Permitting Decisions- Variation

We have decided to grant the variation for Stanlow Manufacturing Complex operated by Essar Oil (UK) Limited.

The variation number is EPR/FP3139FN/V015

The permit was issued on 13/03/2025.

The variation covers:

- The installation of a new furnace to replace the three existing atmospheric crude oil furnaces. The new furnace has been selected to achieve lower NOx emissions to comply with the NOx and bubble BAT-AELs.
- Consideration of a further time limited derogation from the NOx BAT-AEL associated with BAT Conclusion 34 of the Refining of Mineral Oil and Gas BAT conclusions for the existing CDU4 furnaces (F201 A/B/C).

We consider in reaching that decision we have taken into account all relevant considerations and legal requirements and that the permit will ensure that the appropriate level of environmental protection is provided.

Purpose of this document

This decision document provides a record of the decision-making process. It

- highlights key issues in the determination
- summarises the decision making process in the decision considerations section to show how the main relevant factors have been taken into account
- explains the reasons for the refusal of the Operator's application for a further time limited derogation from the NOx BAT-AEL associated with BAT Conclusion 34 of the Refining of Mineral Oil and Gas BAT conclusions for the existing CDU4 furnaces (F201 A/B/C).
- explains why we have also made an Environment Agency initiated variation
- shows how we have considered the consultation responses

Unless the decision document specifies otherwise we have accepted the applicant's proposals.

Read the permitting decisions in conjunction with the environmental permit and the variation notice.

Key issues of the decision

The key issues arising during the determination of this variation application are

- The assessment of the potential environmental impact of the replacement furnace.
- The review and assessment of the application for a time limited derogation from meeting BAT conclusion 34 of Best Available Techniques Conclusions Document for the Refining of Mineral Oil and Gas (2014/7/738/EU of 28/10/2014).

We describe how we determined these issues in more detail in the following sections of this document.

Overview of the site and installation

Stanlow Manufacturing Complex (installation) is situated south of the Mersey estuary near Ellesmere Port. The Mersey estuary is identified as a Special Protection Area (SPA) and Ramsar site.

The installation processes crude oil in a refinery which includes a fluid catalytic cracker, alkylation unit, platformer and hydrodesulphurisation plant. The refinery is integrated with adjoining chemicals plants and process waste is incinerated at the installation. The refinery also operates large combustion plant (LCP).

Crude oil is received from a separate EPR installation at the Tranmere oil terminal on the Mersey and is transferred by pipeline to storage at the installation. Finished products are exported by pipeline and transported either by road tanker from the loading terminal or by water via the Manchester Ship Canal.

Fractional distillation or “fractionation” is the key unit operation within Crude Distillation Units (CDU) where the crude oil is distilled into different fractions or components. There are two CDUs at Stanlow, CDU-3 and CDU-4. CDU-3 is currently mothballed. CDU-4 is still operational, categorised as LCP 139, it was commissioned in 1973 but was not designed to meet current emission limits. It currently consists of four furnaces / combustion units which are used to heat crude oil and intermediate residue for fractionation:

- F201 A (58.9 MWth);
- F201 B (58.9 MWth);
- F201 C (49 MWth); and
- F202 (53.3 MWth).

Each combustion unit has the capability to burn both oil and gas. The units are started up on oil and typically run on 100% gas during normal operation, although liquid firing may be required, for example as fouling builds up over the operating run in the period prior to maintenance.

NOx emissions are minimised by burning 100% gas when possible, and optimising furnace operation in terms of excess oxygen (O_2) control. No other NOx reduction measures are employed on these furnaces.

Essar Oil UK Ltd has committed to installing a new furnace to replace the three existing atmospheric crude oil furnaces. The CDU4 main crude distillation furnaces (F201 A/B/C) will be replaced with the new furnace F204 (118 MWth), which will incorporate low-NOx burners. As well as reducing NOx emissions, the new furnace will allow 100% gas firing only (mix of refinery fuel gas and natural gas). The existing vacuum furnace, F202, will be retained, however the capability of burning liquid fuel will also be removed when F204 is installed. F204 will be more energy efficient than the existing furnaces F201 A/B/C and will be designed to allow future 100% hydrogen firing, although hydrogen firing is not in the scope of this variation application and will need to be permitted through a subsequent variation.

Review and assessment of the potential environmental impact of the replacement furnace

Essar Oil UK Ltd has proposed installing a new furnace to replace the three existing atmospheric crude oil furnaces.

The CDU4 main crude distillation furnaces (F201 A/B/C) will be replaced with a new furnace (F204), which will incorporate low-NOx burners. As well as reducing NOx emissions, the new furnace will allow 100% gas firing and therefore reduce emissions of sulphur oxides (SOx) and Particulate Matter (PM). The existing vacuum furnace, F202, will be retained, however the capability of burning liquid fuel will also be removed when F204 is installed. F204 will be more energy efficient than the existing furnaces F201 A/B/C and will be designed to permit future 100% hydrogen firing. The proposed new furnace will not alter the throughput of the CDU4 plant. The existing stack will be demolished, and replaced with a shorter, less visually prominent, stack.

Environmental risk assessment

In line with the Environment Agency's guidance (https://www.gov.uk/guidance/air-emissions-risk-assessment-for-your-environmental-permit) and the relevant parts of the guidance applicable to the assessment of air dispersion modelling of emissions from generators (https://www.gov.uk/guidance/specified-generators-dispersion-modelling-assessment) the Applicant submitted detailed air

dispersion modelling and impact assessment to assess the predicted impacts on human receptors and ecological sites.

The methodology for risk assessment of point source emissions to air, and the associated definitions, are set out in our guidance https://www.gov.uk/guidance/air-emissions-risk-assessment-for-your-environmental-permit.

We reviewed the four air quality assessments and associated modelling files:

- Dispersion modelling assessment for proposed replacement furnace, Essar Stanlow Refinery: CD4 furnace stack comparison – all receptors
- Dispersion modelling assessment of emissions of nitrogen oxides, Essar Stanlow Refinery
- Dispersion modelling assessment for proposed replacement furnace, Essar Stanlow Refinery: Cumulative assessment for SO2
- Dispersion modelling assessment of nitrogen and acid deposition resulting from emissions of sulphur dioxide and nitrogen oxides, Essar Stanlow Refinery.

Our audit of the applicant's air dispersion modelling concluded that the methodologies, assumptions and modelling used are sound. The conclusions and numerical predictions can be used to determine this application. The applicant used emission levels based on the average levels measured over 2016 – 2020 for F202 (existing furnace to be retained in the new unit) and manufacturers design specifications for emissions from the new furnace F204. This approach is less conservative than using the relevant BAT-AELs however when looking at the consequential increase in PCs we concur that although the actual ground level concentrations will be higher, there will be no change to the overall conclusions of the modelling assessment.

The new furnace will allow 100% gas firing (mix of refinery fuel gas and natural gas), and therefore reduce emissions of sulphur oxides (SOx) and Particulate Matter (PM) compared to liquid firing. The existing vacuum furnace, F202, will be retained, however the capability of burning liquid fuel will also be removed when F204 is installed.

Dispersion modelling of emissions to air from the CDU4 furnace stack was carried out by Cambridge Environmental Research Consultants Ltd (CERC). The modelling was carried out using ADMS 5 software.

The conclusion of the modelling is that when the current CDU4 stack NOx is modelled, the results are screened out as insignificant at all human health and ecological receptors in the vicinity of the site. The current CDU4 stack was modelled alongside all NOx emissions from the Stanlow Refinery, and the results showed that CDU4 is not a major source of refinery NOx emissions at modelled offsite locations. This was compared to the impact when the proposed CDU4 furnace and stack is installed, and this showed no significant change to the short

and long term predicted environmental concentrations at sensitive human health and ecological receptors.

For both the current CD4 furnace stack and the proposed CD4 combined furnace stack, the maximum offsite SO_2, PM_{10} and $PM_{2.5}$ Process Contributions are screened out as insignificant at all modelled locations. They are less than 1% of the long-term and 10% of the short-term objective in each case.

The impact assessment undertaken when the current permit limit was set, demonstrated no significant impact. That situation remains the same and will be improved once the replacement furnace is installed. This is supported by measurements from local air quality monitoring stations.

We therefore conclude that there will be no increase in overall emissions and impacts at sensitive receptors. The operator has provided the necessary information to demonstrate that the impact of emissions from CDU-4 combustion units are insignificant.

Emission limits for replacement furnace configuration (F204 and F202)

Emission Limit Values (ELVs) have been set as a result of this variation for the following substances:

- Sulphur dioxide (SO_2)
- Oxides of nitrogen (NOx)

We have included these limits based on the requirements of the Refining of Mineral Oil and Gas BAT conclusions and IED Annex V.

<u>IED Chapter III ELVs</u>

Compliance with IED Chater III Annex V emission limit values (ELVs) is based on meeting the requirements of Part 4 of Annex V as required by Article 39. That is, no validated monthly average exceeds the defined ELV, no validated daily average exceeds 110% of the ELV and 95% of the validated hourly averages over the year do not exceed 200% of the ELV. Therefore, we consider that ELVs given in Annex V aren't absolute ELVs. Instead, they are values against which the various calculated averages are measured. The continuous emission monitoring system (CEMs) provides data from which the hourly, daily and monthly averages can each subsequently be calculated.

Compliance is assessed by comparing the CEMs monthly and daily average emissions against the corresponding monthly and daily ELVs, and by comparing the 95th percentile of all of the hourly average emissions over a calendar year against the hourly ELV.

We have set ELVs for the entire Large Combustion Plant (LCP), rather than for each individual combustion unit (furnace) within it. This decision reflects our assessment that the two furnaces operating together constitute the normal mode of operation, and the ELVs are based on this configuration. Whilst we recognise that F204 may occasionally

operate independently of F202, this is not the standard operating scenario. Therefore, even in these rare instances when only one furnace is operational, the combined ELVs for the LCP will continue to apply.

Emissions bubble

Compliance with the emission limit value for this unit can be achieved through inclusion of the unit in the BREF air emissions bubble for NOx and SO_2. When complying with the emission limit through the air emissions bubble; the emission concentration from the emission point shall not exceed the monthly mean Chapter III IED Annex V limit (specified in brackets in Table S3.1(a) of the permit). The Chapter III IED Annex V limit is a backstop, therefore both the BAT AEL and Annex V limits for NOx and SO_2 are set in the permit.

Multi-fuel firing

The capability of burning liquid fuel will be removed when F204 is installed. However, the furnace will continue to burn a mix of gaseous fuels (RFG and Natural Gas), therefore we have considered the applicability of multi-fuel firing emission limits.

Article 40(1) of IED sets the fuel-weighted approach that should be taken in setting the emission limit values for multi-fuel firing plant involving the simultaneous use of two or more fuels. However, as both gaseous fuels have the same emission limit values in Chapter III, Annex 5, Part 2 of IED, a fuel-weighted ELV won't make a difference in this case if the proportion of the fuels change.

F202 falls under the scope of Article 40(2) and Article40(3). Therefore Article 40(1) is only applicable to F204.

Article 40(2) of IED makes specific provisions for combustion plants covered by Article 30(2) firing refinery fuels and is applicable to F202. Emission limit values set using the methodology given in Article 40(2) take into account the determinative fuel. This is the fuel with the highest ELV set out in Part 1 of Annex V, or where 2 fuels both have the highest ELV, whichever has the highest thermal input. RFG has previously been confirmed as the determinative fuel. Gas firing ELVs have been set accordingly, for F202, following the IED Chapter III Protocol for Multi-fuel Firing Refinery Combustion Plants granted a Permit prior to 7th January 2013, version 5 (Section 6(I)). Meaning a fixed emission limit value is considered in the emission limit calculations for this plant (see below).

Additional provision is made for SO_2 emissions from plants firing distillation and conversion residues from the refining of crude oil, in Article 40(3) and Part 7 of Annex V for plant which were granted a permit before 27 November 2002. This is discussed further below.

BAT AELs are given in the Refineries BAT Conclusions for 'gaseous fuels', no further specification is given to differentiate between RFG and Natural Gas.

Therefore, firing on a combination of RFG and Natural Gas does not affect the applicable BAT AELs.

SO_2:

The BAT-AEL for SO_2 emissions is 35 mg/Nm^3 (monthly mean) for combustion unit firing on gas. This is the same as the limit set for the existing furnace when fired on gas (F201 A/B/C).

As explained above, both the BAT AEL and the IED Annex V are included in the permit. We have set an emission limit based on the IED Annex V limits for new and existing plant. This is explained below:

The new furnace will be fired on a mixture of refinery fuel gas and natural gas. Refinery fuel gas is a gaseous fuel derived from distillation and conversion processes and therefore can be considered a distillation and conversion residue from the refining of crude oil. Where refinery fuel gas is burned in combination with another fuel, e.g. natural gas, the SO_2 emission limits in Part 7 of Annex V can apply. However, Part 7 only applies to plant which have been granted a permit before 7 January 2013, or the operators of which have submitted a complete application for a permit before that date, provided that such plants are put into operation no later than 7 January 2014 (Article 40(3) and Article 30(2) of IED). Therefore, the limits given in Annex V Part 7 are only applicable to F202, being the remaining part of the combustion plant to which the Annex V Part 1 ELVs otherwise would apply, under Art 30(2). Since F204 is a changed part of the combustion plant, the Annex V Part 1 limits (under Art 30(2)) do not apply to it and instead, as indicated by Article 30(7), the limits in Annex V Part 2 apply to it, putting it outside the scope of Art 40(3) and Annex V Part 7.

According to Article 30(7), we consider that the limit should be weighted based on the new and existing plant configuration, with 35mg/m^3 applicable to F204 and 1000 mg/m^3 for F202.

As described above, we have calculated combined IED emission limits taking into account the different SO_2 emission limit values relevant to the existing combustion unit (F202) and the new combustion unit (F204), according to IED:

Monthly mean: (1000*53.3 + 35*118) / (53.3 + 118) = 335 mg/Nm^3

In line with IED Annex V Part 4 we have set a daily mean IED Chapter III ELV corresponding to 110% of the monthly mean and an hourly mean (95%ile) corresponding to 200% of the monthly mean:

Daily average: 369 mg/Nm^3

Hourly average (95%ile): 670 mg/Nm^3

Replacing F201 A/B/C with F204 to deliver an environmental improvement by reducing NOx emissions results in an unintended consequence of the SO_2 ELV also being tightened. This is a result of the ELV for F204 needing to be set at a lower level than for F201 A/B/C. Different ELVs apply to new and existing plants, even when the fuel is unchanged.

Paragraph 1 of IED Annex V Part 4 specifically refers to the limits in Part 1 and Part 2. Annex V Part 7 is not mentioned in Part 4. For this reason, and because it was previously considered that the relevant higher limits based solely on Part 7 could be met, we would not normally and previously have not applied Part 4 to Part 7 ELVs.

Based on the above, in these exceptional circumstances (and taking into account the factors listed below), we consider it appropriate to apply the provisions of Parts 3 and 4 of Annex V to Part 7 ELVs. We have therefore applied the Part 4 provisions (110% for daily average and 200% for 95%ile hourly average ELVs) to both parts of the combined ELVs for SO2 in this case. This decision specifically takes account of the following:

- The combustion plant is being extended/ changed, within Article 30(7) of IED;
- SO_2 emissions remain within acceptable limits, ensuring the protection of the environment as a whole;
- the new combined ELVs are significantly lower than those set for the current plant;
- the change to the plant overall is limited and there is a shared stack;
- the specification of the refinery fuel gas remains unchanged;
- a benefit has been achieved due to the installation of F204 (reduction in NOx emissions to meet the BAT AEL) that may not have been achieved otherwise; and
- requiring a further reduction in SO_2 at this moment would be expensive and likely only of limited environmental benefit, given current plans for the transition to 100% hydrogen fuel firing in the future.

We take these factors into account as part of our duty to consider the importance of the promotion of economic growth. We consider the regulatory approach we have taken here to the setting of ELVs to be both necessary and proportionate in order to comply with our duties, including our duty to protect the environment, under Environmental Permitting Regulations 2016 and the Industrial Emissions Directive 2010 as that directive is transposed into UK law.

NOx:

LCP139 (CDU-4) will consist of a mixture of existing plant (F202) and new plant (F204). We consider that the definitions of 'new and existing units' in the Refineries BAT conclusions refer to the individual combustion plants (i.e. the individual furnaces) as opposed to stack-aggregated combustion plants. There are different BAT-AELs for new and existing plant (BATc 34 table 10):

- BAT-AEL for gas firing, existing unit with hydrogen content higher than 50%: 200 mg/Nm^3 (monthly mean)
- BAT-AEL for gas firing, new unit: 100 mg/Nm^3 (monthly mean)

Retaining a limit of 200 mg/Nm^3 for the stack would mean permitting a risk envelope much greater than what has been assessed in the air emissions risk assessment. Also, we would not be implementing the correct BAT-AEL for the new furnace F204. Similarly, setting a limit of 100 mg/Nm^3 for the stack wouldn't account for the existing plant.

We have therefore set a new combined emission limit of 132 mg/Nm^3 calculated using the net rated thermal inputs for F202 (53.3 MWth) and F204 (118 MWth) as weighting factors:

(200*53.3 + 100*118) / (53.3 + 118) = 132 mg/Nm^3 (monthly mean)

This is a combined BAT-AEL taking into account the proportion of combustion plant that is existing and new. F202 is a vacuum furnace, which is a downstream process receiving the feed from the upstream atmospheric distillation, so it is not likely to run without F204 that drives the atmospheric distillation process. When the furnaces are running the loads are expected to be proportionate, we therefore consider the limit of 132 mg/Nm^3 to be appropriate.

Similarly, we have calculated combined IED emission limits taking into account the different NOx emission limit values relevant to the new combustion unit (F204) and to the existing combustion unit (F202), according to IED Article 30(7) as follows:

- 300 mg/Nm^3 for gas firing combustion plants with a total rated thermal input not exceeding 500 MW which were granted a permit before 27 November 2002 or the operators of which had submitted a complete application for a permit before that date, provided that the plant was put into operation no later than 27 November 2003 – IED Annex V Part 1
- 100 mg/Nm^3 for combustion plants other than gas turbines and gas engines – IED Annex V Part 2

The combined emission limit value has been calculated using the net rated thermal inputs for F202 and F204 as weighting factors:

(300*53.3 + 100*118) / (53.3 + 118) = 163 mg/Nm^3 (monthly mean)

According to IED Annex V Part 4 we have set a daily mean IED Chapter III ELV corresponding to 110% of the monthly mean and a hourly mean (95%ile) corresponding to 200% of the monthly mean:

Daily average: 179 mg/Nm^3

Hourly average (95%ile): 326 mg/Nm^3

The new limits shall apply following the completion of pre-operational condition POC12, which requires the operator to notify the Environment Agency of the successful completion of the commissioning and put in service of the new CDU-4 furnace.

As explained above, both the BAT AEL and the IED Annex V are included in the permit.

The combined BAT-AEL contributes to the calculation of the NOx bubble. The bubble will shrink by using the new combined BAT-AEL at 132 mg/Nm^3, compared to using the existing BAT-AEL at 200 mg/Nm^3. We have set Improvement Condition IC65, which requires the Operator to submit an updated design for the fixed NOx and SO_2 emissions bubbles for the installation and an associated monitoring programme to demonstrate compliance with the bubble; taking the changes made under EPR/FP3139FN/V015 into account.

Derogation

Derogation methodology

The IED enables a competent authority to allow derogations from BAT AELs stated in BAT Conclusions under specific circumstances as detailed under Article 15(4):

By way of derogation from paragraph 3, and without prejudice to Article 18, the competent authority may, in specific cases, set less strict emission limit values. Such a derogation may apply only where an assessment shows that the achievement of emission levels associated with the best available techniques as described in BAT conclusions would lead to disproportionately higher costs compared to the environmental benefits due to:

> *(a) the geographical location or the local environmental conditions of the installation concerned; or*
>
> *(b) the technical characteristics of the installation concerned* (stage 1 assessment)

Cost Benefit Analysis (stage 2 assessment)

If the regulator finds, in its stage 1 assessment, that special factors are present relating to the geographical location, local environmental conditions or technical characteristics (as applicable) of the installation, then a stage 2 Cost Benefit Analysis (CBA) is undertaken. The CBA allows calculation to indicate whether the costs of compliance are greater or less than the environmental benefits.

Review and assessment of the derogation application

We have refused the application for a further time limited derogation from the BAT-AELs associated with BAT Conclusion 34 of the Refining of Mineral Oil and Gas BAT conclusions for the operation of the existing CDU furnaces (F201 A/B/C). We concluded that the criteria for a derogation have not been met. Further details of our assessment are given below.

The Operator requested a time limited derogation from BAT Conclusion 34 of the Refining of Mineral Oil and Gas BAT conclusions. BAT is to use one or a combination of the techniques given to meet the NOx BAT AELs set out in Tables 10 and 11 of the BAT Conclusions. The scope of this derogation request was to cover non-compliance with BAT AELs referenced in BAT 34 and BAT 57. The site uses an integrated emissions management technique (BAT 57) to assess overall emissions from the site (the “refinery bubble”), rather than to assess emissions on a unit-by-unit basis. There are no valid applicability exclusions.

This is the third derogation request for this activity. A similar time limited derogation had been granted to the operator on 26/09/2018 (variation No. EPR/FP3139FN/V009) expiring on 31/12/2022. We were also minded to grant a renewal of this, expiring on 30/09/2023, although the Operator was not able to meet the compliance date and requested an additional derogation prior to the variation being issued.

The decision to grant the previous derogation, and subsequent renewal, was made based on a finding by the regulator that technical characteristics of the installation were present that were of a nature that would cause significant enhanced cost when complying with BAT AELs. This is a further renewal request, we therefore had to consider whether the technical characteristics remained present and, if they did, whether they continued to be capable of causing significant enhanced cost in complying with BAT AELs.

The Operator concluded that they could not meet the BAT AEL as defined in BAT Conclusion 34 by the BAT Conclusions implementation date of 28 October 2018, nor by the subsequent deadlines of 31/12/2022 or 30/09/2023 granted as the result of the previous derogation requests. To support this conclusion the Operator supplied the following evidence.

The site is unique because the age and configuration of the refinery on the site makes it more technically difficult and costly to comply. The reasons for this include the following:

- CDU4 furnaces were installed in the early 1970s with no emission limits specified in design
- High hydrogen content of Refinery Fuel Gas increases NOx formation
- High air preheat increases NOx formation

The operator also cited the general investment cycle for the installation as a contributing factor. The installation of the new furnace can only take place as part of a unit turnaround, which typically take place every 4 years.

In order to close this deviation to BAT 34, Essar Oil UK Ltd is installing a new furnace to replace the three existing atmospheric crude oil furnaces. The new furnace is fitted with low-NOx burners, which will reduce overall NOx emissions from CD4 below BAT. We have undertaken a technical assessment of these proposals and consider that the new furnace is BAT, see key issues sections above of this decision document for details of our assessment. This decision is not affected by the refusal of the derogation. We have updated the environmental permit to include the new furnace as part of this variation.

The Operator has provided an update on the progress under Improvement Condition 43 of their Environmental Permit. The latest update is provided in document “CD4 NOx Compliance Progress Report (IC43) – December 2022”. The ongoing work has made significant progress. The furnace is installed and our understanding is that only the final pipework tie-ins are left to complete prior to commissioning. They had planned for the major turnaround of the ODP units (CD4, HDT3, Platformer, Aromatics and HDS2) to take place starting 19/09/2023 and lasting for 50 days. However, Essar Oil UK Ltd took the decision to delay the turnaround due to the threat of industrial action impacting on contractor availability. They now intend to deliver the full turnaround in Q2 2025, when the risks to the deliverability of the turnaround have been mitigated or have reduced.

The Operator has referred to the investment cycle as justification for missing compliance within the previously agreed derogation periods. Although an investment cycle can constitute a valid basis for a technical characteristic, in this case the Operator chose to postpone the scheduled investment cycle in light of potential industrial unrest.

The above technical characteristic justifications were accepted by the Environment Agency during the initial derogation and previous renewal request.

However, the choice to further delay the turnaround, together with the replacement furnace now being present on-site, distinguishes the circumstances

of this derogation request from the previous requests approved by the Environment Agency.

As the new furnace, capable of complying with BAT-AELs, is installed at the site and ready to be commissioned and the most recent delay is primarily due to commercial reasons (i.e. the operator's decision to delay the turnaround due to the threat of industrial action impacting on contractor availability), we have concluded that the technical criterion is no longer applicable. We therefore consider that the first stage technical criteria have not been met in this case and have refused the application for a time limited derogation.

A cost benefit assessment has been submitted. However, we have not assessed it for this derogation request as we consider the criteria for a derogation have not been met in the first stage assessment.

Emission limits for existing furnaces (F201 A/B/C)

The previous time limited derogation for the operations of Crude Distillation Unit 4 (CDU-4) furnaces has ended. We have not granted a further time limited derogation therefore, as part of this variation, we have amended the emission limits for the existing furnaces as an Environment Agency initiated variation. We have set the applicable NOx BAT AEL for the existing furnaces. This emission limit has been set in line with the Best Available Techniques Conclusions Document for the Refining of Mineral Oil and Gas (2014/7/738/EU of 28/10/2014).

Gas firing: The applicable NOx BAT-AEL for an existing unit with hydrogen content higher than 50% is 200 mg/Nm^3 (monthly mean).

Previously the NOx BAT-AEL for the CDU-4 furnaces was subject to the completion of improvement condition IC43 (via footnote 2a to Table S3.1(a)) as it was subject to a time limited derogation.

We have removed footnote 2a, as this limit now applies to the existing furnaces until the replacement furnace (F204) is operational. We have set pre-operational condition POC12 which requires the operator to submit a report confirming the installation and commissioning of the new CDU-4 furnace F204. At which point the emission limits specified in Table S3.1(a)(i) come into effect.

No changes were required to the other BAT-AELs already set in the environmental permit for these furnaces. The IED Annex V emission limits for these furnaces were already set in Table S3.1(a) of the permit and have not changed as a result of this variation.

Decision considerations

Confidential information

A claim for commercial or industrial confidentiality has been made.

We have accepted the claim for confidentiality. We have excluded the cost impact of a full refinery shutdown used within the Cost Benefit Analysis.

We consider that the inclusion of the relevant information on the public register would prejudice the operator's interests to an unreasonable degree.

The decision was taken in accordance with our guidance on confidentiality.

Identifying confidential information

We have not identified any additional information provided as part of the application that we consider to be confidential.

The decision was taken in accordance with our guidance on confidentiality.

Consultation

The consultation requirements were identified in accordance with the Environmental Permitting (England and Wales) Regulations (2016) and our public participation statement.

The application was publicised on the GOV.UK website.

We only received comments from the UK Health Security Agency (UKHSA). The comments and our responses are summarised in the consultation responses section.

No responses were received from members of the public, local MPs, assembly members, councillors and parish/town community councils, community or other organisations.

The regulated facility

We considered the extent and nature of the facilities at the site in accordance with RGN2 'Understanding the meaning of regulated facility', Appendix 2 of RGN2 'Defining the scope of the installation', Appendix 1 of RGN 2 'Interpretation of Schedule 1'.

The extent of the facilities are defined in the site plan and in the permit. The activities are defined in table S1.1 of the permit.

Nature conservation, landscape, heritage and protected species and habitat designations

We have checked the location of the application to assess if it is within the screening distances we consider relevant for impacts on nature conservation, landscape, heritage and protected species and habitat designations. The application is within our screening distances for these designations.

We have assessed the application to operate a new CDU4 furnace (F204) and its potential to affect sites of nature conservation, landscape, heritage and protected species and habitat designations identified in the nature conservation screening report as part of the permitting process.

We have not consulted Natural England and Natural Resources Wales on our Habitats Regulation Assessment; however we have sent them our assessment for information. The decision was taken in accordance with our guidance.

Environmental risk

We have reviewed the operator's assessment of the environmental risk from the operations of the new CDU4 furnace (F204). The operator’s risk assessment is satisfactory.

The assessment shows that, applying the conservative criteria in our guidance on environmental risk assessment or similar methodology supplied by the operator, or advised by a statutory consultee, and reviewed by ourselves, the emissions associated with the new furnace installation will not cause any significant pollution or prevent a high level of protection of the environment as a whole to be achieved.

General operating techniques

We have reviewed the techniques used by the operator, as relevant to the scope of this variation application, and compared these with the refining of mineral oil and gas BAT Conclusions document.

We consider that the emission limits included in the installation permit as part of this variation reflect the BAT for the sector.

We consider that the new furnace F204 proposed by the operator as part of this application will be compliant with BAT.

National Air Pollution Control Programme

We have considered the National Air Pollution Control Programme as required by the National Emissions Ceilings Regulations 2018. By setting emission limit values in line with technical guidance we are minimising emissions to air. This will

aid the delivery of national air quality targets. We do not consider that we need to include any additional conditions in this permit.

Changes to the permit conditions due to an Environment Agency initiated variation

We have varied the permit as stated in the variation notice. In particular we have:

- amended the monitoring frequency for Hydrocarbon Oil Index testing at S1 in table S3.3(a) to correct a historical mistake. Monitoring for this parameter is required monthly rather than daily;
- corrected the methodology for mercury (Hg) analysis in Tables S3.2(b) and S3.3(a). This was specified as UOP 938, however the method used for the effluent analysis is BS EN 12846; and
- as the result of refusing the further time limited derogation from the BAT-AELs associated with BAT Conclusion 34 of the Refining of Mineral Oil and Gas BAT conclusions for the operation of the existing CDU-4 furnaces (F201 A/B/C), we have amended the emission limits for these furnaces as an Environment Agency initiated variation.

Refer to the key issues section for additional details.

Pre-operational conditions

Based on the information in the application, we consider that we need to include pre-operational conditions.

POC12 – Commissioning of F204

Requirement for the operator to submit a report confirming the installation and commissioning of the new CDU-4 furnace F204.

Improvement programme

Based on the information in the application, we consider that we need to include an improvement programme. We have included an improvement programme setting the requirements outlined below (refer to the variation and consolidation notice for the detailed wording of the improvement conditions):

IC63 - BAT Conclusion 57 (Furnace F201 A/B/C)

Requirement for the Operator to submit an updated design for the fixed NOx emissions bubble for the installation and an associated monitoring programme to demonstrate compliance with the bubble. Taking account of the NOx emission limit for the existing CDU-4 furnaces (F201 A/B/C), set under EPR/FP3139FN/V015.

IC64 - Compliance of emission point REF-A-2 with monitoring standards (Furnace F204)

Requirement for the Operator to demonstrate compliance of the new monitoring features in emission point REF-A-2 with standard BS EN 15259 and supporting Method Implementation Document (MID). The reason for setting this improvement condition is that this compliance can only be demonstrated once the equipment is operational.

IC65 - BAT Conclusions 57 and 58

Requirement for the Operator to submit an updated design for the fixed NOx and SO_2 emissions bubble for the installation and an associated monitoring programme to demonstrate compliance with the bubble. Taking account of the NOx and SO_2 emission limits for the new CDU-4 furnace (F204), set under EPR/FP3139FN/V015.

Emission limits

Emission limits for existing furnaces (F201 A/B/C):

An Emission Limit Value (ELV) has been added as a result of this variation for the following substance:

- Oxides of nitrogen (NOx)

We have set the applicable NOx BAT AEL for the existing furnaces. We have included this limit based on the Refining of Mineral Oil and Gas BAT conclusions. See key issues for more details.

Emission limits for replacement furnace (F204):

Emission Limit Values (ELVs) have been added as a result of this variation for the following substances:

- Sulphur dioxide (SO_2)
- Oxides of nitrogen (NOx)

We have included these limits based on the Refining of Mineral Oil and Gas BAT conclusions and IED Annex V. See key issues for more details.

Monitoring

Based on the information in the application we are satisfied that the operator's techniques, personnel and equipment have either MCERTS certification or MCERTS accreditation as appropriate.

We have specified improvement condition IC64 requiring the operator to demonstrate compliance of the new monitoring features in emission point REF-A-2 with standard BS EN 15259 and supporting Method Implementation Document (MID). The reason for setting this improvement condition is that this compliance can only be demonstrated once the equipment is operational.

We have also carried out an Environment Agency initiated variation to amend the monitoring frequency for Hydrocarbon Oil Index testing at S1 in table S3.3(a) to correct a historical mistake. Monitoring for this parameter is required monthly rather than daily.

Management system

We are not aware of any reason to consider that the operator will not have the management system to enable it to comply with the permit conditions.

The decision was taken in accordance with the guidance on operator competence and how to develop a management system for environmental permits.

Growth duty

We have considered our duty to have regard to the desirability of promoting economic growth set out in section 108(1) of the Deregulation Act 2015 and the guidance issued under section 110 of that Act in deciding whether to grant this permit variation.

Paragraph 1.3 of the guidance says:

"The primary role of regulators, in delivering regulation, is to achieve the regulatory outcomes for which they are responsible. For a number of regulators, these regulatory outcomes include an explicit reference to development or growth. The growth duty establishes economic growth as a factor that all specified regulators should have regard to, alongside the delivery of the protections set out in the relevant legislation."

We have addressed the legislative requirements and environmental standards to be set for this operation in the body of the decision document above. The guidance is clear at paragraph 1.5 that the growth duty does not legitimise non-compliance and its purpose is not to achieve or pursue economic growth at the expense of necessary protections.

We consider the requirements and standards we have set in this permit are reasonable and necessary to avoid a risk of an unacceptable level of pollution. This also promotes growth amongst legitimate operators because the standards applied to the operator are consistent across businesses in this sector and have been set to achieve the required legislative standards.

Consultation Responses

The following summarises the responses to consultation with other organisations, our notice on GOV.UK for the public and the way in which we have considered these in the determination process.

Response received from UK Health Security Agency (UKHSA)

Brief summary of issues raised:

In the consultation response of 24/03/2023, the UKHSA commented that emissions to air from the existing and proposed CDU4 stacks are not deemed to be significant and are not expected to contribute to air quality exceedances at sensitive human health receptors.

The UKHSA also highlighted that the application did not contain a fire management plan and/or accident management plan. Also, the application does not refer to potential releases to surface water or groundwater.

Summary of actions taken:

Based on the information in the application, we consider the environmental risk associated with discharges to waters is unlikely to be changed compared to the risk envelope of the currently permitted operations.

As this installation is part of an upper tier COMAH site, fire risks and associated management measure, along with other major hazards, are expected to be covered as part of the site's Safety Report beyond the scope of the environmental permit. For major accident hazards, we therefore refer to the regulation of the proposed activities under the COMAH regulatory regime and the Safety Report for the installation.

There are no changes to emissions to surface water or groundwater as part of this variation.

No other responses received.