

Notice of partial surrender and consolidation with introductory note

The Environmental Permitting (England & Wales) Regulations 2016

ExxonMobil Chemical Limited
Fawley Refinery Installation
Marsh Lane
Fawley
Southampton
SO45 1TX

Surrender application number

EPR/ZP3839MG/S006

Permit number

EPR/ZP3839MG

Fawley Refinery Installation

Permit number EPR/ZP3839MG

Introductory note

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

The following notice gives notice of the surrender in part of an environmental permit.

This notice authorises the surrender of one of the process areas, Block 36B.

Any changes made as a result of the part surrender are set out in the schedules.

For historical record and as this is a consolidated surrender notice, the Introductory Note to the original permit and previous subsequent variations are summarised below for completeness.

ExxonMobil Chemical Limited (EMCL) is a UK based wholly owned subsidiary of the ExxonMobil Corporation of the USA. Included within the Fawley Refinery installation boundary are the petrochemical plant operated by EMCL covered by this permit, oil refinery operated by Esso Petroleum Company (EPCo) Limited (also an ExxonMobil Company) covered by permit BR6996IC and the Combined Heat and Power (CHP) plant owned by Npower Cogen Trading Limited covered by permit QP3536LT.

The Fawley Refinery installation is located in Fawley, Hampshire, approximately 7.5 km south-east of Southampton. The installation covers an area of 613 hectares and the entire site is centred at National Grid Reference SU 455043.

The installation is bounded to the east and north-east by mudflats, saltmarsh and Southampton Water. To the west and south the site is bounded by Fawley Road, the A326 and Long Lane. Beyond Fawley Road to the south is Fawley Village and undeveloped marshland. The village of Holbury is located to the west. To the north the site is bounded by Cadland Road, beyond which is a number of industrial properties.

The plant produces a range of downstream chemical products from refinery products, namely butylenes, methyl ethyl ketone and halobutyl rubber in addition to higher olefins as intermediaries for the vinyl and plastics industries and speciality chemicals for oil exploration, extraction and refining industries.

The Higher Olefins plant produces several higher olefins from propene and butene through the oligimerisation of propene and butene from feedstock transferred mainly from the refinery into larger molecules. In the HUB, butadiene is converted to butene. In the IB2 unit, isobutylene is extracted from the mixed butenes stream by reacting it with methanol to produce methyl ethyl tertiary butyl ether (MTBE), which is then decomposed to recover the isobutylene and recycle the methanol. The unreacted stream from the IB2 process is transferred either to the Higher Olefins unit or to the MEK (methyl ethyl ketone) unit where butene is recovered by acid extraction and converted to secondary butyl alcohol which is purified and further converted to methyl ethyl ketone.

Halobutyl rubber is produced by the copolymerisation and subsequent halogenation of 2-methyl propene and 2-methylbuta-1, 3-diene and is shipped to customers in pre-formed blocks.

In addition to the materials transferred from the refinery, other secondary materials are used (reaction catalysts, product additives, refrigerants and water treatment chemicals) and these are generally delivered by road.

The following directly associated activities which are not listed are also carried out:

- the operation of process heaters and furnaces, aggregated thermal input approximately 30 MW fired by refinery fuel gas,
- operation of a regenerative thermal oxidiser (RTO) to abate emissions of Volatile Organic Compounds (VOCs) from the Butyl rubber plant,

- provision of site utilities (including importing steam and treated water from EPCo, provision of cooling water and plant drainage systems),
- the provision of cooling by means of refrigeration plant using refrigerants including Freon R22, ethylene and propylene,
- the use of flare systems to dispose of flammable vapour releases from pressure relief devices,
- raw material and waste storage,
- transfer, storage and loading of finished products.

In general, material is transferred between processes without loss. The main emissions to air from the plant are from combustion products generated by process heaters and furnaces and are NO_x, CO and SO₂. Much of the fuel gas used is generated internally by the installation processes. Minimisation of emissions is achieved by controls on fuels (low sulphur content to reduce SO_x which have generally been pre-treated to reduce sulphur content and use of gas fuels to limit particulate release). There are further controls on burner specification such as low-NO_x design technology on the majority of furnaces. Bi-annual monitoring is undertaken at all point source emission points from heaters and furnaces for the main combustion emissions (SO₂ and NO₂). VOCs are monitored quarterly from the Butyl Rubber plant RTO. Annual calculations are made to determine mass emissions for a range of parameters.

Throughout the EMCL process areas, dirty water is routed to the underground dirty water sewer system and there is a separate clean water sewer system. All effluent from the polymerisation plant is transferred to the EPCo dirty and clean sewer systems via Separator SEPS 2 at transfer points T2 and T3 for final discharge via outfall 1. EMCL operates an effluent treatment plant with associated collection and discharge facilities which manages all other effluent from their activities.

Treated dirty water and clean water is transferred via Separator SEPS 3 at transfer point T1 to join the EPCo effluent stream for final discharge through outfall 2 to Southampton Water.

A hydrogenation plant for the production of isoparaffins is permitted on site. The hydrogenation process will use a metal catalyst at elevated temperature and pressure to produce isoparaffins which then undergo stabilisation treatment to remove trace quantities of hydrogen and methane. The final product will be stored in refurbished storage tanks prior to export.

There are no direct emissions from the process to atmosphere or water. The hydrogen rich off gas from the hydrogenation process will be reused on site and the off gas from stabilisation process will be routed to the sites existing flare gas recovery system.

The site has an Environmental Management System that is regularly audited externally and has been attested to meet the requirements of ISO 14001 although not certified to this standard and the operator is a participant in the EU Emissions Trading Scheme.

The site is also subject to the Control of Major Accident Hazard Regulations as a top tier site due to the quantity of petroleum products stored.

The schedules specify the changes made to the original permit.

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
Application ZP3839MG	Duly made 05/10/06	
Letter from operator detailing the use of new catalysts on the Polymerisation plant and Steam Cracker 2	09/03/07	

Status log of the permit		
Description	Date	Comments
Information received during site visit relating to use of fuels in furnaces, details of flare system, details of leak detection system, details of VOC speciation calculations and confirmation of quality assurance procedures to assess changes in composition of material received from the Esso Petroleum refinery	23/03/07	
Details of EU ETS certificate number	Received 26/04/07	
Response to request for further information during meeting 23/4/07	Emails and attachments received from Esso Petroleum Company Limited (G Neal) 04/05/07 and 24/05/07 and from ExxonMobil Chemical Limited (A Pritchard) 21/05/07	
Site plan detailing installation boundary and permit areas for use in public register permit copies	Email from ExxonMobil Chemical Limited (A Pritchard) received 29/06/07	
Definition of start up and shut down for SC2 furnaces	Email from ExxonMobil Chemical Limited (A Pritchard) 22/06/07	
Revised impact assessment for emissions to air	Email from Entec 02/08/07	
Air quality impact modelling	Email from Entec 02/08/07	
Further detail of SO ₂ emissions from EMCL furnaces and RTO project commissioning and emissions	Email from and conversation with ExxonMobil Chemical Limited (A Pritchard) 12/09/07	
Confirmation of RTO project revised timings	Letter from Esso Petroleum Company Limited (G Neal) 12/09/07	
Revised site plan including the transfer of butadiene from Polimeri within the EMCL Permit boundary	Email from ExxonMobil Chemical Limited (A Pritchard) 28/09/07	
Confirmation of completion timescale for the catalyst replacement	Letter from Esso Petroleum Company Limited (G Neal) 24/09/07	

Status log of the permit		
Description	Date	Comments
Revised completion date for catalyst project	Email from Esso Petroleum Company Limited (G Neal) 18/10/07	
Confirmation of what constitutes completion of the RTO project	Email from ExxonMobil Chemical Limited (A Pritchard) 29/10/07	
Permit determined	20/12/07	
Application for a Normal Variation (EPR/ZP3839MG/V002)	Duly made 11/12/09	
Request for confirmation of the revised listed activities and directly associated activities	Response received 16/03/09	
Variation issued (EPR/ZP3839MG/V002)	16/04/10	
Agency variation determined EPR/ZP3839MG/V003	05/03/14	Agency variation to implement the changes introduced by IED
Application EPR/ZP3839MG/V004 (variation)	Duly made 27/11/15	Application to vary the permit to produce and export isoparaffins.
Variation determined EPR/ZP3839MG	25/02/16	Varied permit issued.
Environment Agency Led Variation EPR/ZP3839MG/V005 (Billing Reference: SP3836QJ)	29/11/18	Permit varied to reference Integrated Emissions Management Technique. Varied permit issued.
Part surrender application EPR/ZP3839MG/S006	Duly made 31/01/19	Application to surrender process Block 36B and the associated permitted area.
Additional information received	31/01/19	Non Technical Summary
Part surrender determined EPR/ZP3839MG (PAS Billing ref: RP3331QB)	21/03/19	Part surrender complete.

Other Part A installation permits relating to this installation		
Operator	Permit number	Date of issue
Esso Petroleum Company Limited	EPR/JP3631KW	03/03/2010
Esso Petroleum Company Limited	EPR/BR6996IC	20/12/2007
Biogenie Site Remediation Limited	EPR/ZP3133RH	04/11/2016

End of introductory note

Notice of surrender

The Environmental Permitting (England and Wales) Regulations 2016

The Environment Agency in exercise of its powers under regulation 25 of the Environmental Permitting (England and Wales) Regulations 2016 accepts the surrender in part of

Permit number

EPR/ZP3839MG

Issued to

ExxonMobil Chemical Limited (“the operator”)

whose registered office is

**Ermyn House
Ermyn Way
Leatherhead
Surrey
KT22 8UX**

company registration number **00867162**

to operate part of an installation at

**Fawley Refinery Installation
Marsh Lane
Fawley
Southampton
SO45 1TX**

to the extent set out in the schedules.

The notice shall take effect from 21/03/2019

Name	Date
M Bischer	21/03/19

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/ZP3839MG

This is the consolidated permit referred to in the part surrender and consolidation notice for application EPR/ZP3839MG/S006 authorising,

ExxonMobil Chemical Limited (“the operator”),

whose registered office is

**Ermyn House
Ermyn Way
Leatherhead
Surrey
KT22 8UX**

company registration number **00867162**

to operate part of an installation at

**Fawley Refinery Installation
Marsh Lane
Fawley
Southampton
SO45 1TX**

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

Name	Date
M Bischer	21/03/19

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) review and record at least every four years whether there are suitable opportunities to improve the energy efficiency of the activities; and
- (c) take any further appropriate measures identified by a review.

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; and
- (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.

1.5 Multiple operator installations

- 1.5.1 Where the operator notifies the Environment Agency under condition 4.3.1 (a) or 4.3.1 (c), the operator shall also notify without delay the other operator(s) of the installation of the same information.

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 site, being the land shaded yellow and shown edged in green 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 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.

2.3.3 Any raw materials or fuels listed in schedule 2 table S2.1 shall conform to the specifications set out in that table.

2.3.4 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.

2.3.5 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 and S3.2.
- 3.1.2 The limits given in schedule 3 shall not be exceeded.
- 3.1.3 Total annual emissions from the emission point(s) set out in schedule 3 tables S3.1 and S3.2 of a substance listed in schedule 3 table S3.3 shall not exceed the relevant limit in table S3.3.
- 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 schedule 1 table S1.4, 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;
 - (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 schedule 1 table S1.5, 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;
 - (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 schedule 1 table S1.6 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;
- (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 and S3.2;
 - (b) noise specified in table S3.4;
- 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 continual), 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 and S3.2 unless otherwise agreed in writing by the Environment Agency.

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 (a)(i), or 4.3.1 (b)(i) where the information relates to the breach of a limit specified in the permit, 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:

- (a) any change in the operator's name or address; and
- (b) 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 14 days notice before implementation of any part of the site closure plan.

4.3.7 Where the operator has entered into a climate change agreement with the Government, the Environment Agency shall be notified within one month of:

- (a) a decision by the Secretary of State not to re-certify the agreement;
- (b) a decision by either the operator or the Secretary of State to terminate the agreement; and
- (c) any subsequent decision by the Secretary of State to re-certify such an agreement.

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 “without delay”, in which case it may be provided by telephone.

Schedule 1 – Operations

Table S1.1 activities		
Activity listed in Schedule 1 of the EP Regulations	Description of specified activity	Limits of specified activity
S4.1 A(1) (a) (i). Producing organic chemicals such as hydrocarbons (linear or cyclic, saturated or unsaturated, aliphatic or aromatic)	Production of a range of higher oligomers from short chain low carbon number molecules by oligomerisation reactions in a total of 17 reactors.	From receipt of feed raw materials from the Esso Petroleum Company Limited refinery to dispatch of products and transfer for further processing. Emissions to air from 1.8 MW process heater F301 via point B6 and 10.1 MW process heater F501 via emission point B7. Waste water emissions to Separator 2.
	Production of higher olefins from propene and butene	From receipt of feed from polymerisation plant to dispatch of higher olefins for further processing. Emissions to air from process heater F601 via point B5.
	Production of butyl rubber from 2-methylpropene and methylbuta-1,3-diene by co-polymerisation reactions	From receipt of feedstock from on-site and other ExxonMobil Chemical plants to dispatch of rubber solution for halogenation.
	Production of butene from mixed stream of butene, butane, isobutylene and butadiene by hydrogenation over a fixed bed catalyst in hydrogenation unit for butadiene (HUB)	From receipt of feed stream from SC2 or imports to transfer for further processing in isobutylene (IB2) unit.
	Decomposition of intermediate methyl tertiary butyl ether (MTBE) to isobutylene over a fixed bed catalyst in IB2 unit	From receipt of feed stream from IB2 unit to transfer of final product for storage, then to the Butyl rubber plant (2 methylpropene) and to the MEK and Higher Olefins (butene) plants.

Table S1.1 activities		
Activity listed in Schedule 1 of the EP Regulations	Description of specified activity	Limits of specified activity
	Producing isoparaffins from higher olefins.	From receipt of raw materials to despatch of finished product.
S4.1 A (1) (a) (ii). Producing organic chemicals such as organic compounds containing oxygen, such as alcohols, aldehydes, ketones, carboxylic acids, esters, ethers, peroxides, phenols, epoxy resins.	Production of Secondary Butyl Alcohol (SBA) from butenes and butanes (Raf-2) by acid extraction.	From receipt of Raf- 2 feed stream to storage of intermediate product for further processing.
	Production of methyl ethyl ketone (MEK) from Secondary Butyl Alcohol (SBA) by catalytic hydrogenation reaction.	From receipt of SBA feed stream to storage of purified final product and transfer of co-products for use in other processes. Includes the recycling of un-reacted SBA. Emissions to air from 5.5 MW furnace F701 fitted with low-NO _x staged burner to point B12 and from low-NO _x staged process heater F702 (3.4 MW furnace) via point B16.
	Production of methyl tertiary butyl ether (MTBE) in fixed bed reactors in IB2 to transfer of reactions products to the decomposition section.	From receipt of feed from on-site ExxonMobil Chemical processes to transfer of reaction products to the butyl rubber plant (2-Methylpropene) and to the refinery for further processing (butene).
S4.1 A(1) (a) (ix). Producing organic chemicals such as synthetic rubbers.	Production of halobutyl rubber from butyl rubber slurry by reaction with chlorine or bromine.	From receipt of butyl rubber solution to dispatch of finished products. Includes associated de-watering, drying and baling processes. Emissions to air from drying processes via regenerative thermal oxidiser at emission point B34.

Table S1.1 activities		
Activity listed in Schedule 1 of the EP Regulations	Description of specified activity	Limits of specified activity
S5.4 A (1) (a) (ii). Disposal of non-hazardous waste in a facility with a capacity exceeding 50 tonnes per day by physico-chemical treatment.	Treatment of dirty effluent streams in Separator Seps 3 and Dissolved Air Flotation unit to remove solids by settlement.	From receipt of dirty water effluent to transfer to Esso Petroleum Company Limited sewer system at transfer point T1 via separator Seps 3. Includes discharge of dirty water via Dissolved Air Flotation (DAF) unit and clean water via separators, the use of flocculent material in the DAF unit and disposal of screened out solids.
Directly Associated Activity		
Operation of process heaters and furnaces	Heating of products in process heaters and furnaces, total aggregate thermal input of 35MW fired by refinery fuel gas.	From the receipt of refinery fuel gas to use in the furnaces and process heaters and the discharge of exhaust gases to air.
Operation of fluidised bed conveyor	Drying of halobutyl rubber crumb in finishing stage of production.	From receipt of rubber crumb to transfer to bale press. Emissions to air via regenerative oxidation unit.
Operation of regenerative oxidation unit (RTO)	Incineration of hexane vapour via thermal oxidiser to abate emissions of VOCs (hexane) generated during drying process of halobutyl rubber production.	Emissions to air from product drying processes via regenerative thermal oxidiser (RTO) via emission point B34.
Provision of site utilities	Operation of plant refrigeration units using Freon 22, ethylene and propene.	Includes receipt and handling of refrigerant.
	Importing steam from Esso Petroleum Company Limited processes	From receipt of steam to discharge of condensate to sewer system.
	Importing treated water from Esso Petroleum Company Limited	From receipt of treated water to discharge to sewer system.

Table S1.1 activities		
Activity listed in Schedule 1 of the EP Regulations	Description of specified activity	Limits of specified activity
	Provision of cooling water to the process and ancillaries	From receipt of water from Esso Petroleum Company Limited to final discharge to sewer system. Includes recovery of condensate steam.
	Plant and surface water drainage systems (sumps and drains) and transfer of effluent streams	From discharge in process areas into dirty or clean water system to transfer to EPCo effluent system via SEPS 2 and SEPS 3 via Dissolved Air Flotation unit (dirty water).
Raw material handling and storage	Storage and handling of raw materials used	Includes receipt and handling of bulk raw materials
Effluent Management and Control	Controlled neutralisation of waste streams (caustic and acidic) in MEK unit	From receipt of waste streams to transfer of neutralised effluent to clean water sewer
Waste storage and handling	Storage of wastes produced	From waste generation, storage and monitoring to waste dispatch
Transfer storage and loading of finished products	Transfer and loading of products by pipeline or to road car for onward transportation and marine terminal shipping.	Includes storage of finished products prior to shipment
Storage of ethylene in block 49	Storage prior to removal from site following closure of SC2	Operation of this activity shall cease no later than 6 months after the closure of SC2 or as agreed with the Agency

Table S1.2 Operating techniques		
Description	Parts	Date Received
Application	The response to section 2.1 (parts 2.1 and 2.2 Volume 1 and Volume 2 in the application.	24/08/2006
Application	The response provided in Section 5.1.1 – Butyl Polymers regarding the RTO project phases	24/08/2006
Additional information	Programme for installation of new catalyst on polymerisation plant and SC2	14/3/2007 and 26/3/2007
Operation of furnace F401 on SC2	Email received from ExxonMobil Chemical Limited (A Pritchard)	21/5/2007
Definition of start up and shut down for SC2 furnaces	Email received from ExxonMobil Chemical Limited (A Pritchard)	22/6/2007
Variation Application	The response to sections 2.1 and 2.2 within the application – Supporting Information, which will supersede the previous operating techniques where applicable.	04/12/2009
Confirmation of the revised listed activities and directly associated activities	E-mail received from ExxonMobil Chemical Limited	16/03/2010
Variation Application EPR/ZP3839MG/V004	Parts C2 and C3 and the supplementary information supplied with these parts.	27/11/2015
Variation Application EPR/ZP3839MG/S006	Part E2 and the supplementary information supplied with this part.	31/01/2019

Table S1.3 Improvement programme requirements		
Reference	Requirement	Date
IC1	<p>Written confirmation shall be submitted to the Agency when the introduction of substitute catalysts on the Polymerisation Plant and Steam Cracker 2 has been completed, no later than 2 weeks following completion. This confirmation shall include the duration required for the operation of both existing and replacement catalyst systems and proposed estimated timescale for the final sign off of the new catalyst. Any revisions to the implementation timetable provided in the application (letters dated 9/3/07 and 24/7/07 and email dated 18/10/07 from G Neal) should be notified to the Agency in writing detailing revised action plan for completion of the replacement. The revised action plan shall be implemented from the date of approval in writing by the Agency. The notification requirements of condition 2.5.2 shall be deemed to have been complied with on submission of the written confirmation of completion of the catalyst substitution.</p>	Completed 20/2/2008
IC2	<p>A written methodology shall be submitted to the Agency detailing the calculation method for the determination of emissions (kg/hr and tonnes/year) for the following parameters from the emission points detailed below including justification for choice of methodology and details of the verification of the suitability of the methodology:</p> <ul style="list-style-type: none"> • B5, B6, B7, B12 and B16 - SO₂ • B19, B20 - Methyl chloride • B21- B33 - Hexane <p>The notification requirements of condition 2.5.2 shall be deemed to have been complied with on submission of the methodology. The methodology shall be implemented from the date of approval in writing from the Agency.</p>	Completed 13/8/2008
IC3	<p>A written procedure shall be submitted to the Agency detailing the measures to be used so that monitoring equipment, personnel and organisations employed for the emissions monitoring programme shall have either MCERTS certification or accreditation in accordance with condition 3.6.3. The notification requirements of condition 2.5.2 shall be deemed to have been complied with on submission of the procedure. The procedure shall be implemented by the operator from the date of approval in writing by the Agency.</p>	Completed 26/11/2008
IC4	<p>Written confirmation shall be submitted to the Agency providing confirmation of the commencement of the outage periods for each phase of the RTO project during completion of construction and confirm duration of outage required no later than 10 days following the commencement of the outage, subject to the following maximum outage periods - Phase II – maximum 3 weeks and Phase III – maximum 10 weeks. Written confirmation shall be submitted to the Agency providing confirmation of the commencement of commissioning period for each phase (II, III) for the RTO project as detailed in the application at no later than 10 days following the commencement of commissioning. Written confirmation shall be submitted to the Agency confirming when the commissioning period for each phase is complete no later than 10 days following this completion. The notification requirements of condition 2.5.2 shall be deemed to have been complied with on submission of the written confirmation for each stage of the project.</p>	Completed 28/11/2008
IC5	<p>The operator shall undertake a waste minimisation audit in accordance with Section 2.4.2 of the IPPC Technical Guidance Note S4.01 Large Volume Organic Chemicals. The audit shall include but not be limited to:</p>	Completed 1/12/2008

Table S1.3 Improvement programme requirements		
Reference	Requirement	Date
	<ul style="list-style-type: none"> Procedures in place to identify reduction in raw material usage and opportunities for re-use in the context of reducing waste production Procedures in place to undertake regular reviews of raw material usage to identify less polluting alternatives Identification of best practicable options for waste disposal for all waste streams <p>A written report detailing the findings of the audit shall be submitted to the Agency including a plan detailing a timetable for completion of improvements identified.</p> <p>The notification requirements of condition 2.5.2 shall be deemed to have been complied with on submission of the audit.</p> <p>The plan shall be implemented by the operator from the date of approval by the Agency.</p>	
IC6	<p>A written report shall be submitted to the Agency detailing the results of the assessment required by improvement programme condition IC23 in IPPC permit BR6996IC. The report shall include but not be limited to:</p> <ul style="list-style-type: none"> Improvements identified and timescales for completion Expected levels of sulphur in fuel gas received from Esso Petroleum Company Limited on completion of improvements identified The impact of the proposed improvements on the variability and sulphur content of fuel gas received from Esso Petroleum Company Limited, with specific reference to Zone 3 RFG used in furnaces F601 (higher olefins), F701 and F702 (MEK plant) Where the sulphur content in fuel gas is not predicted to meet levels details in Sector Guidance Note S1.02 Guidance for the Gasification, Liquefaction and Refining Sector, identification of all potential options to meet indicative benchmark concentration emission limits in respect of SO₂ emissions from the above furnaces and timetable for implementation Justification where improvements have not been identified or options not considered <p>The notification requirements of condition 2.5.2 shall be deemed to have been complied with on submission of the report.</p> <p>The plan shall be implemented by the operator from the date of approval by the Agency.</p>	Completed 22/9/2010
IC7	<p>The operator shall carry out an assessment of possible NO_x reduction measures in accordance with sections 2.1.2 and 2.2.2 of IPPC Technical Guidance Note S1.01 Combustion Activities for furnace F201-B (Steam Cracker).</p> <p>A written report shall be submitted to the Agency detailing the findings of the assessment which shall include but not be limited to:</p> <ul style="list-style-type: none"> Identification of all potential NO_x reduction measures to meet indicative benchmark emission limits including a full assessment of the options to including a cost benefit analyses for options considered in accordance with Technical Guidance Note referenced above Timescale for completion of the improvements identified Details of action plan for the furnace to demonstrate steps to be taken to meet indicative benchmark emission limits as detailed in the Technical Guidance Note referenced above Justification where improvements have not been identified or options not considered <p>The notification requirements of condition 2.5.2 shall be deemed to have been complied with on submission of the report.</p> <p>The plan shall be implemented by the operator from the date of approval by the Agency.</p>	Completed 13/7/2009

Table S1.3 Improvement programme requirements		
Reference	Requirement	Date
IC8	<p>A written procedure shall be submitted to the Agency detailing measures in place for the regular assessment and review of water use and reduction in water use measures (as part of the Water Management Plan) against the indicative requirements in Section 2.4.3 of the IPPC Technical Guidance Note S4.01 Large Volume Organic Chemicals.</p> <p>The procedure shall include but not be limited to:</p> <ul style="list-style-type: none"> • A timetable for completion of improvements that are identified by review to address any deficiencies <p>The notification requirements of condition 2.5.2 shall be deemed to have been complied with on submission of the procedure.</p> <p>The procedure shall be implemented by the operator from the date of approval by the Agency.</p>	Completed 16/4/2010
IC9	<p>The operator shall carry out an assessment of possible NO_x reduction measures in accordance with sections 2.1.2 and 2.2.2 of IPPC Technical Guidance Note S1.01 Combustion Activities for the following furnaces: i) F301 (Polymerisation Plant) ii) F501 (Polymerisation Plant)</p> <p>A written report shall be submitted to the Agency detailing the findings of the assessment which shall include but not be limited to:</p> <ul style="list-style-type: none"> • Identification of all potential NO_x reduction measures to meet indicative benchmark emission limits including a full assessment of the options to including a cost benefit analyses for options considered in accordance with Technical Guidance Note referenced above • Timescale for completion of the improvements identified • Details of action plans for each furnace to demonstrate steps to be taken to meet indicative benchmark emission limits as detailed in the Technical Guidance Note referenced above • Justification where improvements have not been identified or options not considered <p>The notification requirements of condition 2.5.2 shall be deemed to have been complied with on submission of the report.</p> <p>The plan shall be implemented by the operator from the date of approval by the Agency.</p>	Completed 29/4/2009
IC10	<p>The operator shall undertake an assessment of secondary containment for raw material, feedstock, intermediate and product tanks (as detailed in Table D1.1, Volume 3 of the application) and raw material potentially polluting substances (as detailed in Table D1.2, Volume 3 of the application) in accordance with Section 2.2.5 of IPPC Technical Guidance Note S4.01 Large Volume Organic Chemicals and IPPC Technical Guidance Note S1.02 Gasification, Liquefaction and Refining or other relevant guidance. The assessment shall include but not be limited to:</p> <ul style="list-style-type: none"> • Details of secondary containment measures including bund construction, permeability and capacity as a percentage of tank capacity • Where secondary containment does not exist to identify improvement measures to provide adequate secondary containment • Identification of improvements to existing measures to meet requirements detailed in Technical Guidance note referenced above • Justification for the use of 'routing to sewer' as containment option where stated in table D1.2. <p>A written report detailing the findings of the assessment shall be submitted to the Agency including a plan detailing a timetable for completion of improvements identified.</p> <p>The notification requirements of condition 2.5.2 shall be deemed to have been complied with on submission of the report.</p> <p>The plan shall be implemented by the operator from the date of approval by the Agency.</p>	Completed 19/5/2011

Table S1.3 Improvement programme requirements		
Reference	Requirement	Date
IC11	<p>The operator shall undertake an assessment of the measures in place to monitor and review the quality of the effluent transferred to Esso Petroleum Company Limited sewer systems at transfer point T1, T2 and T3 with specific reference to levels of phenol, sulphide, TOC, copper and arsenic. The assessment shall include but not be limited to:</p> <ul style="list-style-type: none"> • Methods in place to monitor and review the levels of the parameters listed above in the effluent streams • The results of investigations to ascertain the source of copper and arsenic detected in Esso Petroleum Company Limited Outfall 2 • Details of internal limits or targets set at the points of transfer • Identification of improvement measures <p>A written report detailing the findings of the assessment shall be submitted to the Agency including a plan detailing a timetable for completion of improvements identified.</p> <p>The notification requirements of condition 2.5.2 shall be deemed to have been complied with on submission of the report.</p> <p>The plan shall be implemented by the operator from the date of approval by the Agency.</p>	Completed 10/11/2009
IC12	<p>Following shutdown of SC2, for a period of 12 months, the Operator shall undertake monitoring of emissions of copper at relevant upstream points to emission point OF2. This shall include but not necessarily be limited to the drain from Block 36B, the outlet from SEPS 3 or transfer point T1. The Operator shall present a report to the Agency, which details the results of the monitoring and provides an action plan, including timetable, if appropriate.</p>	Completed 26/9/2011
IC13	<p>Following installation and commissioning of the new facilities (as described in the application), the Operator shall provide written confirmation to the Agency of the date that operation commenced</p>	Completed 17/6/2010
IC14	<p>The Operator shall provide written confirmation to the Agency of the date of shut down of SC2 and the benzene unit.</p>	Completed 7/7/2010

Table S1.4 Appropriate measures for fugitive emissions	
Measure	Dates
<p>The operator shall carry out a managed LDAR programme for testing potential sources of fugitive emissions of VOCs from operational plant covered by the permit, as described in sections 2.2.4 and 2.10 of the application, or method agreed in writing with the Environment Agency. The operator shall complete repairs and/or carry out other actions to prevent, or where that is not possible, minimise continued emissions from those sources.</p>	From date of permit issue

Table S1.5 Appropriate measures for odour	
Measure	Dates
<p>A written odour management plan shall be submitted to the Agency, detailing the measures to be used to control emissions of odour and in accordance with section 2.2.6 of IPPC Sector Guidance Note Large Volume Organic Chemicals.</p> <p>The plan shall include but not be limited to:</p> <ul style="list-style-type: none"> • Measures in place to limit odour from sulphiding chemical (DMDS) used on Steam Cracker 2 including procedures for transfer during filling operations • Measures in place to limit odour from the MEK acid concentration area including identification of meteorological conditions under which odours are most likely to occur <p>The plan shall be implemented by the operator from the date of approval in writing by the Agency.</p> <p>The operator shall review the plan annually and record at least once a year or as soon as practicable after a complaint (whichever is earlier), whether changes to the plan should be made and make any appropriate changes to the plan identified by a review.</p>	<p>The plan shall be submitted 12 months following permit issue</p>
<p>The Operator shall provide written confirmation to the Agency that the Odour Management Plan has been updated to reflect the shutdown of SC2.</p>	<p>1st August 2010 or as agreed with the Agency</p>

Table S1.6 Appropriate measures for noise	
Measure	Dates
<p>A noise management plan shall be submitted to the Agency, detailing the measures to be used to control emissions of noise and shall be in accordance with Appendix 4 (noise management plan) of Horizontal Guidance Note: H3 (Part 2 - Noise Assessment and Control).</p> <p>Without diminishing the requirements of the above, the plan shall build on the operator's proposed Environment Noise Management Procedures scoping document, reference EA763, and shall include but not be limited to the following techniques and actions:</p> <ol style="list-style-type: none"> (i) Identification and assessment of the impact of current noise emissions arising from the installation using the 'survey methodology: process or site survey' given in H3 Part 2, section 2.4.1.2 (ii) An options appraisal for achieving Best Available Techniques for targeted noise attenuation and compliance, based on indicative benchmarks given in H3 (iii) Further to (ii), proposal to implement Best Available Techniques with timescales for the implementation of individual measures (iv) Proposals to ensure that new items of plant and equipment minimise any potential to contribute to creeping ambient levels in the locality (v) Proposals for measuring and assessing the impact of installation noise upon community noise levels using a hazard and risk-based approach. The proposals should include timescales for the implementation of individual measures <p>The plan shall be implemented by the operator from the date of approval in writing by the Agency.</p> <p>The operator shall review the plan annually and record at least once a year or as soon as practicable after receipt of complaint(s), whichever is earlier, whether changes to the plan should be made and make any appropriate changes to the plan identified by a review.</p>	<p>The plan shall be submitted 12 months following issue of permit</p>

Schedule 2 – Waste types, raw materials and fuels

Table S2.1 Raw materials and fuels	
Raw materials and fuel description	Specification
Refinery fuel gas	No more than 3000 parts per million by volume sulphur content and maximum average value of 1300 parts per million by volume over the calendar year
Water treatment chemicals	Transfer of effluent discharges of mercury, cadmium, arsenic, copper, lead, manganese, nickel and zinc as a result of impurities in raw materials used in the treatment of water shall be controlled by ensuring that impurity levels are the minimum available in the commercial product

Schedule 3 – Emissions and monitoring

Table S3.1 Point source emissions to air – emission limits and monitoring requirements						
Emission point ref. & location	Source	Parameter	Limit (including unit) A	Reference Period	Monitoring frequency	Monitoring standard or method B
B5 on site plan (figure 1) in Schedule 2	Stack from furnace F-601 from higher olefins plant	Oxides of Nitrogen (NO and NO ₂ expressed as NO ₂)	200 mg/m ³ ^H	Average over sampling period	Every 6 months	BS EN 14792
		Sulphur dioxide	3 kg/hr ^H	Maximum monthly average	Continuous	Using calculation method agreed in writing with the Agency (IC2 refers)
		Sulphur dioxide	10 tonnes per year ^H	Calculated mass emission	Annual	Using calculation method agreed in writing with the Agency (IC2 refers)
Process vents	Process vents from higher olefins	No parameters set	No limits set	-	-	Permanent sampling access not required
Relief valves	Relief valves from higher olefins	No parameters set	No limits set	-	-	Permanent sampling access not required
B6 on site plan (figure 1) in schedule 2	Stack from furnace F-301 from polymerisation and heptene recovery plant	Oxides of Nitrogen (NO and NO ₂ expressed as NO ₂)	350 mg/m ³ ^H	Average over sampling period	Every 6 months	BS EN 14792
		Sulphur dioxide	3 kg/hr ^H	Maximum monthly average	Continuous	Using calculation method agreed in writing with the Agency (IC2 refers)
		Sulphur dioxide	2 tonnes per year ^H	Calculated mass emission	Annual	Using calculation method agreed in writing with the Agency (IC2 refers)
B7 on site plan (figure 1) in schedule 2	Stack from furnace F-501 from polymerisation and heptene recovery plant	Oxides of Nitrogen (NO and NO ₂ expressed as NO ₂)	330 mg/m ³ ^H	Average over sampling period	Every 6 months	BS EN 14792
		Sulphur dioxide	3 kg/hr ^H	Maximum monthly average	Continuous	Using calculation method agreed in writing with the Agency (IC2 refers)
		Sulphur dioxide	3 tonnes per year ^H	Calculated mass emission	Annual	Using calculation method agreed in writing with the Agency (IC2 refers)

Table S3.1 Point source emissions to air – emission limits and monitoring requirements						
Emission point ref. & location	Source	Parameter	Limit (including unit) A	Reference Period	Monitoring frequency	Monitoring standard or method B
Process vents	Process vents from polymerisation and heptene recovery plant	No parameters set	No limits set	-	-	Permanent sampling access not required
Relief valves	Relief valves from polymerisation and heptene recovery plant	No parameters set	No limits set	-	-	Permanent sampling access not required
B8	MEK tank 516	No parameters set	No limits set	-	-	Permanent sampling access not required
B9	Butanol tank 544	No parameters set	No limits set	-	-	Permanent sampling access not required
B10	Butanol tank 511	No parameters set	No limits set	-	-	Permanent sampling access not required
B11	Butanol tank 588	No parameters set	No limits set	-	-	Permanent sampling access not required
B12 on site plan (figure 1) in Schedule 2	Stack from furnace F-701 from MEK plant	Oxides of Nitrogen (NO and NO ₂ expressed as NO ₂)	130 mg/m ³ ^H	Average over sampling period	Every 6 months	BS EN 14792
		Sulphur dioxide	3 kg/hr ^H	Maximum monthly average	Continuous	Using calculation method agreed in writing with the Agency (IC2 refers)
		Sulphur dioxide	21 tonnes/year ^H	Calculated mass emission	Annual	Using calculation method agreed in writing with the Agency (IC2 refers)
B13	MEK tank 586	No parameters set	No limits set	-	-	Permanent sampling access not required
B14	MEK tank 514	No parameters set	No limits set	-	-	Permanent sampling access not required
B15	MEK tank 515	No parameters set	No limits set	-	-	Permanent sampling access not required
B16 on site plan (figure 1) in Schedule 2	Stack from furnace F-702 from MEK plant	Oxides of Nitrogen (NO and NO ₂ expressed as NO ₂)	130 mg/m ³ ^H	Average over sampling period	Every 6 months	BS EN 14792

Table S3.1 Point source emissions to air – emission limits and monitoring requirements						
Emission point ref. & location	Source	Parameter	Limit (including unit) A	Reference Period	Monitoring frequency	Monitoring standard or method B
		Sulphur dioxide	3 kg/hr ^H	Maximum monthly average	Continuous	Using calculation method agreed in writing with the Agency (IC2 refers)
		Sulphur dioxide	15 tonnes/year ^H	Calculated of mass emission	Annual	Using calculation method agreed in writing with the Agency (IC2 refers)
Process vents	Process vents from MEK plant	No parameters set	No limits set	-	-	Permanent sampling access not required
Relief valves	Relief valves from MEK plant	No parameters set	No limits set	-	-	Permanent sampling access not required
B17	Chlorine scrubber T550X vent on butyl polymers	No parameters set	No limits set	Calculated mass emission	Annually	Using calculation method agreed in writing with the Agency (IC2 refers)
B18	Bromine scrubber T650 vent on butyl polymers	No parameters set	No limits set	Calculated mass emission	Annually	Using calculation method agreed in writing with the Agency (IC2 refers)
B19	Tower T107 vent on butyl polymers	Methyl chlorine	4 kg/tonne product	Calculated annual average	Annually	Using calculation method agreed in writing with the Agency (IC2 refers)
B20	Drum D126 vent on butyl polymers					
B21	Hexane tank 595 vent on butyl polymers	Hexane	12 kg/tonne product from date of Permit issue for phase I of RTO project	Calculated mass emission	Annually	Using calculation method agreed in writing with the Agency (IC2 refers)
B22	Condenser vent to cement tanks 591, 592 and 593 on butyl polymers					
B23A	Vent for slurry tank TK-1A on butyl polymers					
B23B	Vent for slurry tank on TK-1B on butyl polymers					
B24	Slurry feeder vent on butyl polymers					
B25	Slurry feeder vent on butyl polymers					

Table S3.1 Point source emissions to air – emission limits and monitoring requirements						
Emission point ref. & location	Source	Parameter	Limit (including unit) A	Reference Period	Monitoring frequency	Monitoring standard or method B
B26	Slurry feeder vent on butyl polymers					
B27	SF DWE transfer vent on butyl polymers					
B28	SF DWE transfer vent on butyl polymers					
B29	SF DWE transfer vent on butyl polymers					
B30	VCU die vent on butyl polymers					
B31	VCU die vent on butyl polymers					
B32	VCU die vent on butyl polymers					
B33	Drum D508 vent on butyl polymers					
B21	Hexane tank 594 vent on butyl polymers	Hexane	6.5 kg/tonne product from date of completion of phase II of the RTO project ^C	Calculated mass emission	Annually ^D	Using calculation method agreed in writing with the Agency (IC2 refers)
B22	Condenser vent to cement tanks 591, 592 and 593 on butyl polymers					
B24	Slurry feeder vent on butyl polymers					
B25	Slurry feeder vent on butyl polymers					
B26	Slurry feeder vent on butyl polymers					
B27	SF DWE transfer vent on butyl polymers					
B28	SF DWE transfer vent on butyl polymers					

Table S3.1 Point source emissions to air – emission limits and monitoring requirements						
Emission point ref. & location	Source	Parameter	Limit (including unit) A	Reference Period	Monitoring frequency	Monitoring standard or method B
B29	SF DWE transfer vent on butyl polymers					
B30	VCU die vent on butyl polymers					
B31	VCU die vent on butyl polymers					
B32	VCU die vent on butyl polymers					
B33	Drum D508 vent on butyl polymers					
B21	Hexane tank 594 vent on butyl polymers	Hexane	0.5 kg/tonne product from completion of phase III of the RTO project ^C	Calculated mass emission	Annually ^D	Using calculation method agreed in writing with the Agency (IC2 refers)
B22	Condenser vent to cement tanks 591, 592 and 593 on butyl polymers					
B33	Drum D508 vent on butyl polymers					
B34 on site plan (figure 1) in Schedule 2	Stack from regenerative thermal oxidiser on butyl polymers	Oxides of Nitrogen (NO and NO ₂ expressed as NO ₂)	50 mg/m ³	Average over sampling period	Every 6 months	BS EN 14792
		Carbon Monoxide	50 mg/m ³	Average over sampling period	Every 6 months	BS EN 15058 or ISO 12039
		VOCs	75 mg/m ³ ^E	Average over sampling period	Every 3 months	BS EN 12619:1999
			150 mg/m ³ ^F	Calculated mass emission	Weekly	Using calculation method agreed in writing with the Agency (IC2) refers
Process vents	Process vents from butyl polymers	No parameters set	No limits set	-	-	Permanent sampling access not required
Relief valves	Relief valves from butyl polymers	No parameters set	No limits set	-	-	Permanent sampling access not required

Table S3.1 Point source emissions to air – emission limits and monitoring requirements						
Emission point ref. & location	Source	Parameter	Limit (including unit) A	Reference Period	Monitoring frequency	Monitoring standard or method B
A	Limits do not apply during start up.					
B	Permanent means of access for sampling/monitoring is not required where limits have not been set.					
C	As notified in Improvement Programme condition IC4.					
D	For the calendar year in which the RTO commissioning phases are completed, the operator shall report hexane releases in kg/tonne product separately for the part of the year until commissioning of each phase is completed and the remaining part of the year.					
E	Limit does not apply when the RTO is not in service.					
F	Limit and monitoring requirement applies only during commissioning phases for the RTO improvement project provided notification has been received as required by Improvement Programme condition IC4.					
G	The operation this of this emission point will be permitted for 3 months following discontinuance of its regular use, or as agreed with the Agency.					
H	These limits do not apply when the emissions are being assessed for compliance under the agreed Integrated Emissions Management Technique incorporated into permit EPR/BR6996IC.					

Table S3.2 Point source emissions to sewer, effluent treatment plant or other transfers off-site—emission limits and monitoring requirements						
Emission point ref. & location	Source	Parameter	Limit (incl. unit)	Reference Period	Monitoring frequency	Monitoring standard or method
T1: transfer of effluent to Esso Petroleum Company Limited wastewater treatment system via Separator 3 effluent line and separator.	Process water streams, drainage from potentially contaminated process, loading and storage areas via the dirty water sewer having passed through dissolved air flotation unit. Once through cooling water via the clean water sewer. Treated sewage effluent via 12 th St Separator.	No parameters set	No limits set	-	-	Permanent sampling access not required
T2 transfer of effluent from polymerisation plant to Esso Petroleum Company Limited wastewater treatment system via Separator 2	Process water streams, drainage from process areas	No parameters set	No limits set	-	-	Permanent sampling access not required
T3 transfer of clean water effluent from polymerisation plant to Esso Petroleum Company Limited wastewater treatment system via Separator 2	Clean water from non-process areas	No parameters set	No limits set	-	-	Permanent sampling access not required

Table S3.3 Annual limits for EMCL permitted activities		
Substance	Medium	Limit (including unit)
Sulphur dioxide	Air	54 tonnes

Table S3.4 Noise monitoring requirements				
Location or description of point of measurement	Parameter	Monitoring frequency	Monitoring standard or method	Other specifications
Perimeter noise survey	Noise	Annually	BS 4142:1997	-

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 – oxides of nitrogen Parameters as required by condition 3.5.1.	B5, B6, B7, B12, B16, B34	Every 12 months	20/12/07
Emissions to air – sulphur dioxide Parameters as required by condition 3.5.1	B5, B6, B7, B12, B16	Every 12 months	20/12/07
Emissions to air – methyl chloride Parameters as required by condition 3.5.1	B19, B20	Every 12 months	20/12/07
Emissions to air – hexane Parameters as required by condition 3.5.1	B21 – B33 (for each emission point until routed to RTO)	Every 12 months	20/12/07
Emissions to air – carbon monoxide Parameters as required by condition 3.5.1	B34	Every 12 months	20/12/07
Emissions to air – VOCs Parameters as required by condition 3.5.1	B34	Every 12 months	20/12/07
Noise monitoring Parameters as required by condition 3.5.1	Perimeter noise survey	Every 12 months	20/12/07

Table S4.2 Annual production/treatment	
Parameter	Units
Solvent products	Tonnes
Intermediary products	Tonnes
Speciality chemical products	Tonnes

Table S4.3 Performance parameters		
Parameter	Frequency of assessment	Units
Water usage	Annually	Tonnes
Energy usage (electrical)	Annually	MWh
Energy usage (all fuels)	Annually	MJ
Raw material usage	Annually	Tonnes
Specific Energy Consumption	Annually	MWh/tonne of production
Specific Energy Consumption	Annually	GJ/tonne of production
Imports (i.e. feedstocks)	Annually	Tonnes
Waste disposed of off site per tonne of product produced	Annually	Tonnes/tonne of production

Table S4.4 Reporting forms		
Media/parameter	Reporting format	Date of form
Air	Form Air 1 or other form as agreed in writing by the Environment Agency	24/10/07
Water usage	Form Water Usage 1 or other form as agreed in writing by the Environment Agency	24/10/07
Production	Form Production 1 or other form as agreed in writing by the Environment Agency	24/10/07
Other performance indicators	Form Performance 1 or other form as agreed in writing by the Environment Agency	24/10/07

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/ZP3839MG
Name of operator	ExxonMobil Chemical Limited
Location of Facility	Fawley Refinery
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 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.

“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.

“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 limit.

“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.

“Industrial Emissions Directive” means DIRECTIVE 2010/75/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 24 November 2010 on industrial emissions

“*LDAR*” means Leak Detection and Repair, a managed scheme and programme for testing potential sources of fugitive emissions, from operational plant at the installation, and repairing or carrying out other actions to prevent, or where that is not possible, minimise continued emissions from those sources. The LDAR programme at the installation shall be consistent with the requirements of the Institute of Petroleum (Energy Institute) Protocol.

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

“*RTO*” means Regenerative Thermal Oxidiser

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

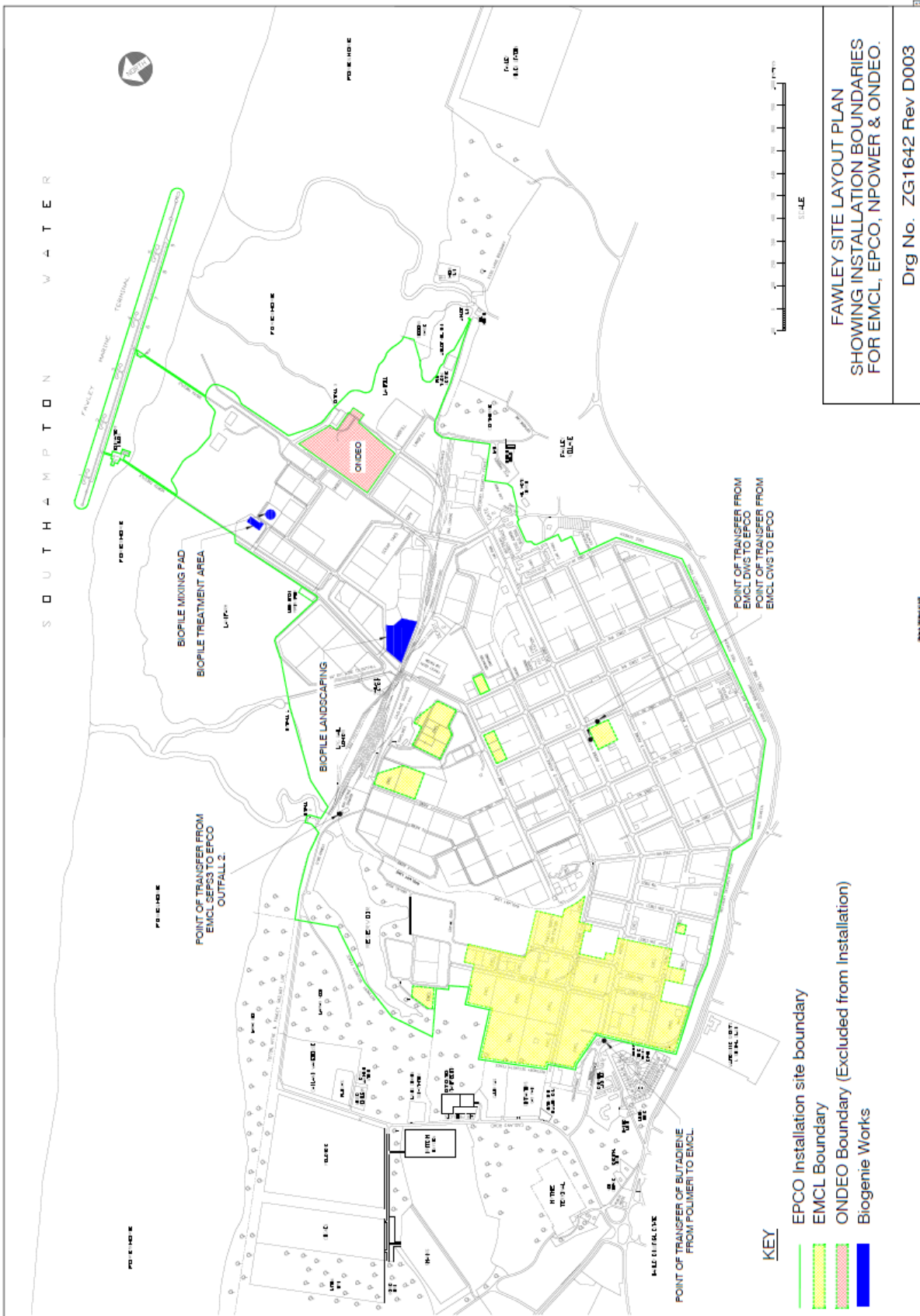
Where a minimum limit is set for any emission parameter, for example pH, reference to exceeding the limit shall mean that the parameter shall not be less than that limit.

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 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.

Schedule 7 – Site plan



END OF PERMIT