Industry & Waste Regulation Team
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Date: 31st January 2022

Subject: Solutia UK Ltd, Newport Chemical Complex – EPR Permit Number: BR9715IB
Permit Condition 4.2.2 – Annual Activity Performance Review

4.2.2 A report or reports on the performance of the activities over the previous year shall be submitted to NRW by 31st January (or other date agreed in writing by NRW) each year. The report(s) shall include as a minimum:

- *(a) a review of the results of the monitoring and assessment carried out in accordance with the permit including an interpretive review of that data;*
- *(b) the annual production / treatment data set out in schedule 4 table S4.2;*
- *(c) the performance parameters set out in schedule 4 table S4.3 using the forms specified in table S4.4 of that schedule*

As such the following should serve as interpretive commentary on the annual Permit forms submitted for the preceding years performance

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Table S4.1 - Reporting of Monitoring Data

Emissions to Air

Throughout 2021, Boiler 16 (main duty boiler) continued to operate in CHP configuration in conjunction with the Gas Turbine unit – although there was an extended annual outage period during which time the backup Boiler 14 unit was in operation in excess of the permitted 14 days (due to the need for unforeseen additional repairs). This was Notified as being outside of Permit conditions, and a non-compliant NOx spot test was also reported for this period. Otherwise all emissions were within the respective NOx & CO emission limits, and the Condensing Economizer (waste heat recovery unit) continued to operate throughout the majority of the year

Chloromethane emissions from the Dequest operation were comparable to previous years, with the spot samples continuing to be somewhat non-consistent due to the range of manufacturing variables. The main factors at play are thought to be; raw material specification, and product grade type – the former considered as being the principle parameter. However direct correlations could not be determined from this process dataset. For information & context however, the raw material in question was within the very tight specification throughout the year, and the most impactful grade amounted to ~20% of the product-mix. The HCl emissions test was also within specification as per previous years.

Benzene is released from the 'bulk' and 'day-tank' Benzene storages via conservation vents. As vapour return is utilized when filling, the main cause of releases to atmosphere are breathing losses i.e. when the temperature fluctuates (day & night) a quantity of benzene vapour is released. The Benzene day-tank has not been in use for any part of the 2021 (currently monthballed), and so the bulk storage is the only point source emission. This in conjunction with no spillage / release events being Notified, is reflected in the slightly lower emissions for the period

Emissions from the Therminol Pyrolysis Furnaces have been subject to a Permit Improvement Item for NOx due to elevated emissions having been observed. As advised in previous annual report, the TH2 furnace having undergone a burner upgrade has been compliant for NOx since implementation, and the x2 TH3 furnace upgrade project(s) are now scheduled to be completed in 2022 - albeit the exact timing of the projects being dependant on the availability of key equipment amid global shortages. The benzene emissions from these Pyrolysis furnaces were found to be typically low, and the smaller Biphenyl & Santowax furnaces on TH3 were similarly compliant with the NOx limits throughout the year

Emissions to Water

Emissions to water were reported on a quarterly basis for the permit listed parameters. There were no breaches to any emission limit throughout 2021. There were however x2 Notifications submitted for integrity issues on the main effluent discharge line thus necessitating repairs. One of these was on-site and another off-site – the latter also resulting in a small duration of effluent discharge outside of the 'cease discharge' window whilst these repairs were conducted amid heavy rainfall. To alleviate the risk of a similar recurrence, the lining / replacement of pipework sections is planned to take place in 2022

Greater Crested Newts

GCN's (Greater Crested Newts) reporting was done in 2018, and survey reporting is on a 5year cycle. As such, there is nothing additional to report presently

Table S4.2 – Annual Production / Treatment

Production of Chemicals

Production tonnage was reported in the annual Permit Returns, and for 2021 amounted to 103919 tonnes, this being an increase of ~10% compared to the previous year. External factors at play continue to be those related to; Brexit, Covid, and supply chain impacts

Table S4.3 – Performance Parameters

Effluent COD

The P1 Returns form shows ongoing COD emissions expressed as kg/t. This is a slight reduction, but broadly comparable to recent years - The observable step-change increase in 2017 corresponding to the mothballing of the Bio-Treatment Plant that year, in line with cessation of the Santicizer operation

Effluent Toxicity

Effluent Toxicity (NOEC) has not been monitored or reported since 2015 following the end of an agreed toxicity monitoring campaign in 2014. This showed that with both; the Formose Plant, and the Bio-Treatment plant operating (treating formaldehyde & phenol respectively), the toxicity level was deemed insignificant

VOC

As per the other metrics, VOC kg/t is similarly tracked over time, and the results are comparable over the measurement period. An additional decimal place has been quoted since 2015, which gives a number for comparison rather than a <0.1 kg/t stated previously

PCOP

PCOP (Photochemical Ozone Creation Potential) shows a general longer term declining trend, but with relatively consistent values in recent years

Table S4.4 – Reporting Forms

Air

Refer to 'Table S4.1 – Reporting of Monitoring Data' 'Emissions to Air' section(s) above

Air (Annual Releases)

Oxides of Nitrogen are quoted using the established methodology and is within the 20000 kg annual emission limit. Refer also to the 'Emissions to Air' section above which outlines the issues relating to NOx - As reported previously, some NOx emissions issues have been resolved in recent years (i.e. CHP, TH2 Pyrolysis furnace, and the smaller Therminol furnaces). The TH3 Pyrolysis furnaces are scheduled to commence burner upgrades in 2022 (delayed from 2021), as per the respective Permit Improvement Condition

Oxides of Sulpher are not reported, but justification is given on the A2 report form i.e. 'Effectively zero since final burning of HFO in 2012'. Kerosene (with < 0.1% Sulphur) has historically been retained on site as a back-up fuel, however there is currently no stock of kerosene on site

Chloromethane is well within the annual limit and utilizes a rolling average of monitored concentrations. This approach is being applied to help accommodate; historical over-reporting prior to more recent MCertified methods being employed by external monitoring contractor, and also the wide variability in the spot test results

The Benzene figure quoted comprises 'breathing' emissions from the bulk storages. There were no Notifiable releases during the year. The total was within the 800kg annual limit

Water (Combined W1 + W2)

Refer to 'Table S4.1 – Reporting of Monitoring Data' 'Emissions to Water' section(s) above

Waste Return

The main waste arising from the site is Santotar, which continued to be dispatched off-site for subsequent use as Cemfuel®. There was an increase noted in the site t/t waste metric, and this is attributed to a change in the overall site product mix i.e. an increase in the Therminol process throughput of some ~17%

Water Usage

All water to site is via a single metered supply. For 2021 there was comparable consumption compared to the previous year, but nonetheless considered to be elevated as a result of; draining down & refilling of the site Cooling-Water system, and additional feed-water requirements during uncharacteristically hot summer months i.e. placing additional cooling load requirement on the system

Energy

The main site boiler continued to operate in Combined Heat & Power configuration throughout most of the year - as such all of the (Eastman) net electricity requirements were met via a combination of the, Gas & Wind Turbines. The Condensing Economizer waste heat recovery unit also operated well throughout the year, which served to capture & utilise an appreciable amount of waste heat energy. Further energy efficiency projects are intended to be implemented in 2022, which should further contribute to a betterment of the energy efficiency metrics in line with corporate & site energy & CO2 goals

Performance Indicators

All of the metrics listed on P1 have been detailed in the preceding sections. Thermal efficiency for the CHP has not been quoted as yet, as this is derived from the CHP QA scheme verified annual submission, which (at the time of this report) has yet to be completed for the preceding year

Signed:

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* A subsidiary of Eastman Chemical Company