Notice of variation and consolidation with introductory note

The Environmental Permitting (England & Wales) Regulations 2016

Croda Europe Ltd

Croda Europe Ltd – Barnfield Road
Barnfield Road
Leek
Staffordshire
ST13 5QJ

Variation application number

EPR/BT8155ID/V004

Permit number

EPR/BT8155ID

Croda Europe Ltd – Barnfield Road
Permit number EPR/BT8155ID

Introductory note

This introductory note does not form a part of the notice

Under the Environmental Permitting (England & Wales) Regulations 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.

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.

The schedules specify the changes made to the permit.

Croda operates a chemical manufacturing site at Barnfield Road, Staffordshire, producing organic chemicals such as refined fish oil and derivatives, which is covered under Section 4.1 Part A(1)(a)(ii) - “Producing organic chemicals such as organic compounds containing oxygen, such as alcohols, aldehydes, ketones, carboxylic acids, esters, peroxides, phenols, epoxy resins” of the EP Regulations.

Croda has been involved in trialling a new process in their existing pilot plant, in conjunction with a third-party chemical manufacturer, to produce novel lipids for use as pharmaceutical excipients or healthcare ingredients. The pilot plant process has an output capacity of between 150 and 200kg per annum, and it is intended that 5 batches will have been produced by the end of 2020. This is termed as Stage 1 of the novel lipid excipient product development. Based on the output capacity of the pilot plant operations, the manufacturing process has to date been undertaken with the agreement of the Environment Agency but has thus far not required a formal variation to the Environmental Permit.

The next stage of the product development (Stage 2) is to increase the product throughput to up to 2,000kg per year, referred to as ‘small scale operation’. Following implementation of Stage 2, intended to be in 2021, it is expected that full scale operations i.e. Stage 3 will be established at the site.

As the manufacturing process is still in the process of being gradually scaled-up, it is under continuous review, with the process components being improved and optimised, as considered necessary.

This Permit variation is concerned with the Stage 2 operations only.

This variation seeks to

- Add an additional listed activity under Section 4.1 Part A(1)(a)(iv) of the EP Regulations for production of novel lipids for use as pharmaceutical excipients or healthcare ingredient products.
- Use of the existing Pilot Plant for the initial synthesising of the lipid.
- Refurbishment the existing engineering maintenance workshop to accommodate the purification of the synthesised lipid via chromatography (“Chromatography building”), and
- Replacement of three existing bulk storage tanks with three new tanks for the storage of associated raw materials and process waste pending collection and off-site disposal or recovery by licenced waste management contractors.

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 received	Received 29/08/2003	Duly made 29/08/2003
Permit determined EPR/BT8155ID	02/02/2004	Permit issued to Croda Chemicals International Ltd.
Variation application EPR/BT8155ID/V002	Received 26/07/2007	Duly Made 26/07/2007
Variation determined EPR/BT8155ID/V002	09/08/2007	
Variation application EPR/BT8155ID/V003	Received 23/06/2010	Duly Made 16/08/2010
Variation determined EPR/BT8155ID/V003	14/03/2011	
Application EPR/BT8155ID/V004 (variation and consolidation)	Duly made 09/10/2020	Application to vary permit to include new listed activity and update the permit to modern conditions. Please note the operator changed the company name to Croda Europe Ltd on 3 January 2012.
Variation determined and consolidation issued EPR/BT8155ID/V004	02/12/2020	

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

Permit number

EPR/BT8155ID

Issued to

Croda Europe Ltd ("the operator")

whose registered office is

Cowick Hall
Snaith
Goole
East Yorkshire
DN14 9AA

company registration number 00167236

to operate a regulated facility at

Croda Europe Ltd – Barnfield Road
Barnfield Road
Leek
Staffordshire
ST13 5QJ

to the extent set out in the schedules.

The notice shall take effect from 02/12/2020

Name	Date
Daniel Timney	**02/12/2020**

Authorised on behalf of the Environment Agency

Schedule 1

All conditions have been varied by the consolidated permit as a result of the application made by the operator.

Schedule 2 – consolidated permit

Consolidated permit issued as a separate document.

Permit

The Environmental Permitting (England and Wales) Regulations 2016

Permit number

EPR/BT8155ID

This is the consolidated permit referred to in the variation and consolidation notice for application EPR/BT8155ID/V004 authorising,

Croda Europe Ltd ("the operator"),

whose registered office is

Cowick Hall
Snaith,
Goole,
East Yorkshire
DN14 9AA

company registration number 00167236

to operate a regulated facility at

Croda Europe Ltd – Barnfield Road
Barnfield Road
Leek
Staffordshire
ST13 5QJ

Name	Date
Daniel Timney	**02/12/2020**

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 For the following activities referenced in schedule 1, table S1.1 (AR1 to AR2) 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 For the following activities referenced in schedule 1, table S1.1 (AR1 to AR2) 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.

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 shown edged in green on the site plan at schedule 7 to this permit.

2.3 Operating techniques

2.3.1 For the following activities referenced in schedule 1, table S1.1 (AR1 to AR2) 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 For the following activities referenced in schedule 1, table S1.1 (AR1 to AR2) where a substance is specified in schedule 3 table S3.2 but no limit is set for it, the concentration of such substance in emissions to water from the relevant emission point shall be no greater than the background concentration.

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;

(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;

(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;

(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;

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 For the following activities referenced in schedule 1, table S1.1 (AR1 to AR2) 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 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.

4.3.4 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.

4.3.5 The Environment Agency shall be given at least 14 days notice before implementation of any part of the site closure plan.

4.3.6 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 "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 and WFD Annex I and II operations**	**Limits of specified activity and waste types**
AR1	Section 4.1 A(1)(a)(ii) - "Producing organic chemicals such as organic compounds containing oxygen, such as alcohols, aldehydes, ketones, carboxylic acids, esters, peroxides, phenols, epoxy resins."	Producing organic chemicals such as refined fish oil and derivatives	Receipt of raw materials to storage of finished product incorporating the activities below
AR2	Section 4.1 A(1)(a)(iv) – "Producing organic chemicals such as organic compounds containing nitrogen (for example amines, amides, nitrous-, nitro- or azocompounds, nitrates, nitriles, nitrogen heterocyclics, cyanates, isocyanates, diisocyanates and di-isocyanate prepolymers)."	Producing organic chemicals such as novel lipids	Receipt of raw materials to storage of finished product incorporating the activities below. This activity relates to the production of novel lipids for use as pharmaceutical excipients or healthcare ingredient products. The maximum annual tonnage of novel lipids produced shall not exceed 2,000Kgs. (Stage 2 - small scale production)
	Directly Associated Activity		
AR3	Further processing	Refining of crude oils and intermediates	Thin Film (LUWA), Winterisation, Super Refining and CO2 pilot plants
AR4	Clathration	Production of up to 1000 tonnes per annum of clathrated fish oil.	Refluxing of fish oil and urea in ethanol, including receipt and storage of raw materials associated with this process.
AR5	Earth Treatment	Further refining of oil up to 1900 tonnes per annum, using bentonite clay.	Heating of the oil and agitating it with bentonite clay, followed by cooling and filtration, including receipt and storage of raw materials associated with this process.

Table S1.1 activities			
Activity reference	**Activity listed in Schedule 1 of the EP Regulations**	**Description of specified activity and WFD Annex I and II operations**	**Limits of specified activity and waste types**
AR6	Storage and handling of raw materials	Storage of solid and liquid materials in bulk storage tanks, drums, IBC.s, bags and other containers. This includes the installation of two 55m³ above ground bulk storage tanks for the storage of n-hexane and ethyl acetate.	Receipt and storage of raw materials to transfer to batch preparation or other process areas.
AR7	Storage, handling and dispatch of intermediates, finished products, waste & other materials	Storage of intermediates and finished product in bulk storage tanks, drums, IBC's or other containers. Process waste segregation and storage. This includes the installation of one 55m³ above ground bulk storage tanks for the storage waste solvent.	Internal & external storage of intermediates, finished products, storage of waste in designated areas and loading for transit off site.
AR8	Control & abatement systems for emissions to air	Abatement of releases to air	Extraction and collection of waste gases and treatment in wet scrubber and condensers
AR9	Effluent treatment	Settlement, pH adjustment and oil separation	From drainage system to effluent treatment plant to point of entry to sewer
AR10	Process heating	Steam generation plant and hot oil heaters (aggregate capacity 16.7MWth)	Boilers and hot oil heaters
AR11	Cooling water system	Cooling water supply, treatment and re circulation	Cooling water loops to cooling towers
AR12	Combined Heat and Power (CHP) unit	Combined Heat and Power (CHP) unit	The operation of a 650 – 1000 kW rated CHP unit from the burning of fuel derived from bio mass.
A13	Chromatography plant	Purification of synthesised product via column chromatography.	The operation shall be carried out in chromatography units operated as batch processes. (For example using biotage units.)

Table S1.2 Operating techniques		
Description	**Parts**	**Date Received**
Application	The response to questions 2.1 and 2.2 given in pages 7 - 38 of the application	29/08/2003

Table S1.2 Operating techniques		
Description	**Parts**	**Date Received**
Application	Process description (SHE Report 199), & Drawings (No. 00-036 & 99-010)	29/08/2003
Application for variation RP3836UB	Application for an environmental permit Part C	26/07/2007
Application for variation EPR/BT8155ID/V003	Application for an Environmental Permit Part C	23/06/2010
Further information	Update provided for certain technical aspects of application variation EPR/BT8155ID/V003	16/12/2010
Further information	Details of additional emission point A10	24/02/2011
Application for variation EPR/BT8155ID/V004	Responses in application form Part C3	09/10/2020
	Document entitled 'Environmental permit variation application' dated 09/10/2020 and referenced 6064 1314-ACM-PM-RP-EN-001-A	09/10/2020
	Document entitled 'Assessment of indicative BAT for the production of speciality organic chemicals sector (EPR 4.02)	09/10/2020
Further information	Email detailing additional secondary and tertiary containment measures to be implemented	18/11/2020

Table S1.3 Improvement programme requirements		
Reference	**Requirement**	**Date**
IP1	The Operator shall assess (with regard to minimising emissions of VOC's to air) the benefits of connecting the LUWA vacuum pump vent to the Lipid plant knock out and condenser system and submit proposals for implementing a scheme should it be identified as BAT.	Complete
IP2	The Operator shall replace the scrubber with a condenser to abate VOC emissions from the Lipid Plant (VT4003). Upon completion of installation a monitoring exercise shall be undertaken and a report submitted to the Environment Agency to establish the emissions.	Complete
IP3	The Operator shall complete the condensate return project as identified in section 2.4.3 of the application.	Complete
IP4	The Operator shall clearly label all waste storage areas on site with the waste classification specifying the maximum storage capacity and maximum storage period and amend the controlling procedures accordingly.	Complete
IP5	The Operator shall review the preventative maintenance system to ensure it suitably covers maintenance of plant to ensure energy is used efficiently and noise is minimised having regard to the Agency's Technical guidance Notes H2 and H3 and submit a summary report of the findings.	Complete
IP6	The Operator shall submit proposals for the installation of new boilers. This shall include a BAT justification for the boilers selected and an assessment of the impact of the emissions to air from them.	Complete
IP7	The Operator shall install the following plant and infrastructure changes on site to achieve the specified improvements details: • Back venting of vapour displaced from the bulk solvent tanks during solvent deliveries into the delivery tankers to minimise VOC emissions via Emission point A11; • Installation of chiller systems on the cooling water to the condensers associated with PP1, PP2 and PP3 reactors within	Within 12 months of the date of this variation.

Table S1.3 Improvement programme requirements		
Reference	**Requirement**	**Date**
	the pilot plant to optimise solvent recovery and minimise emissions to air; • Design and installation of a suitable permanent scrubber to abate emissions of Dimethyl sulphide and prevent ion site odour impacts; • Review of the design and discharge height of the high vacuum emission vent (A12b) to improve air emission dispersion. Where any of the above is not proposed to be installed a report must be submitted to demonstrate how BAT compliance will be achieved.	
IP8	The Operator shall install the following improvement converting the existing liquid ring vacuum pumps used for the low vacuum duty on PP1, PP2 and PP3 to dry vacuum units which would remove the wastewater effluent source from the process (potentially containing solvents) into the pilot plant sump. Where the above is not proposed to be installed a report must be submitted to demonstrate how BAT compliance will be achieved.	Within 12 months of the date of this variation.
IP9	Once IP7 has been complete a revised H1 assessment for air emissions shall be carried out on site and submitted to the Agency for assessment.	Within 3 months of the completion of IP7
IP10	Once IP8 has been complete a H1 assessment on the discharges to sewer from the effluent treatment plant shall be carried out and submitted to the Agency for assessment.	Within 3 months of the completion of IP8.

Schedule 2 – Waste types, raw materials and fuels

Table S2.1 Raw materials and fuels	
Raw materials and fuel description	**Specification**
Ethyl Acetate	none
n-Hexane	none
Branched Medium Chain Fatty Acid	none
Short Chain Diol	none
Sulphuric Acid	none
Potassium hydroxide	none
Dimethyl Sulfoxide (DMSO)	none
Toluene	none
1-(3-Dimethylaminopropyl)-3-ethylcarbodiimidehydrochloride (EDAC-HCl)	none
Phosphoric Acid	none
Deionised Water	none
Sodium Chloride	none
Acetonitrile	none
Molecular Sieves	none
Sodium triacetoxyborohydride (STAB)	none
4-aminobutanol	none
Sodium Bicarbonate	none
Ethanol	none
Ammonium Hydroxide	none
Sodium Hypochlorite 10% Solution	none

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)**	**Reference period**	**Monitoring frequency**	**Monitoring standard or method**
A1 [Point A1 on site plan in Schedule 7]	Lipid Plant Exhaust	--	--	--	--	--
A2 [Point A2 on site plan in schedule 7]	Super refining VOC abatement skid	--	--	--	--	--
A3 [Point A3 on site plan in schedule 7]	PP4 & 5 Vent through condensing system	--	--	--	--	--
A4 [Point A4 on site plan in schedule 7]	PP6 Vent through condensing system	--	--	--	--	--
A5 [Point A5 on site plan in schedule 7]	Vacuum pump vent	--	--	--	--	--
A6 [Point A6 on site plan in schedule 7]	Combined heat and power exhaust	--	--	--	--	--
A7 [Point A7 on site plan in schedule 7]	Clathration VOC skid	--	--	--	--	--
A8 [Point A8 on site plan in schedule 7]	Urea Solution tank vent	--	--	--	--	--
A9 [Point A9 on site plan in schedule 7]	Urea Solution tank vent	--	--	--	--	--
A10 [Point A10 on site plan in schedule 7]	Ethanol centrifuge	--	--	--	--	--
A11 [Point A11 on site plan in schedule 7]	Solvent storage tanks, day tanks and batch tanks from the chromatography process.	--	--	--	--	--
A12 [Point A12 on site plan in schedule 7]	Pilot plant 12a	Ethyl acetate, Toluene, Acetonitrile, Ethanol.	--	--	To be agreed in writing	To be agreed in writing

Table S3.1 Point source emissions to air – emission limits and monitoring requirements						
Emission point ref. & location	**Source**	**Parameter**	**Limit (including unit)**	**Reference period**	**Monitoring frequency**	**Monitoring standard or method**
	Pilot plant 12b	Ethyl acetate, Toluene, Di-methyl sulphide.	--	--	To be agreed in writing	To be agreed in writing
	Pilot plant 12c	Ethyl acetate, Toluene, Acetonitrile, Ethanol.	--	--	To be agreed in writing	To be agreed in writing

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**
S1 on site plan in drawing No.99-010.	Surface water settlement tank (heavy rainfall periods only	--	--	--	--	--
S2 on site plan in drawing No.99-010.	Process and surface water via site effluent treatment plant	Total daily volume of discharge	--	--	Continuous	To be agreed.

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.	A12	Every 12 months	1 January
Emissions to water Parameters as required by condition 3.5.1	S2	Every 12 months	1 January

Table S4.2: Annual production/treatment	
Parameter	**Units**
Production of refined fish oil and derivatives	tonnes
Production of the novel lipids	Kgs

Table S4.3 Performance parameters		
Parameter	**Frequency of assessment**	**Units**
Production efficiency for the refined fish oil & derivatives/unrefined fish oil	Annually	tonnes
Production efficiency for the novel lipids	Annually	Kgs
Water usage	Annually	tonnes
Energy usage	Annually	MWh
Total raw material used (split down based on the raw materials detailed in Table 2.1 above)	Annually	tonnes
Waste produced (split down by inert, non-hazardous and hazardous)	Annually	tonnes
Process effluent discharges to sewer	Annually	m^3/tonne
COD load of process effluent	Annually	Kg/tonne

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	-
Sewer	Form sewer 1 or other form as agreed in writing by the Environment Agency	-
Water usage	Form water usage 1 or other form as agreed in writing by the Environment Agency	-

Table S4.4 Reporting forms		
Media/parameter	**Reporting format**	**Date of form**
Energy usage	Form energy 1 or other form as agreed in writing by the Environment Agency	-
Waste return	Form waste return 1 or other form as agreed in writing by the Environment Agency.	-
Other performance indicators	Form performance 1 or other 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	
Name of operator	
Location of Facility	
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:

- 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.

"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 or background concentration 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.

"Hazardous property" has the meaning in Annex lll of the Waste Framework Directive.

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

"List of Wastes" means the list of wastes established by Commission Decision 2000/532/EC replacing Decision 94/3/EC establishing a list of wastes pursuant to Article 1(a) of Council Directive 75/442/EEC on waste and Council Decision 94/904/EC establishing a list of hazardous waste pursuant to Article 1(4) of Council Directive 91/689/EEC on hazardous waste.

"MCERTS" means the Environment Agency's Monitoring Certification Scheme.

"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.

"year" means calendar year ending 31 December.

'hazardous substance' means a substance classified as hazardous as a consequence of fulfilling the criteria laid down in parts 2 to 5 of Annex I to Regulation (EC) No 1272/2008

'heavy metal' means any compound of antimony, arsenic, cadmium, chromium (VI), copper, lead, mercury, nickel, selenium, tellurium, thallium and tin, as well as these materials in metallic form, as far as these are classified as hazardous substances

'PCBs' means

- polychlorinated biphenyls
- polychlorinated terphenyls
- monomethyl-tetrachlorodiphenyl methane, Monomethyl-dichloro-diphenyl methane, Monomethyldibromo-diphenyl methane

- any mixture containing any of the above mentioned substances in a total of more than 0,005 %by weight

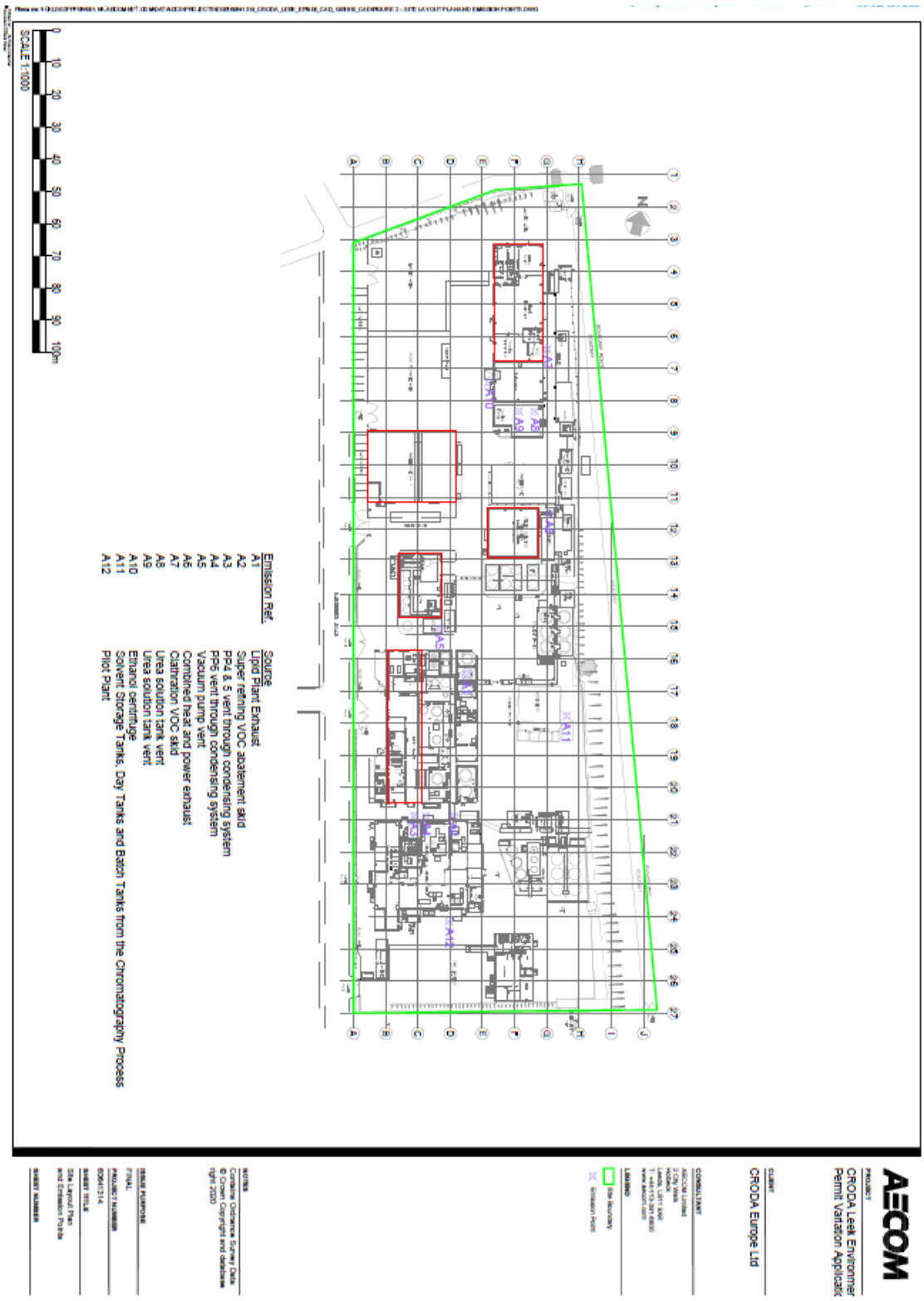
‘transition metals’ means any of the following metals: any compound of scandium, vanadium, manganese, cobalt, copper, yttrium, niobium, hafnium, tungsten, titanium, chromium, iron, nickel, zinc, zirconium, molybdenum and tantalum, as well as these materials in metallic form, as far as these are classified as hazardous substances

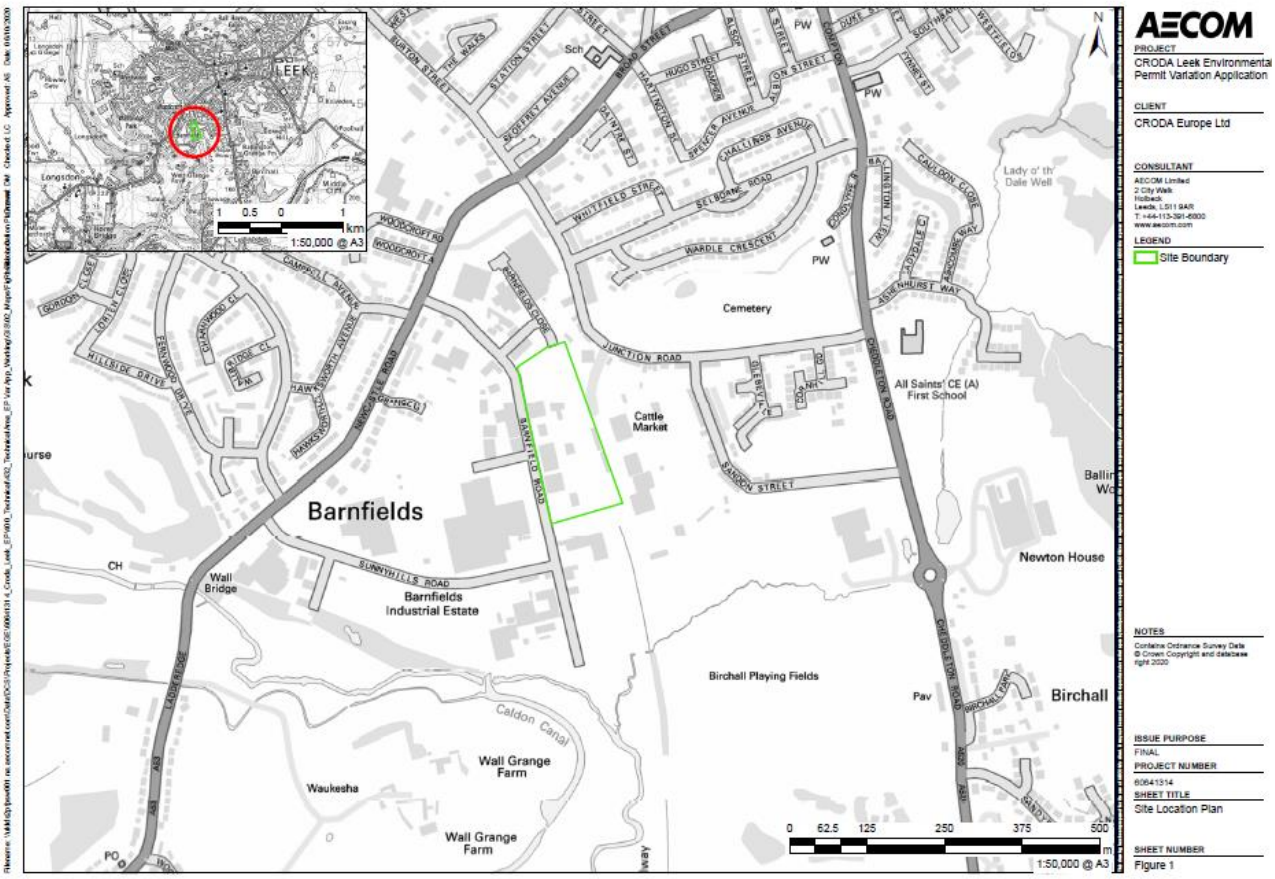
‘stabilisation’ means processes which change the hazardousness of the constituents in the waste and transform hazardous waste into non-hazardous waste

‘solidification’ means processes which only change the physical state of the waste by using additives without changing the chemical properties of the waste

‘partly stabilised wastes’ means wastes containing, after the stabilisation process, hazardous constituents which have not been changed completely into non-hazardous constituents and could be released into the environment in the short, middle or long term

Schedule 7 – Site plan





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