



31st January 2021

[REDACTED],
Scottish Environment Protection Agency, Edinburgh Office
Silvan House,
231 Corstorphine Road,
Edinburgh,
EH12 7AT

Dear [REDACTED],

Pollution Prevention and Control Act 1999
Permit PPC/A/1013494
Condition 4.1.5

Please find enclosed the annual mass and composition to air report as required under Condition 4.1.5 of PPC/A/1013494.

The furnace and gas turbine NO_x and gas turbine SO_x values are obtained using quarterly stack sampling data. All results are consistent with previous year emissions and the plants operational status (full plant shutdown and restart in April and July 2021 respectively).

The elevated and ground flare NO_x and Total Organic Carbon (VOC's) are typically calculated using continuous composition data and flow to flare. If the continuous analyser is unavailable, composition to the flare is determined using engineering calculation based on process conditions and operational state. All results are reduced by comparison to 2020 as a direct result of a decrease in mass of gas flared.

Mass emissions for carbon dioxide (CO₂) are calculated using the approach consistent with the EU ETS Phase IV Monitoring Methodology Plan. As this uses standard methodology for each piece of equipment, it will therefore differ slightly from the EU ETS Phase III data which utilises a mass balance methodology for the site. All results are consistent with the plant operation including full plant shutdown and restart in April and July 2021 respectively.

Total hydrogen sulfide mass emissions from the feed treatment unit venting are calculated by using a conservative H₂S concentration against total volume vented. All offgas was vented in 2021 as it was unable to be routed via the boilers. H₂S and CO₂ emissions from this emission point were reduced in 2021 due to a combination

of reduced unit throughput and an increased proportion of ethane feed from an alternate source, which is not treated at site.

Please note that a typographic error was detected in the 2020 Condition 4.1.5 report which reported December dilution steam venting VOC's as kilograms as opposed to tonnes. This resulted in an over-statement of dilution steam venting of 3.5tonnes in 2020. VOC vented emissions are consistent with previous years in line with the plant operation including full plant shutdown and restart in April and July 2021 respectively.

Please do not hesitate to get in contact if you require any further information.

Yours sincerely,

[REDACTED]

[REDACTED]

CC: [REDACTED]
[REDACTED]

	K-F-01	K-F-02	K-F-03	K-F-04	K-F-05	K-F-06	K-F-07	Total furnace	Method Used to Calculate NOx Emissions
	NO _x	NO _x	NO _x	NO _x	NO _x	NO _x	NO _x	NO _x	
	(t/quarter)	(t/quarter)	(t/quarter)	(t/quarter)	(t/quarter)	(t/quarter)	(t/quarter)	(t/quarter)	
January	14.7	21.1	36.3	23.9	20.5	24.6	34.6	176	Calculated using quarterly stack monitoring data, Fuel Molecular Weight, and fuel usage.
February									
March									
April	3.1	4.2	5.3	3.2	0.0	3.2	5.2	24	
May									
June									
July	18.2	26.9	37.8	29.4	0.6	22.9	21.4	157	
August									
September									
October	25.3	14.9	35.9	21.7	1.2	18.3	15.8	133	
November									
December									
	TOTAL FURNACE NO _x FOR YEAR 2021 (Tonnes)							490	

Month	Total Organic Carbon T/month	SO2 from GTE T/quarter	NOx from GTE T/quarter	Method Used to Calculate NOx & SO2 Emissions
Jan	Method to be agreed with SEPA	0.00	123.9	NOx and Sox calculated using quarterly stack sampling data, fuel molecular weight and fuel usage.
Feb				
Mar				
Apr		0.00	20.7	
May				
June				
July		1.70	110.2	
August				
September				
October		3.72	74.2	
November				
December				

2021 Totals (Tonnes)	5.42	329.0
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% of time GTE valve closed to atmosphere	22%
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	Oxides of Nitrogen Emissions to Atmosphere		Method Used to Calculate NOx Emissions
	Elevated Flare	Ground Flare	
MONTH			
Jan-21	0.0	1.4	Calculated using Standard emission factors and Flare tonnages and standard composition
Feb-21	0.1	1.6	
Mar-21	0.0	1.0	
Apr-21	1.3	6.6	
May-21	0.0	1.3	
Jun-21	0.0	48.6	
Jul-21	0.2	68.4	
Aug-21	0.0	0.7	
Sep-21	0.0	1.0	
Oct-21	0.2	1.4	
Nov-21	0.1	1.2	
Dec-21	0.0	1.2	
Total	1.9	134.7	
	Tonnes	Tonnes	

Carbon Dioxide Mass Emissions		Calculation Method
Feed Treatment Unit Vent		
1Q21	19,738	Represents total CO2 inherent in feed which is removed in feed treatment unit.
2Q21	1,766	
3Q21	14,143	
4Q21	4,908	
Total (T)	40,555	

Carbon Dioxide Mass Emissions	
Gas Turbine	
Month	G-GT-20
January	16,616
February	
March	
April	1,825
May	
June	
July	17,676
August	
September	
October	14,235
November	
December	
Total	50,352

	Total furnace CO2 (t/quarter)	Method Used to Calculate CO2 Emissions
January	105,133	Calculated using continuous fuel composition, flow and carbon content (Tag)
February		
March		
April	15,496	
May		
June		
July	92,649	
August		
September		
October	84,033	
November		
December		
TOTAL	297,310	

Carbon Dioxide Mass Emissions		
	Flaring	
	Elevated Flare	Ground Flare
1Q2019	85	4,900
2Q2019	1,270	29,844
3Q2019	197	34,951
4Q2019	340	4,836
Annual Total	1,892	74,531
	TOTAL (T)	76,423

MONTH	Flare VOC's (T/Month)		Method Used to Calculate TOC Emissions
	Elevated Flare	Ground Flare	
Jan-21	0.06	7.92	Calculated as VOC using Standard emission factor and volume flared
Feb-21	0.17	6.89	
Mar-21	0.06	6.19	
Apr-21	2.03	19.04	
May-21	0.06	7.99	
Jun-21	0.05	118.14	
Jul-21	0.24	168.13	
Aug-21	0.06	4.40	
Sep-21	0.06	6.30	
Oct-21	0.38	9.43	
Nov-21	0.24	7.87	
Dec-21	0.12	7.58	
Total	3.51	369.87	
	Tonnes	Tonnes	

	Dilution Steam Vent VOC's	CO Vent VOC's	Method Used to Calculate TOC Emissions
1Q21	0.02	3.49	Calculated as VOC using composition data and amount vented
2Q21	0.35	0.77	
3Q21	0.79	1.08	
4Q21	0.43	1.05	
	1.59	6.38	
	Tonnes	Tonnes	

Date	Tonnes Offgas from S-D-02 in Month	Estimate H2S Vented (Kg)	Reason for Venting
Jan-21	6,751	675.13	During 2021 all offgas was vented from S-D-02 as it was unable to be routed via boilers.
Feb-21	7,298	727.66	
Mar-21	7,905	787.27	
Apr-21	2,178	81.98	
May-21	0	0.00	
Jun-21	732	2.74	
Jul-21	4,093	409.25	
Aug-21	5,480	547.95	
Sep-21	4,898	489.82	
Oct-21	2,631	263.11	
Nov-21	1,072	107.21	
Dec-21	1,436	143.58	
	TOTAL	4,236	