

Introduction

This document is submitted to meet the requirement of section 4.2.2 (a) of the EPR Permit that is for an annual 'review of the results of the monitoring and assessment carried out in accordance with the Permit including an interpretive review of that data'.

Manual Extractive Monitoring

Annual and six monthly monitoring was undertaken, by the prescribed methods, and reported as per the Permit requirements for Emission Points A, C, D, F and G. Any emission breaches were notified under Schedule 5 Part A Notifications with follow up Part B Notifications.

Annual manual monitoring for Emission Point A Cupola Furnace Main Stack, for the parameters of chlorides (as HCl), fluorides (as hydrogen fluoride), hydrogen sulphide and metals (Group 1 and Group 2 as defined in the Permit) are measured in triplicate. The results recorded for these parameters are consistently low by comparison and consistently below their respective emission limit values, with the exception of chlorides. A breach of HCl was reported with the results of the triplicate monitoring being 33.9mg/Nm³, 23.7mg/Nm³ and 28mg/Nm³ against a limit of 10mg/m³. The 2016 results were lower than the monitoring results for 2015.

Whilst investigatory work is on-going to find the source of the high HCl, Knauf Queensferry commissioned Amec Foster Wheeler to undertake detailed dispersion modelling to update a previous modelling study (2010) with more recent process emissions data (from 2015) for the main stack. The modelling demonstrated that no exceedances of statutory air quality standards or non-statutory guideline values were predicted to occur at nearby human receptor locations due to emissions from the main stack, based on 2015 monitored levels. In this regard, significant effects on air quality were considered unlikely.

For Emission Point C Mainline Forming Stack, there is a six monthly monitoring requirement to determine, by triplicate measurement, particulate, volatile organic compounds (as carbon) (VOCs), ammonia, formaldehyde, phenol and amines. The first monitoring visit, undertaken in June 2016, recorded results in excess of the emission limit value for particulates and ammonia on each of the three tests. To ensure compliance, a re-test for particulates and ammonia, by triplicate measurement, was undertaken on 18th August 2016 and all recorded results were below the emission limit values for both parameters.

The second monitoring visit undertaken in October 2016 recorded results below the emission limit values for all parameters.

For Emission Points D, F and G, there is an annual monitoring requirement to determine, by triplicate measurement, particulate, VOC as C, ammonia, formaldehyde, phenol and amines. There are no permit limits applied to Emission Point "D" Binder Plant Local Exhaust Ventilation; however, the monitoring results are considered to be low (below the laboratory analytical detection limit for amines and phenol; an average of <2mg/Nm³ for particulates; an average of <2.5 for VOCs; an average of <0.3mg/Nm³ for formaldehyde and an average of <104 mg/Nm³ for ammonia) and comparable with historic annual data.

With respect to Emission Point F Mainline Oven Oxidiser, all of the parameters returned results lower than the permitted emission limit values. Work to improve the performance of the curing oven is continuous.

With respect to Emission Point G Mainline Cooling Zone, all of the parameters tested in the 2016 monitoring round returned results lower than the permitted emission limit values. Previous testing has shown breaches in emission limits for ammonia and particulate matter and design improvements

were proposed and implemented within the Line Widening Project and planned maintenance works undertaken in November 2016, which encompassed:

- Removal of oven door seals and replacement with new to reduce the amount of ammonia being entrained within the cooling zone emissions.
- The extraction point from the cooling zone suction box was relocated centrally underneath the line to give more uniform air flow, hence more uniform cooling, and potentially less fibre drawn from the product as a result, thus reducing particulate matter.

Continuous Emissions Monitoring (CEMs)

A differential optical attenuation spectroscopy (DOAS) system, working in both infrared and ultraviolet light, is employed for direct measurement of carbon monoxide, oxides of nitrogen and oxides of sulphur with particulate monitoring by triboelectric probe. To enable continuous correction to the required conditions of NTP at 8% oxygen and dry gas the equipment monitors Hydrogen Sulphide, Oxygen, temperature, barometric pressure and also flowrate to enable mass emission calculations. The equipment is serviced and calibrated, by technicians from the equipment suppliers, every six months using certified gases for the gas calibrations.

The availability rate of data from the CEMs has been calculated at greater than 98% for all determinands whilst operating under normal conditions.

The CEMs data for Emission Point A Cupola Stack After Oxidiser are reported quarterly in monthly summaries as required by the Permit. The validated data demonstrates compliance with the limits, enables reporting of un-authorised releases and the calculation of period averaged concentration data and mass emission values.

Storm Water

For storm water, the concentrations of suspended solids, pH and chemical oxygen demand (COD) are measured on a six monthly basis as required by the Permit from each of the four release points referenced as L3 to L6 that are discharging.

During 2016, the storm water sampling was undertaken during the Months of February and November and samples were analysed by an independent, UKAS accredited laboratory. The Permit does not impose any limits on the discharge of the stated parameters, however, the analytical results for both monitoring periods are generally within the expected ranges normally seen for storm water discharges from the site. The results for COD ranged from below the laboratory analytical detection limit (February 2016) and 83.6mg/l (November 2016); pH results ranged between 6.73 (November 2016) and 7.99 (February 2016); and suspended solids from below the laboratory analytical detection limit (February 2016) to 106mg/l (November 2016).

Conclusion

Process emissions are monitored in accordance with the Permit requirements and show that the controls and abatement normally result in the emissions being maintained within permitted limits. Where there are problems with un-authorised emissions, equipment breakdown and/or other unforeseen situations, every effort is made to ensure the plant regains compliance as soon as is possible within practical timescales.

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