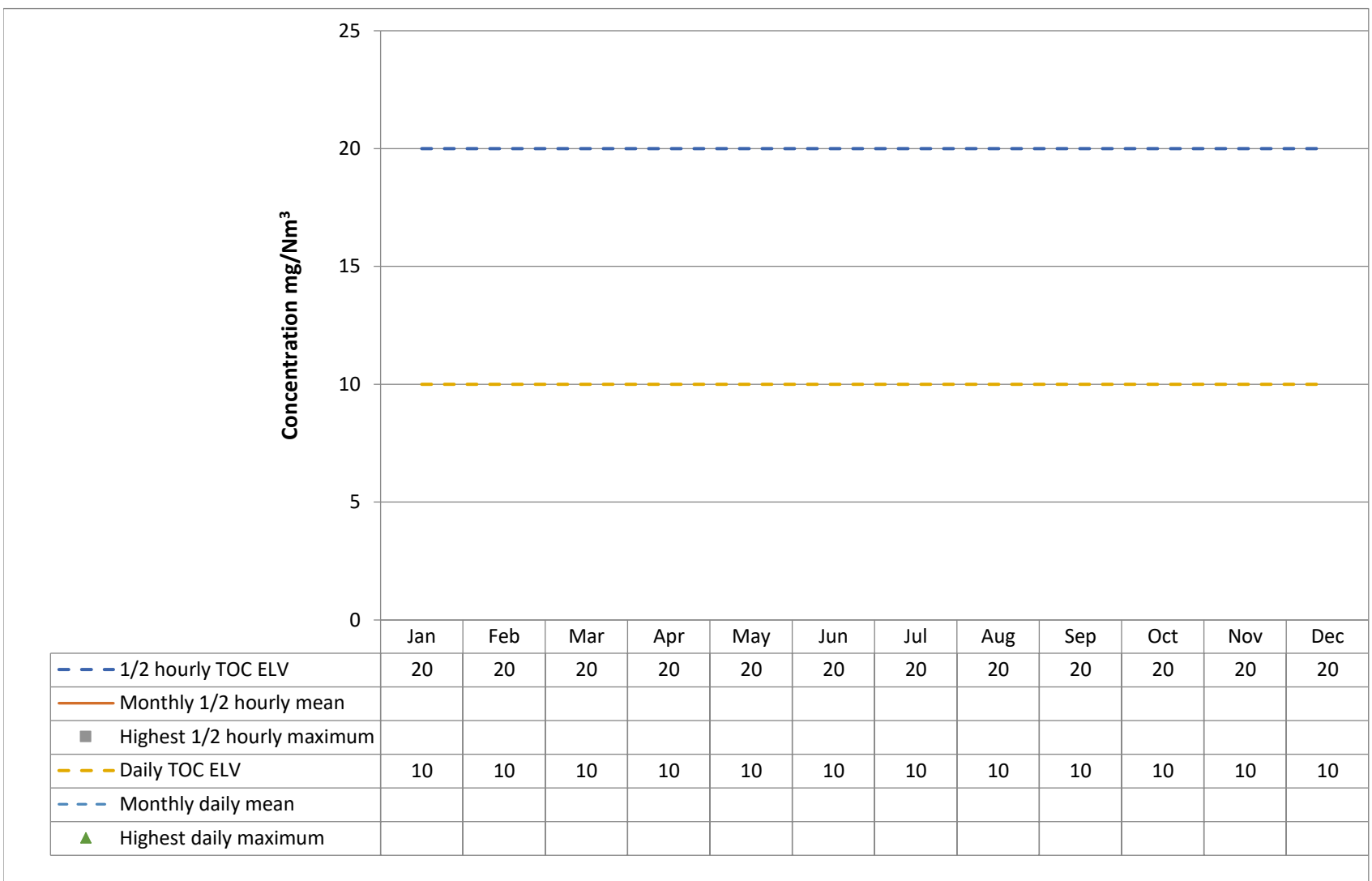


**Comments :**  
 The site did not process any wastes during 2023 and so no monitoring was undertaken.

Monitoring of Total organic carbon emissions Whole Installation

See Notes in Cell Q3

mg/Nm <sup>3</sup>	1/2 Hourly Reference Periods			Daily Reference Periods		
	1/2 hourly TOC ELV	Monthly 1/2 hourly mean	Highest 1/2 hourly maximum	Daily TOC ELV	Monthly daily mean	Highest daily maximum
2023						
Jan	20			10		
Feb	20			10		
Mar	20			10		
Apr	20			10		
May	20			10		
Jun	20			10		
Jul	20			10		
Aug	20			10		
Sep	20			10		
Oct	20			10		
Nov	20			10		
Dec	20			10		



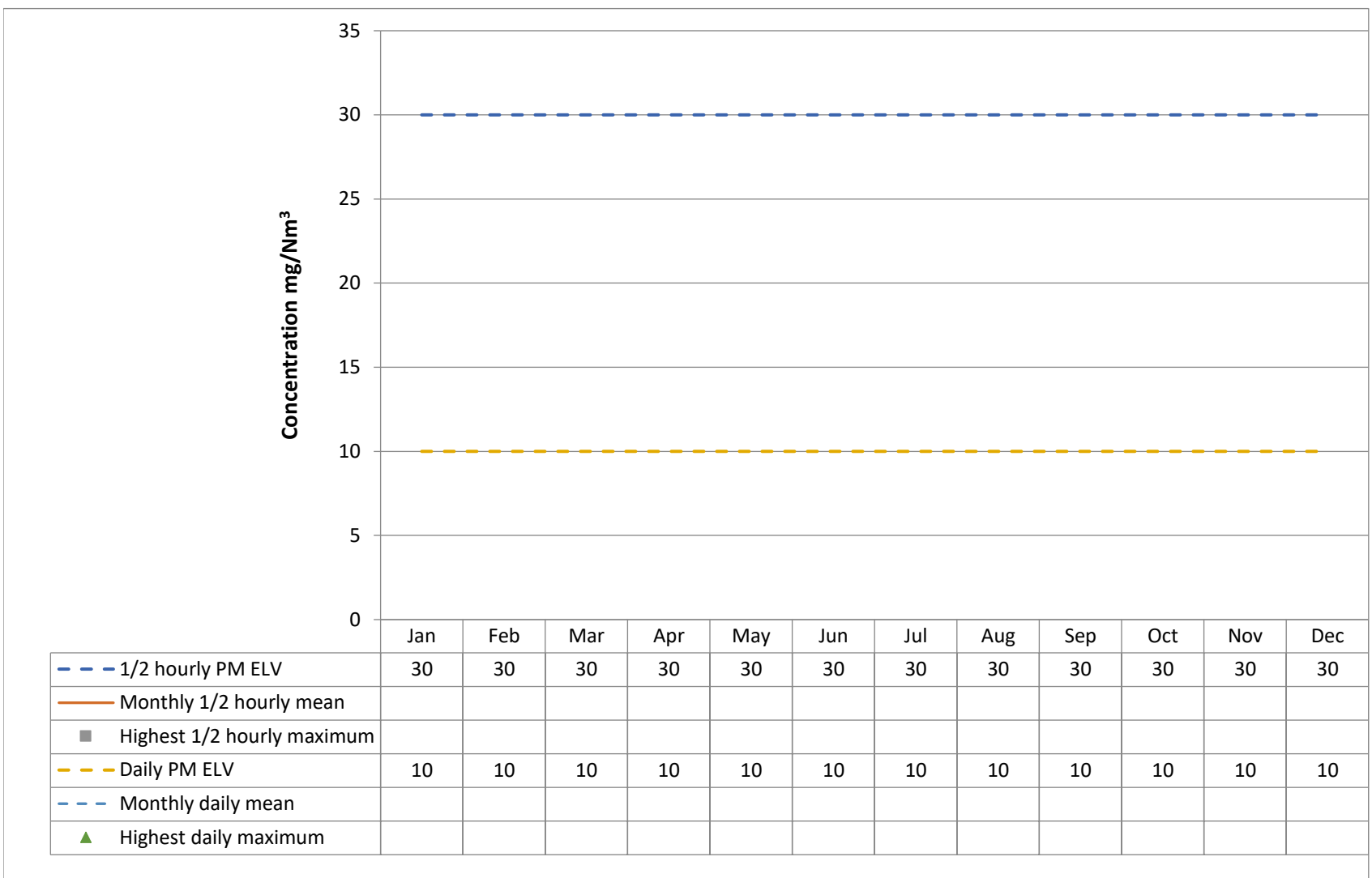
**Comments :**  
 The site did not process any wastes during 2023 and so no monitoring was undertaken.

Monitoring of Particulate matter emissions

Whole Installation

See Notes in Cell Q3

mg/Nm <sup>3</sup>	1/2 Hourly Reference Periods			Daily Reference Periods		
	1/2 hourly PM ELV	Monthly 1/2 hourly mean	Highest 1/2 hourly maximum	Daily PM ELV	Monthly daily mean	Highest daily maximum
2023						
Jan	30			10		
Feb	30			10		
Mar	30			10		
Apr	30			10		
May	30			10		
Jun	30			10		
Jul	30			10		
Aug	30			10		
Sep	30			10		
Oct	30			10		
Nov	30			10		
Dec	30			10		



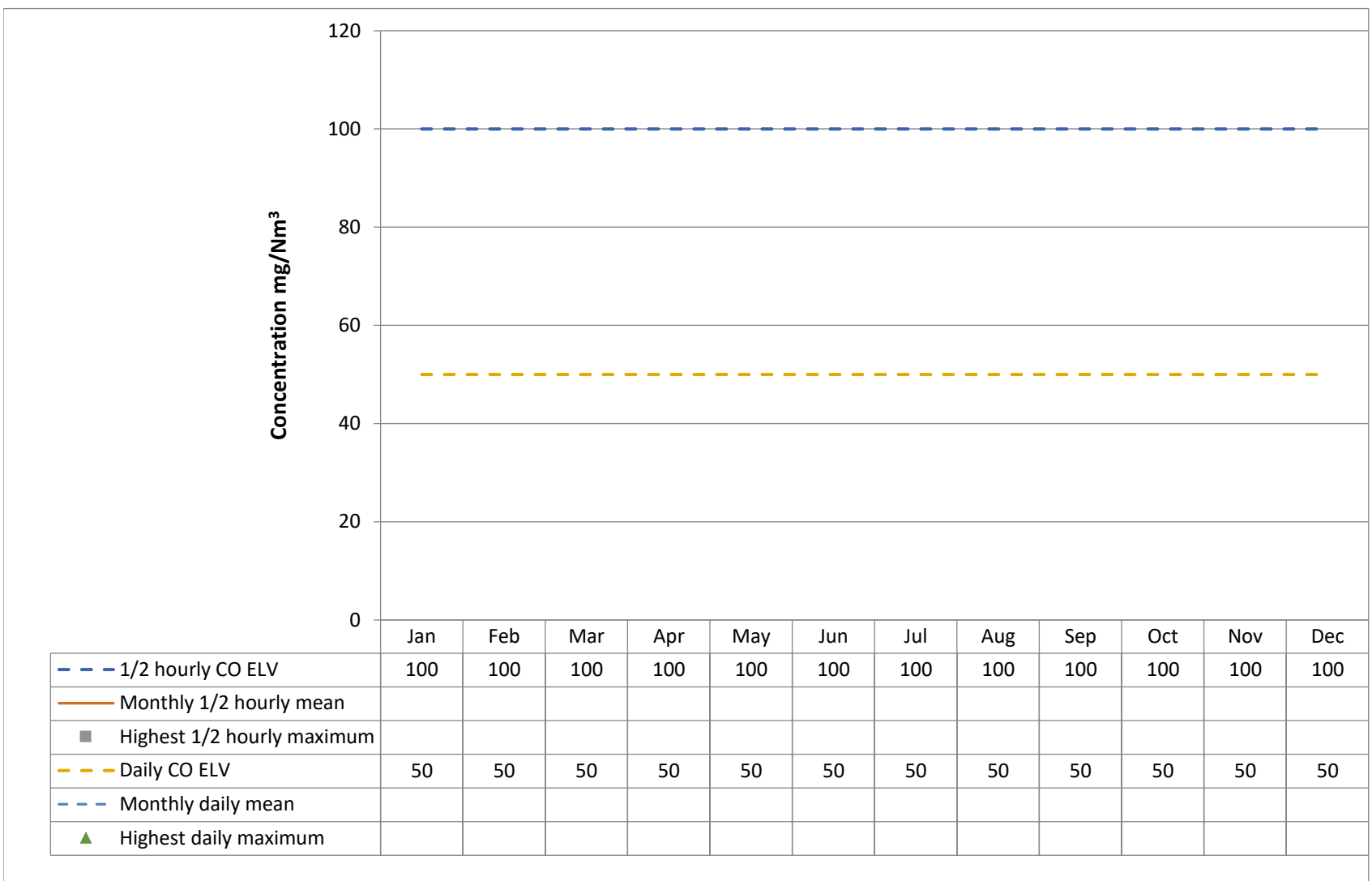
**Comments :**  
 The site did not process any wastes during 2023 and so no monitoring was undertaken.

Monitoring of Carbon Monoxide (half hourly)

Whole Installation

See Notes in Cell Q3

mg/Nm <sup>3</sup>	1/2 Hourly Reference Periods			Daily Reference Periods		
	1/2 hourly CO ELV	Monthly 1/2 hourly mean	Highest 1/2 hourly maximum	Daily CO ELV	Monthly daily mean	Highest daily maximum
2023						
Jan	100			50		
Feb	100			50		
Mar	100			50		
Apr	100			50		
May	100			50		
Jun	100			50		
Jul	100			50		
Aug	100			50		
Sep	100			50		
Oct	100			50		
Nov	100			50		
Dec	100			50		



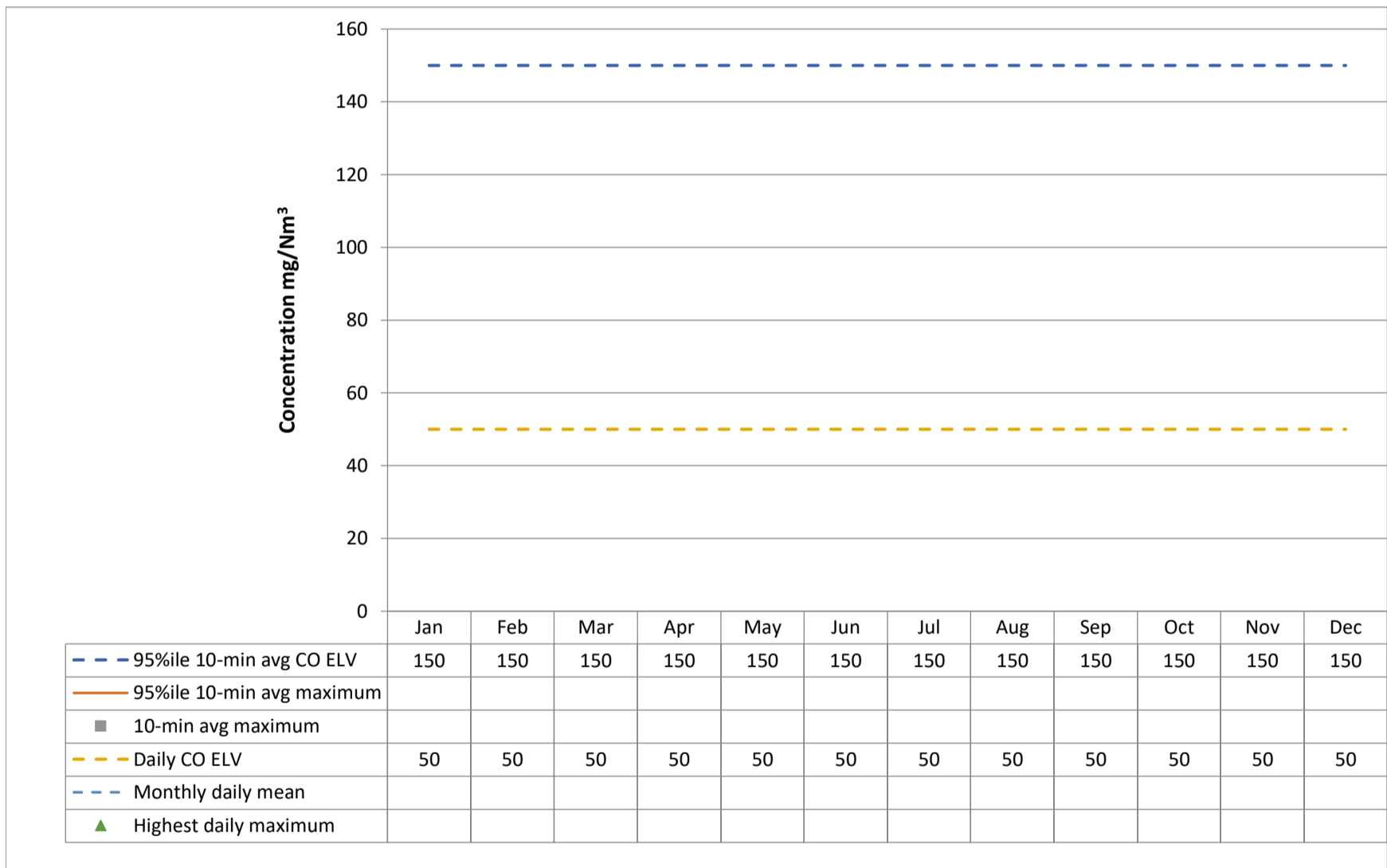
**Comments :**  
 The site did not process any wastes during 2023 and so no monitoring was undertaken.

Monitoring of Carbon Monoxide (10-minute avg)

Whole Installation

See Notes in Cell S3

mg/Nm <sup>3</sup>	10-minute Reference Periods				Daily Reference Periods		
	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
2023							
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 :**

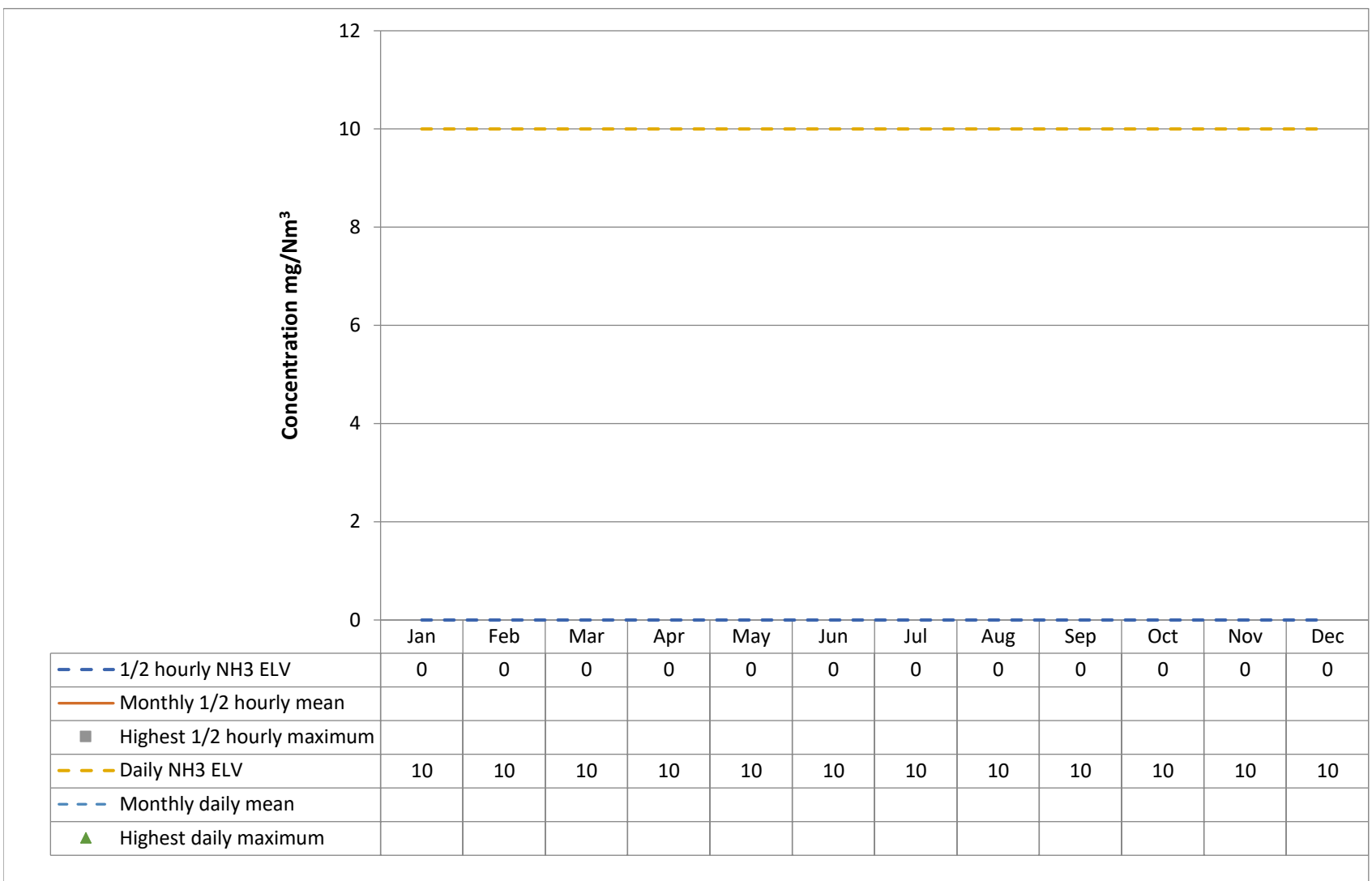
Environment Agency explanatory note: The 10-minute average ELV is based on the “95th percentile”. In this case this means that 95% of the 10 minute averages in the relevant 24-hour period (i.e. 137) must be below 150 mg/Nm3, and 5% (i.e. 7) are allowed to be any value above 150 mg/Nm3. Whilst we expect 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.

Monitoring of Ammonia emissions

Whole Installation

See Notes in Cell Q3

mg/Nm <sup>3</sup>	1/2 Hourly Reference Periods			Daily Reference Periods		
	1/2 hourly NH3 ELV	Monthly 1/2 hourly mean	Highest 1/2 hourly maximum	Daily NH3 ELV	Monthly daily mean	Highest daily maximum
2023						
Jan	0			10		
Feb	0			10		
Mar	0			10		
Apr	0			10		
May	0			10		
Jun	0			10		
Jul	0			10		
Aug	0			10		
Sep	0			10		
Oct	0			10		
Nov	0			10		
Dec	0			10		



**Comments :**  
 An indicated ELV value of zero in the table above means that no ammonia limit is set in the permit.  
 The site did not process any wastes during 2023 and so no monitoring was undertaken.