



Environment
Agency

Notice of variation and consolidation with introductory note

The Environmental Permitting (England & Wales) Regulations 2016

SABIC UK Petrochemicals Limited

Wilton Olefins Installation
Wilton Site
PO Box 99
Redcar
Cleveland
TS10 4YA

Variation application number

EPR/BS3590IE/V015

Permit number

EPR/BS3590IE

Wilton Olefins Installation

Permit number EPR/BS3590IE

Introductory note

This introductory note does not form a part of the notice.

Under the Environmental Permitting (England & Wales) Regulations (EPR) 2016 (schedule 5, part 1, paragraph 19) a variation may comprise a consolidated permit reflecting the variations and a notice specifying the variations included in that consolidated permit.

Changes introduced by this variation notice/statutory review

Review permit conditions

This variation has been issued to update some of the conditions following a statutory review of the permits in the industry sector for the production of large volume organic chemicals (LVOC). The opportunity has also been taken to consolidate the original permit and subsequent variations.

The Industrial Emissions Directive (IED) came into force on 07 January 2014 with the requirement to implement all relevant Best Available Techniques (BAT) Conclusions as described in the Commission Implementing Decision. The BAT Conclusions for production of LVOC were published on 07 December 2017 in the Official Journal of the European Union (L323) following a European Union wide review of BAT, implementing decision 2017/2117/EU of 21 November 2017.

Where appropriate, we also considered other relevant BAT Conclusions published prior to this date but not previously included in a permit review for the installation:

- Common waste water and waste gas treatment/management systems (CWW) in the chemical sector, published 09 June 2016.
- Large Combustion Plants (LCP), published 17 August 2017.

Applicable BAT Conclusions

The BAT Conclusions for this installation which apply from 07 December 2021 are:

Production of LVOC: General BAT Conclusions 1 to 6, 8, 9, 14, 15, 17 to 19 and lower olefins production BAT Conclusions 20 to 23.

CWW: BAT Conclusions 1 to 5, 7, 9 to 19 and 21 to 23. Whilst BAT Conclusion 14 is currently not applicable, it may apply once effluent treatment is in place in accordance with the derogation and IC38 in table S1.3 of this permit.

LCP: The BAT Conclusions already apply and were implemented by variation EPR/BS3590IE/V011. General BAT Conclusions 1 to 4, 6, 9 to 14, 17 and BAT Conclusions 55 to 59 for the combustion of process fuels from the chemical industry.

Derogations

Article 15(4) of the IED enables the Environment Agency to allow derogations from BAT associated emission levels (AELs) stated in the BAT Conclusions under specific circumstances. Derogations from BAT AELs were requested for the BAT Conclusion listed below. A brief explanation is included in the Annex to the conditions of this permit:

CWW BAT Conclusion 12 – Supporting a time limited delay to 07 December 2025, which requires a reduction in emissions to water at W1 of total organic carbon (TOC) and adsorbable organically bound halogens (AOX). This BAT Conclusion lists a number of final waste water treatment techniques with the applicable BAT AELs set out in Tables 1, 2 and 3.

This BAT Conclusion is linked to a number of 'narrative' BAT Conclusions whose compliance status may

change once the BAT Conclusion 12 improvements are implemented: LVOC BAT Conclusion 14 and CWW BAT Conclusions 3, 7, 9, 10, 11, 14 and 21.

The schedules specify the changes made to the permit.

Schedule 1 of the notice specifies the conditions that have been varied and schedule 2 comprises a consolidated permit which reflects the variations being made. All the conditions of the permit have been varied and are subject to the right of appeal.

Brief update on existing/future operations

At the time of this statutory permit review variation, the Olefins 6 cracker was mothballed and had not operated since the end of September 2020.

The operator has submitted a variation (EPR/BS3590IE/V016) to implement changes to the configuration of the installation via the Teesside Improvement Project (TIP). This shall be subject to a separate assessment.

The new configuration will result in a reduced throughput, which will result in the removal of some units and furnaces. This will consequently result in a reduction in the impacts to air and water, resulting in a betterment of the environmental baseline.

Brief description of the process

The rest of the installation is unchanged and continues to be operated as follows:

The Wilton Olefins installation is located on the Wilton Site, at Redcar, Teesside at national grid reference NZ58202120.

The installation falls under the following Schedule 1 listed activity descriptions:

Section 4.1 Part A(1)(a)(i) - Producing organic chemicals such as hydrocarbons.

Section 1.1 Part A(1)(a) - Burning any fuel in an appliance with a rated thermal input of 50 or more megawatts.

The main production plant is Olefins 6, a large cracker, using hydrocarbon as a feedstock, but also having the flexibility to use propane, ethane and butane as well. The cracker produces a variety of aliphatic and aromatic hydrocarbons products which are the feed-stocks for other plants on and off the Wilton Site. The site is currently operated by SABIC UK Petrochemicals Ltd and has been regulated under Integrated Pollution Control (IPC) and then the EPR since 1993.

Average annual production is in the region of 1,250,000 tonnes of primary products (ethylene and propylene) with around another 1,000,000 tonnes of co-products (predominantly gasoline and mixed C4s) and materials recycled for use as fuel (methane). The process uses furnaces at elevated temperatures to breakdown the feed-stocks into the products that are then separated and purified using distillation techniques.

Gasoline is further processed into a range of products on an associated Gasoline Treatment Unit. The mixed C4s are separated into a butadiene product and a raffinate product using a solvent extraction process on the butadiene 3 plant.

The products are then stored in and distributed from the other two parts of the installation - Central Control (CC) and Wilton Ethylene Control (WEC). CC is at the north end of the site and consists of above ground storage for liquid and gas products. WEC has above ground storage for gases and liquids and below ground cavity storage for ethylene and mixed C4s. Products are distributed from Olefins 6 WEC and CC by pipeline directly to customers or to ship loading facilities outside the installation.

The majority of releases to air are either products of combustion, primarily carbon dioxide (CO₂) and oxides of nitrogen (NO_x) and volatile organic compounds (VOCs). NO_x is released continuously from up to 14 Ultra Selective Coil (USC) furnaces (B1701A-P (there are no furnaces I and O)), three Vapour Mixed Recycle (VMR) furnaces (B1702A-C), boiler B1703E (LCP 648) and three super-heaters (B1704A-C) within the installation. The fuel used in the combustion units is formed as a by-product of the cracking process, supplemented with natural gas, methane or ethane as required i.e. fuel-gas.

The high pressure (HP) steam raising boiler B1703E was authorised by variation EPR/BS3590IE/V011, with a net thermal input of 85 MW. This means it is a large combustion plant (LCP) under chapter III of the IED and is referred to as LCP 648. The boiler is sited in the location previously occupied by boiler B1703A, which has been demolished. The boiler is an efficient, modern design, and improves the reliability of steam supply to the Olefins 6 plant. It has a 40m stack and employs a continuous emission monitoring system (CEMS).

Boiler B1703C (LCP 292, emission point A4a) was operating under the transitional national plan (TNP) and was shut down in May 2019. This was removed from the permit by variation EPR/BS3590IE/V012.

On Olefins 6, the HP steam produced is used to drive condensing steam turbines which act as mechanical drives for large gas compressors. No electrical power is produced by the turbines which means that the plant is a member of the “combustion plants generating only heat” class. There is no infrastructure currently in place at the site to facilitate any electrical energy export to the National Grid.

There are some point source releases of hydrocarbon feed-stocks and products. The majority of potential emissions to air are routed to the flare system at emission point A10. In addition there are intermittent fugitive releases (e.g. tank breathing). VOC emissions are released from a combination of area and point sources (emission points A13 to A20), comprising benzene, 1, 3-butadiene and ethylene.

Releases to water from the installation enter into the Wilton Site drains which are owned and operated by Sembcorp Utilities Teesside Limited (SUTL). Effluent from the Wilton Site drains is discharged to the River Tees without any treatment under a Water Discharge Activity Environmental Permit.

The installation is within the 10 km screening distance of Natura 2000 sites, however no significant environmental impact from the installation is expected there.

The activities carried out at the installation have the potential to cause noise from flaring operations that may be audible beyond the installation boundary and cause annoyance. However this is restricted to intermittent operations not carried out on a daily basis. The activities carried out at the installation also have the potential to cause odour, but in normal operations such odour is not likely to cause annoyance. Waste arisings from the installation are relatively small for the size of the operation.

SABIC UK Petrochemicals Limited has an Environmental Management System (EMS) which is accredited to RC 14001 (incorporating ISO 14001).

The status log of a permit sets out the permitting history, including any changes to the permit reference number.

Status log of the permit		
Description	Date	Comments
Permit application EPR/BS3590IE/A001	20/03/2003	Duly made
Permit determined EPR/BS3590IE	19/11/2003	Permit issued to Huntsmans Petrochemicals (UK) Ltd
Variation issued EPR/BS3590/V002	31/01/2007	Large Combustion Plant Directive (LCPD)
Variation issued EPR/BS3590IE/V003	01/02/2007	Change operator name and registered address (SABIC UK Petrochemicals Limited)
Variation issued EPR/BS3590IE/V004	30/04/2007	Inspection and repair of EHS critical drainage system
Variation issued EPR/BS3590IE/V005	17/12/2007	National Emissions Reduction Plan (NERP)

Status log of the permit		
Description	Date	Comments
Variation issued EPR/BS3590IE/V006	04/04/2008	Bring back on-line mothballed boiler B1703A
Variation application EPR/BS3590IE/V007	04/10/2011	Duly made Additional storage for p-xylene
Variation issued EPR/BS3590IE/V007	10/10/2011	
Variation application EPR/BS3590IE/V008	14/09/2015	Duly Made To increase the NOx limit for boiler B1703C
Schedule 5 notice for further information issued 28/10/2015	13/11/2015	Responses received
	20/11/2015	
Variation issued EPR/BS3590IE/V008	18/12/2015	
Regulation 60 Notice sent to the operator	31/10/2014	Issue of a Notice under Regulation 60(1) of the EPR. Environment Agency initiated review and variation to vary the permit under IED to implement the special provisions for LCP under Chapter III, introducing new limits applicable to LCP, referred to in Article 30(2) and set out in Annex V. The permit is also updated to modern conditions.
Regulation 60 Notice response	31/03/2015	Response received from the operator
Additional information received	21/12/2015	Response to request for further information dated 18/12/2015
Variation determined EPR/BS3590IE/V009	24/12/2015	Varied and consolidated permit issued in modern condition format Variation effective from 01/01/2016
Administrative Variation EPR/BS3590IE/V010	18/08/2016	Environment Agency initiated administrative variation, issued to correct errors in LCP variation
Variation application EPR/BS3590IE/V011	08/06/2017	Duly made Application to add steam raising boiler, B1703E, LCP 648 with a net thermal input of 85 MW
Additional information received	11/10/2017	Response to schedule 5 request for further information dated 28/09/2017
Additional information received	28/11/2017	Email providing updated operating techniques documents to replace those in table S1.2 of the permit
Variation determined EPR/BS3590IE/V011	20/12/2017	Varied permit issued
Variation determined EPR/BS3590IE/V012	27/04/2020	Varied permit issued to remove LCP 292 from the permit
Variation application EPR/BS3590IE/V013	30/06/2020	Application returned

Status log of the permit		
Description	Date	Comments
Variation application EPR/BS3590IE/V014	14/09/2020	Duly made Application for temporary installation of 2 x 5MW thermal input boilers, waste treatment and storage activities
Schedule 5 notice for further information dated 15/02/2021	18/03/2021	Response received
Variation determined EPR/BS3590IE/V014	12/08/2021	Varied and consolidated permit issued to SABIC UK Petrochemicals Limited
LVOC permit review		
Regulation 61 Notice dated 04/05/2018 (Notice requiring information for statutory review of permit)	26/10/2018	Response received Technical standards detailed in response to the information notice
Request for further information sent 06/07/2020	27/08/2020	Response received Replaces original submission for LVOC and CWW BAT Conclusions
Request for information sent 21/01/2021	22/01/2021	Response received LVOC BAT Conclusion 1 and CWW BAT Conclusion 12
Request for information sent 28/01/2021	04/02/2021	Response received LVOC BAT Conclusion 20
Request for information sent 03/02/2021	04/02/2021	Response received LCP 648 primary fuel
Request for information sent 10/02/2021	02/03/2021	Response received LVOC BAT Conclusion 1
Request for information sent 24/02/2021	31/03/2021	Response received Continuous emissions monitoring systems (CEMS)
Request for information sent 03/03/2021	29/04/2021	Response received LCP 648, VMR furnaces, process heaters (periodic monitoring)
Request for information sent 17/03/2021	31/03/2021	Response received Correlation between oxygen and NOx produced by the VMR furnaces
Request for information sent 04/05/2021	14/05/2021	Response received Temporary platforms and EN 15259 compliance for VMR furnaces
Information received	25/05/2021	Section 4 of the Wood report
Request for information sent 25/10/2021	29/10/2021	Response received LVOC BAT Conclusions 2 and 20
Information received	24/11/2021	Section 4 of the Wood report (ref: 38454/C001/003, dated November 2018) - compliance pre and post effluent treatment
	29/11/2021	
Updated site plan	24/11/2021	Received (emission point A4a removed)

Status log of the permit		
Description	Date	Comments
Information received	29/11/2021	Hazardous pollutants
Information received	03/12/2021	Definition of start-up date
LVOC permit review Derogation request		
Request for derogation from CWW BAT Conclusion 12 (TOC and AOX limits)	30/04/2021	Response received
CWW BAT Conclusion 12 Cost Benefit Analysis (CBA) tools	13/05/2021	Received
CWW BAT Conclusion 12 Impact assessment	25/05/2021	Received
Request for information sent 03/06/2021	18/06/2021	Received
	24/06/2021	Received (item 6)
	29/10/2021	Received (item 1)
	11/11/2021	Received (item 1) amended
Clarification on project time line requested 29 June 2021	30/06/2021	Confirmed
Request for information sent 29/06/2021	14/07/2021	Weighted average cost of capital (WACC)
	28/07/2021	CBA tools Replace those submitted 13/05/2021
Request for information sent 13/07/2021	14/07/2021	Response received I.C.15 and I.C.20 (historic improvements to effluent released)
Information provided	28/07/2021	Clarification on use of NWEBs values
Information provided	06/08/2021	Explanation of OPEX and CAPEX CBA figures
Proposed annual average TOC limit (reduced)	07/09/2021	Response received
Request for information sent 29/09/2021	08/10/2021	Response received
	29/10/2021	CBA queries
Request for information sent 10/11/2021	10/11/2021	Segregation and granulated activated carbon (GAC) treatment
DRAFT DECISION EPR/BS3590IE/V015	14/12/2021	Environment Agency initiated variation Statutory review of permit occasioned by LVOC BAT Conclusions published 07 December 2017 Varied and consolidated permit Consultation 15/12/2021 to 17/01/2022
FINAL DECISION Variation determined EPR/BS3590IE/V015 (Billing Ref: RP3602LB)	18/01/2022	Environment Agency initiated variation Statutory review of permit occasioned by LVOC BAT Conclusions published 07 December 2017 Varied and consolidated permit issued

End of introductory note

Notice of variation and consolidation

The Environmental Permitting (England and Wales) Regulations 2016

The Environment Agency in exercise of its powers under regulation 20 of the Environmental Permitting (England and Wales) Regulations 2016 varies and consolidates

Permit number

EPR/BS3590IE

Issued to

SABIC UK Petrochemicals Limited (“the operator”)

whose registered office is

The Wilton Centre

Wilton

Redcar

Cleveland

TS10 4RF

company registration number **03767075**

to operate a regulated facility at

Wilton Olefins Installation

Wilton Site

PO Box 99

Redcar

Cleveland

TS10 4YA

to the extent set out in the schedules.

The notice shall take effect from **18/01/2022**

Name	Date
Philip Lamb	18/01/2022

Authorised on behalf of the Environment Agency

Schedule 1

All conditions have been varied by the consolidated permit as a result of an Environment Agency initiated variation.

Schedule 2 – consolidated permit

Consolidated permit issued as a separate document.

Permit

The Environmental Permitting (England and Wales) Regulations 2016

Permit number

EPR/BS3590IE

This is the consolidated permit referred to in the variation and consolidation notice for application EPR/BS3590IE/V015 authorising,

SABIC UK Petrochemicals Limited (“the operator”),

whose registered office is

The Wilton Centre

Wilton

Redcar

Cleveland

TS10 4RF

company registration number **03767075**

to operate an installation at

Wilton Olefins Installation

Wilton Site

PO Box 99

Redcar

Cleveland

TS10 4YA

to the extent authorised by and subject to the conditions of this permit.

Name	Date
Philip Lamb	18/01/2022

Authorised on behalf of the Environment Agency

Conditions

1 Management

1.1 General management

- 1.1.1 The operator shall manage and operate the activities:
- (a) in accordance with a written management system that identifies and minimises risks of pollution, including those arising from operations, maintenance, accidents, incidents, non-conformances, closure and those drawn to the attention of the operator as a result of complaints; and
 - (b) using sufficient competent persons and resources.
- 1.1.2 Records demonstrating compliance with condition 1.1.1 shall be maintained.
- 1.1.3 Any person having duties that are or may be affected by the matters set out in this permit shall have convenient access to a copy of it kept at or near the place where those duties are carried out.

1.2 Energy efficiency

- 1.2.1 The operator shall:
- (a) take appropriate measures to ensure that energy is used efficiently in the activities;
 - (b) take appropriate measures to ensure the efficiency of energy generation at the permitted installation is maximised;
 - (c) review and record at least every four years whether there are suitable opportunities to improve the energy efficiency of the activities; and
 - (d) take any further appropriate measures identified by a review.
- 1.2.2 The operator shall review the viability of Combined Heat and Power (CHP) implementation at least every 4 years, or in response to any of the following factors, whichever comes sooner:
- (a) new plans for significant developments within 15 km of the installation;
 - (b) changes to the Local Plan;
 - (c) changes to the UK CHP Development Map or similar; and
 - (d) new financial or fiscal incentives for CHP.

The results shall be reported to the Agency within 2 months of each review, including where there has been no change to the original assessment in respect of the above factors.

1.3 Efficient use of raw materials

- 1.3.1 The operator shall:
- (a) take appropriate measures to ensure that raw materials and water are used efficiently in the activities;
 - (b) maintain records of raw materials and water used in the activities;
 - (c) review and record at least every four years whether there are suitable alternative materials that could reduce environmental impact or opportunities to improve the efficiency of raw material and water use; and
 - (d) take any further appropriate measures identified by a review.

1.4 Avoidance, recovery and disposal of wastes produced by the activities

- 1.4.1 The operator shall take appropriate measures to ensure that:
- (a) the waste hierarchy referred to in Article 4 of the Waste Framework Directive is applied to the generation of waste by the activities;
 - (b) any waste generated by the activities is treated in accordance with the waste hierarchy referred to in Article 4 of the Waste Framework Directive; and
 - (c) where disposal is necessary, this is undertaken in a manner which minimises its impact on the environment.
- 1.4.2 The operator shall review and record at least every four years whether changes to those measures should be made and take any further appropriate measures identified by a review.

2 Operations

2.1 Permitted activities

- 2.1.1 The operator is only authorised to carry out the activities specified in schedule 1 table S1.1 (the “activities”).

2.2 The site

- 2.2.1 The activities shall not extend beyond the installation, being the land shown shaded in red on the site plan at schedule 7 to this permit.

2.3 Operating techniques

- 2.3.1 The activities shall, subject to the conditions of this permit, be operated using the techniques and in the manner described in the documentation specified in schedule 1, table S1.2, unless otherwise agreed in writing by the Environment Agency.
- 2.3.2 For the activities referenced in schedule 1, table S1.1: LCP 648, without prejudice to condition 2.3.1, the activities shall be operated in accordance with the “Electricity Supply Industry IED Compliance Protocol for Utility Boilers and Gas Turbines” dated December 2015 or any later version unless otherwise agreed in writing by the Environment Agency.
- 2.3.3 If notified by the Environment Agency that the activities are giving rise to pollution, the operator shall submit to the Environment Agency for approval within the period specified, a revision of any plan or other documentation (“plan”) specified in schedule 1, table S1.2 or otherwise required under this permit which identifies and minimises the risks of pollution relevant to that plan, and shall implement the approved revised plan in place of the original from the date of approval, unless otherwise agreed in writing by the Environment Agency.
- 2.3.4 Any raw materials or fuels listed in schedule 2 table S2.1 shall conform to the specifications set out in that table.

- 2.3.5 The end of the start-up period and the start of the shut-down period shall conform to the specifications set out in schedule 1, tables S1.2 and S1.4.
- 2.3.6 The operator shall ensure that where waste produced by the activities is sent to a relevant waste operation, that operation is provided with the following information, prior to the receipt of the waste:
- (a) the nature of the process producing the waste;
 - (b) the composition of the waste;
 - (c) the handling requirements of the waste;
 - (d) the hazardous property associated with the waste, if applicable; and
 - (e) the waste code of the waste.
- 2.3.7 The operator shall ensure that where waste produced by the activities is sent to a landfill site, it meets the waste acceptance criteria for that landfill.

2.4 Improvement programme

- 2.4.1 The operator shall complete the improvements specified in schedule 1 table S1.3 by the date specified in that table unless otherwise agreed in writing by the Environment Agency.
- 2.4.2 Except in the case of an improvement which consists only of a submission to the Environment Agency, the operator shall notify the Environment Agency within 14 days of completion of each improvement.

3 Emissions and monitoring

3.1 Emissions to water, air or land

- 3.1.1 There shall be no point source emissions to water, air or land except from the sources and emission points listed in schedule 3 tables S3.1, S3.2, S3.2a and S3.3.
- 3.1.2 The limits given in schedule 3 shall not be exceeded.
- 3.1.3 Total annual emissions from the emission points set out in schedule 3 tables S3.2 and S3.2a of a substance listed in schedule 3 table S3.4 shall not exceed the relevant limit in table S3.4.
- 3.1.4 Periodic monitoring shall be carried out at least once every 5 years for groundwater and 10 years for soil, unless such monitoring is based on a systematic appraisal of the risk of contamination.

3.2 Emissions of substances not controlled by emission limits

- 3.2.1 Emissions of substances not controlled by emission limits (excluding odour) shall not cause pollution. The operator shall not be taken to have breached this condition if appropriate measures, including, but not limited to, those specified in any approved emissions management plan, have been taken to prevent or where that is not practicable, to minimise, those emissions.
- 3.2.2 The operator shall:
- (a) if notified by the Environment Agency that the activities are giving rise to pollution, submit to the Environment Agency for approval within the period specified, an emissions management plan which identifies and minimises the risks of pollution from emissions of substances not controlled by emission limits; and
 - (b) implement the approved emissions management plan, from the date of approval, unless otherwise agreed in writing by the Environment Agency.

- 3.2.3 All liquids in containers, whose emission to water or land could cause pollution, shall be provided with secondary containment, unless the operator has used other appropriate measures to prevent or where that is not practicable, to minimise, leakage and spillage from the primary container.

3.3 Odour

- 3.3.1 Emissions from the activities shall be free from odour at levels likely to cause pollution outside the site, as perceived by an authorised officer of the Environment Agency, unless the operator has used appropriate measures, including, but not limited to, those specified in any approved odour management plan, to prevent or where that is not practicable to minimise the odour.
- 3.3.2 The operator shall:
- (a) if notified by the Environment Agency that the activities are giving rise to pollution outside the site due to odour, submit to the Environment Agency for approval within the period specified, an odour management plan which identifies and minimises the risks of pollution from odour; and
 - (b) implement the approved odour management plan, from the date of approval, unless otherwise agreed in writing by the Environment Agency.

3.4 Noise and vibration

- 3.4.1 Emissions from the activities shall be free from noise and vibration at levels likely to cause pollution outside the site, as perceived by an authorised officer of the Environment Agency, unless the operator has used appropriate measures, including, but not limited to, those specified in any approved noise and vibration management plan to prevent or where that is not practicable to minimise the noise and vibration.
- 3.4.2 The operator shall:
- (a) if notified by the Environment Agency that the activities are giving rise to pollution outside the site due to noise and vibration, submit to the Environment Agency for approval within the period specified, a noise and vibration management plan which identifies and minimises the risks of pollution from noise and vibration; and
 - (b) implement the approved noise and vibration management plan, from the date of approval, unless otherwise agreed in writing by the Environment Agency.

3.5 Monitoring

- 3.5.1 The operator shall, unless otherwise agreed in writing by the Environment Agency, undertake the monitoring specified in the following tables in schedule 3 to this permit:
- a) point source emissions specified in tables S3.1, S3.2 and S3.2a; and
 - b) process monitoring specified in table S3.5.
- 3.5.2 The operator shall maintain records of all monitoring required by this permit including records of the taking and analysis of samples, instrument measurements (periodic and continuous), calibrations, examinations, tests and surveys and any assessment or evaluation made on the basis of such data.
- 3.5.3 Monitoring equipment, techniques, personnel and organisations employed for the emissions monitoring programme and the environmental or other monitoring specified in condition 3.5.1 shall have either MCERTS certification or MCERTS accreditation (as appropriate), where available, unless otherwise agreed in writing by the Environment Agency.
- 3.5.4 Permanent means of access shall be provided to enable sampling/monitoring to be carried out in relation to the emission points specified in schedule 3 tables S3.1, S3.2 and S3.2a unless otherwise agreed in writing by the Environment Agency.

3.6 Monitoring for the purposes of Large Combustion Plant

- 3.6.1 All monitoring required by this permit shall be carried out in accordance with the provisions of Annex V of the Industrial Emissions Directive.
- 3.6.2 If the monitoring results for more than 10 days a year are invalidated within the meaning set out in condition 3.6.7, the operator shall:
- (a) within 28 days of becoming aware of this fact, review the causes of the invalidations and submit to the Environment Agency for approval, proposals for measures to improve the reliability of the continuous measurement systems, including a timetable for the implementation of those measures; and
 - (b) implement the approved proposals.
- 3.6.3 Continuous measurement systems on emission points from the LCP shall be subject to quality control by means of parallel measurements with reference methods at least once every calendar year.
- 3.6.4 Unless otherwise agreed in writing by the Environment Agency in accordance with condition 3.6.5 below, the operator shall carry out the methods, including the reference measurement methods, to use and calibrate continuous measurement systems in accordance with the appropriate CEN standards.
- 3.6.5 If CEN standards are not available, ISO standards, national or international standards which will ensure the provision of data of an equivalent scientific quality shall be used, as agreed in writing with the Environment Agency.
- 3.6.6 Where required by a condition of this permit to check the measurement equipment, the operator shall submit a report to the Environment Agency in writing, within 28 days of the completion of the check.
- 3.6.7 Where Continuous Emission Monitors are installed to comply with the monitoring requirements in schedule 3, table S3.1; the Continuous Emission Monitors shall be used such that:
- (a) for the continuous measurement systems fitted to the LCP release points defined in table S3.1, the validated hourly, daily, monthly and yearly averages shall be determined from the measured valid hourly average values after having subtracted the value of the 95% confidence interval;
 - (b) the 95% confidence interval for nitrogen oxides and sulphur dioxide of a single measured result shall be taken to be 20%;
 - (c) the 95% confidence interval for dust releases of a single measured result shall be taken to be 30%;
 - (d) the 95% confidence interval for carbon monoxide releases of a single measured result shall be taken to be 10%;
 - (e) an invalid hourly average means an hourly average period invalidated due to malfunction of, or maintenance work being carried out on, the continuous measurement system. However, to allow some discretion for zero and span gas checking, or cleaning (by flushing), an hourly average period will count as valid as long as data has been accumulated for at least two thirds of the period. Such discretionary periods are not to exceed more than 5 in any one 24-hour period unless agreed in writing. Where plant may be operating for less than the 24-hour period, such discretionary periods are not to exceed more than one quarter of the overall valid hourly average periods unless agreed in writing; and
 - (f) any day, in which more than three hourly average values are invalid shall be invalidated.

4 Information

4.1 Records

4.1.1 All records required to be made by this permit shall:

- (a) be legible;
- (b) be made as soon as reasonably practicable;
- (c) if amended, be amended in such a way that the original and any subsequent amendments remain legible, or are capable of retrieval; and
- (d) be retained, unless otherwise agreed in writing by the Environment Agency, for at least 6 years from the date when the records were made, or in the case of the following records until permit surrender:
 - (i) off-site environmental effects; and
 - (ii) matters which affect the condition of the land and groundwater.

4.1.2 The operator shall keep on site all records, plans and the management system required to be maintained by this permit, unless otherwise agreed in writing by the Environment Agency.

4.2 Reporting

4.2.1 The operator shall send all reports and notifications required by the permit to the Environment Agency using the contact details supplied in writing by the Environment Agency.

4.2.2 A report or reports on the performance of the activities over the previous year shall be submitted to the Environment Agency by 31 January (or other date agreed in writing by the Environment Agency) 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; and
- (c) the performance parameters set out in schedule 4 table S4.3 using the forms specified in table S4.4 of that schedule.

4.2.3 Within 28 days of the end of the reporting period the operator shall, unless otherwise agreed in writing by the Environment Agency, submit reports of the monitoring and assessment carried out in accordance with the conditions of this permit, as follows:

- (a) in respect of the parameters and emission points specified in schedule 4 table S4.1;
- (b) for the reporting periods specified in schedule 4 table S4.1 and using the forms specified in schedule 4 table S4.4; and
- (c) giving the information from such results and assessments as may be required by the forms specified in those tables.

4.2.4 The operator shall, unless notice under this condition has been served within the preceding four years, submit to the Environment Agency, within six months of receipt of a written notice, a report assessing whether there are other appropriate measures that could be taken to prevent, or where that is not practicable, to minimise pollution.

4.3 Notifications

4.3.1 In the event:

- (a) that the operation of the activities gives rise to an incident or accident which significantly affects or may significantly affect the environment, the operator must immediately—
 - (i) inform the Environment Agency,
 - (ii) take the measures necessary to limit the environmental consequences of such an incident or accident, and
 - (iii) take the measures necessary to prevent further possible incidents or accidents;
- (b) of a breach of any permit condition the operator must immediately—
 - (i) inform the Environment Agency, and
 - (ii) take the measures necessary to ensure that compliance is restored within the shortest possible time;
- (c) of a breach of permit condition which poses an immediate danger to human health or threatens to cause an immediate significant adverse effect on the environment, the operator must immediately suspend the operation of the activities or the relevant part of it until compliance with the permit conditions has been restored.

4.3.2 Any information provided under condition 4.3.1 shall be confirmed by sending the information listed in schedule 5 to this permit within the time period specified in that schedule.

4.3.3 Where the Environment Agency has requested in writing that it shall be notified when the operator is to undertake monitoring and/or spot sampling, the operator shall inform the Environment Agency when the relevant monitoring and/or spot sampling is to take place. The operator shall provide this information to the Environment Agency at least 14 days before the date the monitoring is to be undertaken.

4.3.4 The Environment Agency shall be notified within 14 days of the occurrence of the following matters, except where such disclosure is prohibited by Stock Exchange rules:

Where the operator is a registered company:

- (a) any change in the operator's trading name, registered name or registered office address; and
- (b) any steps taken with a view to the operator going into administration, entering into a company voluntary arrangement or being wound up.

Where the operator is a corporate body other than a registered company:

- (c) any change in the operator's name or address; and
- (d) any steps taken with a view to the dissolution of the operator.

4.3.5 Where the operator proposes to make a change in the nature or functioning, or an extension of the activities, which may have consequences for the environment and the change is not otherwise the subject of an application for approval under the Regulations or this permit:

- (a) the Environment Agency shall be notified at least 14 days before making the change; and
- (b) the notification shall contain a description of the proposed change in operation.

4.3.6 The Environment Agency shall be given at least 30 days notice before implementation of any part of the site closure plan.

4.3.7 The operator shall inform the Environment Agency in writing of the closure of any LCP within 28 days of the date of closure.

4.4 Interpretation

4.4.1 In this permit the expressions listed in schedule 6 shall have the meaning given in that schedule.

4.4.2 In this permit references to reports and notifications mean written reports and notifications, except where reference is made to notification being made “immediately”, in which case it may be provided by telephone.

Schedule 1 – Operations

Table S1.1 activities			
Activity reference	Activity listed in Schedule 1 of the EP Regulations	Description of specified activity	Limits of specified activity
AR1	Section 4.1 Part A(1)(a)(i) Producing organic chemicals such as hydrocarbons.	Production of aliphatic and aromatic hydrocarbon products from hydrocarbon feed-stocks.	From receipt of raw materials to despatch of finished products and by products.
AR2	Section 1.1 Part A(1)(a) Burning any fuel in an appliance with a rated thermal input of 50 megawatts (MW) or more.	LCP 648 85 MW thermal input gas fired boiler B1703E for the production of steam.	From receipt of gas to boiler B1703E, to discharge of exhaust gases at emission point A4b and the generation of steam.
		3 VMR furnaces B1702A-C, each at 57.5 MWth.	From receipt of fuel gas to furnaces and super-heaters to discharge of exhaust gases at emission points A1 (USC), A2 & A3 (VMR) and A5 (super-heaters).
		14 USC furnaces B1701A-P (there are no furnaces I and O), each at 45 MWth.	
		3 super-heaters B1704A-C, each at 46.8 MWth.	
	2 x 5 MWth gas-oil boilers for the production of steam.	From receipt of fuel to the production of hot water and steam for the use in the cleaning of the installation only. Only to be used for a maximum of four weeks at any one time during the cleaning process.	
AR3	Section 5.3 Part A(1)(ii)(iii) Disposal or recovery of hazardous waste with a capacity exceeding 10 tonnes per day by: (ii) physico-chemical treatment; and (iii) blending or mixing.	D9 – Physico-chemical treatment not specified elsewhere which results in final compounds or mixtures are discarded by means of any of the operations numbered D1 to D12. R3 – Recycling/reclamation of organic substances which are not used as solvents.	From the pre-treatment of waste, the storage of the treated waste, to dispatch for recovery or disposal. Only waste (waste code 07 01 04*) derived from the cleaning of the installation shall be pre-treated. Pre-treatment operations shall be limited to: Heat treatment, chemical treatment, filtration and separation of waste for the purpose of recovery or disposal. Pre-treatment shall only take place in the areas shown on Figure 1 of the Non-technical summary (Application EPR/BS3590IE/V014).

Table S1.1 activities			
Activity reference	Activity listed in Schedule 1 of the EP Regulations	Description of specified activity	Limits of specified activity
AR4	Section 5.6 Part A(1)(a) Temporary storage of hazardous waste with a total capacity exceeding 50 tonnes	D15 and R13 – Storage of hazardous waste.	Storage of waste arising from the cleaning of the installation. Storage shall only take place in the areas shown on Figure 1 of the Non-technical summary (Application EPR/BS3590IE/V014).
Directly associated activity			
AR5	Flaring of gases	Burning of hydrocarbon gases at the flares during abnormal operation.	From receipt of gases from the process to release at emission points A10 to A12.

Table S1.2 Operating techniques		
Description	Parts	Date Received
Variation application EPR/BS3590IE/V011	Supplementary documents provided with the application: Boiler B1703E M1 Assessment	08/06/2017
Response to Schedule 5 Notice request for information dated 28/09/2017	Responses to: Question 2 confirming net rated thermal input; Question 7 monitoring; Question 8 fuel characterisation; and Question 9 monitoring during other than normal operating conditions.	11/10/2017
Variation application EPR/BS3590IE/V011 Updated documentation, replacing existing documentation provided via email.	2.1 Process description; 2.4 Raw and auxiliary materials (including water usage); 2.5 Avoidance, Recovery and Disposal of Wastes Produced by the Activities; 2.6 Waste handling; 2.7 Energy Management Techniques; 2.10 Emissions Monitoring; 4.2 Waste Management; 2.9 Noise Management Plan; 5 BAT assessment; Odour Management Plan.	28/11/2017
Variation application EPR/BS3590IE/V014	Non-technical summary – Sections titled: <ul style="list-style-type: none"> • Pre-treatment of Waste activities; • Waste handling Best Available Techniques (BAT) Assessment; • Temporary steam generating boilers; and • Olefins installation boundary, drawing number OL- 546875. 	14/09/2020
Response to schedule 5 notice dated 15/02/2021	Response to questions: 15. Waste tracking 16. General storage and handling 17. Bulk storage	18/03/2021
Regulation 61(1) Notice – request for information dated 04/05/2018 & 06/07/2020 (Variation EPR/BS3590IE/V015)	Technical standards in relation to best available techniques as described in BAT Conclusions under Directive 2010/75/EU of the European Parliament and of the Council on industrial emissions for: Production of Large Volume Organic Chemicals (LVOC) BAT Conclusions: General BAT Conclusions 1 to 6, 8, 9, 14, 15, 17 to 19; and lower olefins production BAT Conclusions 20 to 23. Common waste water and waste gas treatment/management systems (CWW) in the chemical sector BAT Conclusions: 1 to 5, 7, 9 to 19; and 21 to 23. Large Combustion Plants (LCP) BAT Conclusions: General BAT Conclusions 1 to 4, 6, 9 to 14 and 17; and BAT Conclusions 55 to 59 for the combustion of process fuels from the chemical industry.	27/08/2020 (supersedes submission received 26/10/2018)

Table S1.2 Operating techniques		
Description	Parts	Date Received
Regulation 61(1) Notice – request for information dated 04/05/2018 & 06/07/2020 (Variation EPR/BS3590IE/V015)	Operational change (following consolidation in 2016) which is BS3590IE Issue 56, to use a mixed amine boiler feed water additive in the installations boiler feed water system.	22/06/2016
Response to request for further information sent 28/01/2021	Technical standards in relation to best available techniques as described in BAT Conclusions under Directive 2010/75/EU of the European Parliament and of the Council on industrial emissions for: Production of LVOG BAT Conclusion 20.	04/02/2021
Response to request for further information sent 03/06/2021	Technical standards in relation to best available techniques as described in BAT Conclusions under Directive 2010/75/EU of the European Parliament and of the Council on industrial emissions for: CWW BAT Conclusion 12.	11/11/2021
Annex to conditions in variation EPR/BS3590IE/V015	Operating techniques for CWW BAT Conclusion 12 derogation.	-

Table S1.3 Improvement programme requirements		
Reference	Requirement	Date
IC1 to IC31	-	Complete
IC32	The operator shall submit a noise assessment report undertaken by an experienced and suitably qualified person in accordance with the procedures given in BS4142:2014 (Methods for rating and assessing industrial and commercial sound). The assessment shall include the identification and assessment of the impact of noise emissions upon surrounding sensitive receptors arising from the operation of the installation, including an assessment of any change due to the operation of boiler B1703E.	Within 6 months of the start-up date ^{Note 1} of the Olefins 6 cracker
IC33	The operator shall update the relevant operating procedures and management plans with the details of the measures and processes taken to prevent the release of emissions from the maintenance shut down waste treatment process and the temporary storage of hazardous waste and shall incorporate these into the environmental management system.	6 months prior to the next maintenance shut-down
IC34	<u>LVOG BAT Conclusion 1 – CEMS on VMR furnaces (emission points A2 and A3)</u> The operator shall submit, for approval by the Environment Agency, reports setting out progress to achieving the 'Narrative' BAT for BAT Conclusion 1 for the <u>Production of LVOG</u> (continuous monitoring of VMR furnaces (≥ 50 MWth)), where BAT is currently not achieved. Methodology for achieving BAT, is set out in IC34a to IC34d below:	As set out in IC34a to IC34d in this table

Table S1.3 Improvement programme requirements		
Reference	Requirement	Date
IC34a	<u>Assess current VMR monitoring locations for homogeneity</u> <ul style="list-style-type: none"> The operator shall confirm if modifications to the temporary platforms and sampling ports are required for the one-off homogeneity testing. The operator shall make any identified modifications to the monitoring location to enable EN 15259 homogeneity testing or install the proposed BS EN 15259 compliant stacks. 	Progress report by: 07/06/2022 and then at six monthly intervals
IC34b	<u>Continuous monitoring</u> <ul style="list-style-type: none"> The operator shall submit proposals for continuous monitoring. Where the proposals are not finalised, the operator shall submit progress reports as notified by this improvement condition. Where CEMS are proposed, the operator shall submit the details of the CEMS to be installed, including timescales for installation and commissioning. Where predictive emission monitoring systems (PEMS) are proposed, the operator shall submit the details of the PEMS, confirm they meet EN/TS 17198, including plans for certification and timescales for installation and commissioning. 	Progress report by: 07/06/2022 and then at six monthly intervals
IC34c	<u>BS EN 15259 compliance</u> <ul style="list-style-type: none"> After start-up of the installation, the operator shall carry out tests to assess whether the proposed air monitoring location(s) meet the requirements of BS EN 15259 and supporting Method Implementation Document (MID). A written report shall be submitted for approval setting out the results and conclusions of the assessment including where necessary proposals for improvements to meet the requirements. Where notified in writing by the Environment Agency that the requirements are not met, the operator shall submit proposals or further proposals for rectifying this in accordance with the timescale in the notification. The proposals shall be implemented in accordance with the Environment Agency's written approval. 	Within 3 months of start-up of the VMR furnaces
IC34d	<u>Calibration</u> <ul style="list-style-type: none"> The operator shall carry out the initial calibration of the CEMS or PEMS and submit the calibration report to the Environment Agency. Where notified in writing by the Environment Agency that the requirements are not met, the operator shall submit proposals for rectifying this in accordance with the timescale in the notification. The proposals shall be implemented in accordance with the Environment Agency's written approval. 	Within 7 months of the use of the CEMS or PEMS

Table S1.3 Improvement programme requirements		
Reference	Requirement	Date
IC35	<p><u>LVOC BAT Conclusions 2 and 20 – emissions from de-coking</u></p> <p>The operator shall submit, for approval by Environment Agency, a report setting out progress to achieving the ‘Narrative’ BAT where BAT is currently not achieved. The report shall include, but not be limited to, the following:</p> <ul style="list-style-type: none"> • Methodology for achieving BAT. • Associated targets / timelines for reaching compliance. • Any alterations to the initial plan (in progress reports). <p>The report shall address the following BAT Conclusions:</p> <ul style="list-style-type: none"> • <u>Production of LVOC:</u> BAT Conclusion 2 (monitor emissions to air (carbon monoxide (CO) and dust) <u>other than</u> from process furnaces/heaters); and BAT Conclusion 20 (reduce emissions to air of dust and CO from decoking). <p>Refer to BAT Conclusions for a full description of the BAT requirement.</p>	<p>Progress report by: 07/06/2022</p> <p>then at six monthly intervals until compliance is reached, which shall be within the third calendar year following the year of publication of the relevant BAT AELs</p>
IC36	<p><u>CWW BAT Conclusion 12 (waste water treatment) derogation at emission point W1</u></p> <p>The operator shall submit, for approval by the Environment Agency, a report setting out progress to achieving the BAT Conclusion AELs where a derogation has been applied for and granted. The report shall include, but not necessarily be limited to, the following:</p> <ol style="list-style-type: none"> 1) Current performance against the BAT Conclusion AELs. 2) An assessment of the concentration of relevant parameters in the effluent at emission point W1 under the new installation configuration, following a representative period of operation. 3) Methodology for reaching the AELs. 4) Associated targets / timelines for reaching compliance by 07 December 2025, time limited date in granted derogations for TOC and AOX at water emission point W1. 5) Any alterations to the initial plan (in progress reports). <p>The report shall address the following BAT Conclusion:</p> <ul style="list-style-type: none"> • CWW BAT Conclusion 12, Table 1 (compliance with TOC BAT AEL) and Table 3 (compliance with AOX BAT AEL) at emission point W1. <p>Refer to BAT Conclusions for a full description of the BAT requirement.</p>	<p>Progress report by: 07/06/2022</p> <p>then at six monthly intervals until compliance is reached, which shall be no later than 07 December 2025</p>

Table S1.3 Improvement programme requirements		
Reference	Requirement	Date
IC37	<p><u>Assessment of TOC and AOX impacts from emission point W1</u></p> <p>The operator shall investigate and submit for approval by the Environment Agency, a report that reviews the impact of emissions of TOC and AOX from emission point W1 to the receiving water body.</p> <p>The investigation shall encompass the following:</p> <ol style="list-style-type: none"> 1) Shall follow a minimum of three representative months of sampling. 2) For the purpose of this IC, a more frequent sampling frequency for AOX than that defined in table S3.2a of this permit, shall be agreed with the Environment Agency. 3) Shall review TOC and AOX in the abstracted/raw water. 4) Shall review potential sources of TOC and AOX via raw material inputs and process chemistry. 5) The output from the sampling programme shall be used to assess the impact of emissions to the receiving water body from TOC and AOX in accordance with Environment Agency guidance <u>Surface water pollution risk assessment for your environmental permit - GOV.UK (www.gov.uk)</u>. 	<p>Within 9 months of the start-up date ^{Note 1} of the Olefins 6 cracker</p>
IC38	<p><u>LVOC BAT Conclusion 14 and CWW BAT Conclusions 3, 7, 9, 10, 11, 14 and 21 (linked to BAT Conclusion 12 derogation)</u></p> <p>The operator shall submit, for approval by Environment Agency, a report setting out progress to achieving the 'Narrative' BAT where BAT is currently not achieved. The report shall include, but not be limited to, the following:</p> <ul style="list-style-type: none"> • Methodology for achieving BAT. • Associated targets / timelines for reaching compliance. • Any alterations to the initial plan (in progress reports). <p>The report shall address the following BAT Conclusions:</p> <ul style="list-style-type: none"> • <u>LVOC</u>: BAT Conclusion 14 (reduce emissions to water, effluent treatment). • <u>CWW</u>: BAT Conclusion 3 (monitor key process parameters for emissions to water); BAT Conclusion 7 (reduce water usage and generation of waste water); BAT Conclusion 9 (buffer storage capacity for waste water); BAT Conclusion 10 (reduce emissions to water); BAT Conclusion 11 (pre-treating waste water); BAT Conclusion 14 (waste water sludge); and BAT Conclusion 21 (reduce odour emissions from waste water collection and treatment and from sludge treatment) <p>Refer to BAT Conclusions for a full description of the BAT requirement.</p>	<p>Progress report by 07/06/2022</p> <p>then at six monthly intervals until compliance is reached, which shall be no later than 07 December 2025</p>

Table S1.3 Improvement programme requirements		
Reference	Requirement	Date
IC39	<p><u>CWW BAT Conclusion 18</u></p> <p>The operator shall submit, for approval by the Environment Agency, a report on their management of flaring in order to minimise emissions to air in accordance with CWW BAT Conclusions 17 and 18.</p> <p>This shall include, but not be limited to, the following:</p> <ul style="list-style-type: none"> • An assessment of the feasibility of installing a flare gas recovery system to minimise baseline flaring, or any other possible improvements. • A timetable for implementation of any improvements planned. • Progress against any improvement proposals identified in previous reports. 	<p>Within 18 months of the start-up date ^{Note 1} of the Olefins 6 cracker</p>
IC40	<p><u>Emissions to air from Olefins 6 cracker furnaces</u></p> <p>For emission points A1 to A3 in Schedule 3 of this permit, where the indicative limit for carbon monoxide (CO) of 50 mg/Nm³ (expressed as a daily average or an average over the sampling period) cannot be met, then the operator shall provide a site specific justification for a higher CO limit to be approved in writing by the Environment Agency.</p>	<p>Within 9 months of the start-up date ^{Note 1} of the Olefins 6 cracker</p>
IC41	<p><u>Performance of effluent treatment</u></p> <p>The operator shall review the performance of the effluent treatment against the conditions of this permit and verify that they have control over their effluent quality following the improvements at the installation under IC36 and IC38 in this table.</p> <p>The operator shall submit a report on the findings of the review, with details of procedures developed during the improvements for achieving and demonstrating satisfactory process control and timescales to implement any remedial actions to maintain compliance with the relevant BAT Conclusions.</p> <p>The operator shall implement the actions as approved in writing and from the date approved by the Environment Agency.</p>	<p>Within 12 months of the achievement of the BAT AELs and no later than 07 December 2026</p>

Table S1.3 Improvement programme requirements		
Reference	Requirement	Date
IC42	<p><u>Surface water pollution risk assessment</u></p> <p>The operator shall submit a surface water pollution risk assessment to the Environment Agency for approval, which shall assess the impact of discharges of hazardous pollutants to surface water from the installation at emission point W1 following off-site effluent treatment. The risk assessment shall include, but not be limited to the following:</p> <ul style="list-style-type: none"> a) representative emissions data for the relevant hazardous pollutants; and any other relevant substances discharged from the installation. Any emissions monitoring required should be carried out using the methods and standards described in Environment Agency guidance “Monitoring discharges to water” on .gov.uk; b) a risk assessment in accordance with the screening procedures in Environment Agency guidance “<u>Surface water pollution risk assessment for your environmental permit</u>” on .gov.uk, using the representative emissions data obtained in (a) above; and <p>The results of the assessment shall be used to determine the requirement for any additional control measures together with a timetable for implementation of any proposed measures for approval by the Environment Agency.</p>	<p>Within 12 months of the achievement of the BAT AELs and no later than 07 December 2026</p>
<p>Note 1: Refer to Schedule 6 - Interpretation of this permit for the definition of “start-up date”.</p>		

Table S1.4 Start-up and Shut-down thresholds		
Emission Point and Unit Reference	“Minimum start-up load (MSUL)”	“Minimum shut-down load (MSDL)”
	<p>A4b: Steam flow rate in t/h and as percent of maximum continuous rating (%) and when one of the two other criteria listed below for the LCP have been met</p>	<p>A4b: Steam flow rate in t/h and as percent of maximum continuous rating (%) and when one of the two other criteria listed below for the LCP have been met</p>
A4b Unit LCP 648 (B1703E)	<p>10t/h steam, Boiler load - 10% MCR and Steam pressure - 60 bar(g) or Steam temperature - 375°C</p>	<p>10t/h steam, Boiler load - 10% MCR and Steam pressure - 60 bar(g) or Steam temperature - 375°C</p>

Schedule 2 – Waste types, raw materials and fuels

Table S2.1 Raw materials and fuels	
Raw materials and fuel description	Specification
Natural gas	-
Diesel	<0.1% sulphur content

Schedule 3 – Emissions and monitoring

Table S3.1 Point source emissions to air limits and monitoring requirements shall apply from the start-up date ^{Note 12} of the Olefins 6 cracker						
Emission point ref. & location	Parameter	Source ^{Note 13}	Limit (including unit)-these limits do not apply during start up or shut down. ^{Note 1}	Reference period	Monitoring frequency	Monitoring standard or method ^{Note 3}
A1 ^{Notes 2 & 6}	Oxides of Nitrogen (NO and NO ₂ expressed as NO ₂) ^{Note 4}	14 USC furnaces B1701A-P fired on process generated off gas/natural gas	180 mg/m ³	Average over the sample period	Once every six months	EN 14792
A1 ^{Notes 2 & 6}	Carbon monoxide (CO)	14 USC furnaces B1701A-P fired on process generated off gas/natural gas	Note 11	Average over the sample period	Once every six months	EN 15058
A1 ^{Notes 2 & 6}	Sulphur dioxide (SO ₂)	14 USC furnaces B1701A-P fired on process generated off gas/natural gas	-	-	Once every six months	Concentration by calculation, as agreed in writing with the Environment Agency
A2 ^{Note 6}	Oxides of Nitrogen (NO and NO ₂ expressed as NO ₂) ^{Note 4}	2 VMR furnaces B1702A/B fired on process generated off gas/natural gas	180 mg/m ³	Note 8	Note 8	Note 8
A2 ^{Note 6}	Carbon monoxide (CO)	2 VMR furnaces B1702A/B fired on process generated off gas/natural gas	Note 11	Note 8	Note 8	Note 8
A2 ^{Note 6}	Sulphur dioxide (SO ₂)	2 VMR furnaces B1702A/B fired on process generated off gas/natural gas	-	-	Once every six months	Concentration by calculation, as agreed in writing with the Environment Agency

Table S3.1 Point source emissions to air limits and monitoring requirements shall apply from the start-up date ^{Note 12} of the Olefins 6 cracker						
Emission point ref. & location	Parameter	Source ^{Note 13}	Limit (including unit)-these limits do not apply during start up or shut down. ^{Note 1}	Reference period	Monitoring frequency	Monitoring standard or method ^{Note 3}
A3 ^{Note 6}	Oxides of Nitrogen (NO and NO ₂ expressed as NO ₂) ^{Note 4}	1 VMR furnace B1702C fired on process generated off gas/ natural gas	180 mg/m ³	Note 8	Note 8	Note 8
A3 ^{Note 6}	Carbon monoxide (CO)	1 VMR furnace B1702C fired on process generated off gas/natural gas	Note 11	Note 8	Note 8	Note 8
A3 ^{Note 6}	Sulphur dioxide (SO ₂)	1 VMR furnace B1702C fired on process generated off gas/natural gas	-	-	Once every six months	Concentration by calculation, as agreed in writing with the Environment Agency
A4b ^{Note 6}	Oxides of Nitrogen (NO and NO ₂ expressed as NO ₂)	LCP 648 Boiler plant B1703E fired on process generated off gas/natural gas	200 mg/m ³ MSUL/MSDL to base load ^{Note 5}	95% of validated hourly averages within a calendar year	Continuous	EN 14181
A4b ^{Note 6}	Oxides of Nitrogen (NO and NO ₂ expressed as NO ₂)	LCP 648 Boiler plant B1703E fired on process generated off gas/natural gas	100 mg/m ³ MSUL/MSDL to base load ^{Note 5}	Daily mean of validated hourly averages	Continuous	EN 14181
A4b ^{Note 6}	Oxides of Nitrogen (NO and NO ₂ expressed as NO ₂)	LCP 648 Boiler plant B1703E fired on process generated off gas/natural gas	100 mg/m ³ MSUL/MSDL to base load ^{Note 5}	Calendar monthly mean	Continuous	EN 14181
A4b ^{Note 6}	Oxides of Nitrogen (NO and NO ₂ expressed as NO ₂)	LCP 648 Boiler plant B1703E fired on process generated off gas/natural gas	80 mg/m ³ MSUL/MSDL to base load ^{Note 5}	Yearly average	Continuous	EN 14181

Table S3.1 Point source emissions to air limits and monitoring requirements shall apply from the start-up date ^{Note 12} of the Olefins 6 cracker						
Emission point ref. & location	Parameter	Source ^{Note 13}	Limit (including unit)-these limits do not apply during start up or shut down. ^{Note 1}	Reference period	Monitoring frequency	Monitoring standard or method ^{Note 3}
A4b ^{Note 6}	Carbon Monoxide	LCP 648 Boiler plant B1703E fired on process generated off gas/natural gas	200 mg/m ³ MSUL/MSDL to base load ^{Note 5}	95% of validated hourly averages within a calendar year	Continuous	EN 14181
A4b ^{Note 6}	Carbon Monoxide	LCP 648 Boiler plant B1703E fired on process generated off gas/natural gas	110 mg/m ³ MSUL/MSDL to base load ^{Note 5}	Daily mean of validated hourly averages	Continuous	EN 14181
A4b ^{Note 6}	Carbon Monoxide	LCP 648 Boiler plant B1703E fired on process generated off gas/natural gas	100 mg/m ³ MSUL/MSDL to base load ^{Note 5}	Calendar monthly mean of validated hourly averages	Continuous	EN 14181
A4b ^{Note 6}	Carbon Monoxide	LCP 648 Boiler plant B1703E fired on process generated off gas/natural gas	30 mg/m ³ MSUL/MSDL to base load ^{Note 5}	Yearly average	Continuous	EN 14181
A4b ^{Note 6}	Sulphur Dioxide	LCP 648 Boiler plant B1703E fired on process generated off gas/natural gas	70 mg/m ³ MSUL/MSDL to base load ^{Note 5}	95% of validated hourly averages within a calendar year	Continuous	EN 14181
A4b ^{Note 6}	Sulphur Dioxide	LCP 648 Boiler plant B1703E fired on process generated off gas/natural gas	70 mg/m ³ MSUL/MSDL to base load ^{Note 5}	Daily mean of validated hourly averages	Continuous	EN 14181

Table S3.1 Point source emissions to air limits and monitoring requirements shall apply from the start-up date ^{Note 12} of the Olefins 6 cracker						
Emission point ref. & location	Parameter	Source ^{Note 13}	Limit (including unit)-these limits do not apply during start up or shut down. ^{Note 1}	Reference period	Monitoring frequency	Monitoring standard or method ^{Note 3}
A4b ^{Note 6}	Sulphur Dioxide	LCP 648 Boiler plant B1703E fired on process generated off gas/natural gas	35 mg/m ³ MSUL/MSDL to base load ^{Note 5}	Calendar monthly mean of validated hourly averages	Continuous	EN 14181
A4b ^{Note 6}	Sulphur Dioxide	LCP 648 Boiler plant B1703E fired on process generated off gas/natural gas	10 mg/m ³ MSUL/MSDL to base load ^{Note 5}	Yearly average	Continuous	EN 14181
A4b ^{Note 6}	Dust	LCP 648 Boiler plant B1703E fired on process generated off gas/natural gas	4 mg/m ³ MSUL/MSDL to base load ^{Note 5}	95% of validated hourly averages within a calendar year	Continuous	EN 14181
A4b ^{Note 6}	Dust	LCP 648 Boiler plant B1703E fired on process generated off gas/natural gas	2 mg/m ³ MSUL/MSDL to base load ^{Note 5}	Daily mean of validated hourly averages	Continuous	EN 14181
A4b ^{Note 6}	Dust	LCP 648 Boiler plant B1703E fired on process generated off gas/natural gas	2 mg/m ³ MSUL/MSDL to base load ^{Note 5}	Calendar monthly mean of validated hourly averages	Continuous	EN 14181
A4b ^{Note 6}	Dust	LCP 648 Boiler plant B1703E fired on process generated off gas/natural gas	2 mg/m ³ MSUL/MSDL to base load ^{Note 5}	Yearly average	Continuous	EN 14181

Table S3.1 Point source emissions to air limits and monitoring requirements shall apply from the start-up date ^{Note 12} of the Olefins 6 cracker						
Emission point ref. & location	Parameter	Source ^{Note 13}	Limit (including unit)-these limits do not apply during start up or shut down. ^{Note 1}	Reference period	Monitoring frequency	Monitoring standard or method ^{Note 3}
A4b ^{Note 6}	Hydrogen chloride	LCP 648 Boiler plant B1703E fired on process generated off gas/natural gas	1 mg/m ³ MSUL/MSDL to base load ^{Note 5}	Average over the sample period	Each time that a change of the fuel characteristics may have an impact on the emissions	EN 1911 Parts 1, 2 and 3
A4b ^{Note 6}	Hydrogen fluoride	LCP 648 Boiler plant B1703E fired on process generated off gas/natural gas	1 mg/m ³ MSUL/MSDL to base load ^{Note 5}	Average over the sample period	Each time that a change of the fuel characteristics may have an impact on the emissions	ISO 15713 CEN TS 17340 ^{Note 7}
A4b ^{Note 6}	Total volatile organic carbon (TVOC) as carbon	LCP 648 Boiler plant B1703E fired on process generated off gas/natural gas	12 mg/m ³	-	At least every 12 months, or each time that a change of the fuel characteristics may have an impact on the emissions	EN 12619
A4b ^{Note 6}	Oxygen	LCP 648 Boiler plant B1703E fired on process generated off gas/natural gas	-	-	Continuous As appropriate to reference	EN 14181
A4b ^{Note 6}	Water vapour	LCP 648 Boiler plant B1703E fired on process generated off gas/natural gas	-	-	Periodic as appropriate to reference	EN 14790
A4b ^{Note 6}	Stack gas temperature	LCP 648 Boiler plant B1703E fired on process generated off gas/natural gas	-	-	Continuous as appropriate to reference	Traceable to national standards

Table S3.1 Point source emissions to air limits and monitoring requirements shall apply from the start-up date ^{Note 12} of the Olefins 6 cracker						
Emission point ref. & location	Parameter	Source ^{Note 13}	Limit (including unit)-these limits do not apply during start up or shut down. ^{Note 1}	Reference period	Monitoring frequency	Monitoring standard or method ^{Note 3}
A4b ^{Note 6}	Stack gas pressure	LCP 648 Boiler plant B1703E fired on process generated off gas/natural gas	-	-	Continuous as appropriate to reference	Traceable to national standards
A4b ^{Note 6}	Stack gas volume flow	LCP 648 Boiler plant B1703E fired on process generated off gas/natural gas	-	-	Periodic as appropriate to reference	EN 16911
A4b ^{Note 6}	As required by the Method Implementation Document for EN 15259	LCP 648 Boiler plant B1703E fired on process generated off gas/natural gas	-	-	Pre-operation and when there is a significant operational change	EN 15259
A5 ^{Note 6}	Oxides of Nitrogen (NO and NO ₂ expressed as NO ₂)	3 super-heaters B1704A-C	300 mg/m ³	Average over the sample period	Annual	EN 14792
A6 ^{Note 6}	No parameters set	L1712 Caustic OWS	-	-	-	-
A7 ^{Note 6}	No parameters set	L1748 OWS	-	-	-	-
A8 [Point A8 on site plan No 1.9]	No parameters set	BFS OWS	-	-	-	-
A9 ^{Note 6}	No parameters set	Olefins analysers	-	-	-	-

Table S3.1 Point source emissions to air limits and monitoring requirements shall apply from the start-up date ^{Note 12} of the Olefins 6 cracker						
Emission point ref. & location	Parameter	Source ^{Note 13}	Limit (including unit)-these limits do not apply during start up or shut down. ^{Note 1}	Reference period	Monitoring frequency	Monitoring standard or method ^{Note 3}
A10 ^{Note 6}	No parameters set	Olefins L1719 A/B flares ^{Note 9}	-	-	-	-
A11 [Point A11 on site plan No 1.8]	No parameters set	WEC L1009A flare ^{Note 9}	-	-	-	-
A12 [Point A12 on site plan No 1.8]	No parameters set	RBS B1945 flare ^{Note 9}	-	-	-	-
A13 [Point A13 on site plan No 1.7]	No parameters set	F1962 A/B Naphtha tanks	-	-	-	-
A15 [Point A15 on site plan No 1.7]	No parameters set	F1781 Naphtha tank	-	-	-	-
A16 ^{Note 6}	No parameters set	Recovered oil tanks	-	-	-	-
A17 ^{Note 6}	No parameters set	FA 1721 GTU surge tank	-	-	-	-
A20 [Point A20 on site plan No 1.9]	No parameters set	2 x Bf1 Bf2 DPHG	-	-	-	-

Table S3.1 Point source emissions to air limits and monitoring requirements shall apply from the start-up date ^{Note 12} of the Olefins 6 cracker

Emission point ref. & location	Parameter	Source ^{Note 13}	Limit (including unit)-these limits do not apply during start up or shut down. ^{Note 1}	Reference period	Monitoring frequency	Monitoring standard or method ^{Note 3}
Temporary Boilers ^{Note 10}	No parameters set	Exhaust from the boilers	-	-	-	-

Note 1: See Schedule 6 of this permit for reference conditions.

Note 2: A minimum of two spot samples from furnaces B1701A-P, one cracking gas feeds and the second cracking liquid feeds shall be considered representative for emission point A1.

Note 3: Monitoring standard or method as specified in table or otherwise agreed in writing with the Environment Agency.

Note 4: During NOx monitoring, a record of the hydrogen content of the combined fuel gas feeding the combustion plant shall be made.

Note 5: This ELV applies where the load varies between MSUL/MSDL and base load during the daily reference period. MSUL and MSDL are defined in table S1.4 of this permit.

Note 6: Emission point on site plan in schedule 7 of this permit.

Note 7: This standard shall replace ISO 15713 from 01 March 2022.

Note 8: The monitoring reference period, frequency and standard shall be based on the outcome of improvement condition IC34 in table S1.3 of this permit.

Note 9: Monitoring of the flares is specified in table S4.3 of this permit.

Note 10: Emission point on Figure 1 of Non-technical summary of variation application EPR/BS3590IE/V014.

Note 11: As an indication, the CO limit shall be 50 mg/Nm³ expressed as a daily average or an average over the sampling period. If a higher limit is required, then a site specific justification shall be provided in accordance with IC40 in table S1.3 of this permit.

Note 12: Refer to Schedule 6 - Interpretation of this permit for the definition of "start-up date".

Note 13: The 14 USC and the three VMR furnaces each vent through their own stack equipped with monitoring ports.

Table S3.2 Point source emissions to water limits and monitoring requirements shall apply until the start-up date ^{Note 4} of the Olefins 6 cracker						
Emission point ref. & location ^{Note 3}	Parameter	Source	Limit (incl. Unit)	Reference period	Monitoring frequency	Monitoring standard or method ^{Note 2}
W1	Benzene	Olefins Area	18 mg/l ^{Note 1}	24 hour composite sample	Daily	-
W1	Toluene	Olefins Area	7 mg/l ^{Note 1}	24 hour composite sample	Daily	-
W1	Xylenes (total)	Olefins Area	5 mg/l ^{Note 1}	24 hour composite sample	Daily	-
W1	EDC – 1,2 Dichloroethane	Olefins Area	No limit	Spot sample	Monthly	-
W1	Ammoniacal Nitrogen (as N)	Olefins Area	No limit	Spot sample	Monthly	-
W1	Cadmium	Olefins Area	No limit	Spot sample	Monthly	-
W1	Mercury	Olefins Area	No limit	Spot sample	Monthly	-
W1	Zinc	Olefins Area	No limit	Spot sample	Monthly	-
W1	Phenol	Olefins Area	No limit	Spot sample	Monthly	-
W1	Chloroform	Olefins Area	No limit	Spot sample	Monthly	-
W1	Total organic carbon (TOC)	Olefins Area	1400 kg	24 hour composite sample	Daily	-
W1	Suspended solids	Olefins Area	1800 kg	24 hour composite sample	Daily	-
W2	Benzene	Wilton Ethylene Control Area Drainage	No limit	Spot sample	Daily ^{Note 5}	-
W2	Toluene	Wilton Ethylene Control Area Drainage	No limit	Spot sample	Daily ^{Note 5}	-
W2	Xylenes (total)	Wilton Ethylene Control Area Drainage	No limit	Spot sample	Daily ^{Note 5}	-
W3	Benzene	Central Control Area Drainage	No limit	Spot sample	Daily ^{Note 5}	-

Table S3.2 Point source emissions to water limits and monitoring requirements shall apply until the start-up date ^{Note 4} of the Olefins 6 cracker

Emission point ref. & location <small>Note 3</small>	Parameter	Source	Limit (incl. Unit)	Reference period	Monitoring frequency	Monitoring standard or method <small>Note 2</small>
W3	Toluene	Central Control Area Drainage	No limit	Spot sample	Daily ^{Note 5}	-
W3	Xylenes (total)	Central Control Area Drainage	No limit	Spot sample	Daily ^{Note 5}	-

Note 1: Limits for Benzene, Toluene, Xylenes samples are based on five day moving average.

Note 2: Monitoring standard or method as specified in table, or otherwise agreed in writing with the Environment Agency.

Note 3: Emission point on site plan in schedule 7 of this permit, emission to Wilton Site Drainage System.

Note 4: Refer to Schedule 6 - Interpretation of this permit for the definition of "start-up date".

Note 5: Monitoring frequencies may be reduced with written agreement from the Environment Agency if the data demonstrates sufficient stability.

Table S3.2a Point source emissions to water limits and monitoring requirements shall apply from the start-up date ^{Note 10} of the Olefins 6 cracker						
Emission point ref. & location ^{Note 2}	Parameter	Source	Limit (incl. Unit)	Reference period	Monitoring frequency ^{Note 4}	Monitoring standard or method
W1	Benzene	Olefins Area	18 mg/l ^{Note 1}	24 hour composite sample	Daily	EN ISO 15680
W1	Toluene	Olefins Area	7 mg/l ^{Note 1}	24 hour composite sample	Daily	EN ISO 15680
W1	Xylenes (total)	Olefins Area	5 mg/l ^{Note 1}	24 hour composite sample	Daily	EN ISO 15680
W1	EDC – 1,2 Dichloroethane	Olefins Area	No limit	Spot sample	Monthly	EN ISO 10301
W1	Ammoniacal Nitrogen (as N)	Olefins Area	No limit	Spot sample	Monthly	EN ISO 11732
W1	Cadmium	Olefins Area	No limit	Spot sample	Monthly	EN ISO 5961
W1	Mercury	Olefins Area	No limit	Spot sample	Monthly	EN 12846
W1	Zinc	Olefins Area	300 µg/l ^{Note 7}	24 hour flow proportional composite sample ^{Note 7}	Monthly	EN ISO 11885
W1	Chromium	Olefins Area	25 µg/l ^{Note 7}	24 hour flow proportional composite sample ^{Note 7}	Monthly	EN 1233
W1	Copper	Olefins Area	50 µg/l ^{Note 7}	24 hour flow proportional composite sample ^{Note 7}	Monthly	EN ISO 11885
W1	Nickel	Olefins Area	50 µg/l ^{Note 7}	24 hour flow proportional composite sample ^{Note 7}	Monthly	EN ISO 11885
W1	Lead	Olefins Area	-	Spot sample	Monthly	EN ISO 11885
W1	Phenol	Olefins Area	No limit	Spot sample	Monthly	EN ISO 15680

Table S3.2a Point source emissions to water limits and monitoring requirements shall apply from the start-up date ^{Note 10} of the Olefins 6 cracker

Emission point ref. & location ^{Note 2}	Parameter	Source	Limit (incl. Unit)	Reference period	Monitoring frequency ^{Note 4}	Monitoring standard or method
W1	Chloroform	Olefins Area	No limit	Spot sample	Monthly	EN ISO 10301
W1	Total organic carbon (TOC)	Olefins Area	1,300 kg/day	24 hour composite sample	Daily	EN 1484
W1 ^{Note 9}	Total organic carbon (TOC)	Olefins Area	60 mg/l ^{Notes 7 & 9}	24 hour flow proportional composite sample ^{Note 7}	Daily	EN 1484
			33 mg/l ^{Notes 7 & 9}	24 hour flow proportional composite sample ^{Note 7}		
W1	Suspended solids	Olefins Area	1800 kg/day	24 hour composite sample	Daily	EN 872
W1	Suspended solids	Olefins Area	35 mg/l ^{Note 7}	24 hour flow proportional composite sample ^{Note 7}	Daily	EN 872
W1	Total nitrogen (TN) ^{Note 3}	Olefins Area	25 mg/l ^{Notes 7 & 8}	24 hour flow proportional composite sample ^{Note 7}	Daily	EN 12260
W1	Total inorganic nitrogen (N _{inorg}) ^{Note 3}	Olefins Area	20 mg/l ^{Notes 7 & 8}	24 hour flow proportional composite sample ^{Note 7}	Daily	ISO 15923-1
W1	Total phosphorus (TP)	Olefins Area	3 mg/l ^{Note 7}	24 hour flow proportional composite sample ^{Note 7}	Daily	EN ISO 15681-1
W1 ^{Note 9}	Adsorbable organically bound halogens (AOX)	Olefins Area	3 mg/l ^{Notes 7 & 9}	24 hour flow proportional composite sample ^{Note 7}	Monthly	EN ISO 9562

Table S3.2a Point source emissions to water limits and monitoring requirements shall apply from the start-up date ^{Note 10} of the Olefins 6 cracker

Emission point ref. & location ^{Note 2}	Parameter	Source	Limit (incl. Unit)	Reference period	Monitoring frequency ^{Note 4}	Monitoring standard or method
			1 mg/l ^{Notes 7 & 9}	24 hour flow proportional composite sample ^{Note 7}		
W1	Flow	Olefins Area	-	24-hour total	Continuous	Operator self-monitoring of flow
W1	pH	Olefins Area	-	Instantaneous	Continuous	BS ISO 10523
W1	Temperature	Olefins Area	-	Instantaneous	Continuous	Resistance temperature detector
W2	Benzene	Wilton Ethylene Control Area Drainage	No limit	Spot sample	Daily ^{Note 6}	-
W2	Toluene	Wilton Ethylene Control Area Drainage	No limit	Spot sample	Daily ^{Note 6}	-
W2	Xylenes (total)	Wilton Ethylene Control Area Drainage	No limit	Spot sample	Daily ^{Note 6}	-
W3	Benzene	Central Control Area Drainage	No limit	Spot sample	Daily ^{Note 6}	-
W3	Toluene	Central Control Area Drainage	No limit	Spot sample	Daily ^{Note 6}	-
W3	Xylenes (total)	Central Control Area Drainage	No limit	Spot sample	Daily ^{Note 6}	-

Table S3.2a Point source emissions to water limits and monitoring requirements shall apply from the start-up date ^{Note 10} of the Olefins 6 cracker						
Emission point ref. & location ^{Note 2}	Parameter	Source	Limit (incl. Unit)	Reference period	Monitoring frequency ^{Note 4}	Monitoring standard or method
<p>Note 1: Limits for Benzene, Toluene, Xylenes samples are based on five day moving average.</p> <p>Note 2: Emission point on site plan in schedule 7 of this permit, emission to Wilton Site Drainage System.</p> <p>Note 3: TN and N_{inorg} monitoring are alternatives.</p> <p>Note 4: Monitoring frequencies may be adapted with written agreement from the Environment Agency if the data clearly demonstrates a sufficient stability in accordance with CWW BAT Conclusion 4.</p> <p>Note 6: Monitoring frequencies may be reduced with written agreement from the Environment Agency if the data demonstrates sufficient stability.</p> <p>Note 7: Limit applies to flow-weighted yearly averages of 24-hour flow proportional composite samples. Time proportional sampling can be used provided that sufficient flow stability is demonstrated and agreed in writing with the Environment Agency.</p> <p>Note 8: Limit applies where the emission has undergone biological treatment in accordance with CWW BAT Conclusion 12.</p> <p>Note 9: The higher limit shall apply until completion of the time limited derogation set out in improvement condition IC36 in table S1.3 of this permit, or until any re-assessment that may result from the TIP variation (EPR/BS3590IE/V016). The lower limit applies to the effluent from W1 following off-site effluent treatment.</p> <p>Note 10: Refer to Schedule 6 - Interpretation of this permit for the definition of “start-up date”.</p>						

Table S3.3 Point Source emissions to sewer – emission limits and monitoring requirements						
Emission point ref. & location	Parameter	Source	Limit (incl. unit)	Reference period	Monitoring frequency	Monitoring standard or method
-	-	-	-	-	-	-

Table S3.4 Annual limits for discharge to water	
Substance	Annual limit – kg ^{Note 1}
Cadmium	0.50
Mercury	0.60
Zinc	4000
Note 1: Limits shall be reviewed in accordance with IC42 in table S1.3 of this permit.	

Table S3.5 Process monitoring requirements				
Emission point reference or source or description of point of measurement	Parameter	Monitoring frequency	Monitoring standard or method	Other specifications
LCP 648	Net total fuel utilisation	After each modification that could significantly affect these parameters	EN Standards or equivalent	-
W1, W2, W3	Use of buffer tanks	-	-	The operator shall record the occasions when, and the reasons for, diversion of the Wilton Drainage System to the buffer tanks, due to abnormal operation

Schedule 4 – Reporting

Parameters, for which reports shall be made, in accordance with conditions of this permit, are listed below.

Table S4.1 Reporting of monitoring data			
Parameter	Emission or monitoring point/reference	Reporting period	Period begins
Emissions to air Parameters as required by condition 3.5.1. (until to 06 December 2021)	A4b	Every 3 months for continuous monitoring	1 January, 1 April, 1 July, 1 October
	A1, A2, A3 A4b, A5	Every 12 months	1 January
Emissions to air Parameters as required by condition 3.5.1. (from 07 December 2021)	A2 ^{Note 1} , A3 ^{Note 1} , A4b	Every 3 months for continuous monitoring	1 January, 1 April, 1 July, 1 October
	A1, A2 ^{Note 1} , A3 ^{Note 1}	Every 6 months	1 Jan, 1 July
	A4b, A5	Every 12 months	1 January
Emissions to water Parameters as required by condition 3.5.1	W1, W2, W3	Every 6 months	1 Jan, 1 July
Note 1: Reporting requirements shall be subject to the outcome of IC34 in table S1.3 of this permit.			

Table S4.2 Annual production/treatment	
Parameter	Units
Annual production tonnage not required to be disclosed but made available on inspection	-

Table S4.3 Large Combustion Plant Performance parameters for reporting to DEFRA and other Performance parameters

Parameter	Frequency of assessment	Units
Thermal input capacity for LCP 648	Annually	MW
Annual fuel usage for LCP 648	Annually	TJ
Total emissions to air of NO _x for LCP 648	Annually	tonnes
Total emissions to air of SO ₂ for LCP 648	Annually	tonnes
Total emissions to air of dust for LCP 648	Annually	tonnes
Operating hours for LCP 648	Annually	hours
Waste Hazard Score	Annually	
Waste Disposal Score	Annually	
<u>CWW BAT Conclusions 17 and 18 – flare management – emission point A10</u> <ul style="list-style-type: none"> • Monitoring data of the gas composition and flaring events. • Number of hours and dates of operation of the flares. • Nature of plant operations at the time of flaring. • Any actions taken in the previous 12 months to minimise the impact of flaring. 	Annually	Durations (minutes)

Table S4.4 Reporting forms

Media/ parameter	Reporting format ^{Note 1}	Starting Point	Agency recipient	Date of form
Air & Energy	Form LCPBREF AR1 – SO ₂ , NO _x and dust mass emission and energy	01/01/2016	National and area office	June 2020
LCP	Form LCPBREF HR1 – operating hours	01/01/2016	National and area office	June 2020
Air	Form LCPBREF CON 1 – continuous monitoring	01/01/2016	Area Office	June 2020
CEMS	Form LCPBREF CEM – invalidation log	01/01/2016	Area Office	June 2020
Air	Form LCPBREF PM1 – discontinuous monitoring and load	01/01/2016	Area Office	June 2020
Other performance indicators	Form performance 1 or other form as agreed in writing by the Environment Agency	01/01/2016	Area Office	December 2021
Water	Form water 1 or other form as agreed in writing by the Environment Agency	01/01/2016	Area Office	December 2021
Air	Form A1	01/01/2017	Area Office	December 2021
Energy	Form E1	19/11/2003	Area Office	December 2021

Table S4.4 Reporting forms				
Media/ parameter	Reporting format ^{Note 1}	Starting Point	Agency recipient	Date of form
Waste return	Form R1	19/11/2003	Area Office	December 2021
Note 1: Or form as agreed in writing by the Environment Agency.				

Schedule 5 – Notification

These pages outline the information that the operator must provide.

Units of measurement used in information supplied under Part A and B requirements shall be appropriate to the circumstances of the emission. Where appropriate, a comparison should be made of actual emissions and authorised emission limits.

If any information is considered commercially confidential, it should be separated from non-confidential information, supplied on a separate sheet and accompanied by an application for commercial confidentiality under the provisions of the EP Regulations.

Part A

Permit Number	EPR/BS3590IE
Name of operator	SABIC UK Petrochemicals Limited
Location of Facility	Wilton Olefins Installation
Time and date of the detection	

(a) Notification requirements for any malfunction, breakdown or failure of equipment or techniques, accident, or emission of a substance not controlled by an emission limit which has caused, is causing or may cause significant pollution	
To be notified within 24 hours of detection	
Date and time of the event	
Reference or description of the location of the event	
Description of where any release into the environment took place	
Substances(s) potentially released	
Best estimate of the quantity or rate of release of substances	
Measures taken, or intended to be taken, to stop any emission	
Description of the failure or accident.	

(b) Notification requirements for the breach of a limit	
To be notified within 24 hours of detection unless otherwise specified below	
Emission point reference/ source	
Parameter(s)	
Limit	
Measured value and uncertainty	
Date and time of monitoring	

(b) Notification requirements for the breach of a limit	
To be notified within 24 hours of detection unless otherwise specified below	
Measures taken, or intended to be taken, to stop the emission	
Time periods for notification following detection of a breach of a limit	
Parameter	Notification period

(c) Notification requirements for the breach of permit conditions not related to limits	
To be notified within 24 hours of detection	
Condition breached	
Date, time and duration of breach	
Details of the permit breach i.e. what happened including impacts observed.	
Measures taken, or intended to be taken, to restore permit compliance.	

(d) Notification requirements for the detection of any significant adverse environmental effect	
To be notified within 24 hours of detection	
Description of where the effect on the environment was detected	
Substances(s) detected	
Concentrations of substances detected	
Date of monitoring/sampling	

Part B – to be submitted as soon as practicable

Any more accurate information on the matters for notification under Part A.	
Measures taken, or intended to be taken, to prevent a recurrence of the incident	
Measures taken, or intended to be taken, to rectify, limit or prevent any pollution of the environment which has been or may be caused by the emission	
The dates of any unauthorised emissions from the facility in the preceding 24 months.	

Name*	
Post	
Signature	
Date	

* authorised to sign on behalf of the operator

Schedule 6 – Interpretation

“accident” means an accident that may result in pollution.

“application” means the application for this permit, together with any additional information supplied by the operator as part of the application and any response to a notice served under Schedule 5 to the EP Regulations.

“authorised officer” means any person authorised by the Environment Agency under section 108(1) of The Environment Act 1995 to exercise, in accordance with the terms of any such authorisation, any power specified in section 108(4) of that Act.

“*background concentration*” means such concentration of that substance as is present in:

- water supplied to the site; or
- where more than 50% of the water used at the site is directly abstracted from ground or surface water on site, the abstracted water; or
- where the Permitted Installation uses no significant amount of supplied or abstracted water, the precipitation on to the site.

for emissions to surface water, the surface water quality up-gradient of the site; or

for emissions to sewer, the surface water quality up-gradient of the sewage treatment works discharge.

“base load” means: (i) as a mode of operation, operating for >4000hrs pa; and (ii) as a load, the maximum load under ISO conditions that can be sustained continuously, i.e. maximum continuous rating.

“BAT-AELs” means BAT-associated emission levels, i.e. the emission levels associated with the best available techniques for emissions to air and/or water, as set out in:

“Common waste water and waste gas treatment/management systems in the chemical sector BAT Conclusions or CWW” means Commission Implementing Decision (EU) 2016/902 of 30 May 2016 establishing Best Available Techniques (BAT) conclusions, under Directive 2010/75/EU of the European Parliament and of the Council, for Common Waste Water And Waste Gas Treatment/ Management Systems in the Chemical Sector as read in accordance with Schedule 1A to the Environmental Permitting (England and Wales) Regulations 2016.

“breakdown” has the meaning given in the ESI IED Compliance Protocol for Utility Boilers and Gas Turbines.

“calendar monthly mean” means the value across a calendar month of all validated hourly means.

“CEN” means Comité Européen de Normalisation.

“Combustion Technical Guidance Note” means IPPC Sector Guidance Note Combustion Activities, version 2.03 dated 27th July 2005 published by Environment Agency.

“D” or “disposal” means any of the operations provided for in Annex I to Directive 2008/98/EC of the European Parliament and of the Council on waste, as read in accordance with Schedule 1A to the Environmental Permitting (England and Wales) Regulations 2016.

“daily average” means the average over a period of 24 hours of validated hourly averages obtained by continuous measurements.

“diffuse emissions” means non-channelled emissions which can result from ‘area’ sources (e.g. tanks) or ‘point’ sources (e.g. pipe flanges).

“DLN” means dry, low NO_x burners.

“Energy efficiency” the annual net plant energy efficiency means the value calculated from the operational data collected over the year.

“emissions of substances not controlled by emission limits” means emissions of substances to air, water or land from the activities, either from the emission points specified in schedule 3 or from other localised or diffuse sources, which are not controlled by an emission or background concentration limit.

“emissions to land” includes emissions to groundwater.

“EP Regulations” means The Environmental Permitting (England and Wales) Regulations SI 2016 No.1154 and words and expressions used in this permit which are also used in the Regulations have the same meanings as in those Regulations.

“fugitive emissions” means diffuse VOC emissions from ‘point’ sources.

“groundwater” means all water, which is below the surface of the ground in the saturation zone and in direct contact with the ground or subsoil.

“Hazardous property” has the meaning in Annex III of the Waste Framework Directive as read in accordance with Schedule 1A to the Environmental Permitting (England and Wales) Regulations 2016.

“Hazardous waste” has the meaning given in the Hazardous Waste (England and Wales) Regulations 2005 (as amended).

“Industrial Emissions Directive” means DIRECTIVE 2010/75/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 24 November 2010 on industrial emissions as read in accordance with Schedule 1A to the Environmental Permitting (England and Wales) Regulations 2016.

“large combustion plant” or “LCP” is a combustion plant or group of combustion plants discharging waste gases through a common windshaft or stack, where the total thermal input is 50 MW or more, based on net calorific value. The calculation of thermal input, excludes individual combustion plants with a rated thermal input below 15MW.

“Large Combustion Plants BAT Conclusions or LCP” means Commission Implementing Decision (EU) 2017/1442 of 31 July 2017 establishing Best Available Techniques (BAT) conclusions, under Directive 2010/75/EU of the European Parliament and of the Council, for Large Combustion Plants as read in accordance with Schedule 1A to the Environmental Permitting (England and Wales) Regulations 2016.

“Large Volume Organic Chemicals BAT Conclusions or LVOC” means The Commission Implementing Decision (EU) 2017/2117 of 21 November 2017 establishing Best Available Techniques (BAT) conclusions, under Directive 2010/75/EU of the European Parliament and of the Council, for the Production of Large Volume Organic Chemicals as read in accordance with Schedule 1A to the Environmental Permitting (England and Wales) Regulations 2016.

“MCERTS” means the Environment Agency’s Monitoring Certification Scheme.

“MCR” means maximum continuous rating.

“MSDL” means minimum shut-down load as defined in Implementing Decision 2012/249/EU as read in accordance with Schedule 1A to the Environmental Permitting (England and Wales) Regulations 2016.

“MSUL” means minimum start-up load as defined in Implementing Decision 2012/249/EU as read in accordance with Schedule 1A to the Environmental Permitting (England and Wales) Regulations 2016.

“Natural gas” means naturally occurring methane with no more than 20% by volume of inert or other constituents.

“ncv” means net calorific value.

“Net total fuel utilisation” means the ratio between the net produced energy minus the imported electrical and/or thermal energy and the fuel/feedstock energy input at the gasification unit boundary over a given period of time.

“operational hours” are whole hours commencing from the first unit ending start up and ending when the last unit commences shut down.

“quarter” means a calendar year quarter commencing on 1 January, 1 April, 1 July or 1 October.

“R” or “recovery” means any of the operations provided for in Annex II to Directive 2008/98/EC of the European Parliament and of the Council on waste, as read in accordance with Schedule 1A to the Environmental Permitting (England and Wales) Regulations 2016.

“SI” means site inspector.

“Start-up date” means the day after the following conditions have been met: (i) the facility of which the Olefins 6 plant is a part is complete and operational and (ii) the Olefins 6 plant has been operated for forty-eight (48) hours to at least eighty percent (80%) of the design production rate”.

“Total Organic Carbon” means Total Organic Carbon. In respect of releases to air this means the gaseous and vaporous organic substances, expressed as TOC.

Where a minimum limit is set for any emission parameter, for example pH, reference to exceeding the limit shall mean that the parameter shall not be less than that limit.

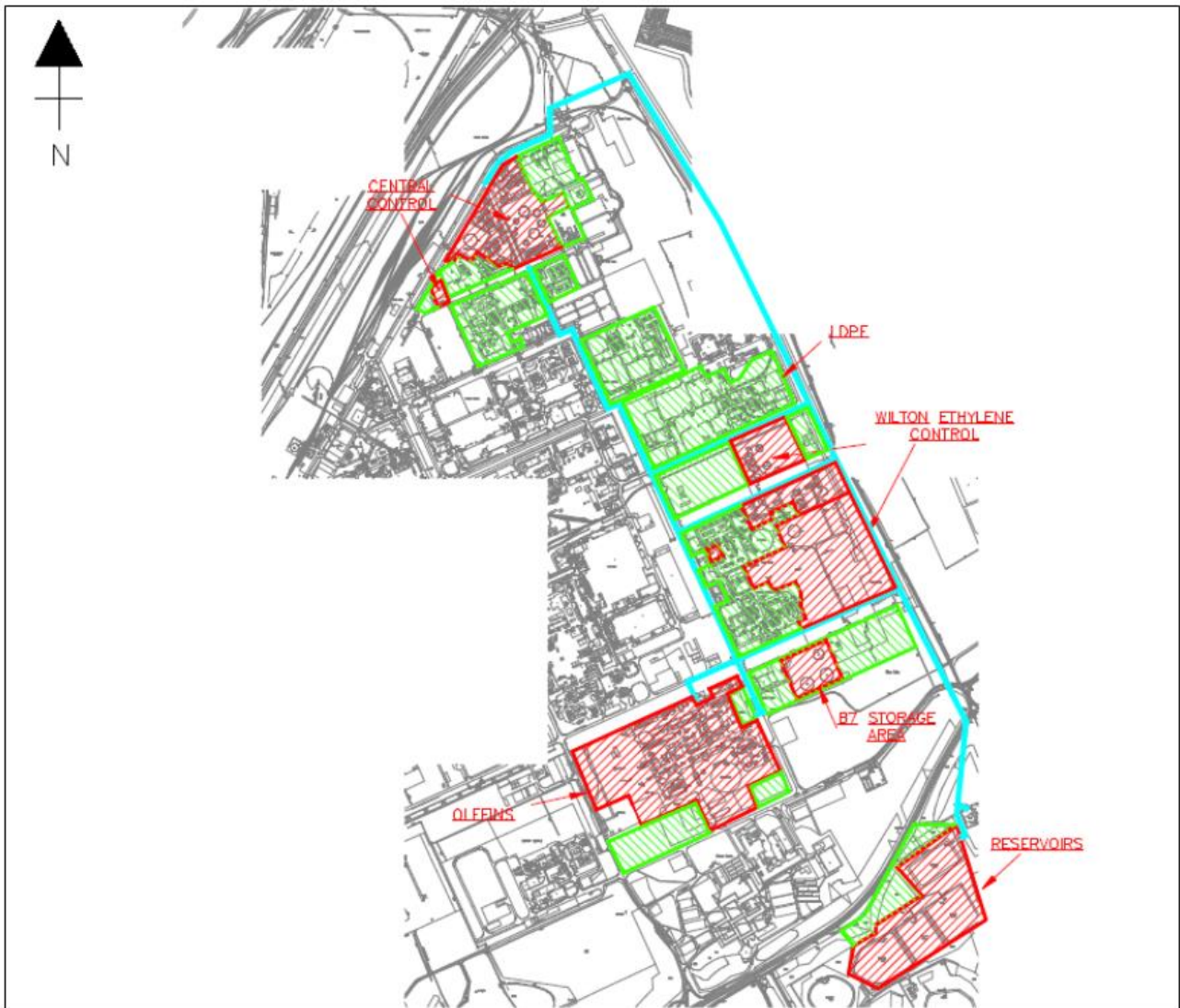
Unless otherwise stated, any references in this permit to concentrations of substances in emissions into air means:

- in relation to emissions from combustion processes, the concentration in dry air at a temperature of 273K, at a pressure of 101.3 kPa and with an oxygen content of 3% dry for liquid and gaseous fuels, 6% dry for solid fuels; and/or
- in relation to emissions from gas turbine or compression ignition engine combustion processes, the concentration in dry air at a temperature of 273K, at a pressure of 101.3kPa and with an oxygen content of 15% dry for liquid and gaseous fuels; or
- in relation to emissions from combustion processes comprising a gas turbine with a waste heat boiler, the concentration in dry air at a temperature of 273K, at a pressure of 101.3kPa and with an oxygen content of 15% dry, unless the waste heat boiler is operating alone, in which case, with an oxygen content of 3% dry for liquid and gaseous fuels; and/or
- in relation to emissions from non-combustion sources, the concentration at a temperature of 273K and at a pressure of 101.3 kPa, with no correction for water vapour content.

“year” means calendar year ending 31 December.

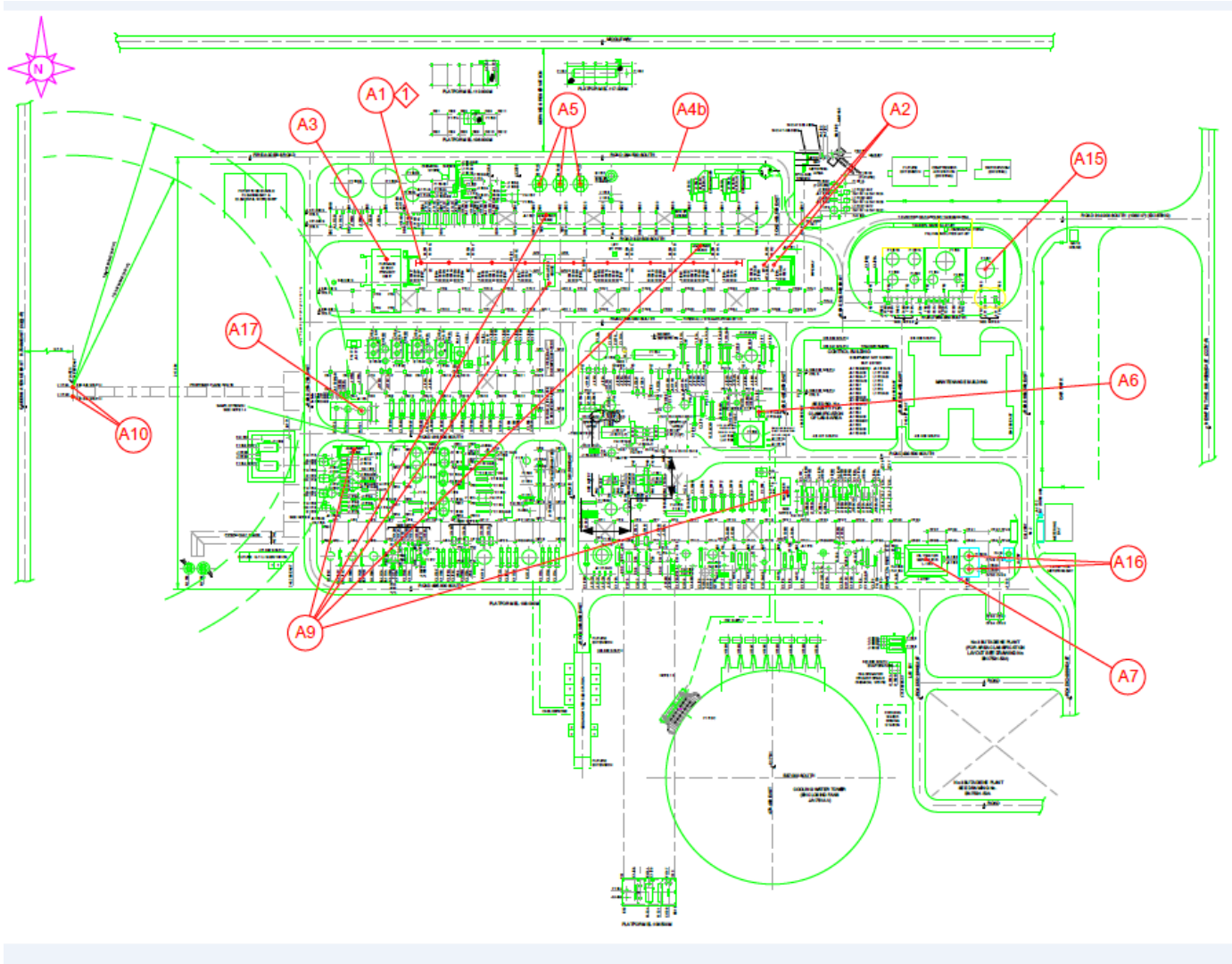
“yearly average” means the average over a period of one year of validated hourly averages obtained by continuous measurements.

Schedule 7 – Site plan



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EMISSION POINT PLAN



END OF PERMIT

Annex to conditions – Derogation under Industrial Emissions Directive

Derogation under Article 15(4) of Industrial Emissions Directive

DIRECTIVE 2010/75/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 24 November 2010 on industrial emissions

Operating Techniques

We have considered the operator's proposed techniques and its comparison against other relevant techniques as described in the Best Available Techniques (BAT) Conclusions for:

- a) Production of Large Volume Organic Chemicals (LVOC), published 07 December 2017.
- b) Common waste water and waste gas treatment/management systems in the chemical sector (CWW), published 09 June 2016.

Our full reasoning is given in our decision document that accompanies this permit determination.

Permits must be reviewed and operators must comply with BAT (Associated Emission Levels) AELs by 07 December 2021.

This derogation is based on the existing site configuration. This will need to be reviewed when the Teesside Improvement Project (TIP) variation application (EPR/BS3590IE/V016) is determined. This application will be determined separately based on its own merits.

The operator requested a time limited derogation from **BAT Conclusion 12 of the CWW**. These BAT Conclusions were published prior to the permit review triggering primary BAT Conclusions for the production of LVOC, which apply from 07 December 2021. The CWW BAT Conclusions have not previously been included in a permit review for the installation and apply from 07 December 2021.

CWW BAT Conclusion 12 requires the application of final waste water treatment techniques to achieve specific BAT AELs for direct waste water discharge to receiving waters from Chemical Industry activities. BAT AELs are listed in tables 1 to 3 of the BAT Conclusion. BAT Conclusion 12 derogation is requested against the following BAT AELs:

Total organic carbon (TOC) in table 1 [10 to 33 mg/l]; and
Adsorbable organically bound halogens (AOX) in table 3 [0.2 to 1.0 mg/l].

The derogation from TOC and AOX limits have been considered together as they both require the implementation of the same final waste water treatment techniques to meet the BAT AELs.

The decision is made on the basis of the technical characteristics of the installation, with local environmental conditions being a valid secondary criteria.

The operator's submission considered seven options for meeting the BAT AELs. They have proposed to implement off-site treatment of all process effluent (up to 800 m³/hour) either by the sewage undertaker (option C) or at a dedicated effluent treatment plant built on the Wilton site, outside of the installation boundary (option D). They have rejected the options for partial treatment off-site (350/570 m³/hour), temporary closure and tankering to sewage undertaker.

The Environment Agency has reviewed the request and concluded that:

- The operator has supplied a valid derogation request against BAT Conclusion 12 of the CWW BAT Conclusions. The derogation request is based on the technical characteristics of the facility, with the local environmental conditions being a valid secondary criteria.
- The operator has described seven relevant options for achieving the BAT AEL and justified the screening out of one of these options. Six options were taken forward to conduct a cost benefit analysis (CBA), together with the business as usual (BAU) option (doing nothing).
- TOC and AOX limits will be higher than the BAT AEL limits (annual average) of TOC 10 - 33 mg/l and AOX 0.2 - 1.0 mg/l until either closure or redevelopment of the facility which shall not extend beyond **07 December 2025**. The proposed limits are: TOC 60 mg/l and AOX 3.0 mg/l.
- The operator has provided a credible argument that the increased costs linked to the technical characteristics are disproportionate for achieving the BAT AEL. An appropriate range of options were reviewed and those identified as technically viable were considered further. Viable options were taken forward for CBA, were adequately described in the CBA and the cost of the BAT AEL option was confirmed as disproportionate compared to the environmental benefits. The CBA using central assumptions shows negative NPVs for the BAT AEL options C and D and therefore the cost of compliance is disproportionate compared to the environmental benefit achieved.
- The proposed derogation options C and D are based on the existing site configuration. The operator has recognised that it is not currently possible to specify with certainty the treatment capacity and capability the plant will be required to achieve under any new configuration and hence there is scope for the effluent treatment solution to change.
- The permit issued includes an improvement condition to address any changes to the effluent treatment proposals.
- We are satisfied that the operator has demonstrated that the proposed derogation options achieve the best overall environmental outcome and we have no concerns regarding the ongoing BAU impact on the River Tees for the duration of the time-limited derogations.
- The permit issued includes an improvement condition requiring the TOC and AOX emissions to be reviewed once the facility is operational.
- The permit issued incorporates the operating techniques for this BAT Conclusion.
- The permit issued includes an improvement condition to ensure that all work to comply with the applicable BAT AELs for the installation are completed by 07 December 2025. The BAT AELs will not be applicable until this date but temporary limits will apply: TOC 60 mg/l and AOX 3.0 mg/l.
- All existing permit emission limit values (ELVs) remain in force and new ELVs are introduced for suspended solids, zinc, chromium, copper, nickel, total nitrogen, total inorganic nitrogen and total phosphorus.
- Significant improvements to reduce TOC emissions have already been implemented as part of completed improvement conditions I.C.15 and I.C.20.

The Environment Agency has therefore allowed this derogation request subject to the improvement conditions and other control measures set out above.