Annual performance report for: **Margam Green Energy Limited**

Permit Number: EPR/DP3137EG

Year: 2021

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.

1. Introduction

Name and address of plant	Margam Green Energy Limited, Land Off Longlands Lane, (Heol Cae'r Bont) Margam, Port Talbot, Neath Port Talbot SA12 2NU
Description of waste input	Waste wood- Biomass 19 12 07
Operator contact details if members of the public have any questions	General Manager 01639 508 810

2. Plant description

Margam Green Energy consists of a biomass-fuelled electricity generating station located in Margam, Port Talbot. The plant consists of a single boiler that combusts non-hazardous biomass fuel to produce steam. The biomass fuel consists of waste wood sourced from commercial, industrial, construction and demolition waste streams. The biomass fuel is delivered to the site in the form of pre-processed wood chips. The plant can process up to 335,000 tonnes per annum of biomass fuel.

3. Summary of Plant Operation

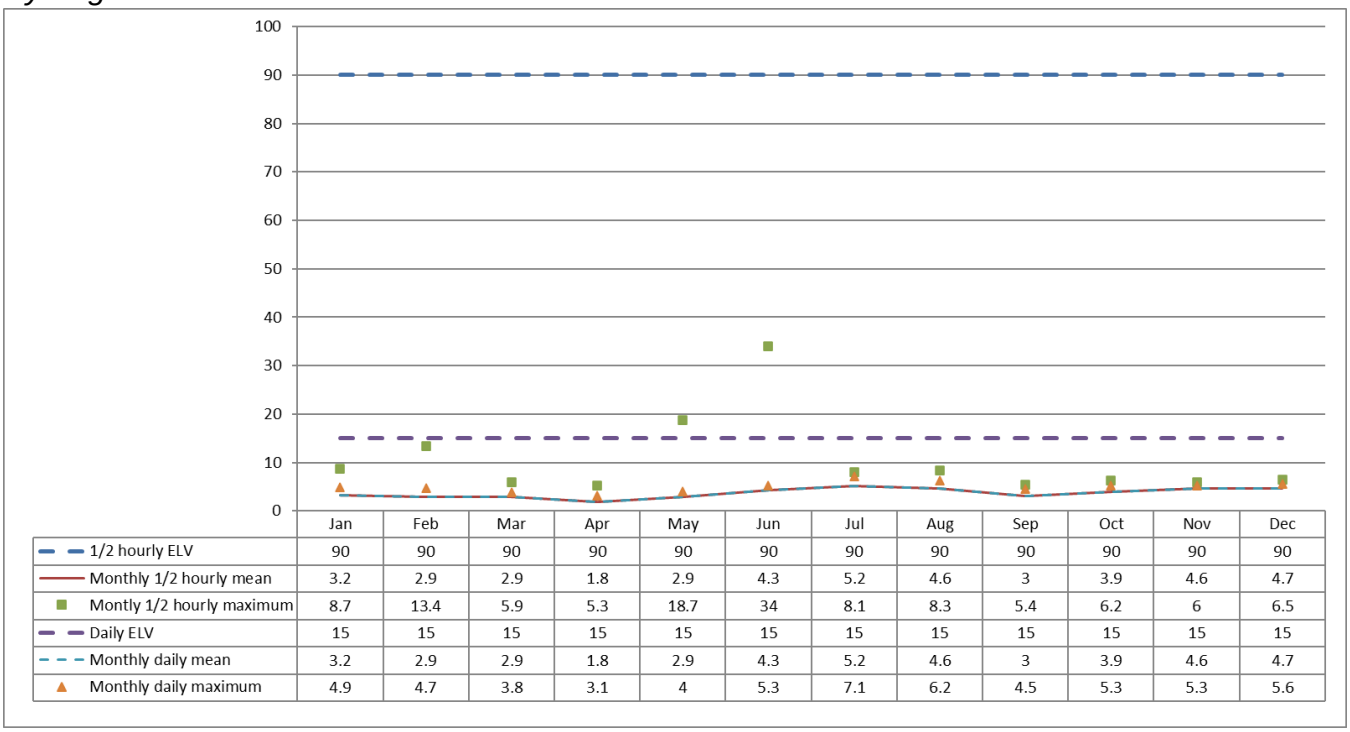
Waste wood (biomass) received	275,341 tonnes
Total waste received	275,341 tonnes
Total plant operational hours	7360.5 hours
Total hours of “abnormal operation” (see permit for definition)	0 hours
Total quantity of incinerator bottom ash (IBA) produced	13,854 tonnes
Disposal or recovery route for IBA	D05.03 Hazardous waste landfill
Did any batches of IBA test as hazardous? If yes, state quantity	Currently catalogued as hazardous waste
Total quantity of air pollution control (APC) residues produced	3,119 tonnes
Disposal or recovery route for APC residues	D05.03 Hazardous waste landfill
Total electricity generated for export to the National Grid	270,668 MWh

4. Summary of Plant Emissions

4.1 Summary of continuous emissions monitoring results for emissions to air

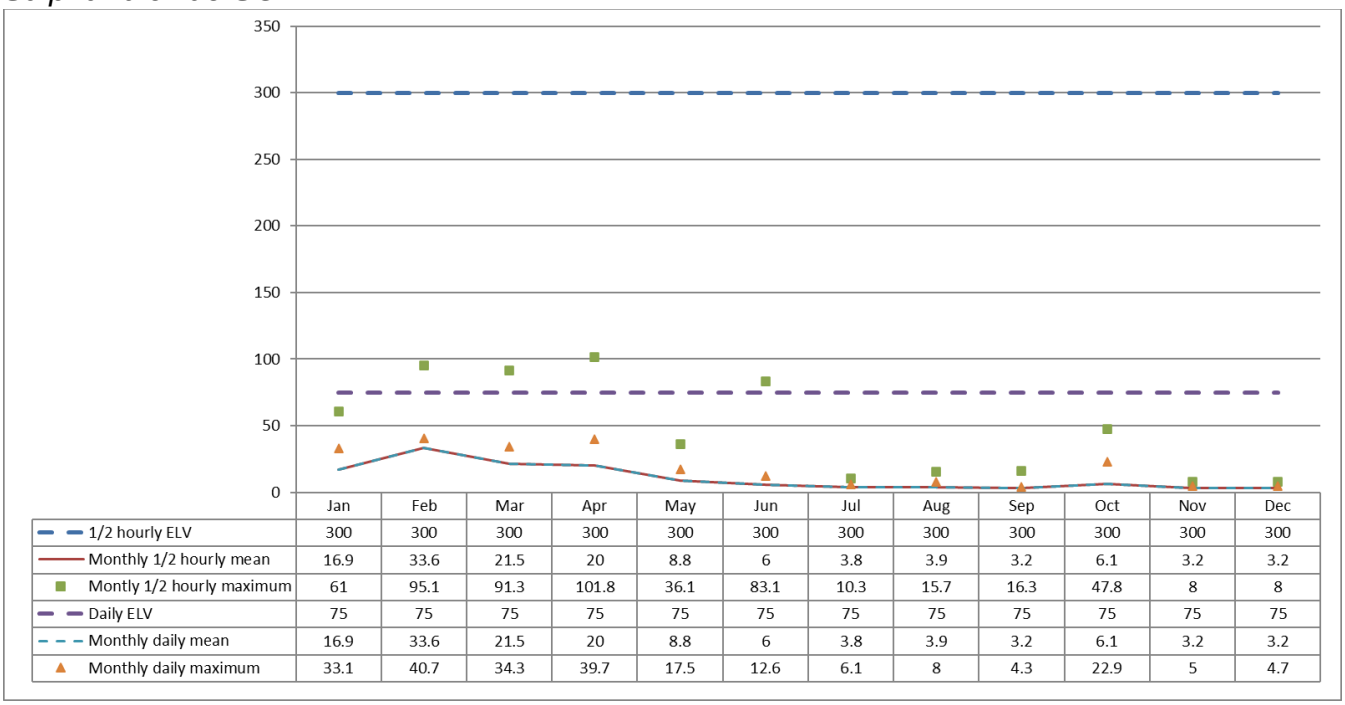
The following charts show the performance of the plant against its emission limit values (ELVs) for substances that are continuously monitored.

Hydrogen chloride HCL



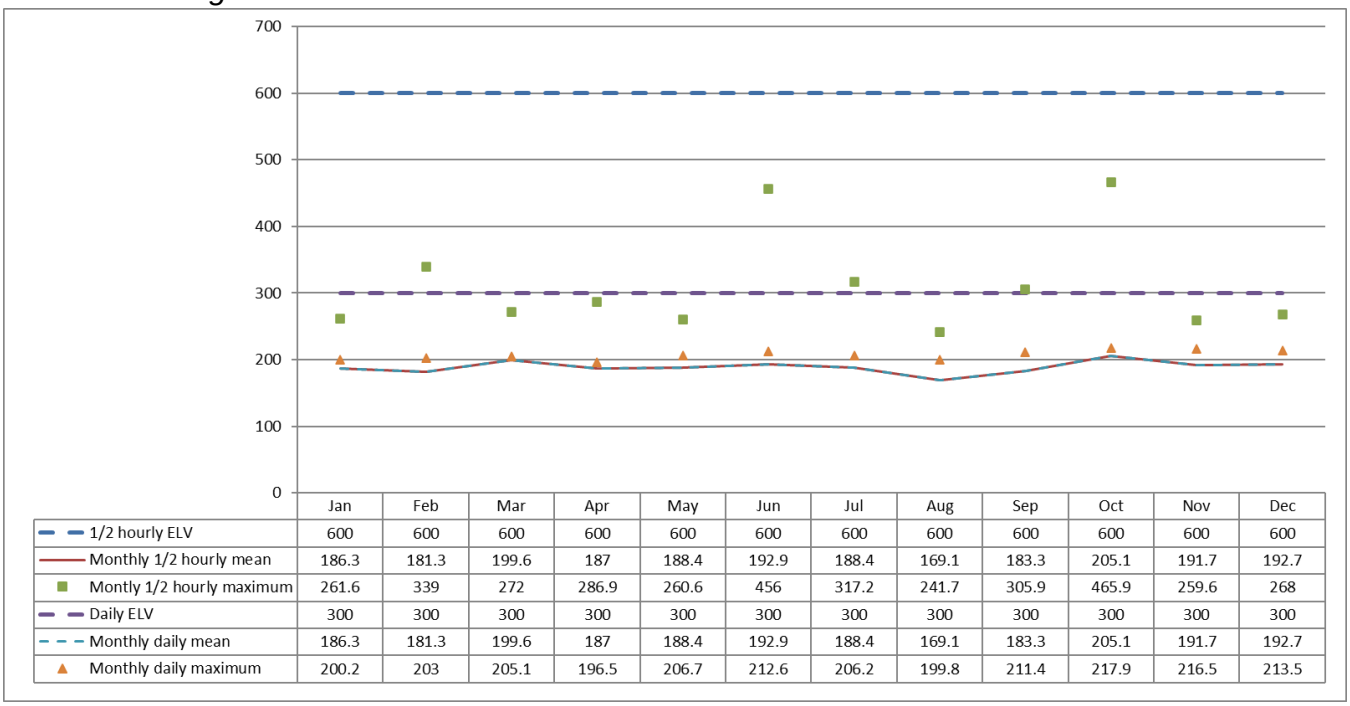
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1/2 hourly ELV	90	90	90	90	90	90	90	90	90	90	90	90
Monthly 1/2 hourly mean	3.2	2.9	2.9	1.8	2.9	4.3	5.2	4.6	3	3.9	4.6	4.7
Montly 1/2 hourly maximum	8.7	13.4	5.9	5.3	18.7	34	8.1	8.3	5.4	6.2	6	6.5
Daily ELV	15	15	15	15	15	15	15	15	15	15	15	15
Monthly daily mean	3.2	2.9	2.9	1.8	2.9	4.3	5.2	4.6	3	3.9	4.6	4.7
Monthly daily maximum	4.9	4.7	3.8	3.1	4	5.3	7.1	6.2	4.5	5.3	5.3	5.6

Sulphur dioxide SO2



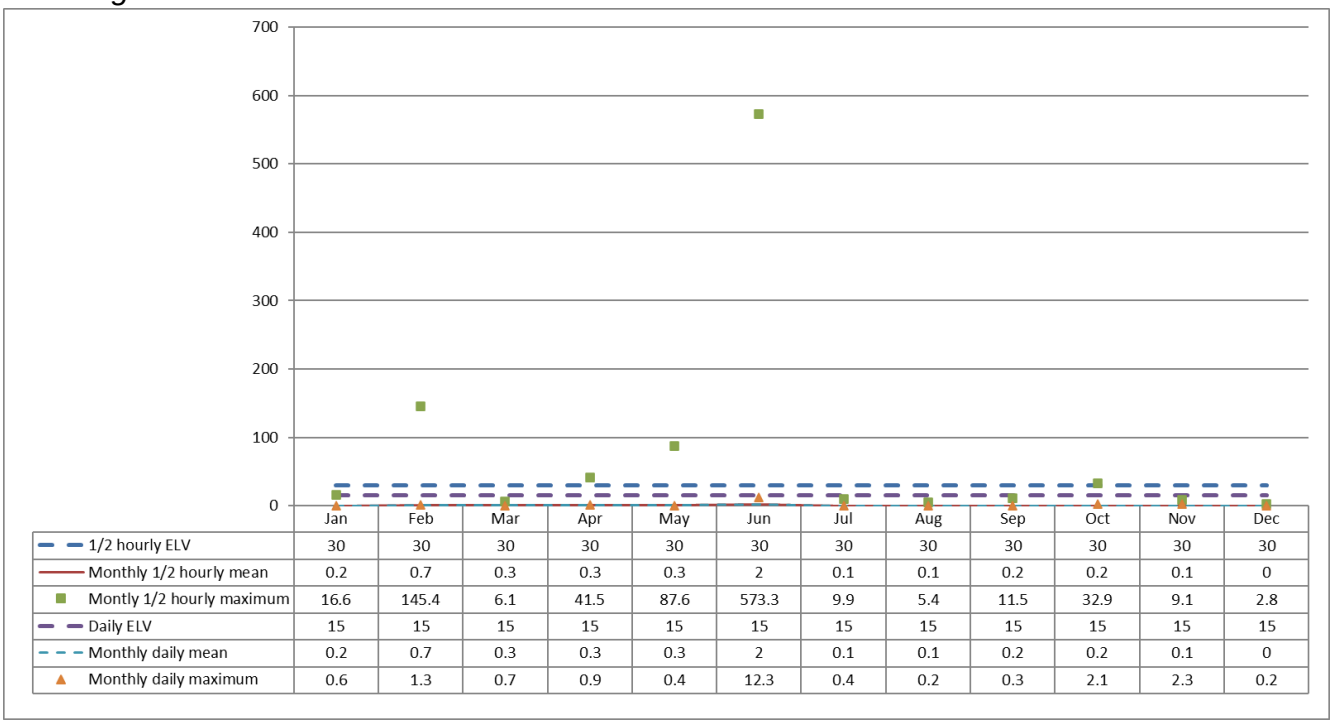
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1/2 hourly ELV	300	300	300	300	300	300	300	300	300	300	300	300
Monthly 1/2 hourly mean	16.9	33.6	21.5	20	8.8	6	3.8	3.9	3.2	6.1	3.2	3.2
Montly 1/2 hourly maximum	61	95.1	91.3	101.8	36.1	83.1	10.3	15.7	16.3	47.8	8	8
Daily ELV	75	75	75	75	75	75	75	75	75	75	75	75
Monthly daily mean	16.9	33.6	21.5	20	8.8	6	3.8	3.9	3.2	6.1	3.2	3.2
Monthly daily maximum	33.1	40.7	34.3	39.7	17.5	12.6	6.1	8	4.3	22.9	5	4.7

Oxides of nitrogen NOx



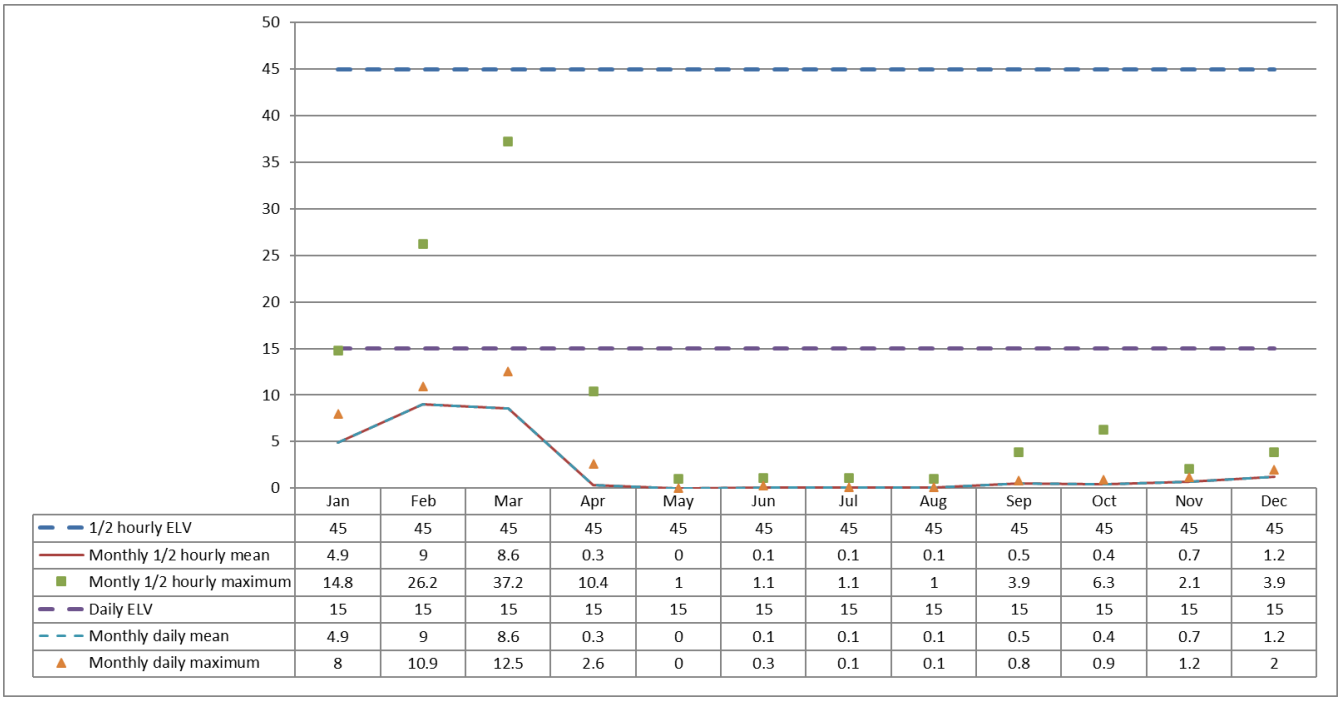
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1/2 hourly ELV	600	600	600	600	600	600	600	600	600	600	600	600
Monthly 1/2 hourly mean	186.3	181.3	199.6	187	188.4	192.9	188.4	169.1	183.3	205.1	191.7	192.7
Montly 1/2 hourly maximum	261.6	339	272	286.9	260.6	456	317.2	241.7	305.9	465.9	259.6	268
Daily ELV	300	300	300	300	300	300	300	300	300	300	300	300
Monthly daily mean	186.3	181.3	199.6	187	188.4	192.9	188.4	169.1	183.3	205.1	191.7	192.7
Monthly daily maximum	200.2	203	205.1	196.5	206.7	212.6	206.2	199.8	211.4	217.9	216.5	213.5

Total organic carbon TOC



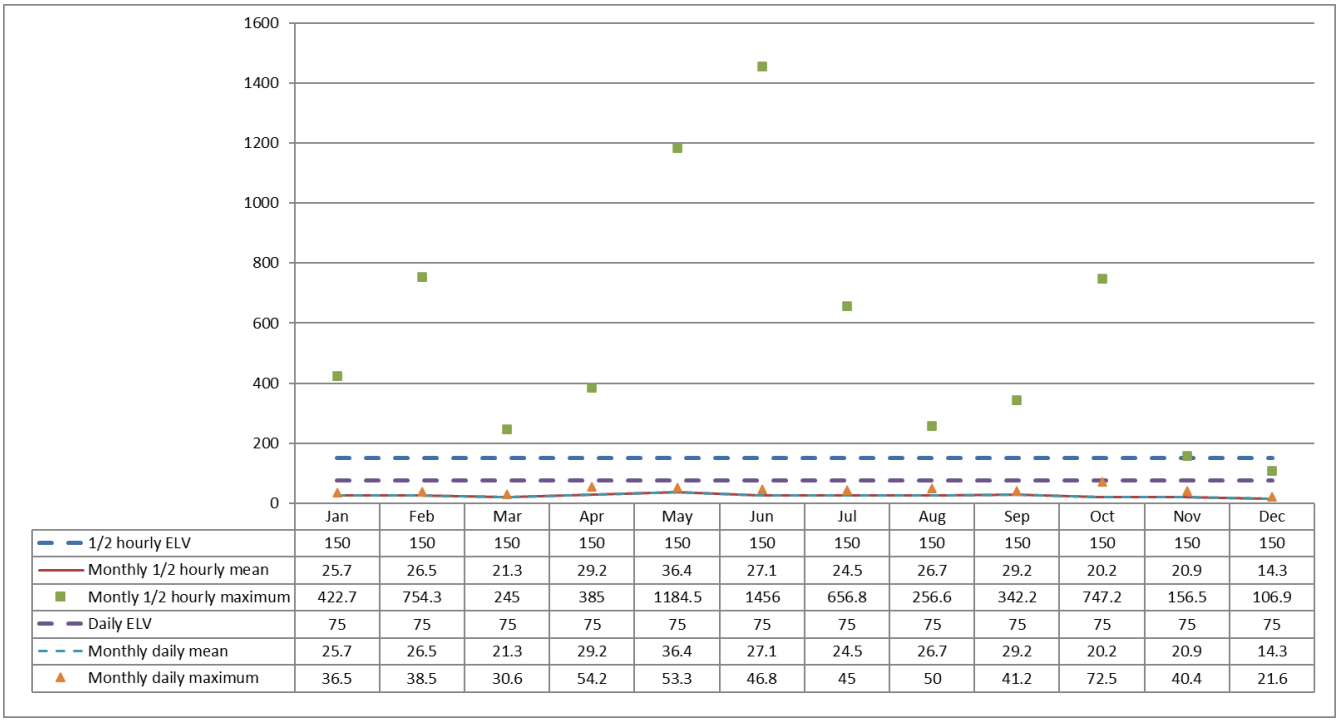
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1/2 hourly ELV	30	30	30	30	30	30	30	30	30	30	30	30
Monthly 1/2 hourly mean	0.2	0.7	0.3	0.3	0.3	2	0.1	0.1	0.2	0.2	0.1	0
Montly 1/2 hourly maximum	16.6	145.4	6.1	41.5	87.6	573.3	9.9	5.4	11.5	32.9	9.1	2.8
Daily ELV	15	15	15	15	15	15	15	15	15	15	15	15
Monthly daily mean	0.2	0.7	0.3	0.3	0.3	2	0.1	0.1	0.2	0.2	0.1	0
Monthly daily maximum	0.6	1.3	0.7	0.9	0.4	12.3	0.4	0.2	0.3	2.1	2.3	0.2

Particulates



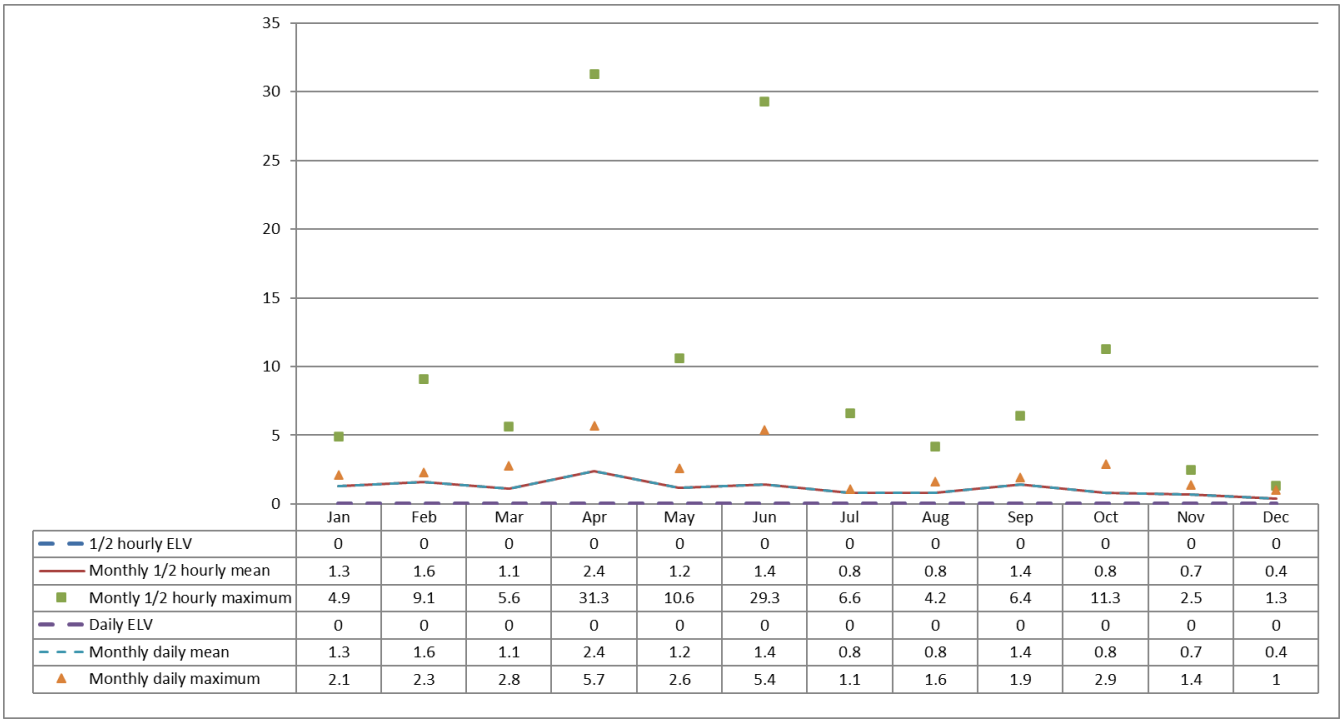
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1/2 hourly ELV	45	45	45	45	45	45	45	45	45	45	45	45
Monthly 1/2 hourly mean	4.9	9	8.6	0.3	0	0.1	0.1	0.1	0.5	0.4	0.7	1.2
Montly 1/2 hourly maximum	14.8	26.2	37.2	10.4	1	1.1	1.1	1	3.9	6.3	2.1	3.9
Daily ELV	15	15	15	15	15	15	15	15	15	15	15	15
Monthly daily mean	4.9	9	8.6	0.3	0	0.1	0.1	0.1	0.5	0.4	0.7	1.2
Monthly daily maximum	8	10.9	12.5	2.6	0	0.3	0.1	0.1	0.8	0.9	1.2	2

Carbon monoxide CO



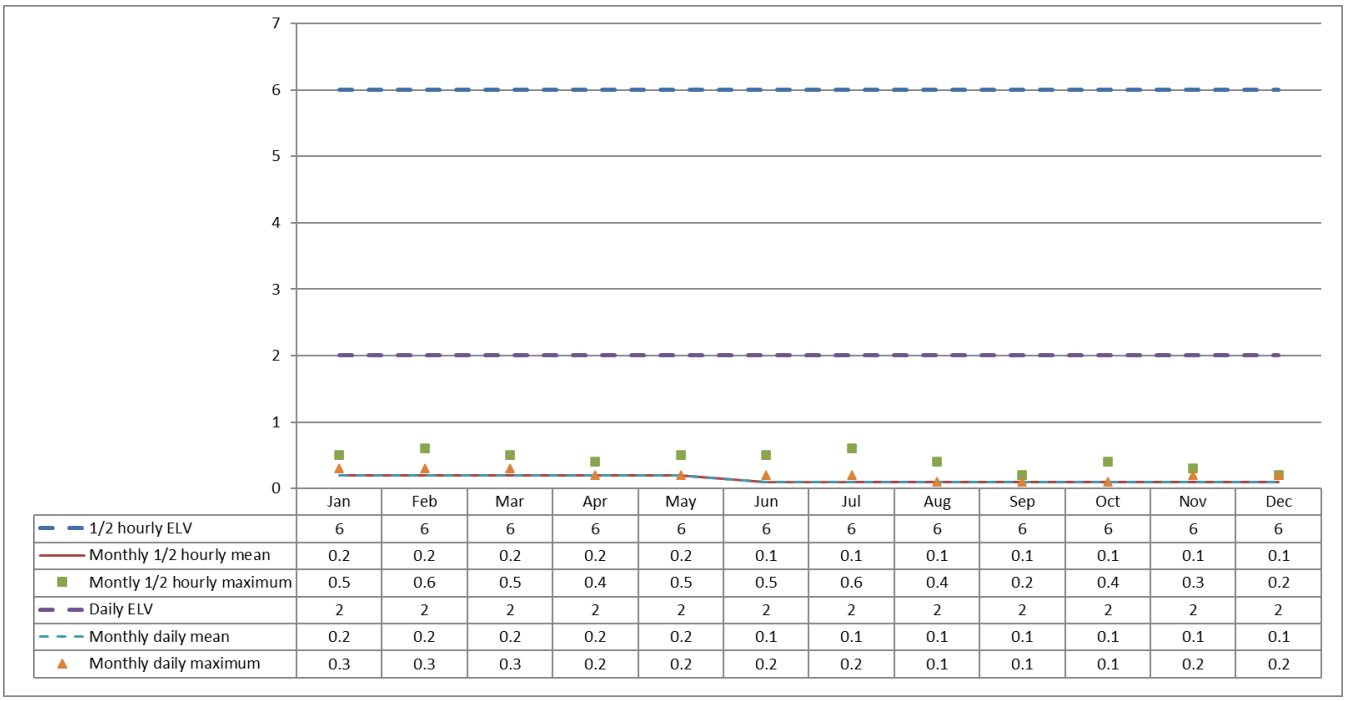
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1/2 hourly ELV	150	150	150	150	150	150	150	150	150	150	150	150
Monthly 1/2 hourly mean	25.7	26.5	21.3	29.2	36.4	27.1	24.5	26.7	29.2	20.2	20.9	14.3
Montly 1/2 hourly maximum	422.7	754.3	245	385	1184.5	1456	656.8	256.6	342.2	747.2	156.5	106.9
Daily ELV	75	75	75	75	75	75	75	75	75	75	75	75
Monthly daily mean	25.7	26.5	21.3	29.2	36.4	27.1	24.5	26.7	29.2	20.2	20.9	14.3
Monthly daily maximum	36.5	38.5	30.6	54.2	53.3	46.8	45	50	41.2	72.5	40.4	21.6

Ammonia NH3



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1/2 hourly ELV	0	0	0	0	0	0	0	0	0	0	0	0
Monthly 1/2 hourly mean	1.3	1.6	1.1	2.4	1.2	1.4	0.8	0.8	1.4	0.8	0.7	0.4
Montly 1/2 hourly maximum	4.9	9.1	5.6	31.3	10.6	29.3	6.6	4.2	6.4	11.3	2.5	1.3
Daily ELV	0	0	0	0	0	0	0	0	0	0	0	0
Monthly daily mean	1.3	1.6	1.1	2.4	1.2	1.4	0.8	0.8	1.4	0.8	0.7	0.4
Monthly daily maximum	2.1	2.3	2.8	5.7	2.6	5.4	1.1	1.6	1.9	2.9	1.4	1

Hydrogen fluoride HF



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1/2 hourly ELV	6	6	6	6	6	6	6	6	6	6	6	6
Monthly 1/2 hourly mean	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Montly 1/2 hourly maximum	0.5	0.6	0.5	0.4	0.5	0.5	0.6	0.4	0.2	0.4	0.3	0.2
Daily ELV	2	2	2	2	2	2	2	2	2	2	2	2
Monthly daily mean	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Monthly daily maximum	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.2

4.2 Summary of periodic monitoring results for emissions to air

The table below shows the results of periodically monitored substances.

Substance	Emission limit value	Results	
		B1 June 2021	B2 Dec 2021
Mercury and its compounds	0.05 mg/m^3	0.00088 mg/m^3	0.00092 mg/m^3
Cadmium & thallium and their compounds (total)	0.05 mg/m^3	0.0010 mg/m^3	0.00091 mg/m^3
Sb, As, Pb, Cr, Co, Cu, Mn, Ni and V and their compounds (total)	0.5 mg/m^3	0.035 mg/m^3	0.045 mg/m^3
Dioxins and furans (I-TEQ)	0.1 ng/m^3	0.037 ng/m^3	0.022 ng/m^3

5. Summary of Permit Compliance

5.1 Summary of any notifications or non-compliances under the permit

Date	Summary of notification or non-compliance	Reason	Measures taken to prevent reoccurrence
13/04/2021	Notification CO 30min breach of 150.3mg/Nm3 07/04/2021 between 11:29 & 11:59.	Combustion tuning in progress	Operator adjusted plant parameters to return emissions to normal levels
13/04/2021	Notification CO 30min breach of 281.3mg/Nm3 08/04/2021 between 07:29 & 07:59.	Combustion tuning in progress	Operator adjusted plant parameters to return emissions to normal levels
13/04/2021	Notification CO 30min breach of 210.6mg/Nm3 09/04/2021 between 10:29 & 10:59.	Combustion tuning in progress	Operator adjusted plant parameters to return emissions to normal levels
30/04/2021	Notification 3 x CO 30min breach of - 158.5 mg/Nm3 06:59-07:29 -160 mg/Nm3 09:29-09:59 -172.9 mg/Nm3 09:59-10:29	Combustion tuning in progress	Operator adjusted plant parameters to return emissions to normal levels
10/05/2021	Notification CO 30min breach of	Combustion tuning in progress	Operator adjusted plant parameters to return

	181mg/Nm3 07/05/2021 between 09:29 & 09:59		emissions to normal levels
17/05/2021	Notification CO 30min breach of 179mg/Nm3 14:29-14:59 14/5/21 195.3mg/Nm3 17:59-18:29 14/5/21 206.6mg/Nm3 12:29-12:59 15/5/21 167.7mg/Nm3 15:29-15:59 15/5/21 289.1mg/Nm3 08:29-08:59 16/5/21.	Combustion tuning in progress	Operator adjusted plant parameters to return emissions to normal levels
20/05/2021	Notification CO 30min breach of 200.8mg/Nm3	Combustion tuning in progress	Operator adjusted plant parameters to return emissions to normal levels
25/05/2021	Notification CO 30min breach of 222.9mg/Nm3	Combustion tuning in progress	Operator adjusted plant parameters to return emissions to normal levels
21/06/2021	Notification CO 30min breach of 416.1mg/Nm3 19/06/2021 between 00:29- 00:59. TOC 30min breach of 279.8mg/Nm3 19/06/2021 01:29-01:59	Combustion tuning in progress	Operator adjusted plant parameters to return emissions to normal levels
15/07/2021	Notification CO 30min reach of 214.6mg/Nm3 on 14/07/2021 between 18:29 & 18:59.	Issue believed to be due to a short term fuel quality issue	ongoing communication with fuel supplier to ensure fuel quality is within specification. Fuel quality management plan in place.
16/07/2021	Notification CO 30min reach of 196mg/Nm3 on 15/07/2021 between 02:59-03:29.	Issue believed to be due to a short term fuel quality issue	ongoing communication with fuel supplier to ensure fuel quality is within specification. Fuel quality management plan in place.
13/08/2021	Notification CO 30min reach of 175.6mg/Nm3 on 12/08/2021 between 11:29-11:59.	Issue was due to a technical fault on a running fuel conveyor system. Compliant under permit reporting conditions	Operator reviewing event to apply lessons learned to operating procedures for any future similar techical issues
24/08/2021	Notification 30min CO breach 256.6mg/Nm3 23/08/2021 half-hour	Unstable combustion	Operating procedure re-issued to operators and

	between 15:59 - 16:29		lower elv alarm limits added into CEMS
27/09/2021	Notification 30min CO breach 176.9mg/Nm3 27/09/2021 half-hour between 09:29 - 09:59	Breakdown of the wet ash conveyor system. Compliant under permit reporting conditions	Breakdown issue resolved and plant operations returned to normal.
21/10/2021	Notification 30min CO ELV 493.2mg/Nm3 19/10/2021 half-hour between 10:29 - 10:59	Plant tripped due to an electrical fault. Compliant under permit reporting conditions	Full shut down procedure carried out. VSD overhaul 2022 as long term preventative action
25/10/2021	Notification CO 30min breach of 486.4mg/Nm3 TOC 30min breach of 279.8mg/Nm3 on 24/10/2021 between 00:59- 01:29.	The issue occurred during plant start-up. Compliant under permit reporting conditions	Operator adjusted plant parameters to return emissions to normal levels
01/11/2021	Notification 30min CO breach 231.7mg/Nm3 31/10/2021 half-hour between 17:59 - 18:29	Plant trip caused by WPD network disruption. Compliant under permit reporting conditions	Operator adjusted plant parameters to return emissions to normal levels
10/11/2021	Notification 09/11/2021 30min CO breach 9/11/2021 between 23:29 and 23:59.	Unstable combustion	Operator adjusted plant parameters to return emissions to normal levels

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

Date of complaint	**Summary of complaint**	**Reason for complaint including whether substantiated by the operator or the EA**	**If substantiated, measures to prevent reoccurrence**
	None		

6. Summary of plant improvements

Summary of any permit improvement conditions that have been completed within the year and the resulting environmental benefits.
The following improvement conditions were completed during 2021: • IC1- EMS 14001- Implementation and accreditation by December 2022. Resulting benefits: To help identify areas of environmental improvement through an aspect and impacts assessment. Findings will contribute to the setting of monitorable objectives and targets. • IC2- PM10 and PM2.5- Report on the size distribution of particulates in gas emissions to air to demonstrate compliance with the environmental permit. Resulting benefits: To ensure environmental compliance and control the impacts associated with emissions to air. • IC3-Environmental Performance- Report on environmental performance as installed against design parameters as described in the permit application submission, along with a review of the facility performance against the permit conditions and development of operational procedures demonstrating compliance.Resulting benefits: To enures all emissions are as per design specification, minimise waste production and control of emissions to air, ensuring minimal impacts on land, air and the local environment. • IC4- Residence Time-Operator must demonstrate checks to verify residence time including minimum temperature and oxygen content of the exhaust gasses under favourable operating conditions.Resulting benefits: To set an optimal steady-state for all-round efficiency, reducing the impact on land, air and local environments. • IC5-SNCR Performance- Demonstrate the performance of the Selective Non-Catalytic Reduction System. Resulting benefits: Control of emissions to air, effects on fauna and flora and acid rain from resulting gasses. • IC6-Qual 1,2,3- Demonstrate compliance with CEMS calibration and verification testing. Control of emissions to air. • IC7-Noise- Undertake noise monitoring at local receptors. Control of noise impacts affecting local community and fauna. • IC8-Impact of emissions- To carry out an assessment on the impact of emissions to air, namely metal compositions. Resulting benefits: To ensure environmental compliance and impacts of emissions to air.

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.
None
Summary of any other improvements made to the plant or planned to be made and a summary of the resulting environmental benefits.
A combustion tuning exercise was conducted in order to maximise plant efficiency. In conducting this exercise both CO and TOC were monitored and improvements to overall combustion and results in emissions were observed.