

## **Environment Agency**

### **Review of an Environmental Permit for an Installation subject to Chapter II of the Industrial Emissions Directive under the Environmental Permitting (England & Wales) Regulations 2016 (as amended)**

#### **Decision document recording our decision-making process following review of a permit**

The Permit number is: EPR/KP3030TZ  
The Operator is: Sedamyl UK Limited  
The Installation is: Selby Wheat Processing Facility  
This Variation Notice number is: EPR/KP3030TZ/V008

#### **What this document is about**

Article 21(3) of the Industrial Emissions Directive (IED) requires the Environment Agency to review conditions in permits that it has issued and to ensure that the permit delivers compliance with relevant standards, within four years of the publication by the European Commission of updated decisions on BAT conclusions.

We have reviewed the permit for this installation against the revised BAT Conclusions for the Large Volume Organic Chemicals industry sector published on 07 December 2017 in the Official Journal of the European Union.

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

Common Waste Water and Waste Gas Treatment/Management Systems in the Chemical Sector. Published 09 June 2016

In this decision document, we set out the reasoning for the consolidated variation notice that we have issued.

It explains how we have reviewed and considered the techniques used by the operator in the operation and control of the plant and activities of the installation. This review has been undertaken with reference to the decision made by the European Commission establishing best available techniques (BAT) conclusions (BATc) for Production of Large Volume Organic Chemicals (LVOC) and Common Waste Water And Waste Gas Treatment/Management Systems in the Chemical Sector (CWW) as detailed in documents reference C(2017) 7469 and C(2016) 3127 respectively. It is our record of our decision-

making process and shows how we have taken into account all relevant factors in reaching our position.

As well as considering the review of the operating techniques used by the operator for the operation of the plant and activities of the installation, the consolidated variation notice takes into account and brings together in a single document all previous variations that relate to the original permit issue. Where this has not already been done, it also modernises the entire permit to reflect the conditions contained in our current generic permit template.

The introduction of new template conditions makes the permit consistent with our current general approach and with other permits issued to installations in this sector. Although the wording of some conditions has changed, while others have been deleted because of the new regulatory approach, it does not reduce the level of environmental protection achieved by the permit in any way. In this document we therefore address only our determination of substantive issues relating to the new BAT Conclusions.

We try to explain our decision as accurately, comprehensively and plainly as possible. Achieving all three objectives is not always easy, and we would welcome any feedback as to how we might improve our decision documents in future.

## **How this document is structured**

1. Our decision
2. How we reached our decision
3. The legal framework
4. Annex 1 – Decision checklist regarding relevant BAT Conclusions.
5. Annex 2 – Improvement Conditions
6. Annex 3 – Review and assessment of changes that are not part of the BAT Conclusions derived permit review.

# 1 Our decision

We have decided to issue the variation notice to the operator. This will allow it to continue to operate the Installation, subject to the conditions in the consolidated variation notice that updates the whole permit.

We consider that, in reaching our decision, we have taken into account all relevant considerations and legal requirements and that the varied permit will ensure that a high level of protection is provided for the environment and human health.

The consolidated variation notice contains many conditions taken from our standard environmental permit template including the relevant annexes. We developed these conditions in consultation with industry, having regard to the legal requirements of the Environmental Permitting Regulations and other relevant legislation. This document does not therefore include an explanation for these standard conditions. Where they are included in the notice, we have considered the techniques identified by the operator for the operation of their installation, and have accepted that the details are sufficient and satisfactory to make those standard conditions appropriate. This document does, however, provide an explanation of our use of “tailor-made” or installation-specific conditions, or where our permit template provides two or more options.

## 2 How we reached our decision

### 2.1 Requesting information to demonstrate compliance with BAT Conclusion techniques

We issued a notice under regulation 61(1) of the Environmental Permitting (England and Wales) Regulations 2016 (a Regulation 61 Notice) on 04/05/18 requiring the operator to provide information to demonstrate where the operation of their installation currently meets, or how it will subsequently meet, the revised standards described in the relevant BAT Conclusions document. The notice required that where the revised standards are not currently met, the operator should provide information that:

- Describes the techniques that will be implemented before 07/12/21 which will then ensure that operations meet the revised standard, or
- justifies why standards will not be met by 07/12/21, and confirmation of the date when the operation of those processes will cease within the installation or an explanation of why the revised BAT standard is not applicable to those processes, or
- justifies why an alternative technique will achieve the same level of environmental protection equivalent to the revised standard described in the BAT Conclusions.

Where the operator proposed that they were not intending to meet a BAT standard that also included a BAT Associated Emission Level (BAT AEL) described in the BAT Conclusions Document, the Regulation 61 notice required that the operator make a formal request for derogation from compliance with that AEL (as provisioned by Article 15(4) of IED). In this circumstance, the notice identified that any such request for derogation must be supported and justified by sufficient technical and commercial information that would enable us to determine acceptability of the derogation request.

The Regulation 61 notice response from the Operator was received on 08/08/18.

We considered that the response did not contain sufficient information for us to commence determination of the permit review. We therefore issued a further information request to the operator. Suitable further information was provided by the operator on 07/11/18.

We considered it was in the correct form and contained sufficient information for us to begin our determination of the permit review but not that it necessarily contained all the information we would need to complete that determination.

The operator made no claim for commercial confidentiality. We have not received any information in relation to the Regulation 61 Notice response that appears to be confidential in relation to any party.

## 2.2 Review of our own information in respect to the capability of the installation to meet revised standards included in the BAT Conclusions document

Based on our records and previous experience in the regulation of the installation we consider that the operator will be able to comply with the techniques and standards described in the BAT Conclusions other than for those techniques and requirements described in LVOC BAT Conclusion 8 and CWW BAT conclusion 5. In relation to these BAT conclusions, we agree with the operator in respect of their current stated capability as recorded in their regulation 61 Notice response and note their plans to achieve compliance. We have therefore included Improvement Condition 13 in the consolidated variation notice to ensure that the requirements of the BAT conclusions are delivered before 07/12/21.

## 2.3 Requests for further information during determination

Although we were able to consider the Regulation 61 notice response generally satisfactory at receipt, we did in fact need more information in order to complete our permit review assessment. We requested this by email and the operator provided further information on monitoring of emissions to air, flaring, VOC emissions/abatement, wastewater monitoring and BAT-AEL applicability on 18/09/19, 06/11/19 and 28/05/20. We made a copy of this information available on our public register.

## 2.4 Condition of Soil and Groundwater

Articles 16 and 22 of the Industrial Emissions Directive (IED) require that a quantified baseline is established for the level of contamination of soil and groundwater with hazardous substances, in order that a comparison can be made on final cessation of activities.

We have used the Large Volume Organic Chemicals permit review to regulate against the above IED requirements. Our Regulation 61 notice required operators, where the activity of the installation involved the use, production or release of a relevant hazardous substance (as defined in Article 3(18) of the Industrial Emissions Directive), to carry out a risk assessment considering the possibility of soil and groundwater contamination at the installation with such substances. Where any risk of such contamination was established we requested that the operator either:

- prepare and submit a baseline report containing information necessary to determine the current state of soil and groundwater contamination; or
- provide a summary report referring to information previously submitted where they were satisfied that such information represented the current state of soil and groundwater contamination so as to enable a quantified comparison to be made with the state of soil and groundwater contamination upon definitive cessation the activity.

Where operators concluded that there were no risks of soil or groundwater contamination (due to there not being any release of hazardous substances), they were required to provide a copy of the risk assessment.

The operator has provided copies of:

- A soil and groundwater contamination assessment (document 10/6041/1, Nov 2010). This was required following the clearance of much of the redundant former process plant, to establish a baseline prior to the commencement of construction works. It includes soil contaminant concentrations, shallow groundwater contaminant concentrations and water quality in the bedrock aquifer.
- A site protection and monitoring plan (07<sup>th</sup> November 2018). This describes all controls and systems in place to prevent and minimise any discharges of hazardous materials.
- A hazardous substances environmental risk assessment, identifying potential environmental impacts from abnormal/emergency situations involving hazardous substances and details of the necessary mitigation measures.

We are satisfied that these documents meet our requirements. Hazardous substances are stored in bunded areas and managed according to operational procedures. Specific environmental procedures and work instructions are in place in case of accidental fugitive emissions in order to

prevent any soil and groundwater contamination. Engineered solutions are in place to avoid the occurrence of any fugitive emission.

## 2.5 Surface Water Pollution Risk Assessment

As part of our delivery of the Water Framework Directive (WFD) requirements, we need to identify and assess the impact of all sources of hazardous pollutants to surface waters from regulated industry. We use the term 'hazardous pollutants' to collectively describe substances covered by the EQSD<sup>1</sup> (priority hazardous substances, priority substances and "other pollutants"). It also applies to the specific pollutants listed in the 2015 Directions<sup>2</sup>, and substances which have operational (non-statutory) Environmental Quality Standards (EQS).

For all installations with discharges to surface water and/or sewer we required the operator, via our Regulation 61 notice, to provide a summary report of the current hazardous pollutant releases referring to the series of screening tests, which are described in our H1 risk assessment guidance, which would allow us to assess whether the emissions of hazardous pollutants from the installation are significant.

The risk assessment methodology uses a number of sequential screening steps to determine if a substance warrants detailed modelling and hence any emission limits being required, namely:

- Screen out insignificant emissions that do not warrant further investigation;
- Determine if significant load test is failed (for priority hazardous substances only);
- Decide if detailed modelling is needed;
- Assess emissions against relevant standards and set permit limits where considered necessary.

The operator has provided a copy of their H1 Risk Assessment, which was undertaken in 2014 as part of their variation application. They note that although the air impacts have changed due to subsequent variations, the water discharge assessment remains valid. We have reviewed this assessment to ensure it meets our current requirements.

We have identified that the some of the EQSs have changed since the assessment was carried out. In particular, those for lead and nickel are now tighter. Also, it is unclear whether the correct flow data for the River Ouse has been used in the assessment, as only one figure is provided with no corresponding flow statistics. At 49.12 m<sup>3</sup>/s it is unlikely that this is the Q95 flow rate that we require.

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<sup>1</sup> Environmental Quality Standards Directive (EQSD) (2008/105/EC, as amended by 2013/39/EU)

<sup>2</sup> The Water Framework Directive (Standards and Classification) Directions (England and Wales) 2015

As such, we have taken the opportunity to run the effluent data through the current H1 screening tool, using a precautionary Q95 flow estimate of 2.77 m<sup>3</sup>/s from upstream at Tadcaster (<https://nrfa.ceh.ac.uk/data/station/meanflow/27089>). The maximum permitted daily flow of 4,320 m<sup>3</sup>/d and maximum instantaneous flow rate of 260 m<sup>3</sup>/hour have been used as the mean and maximum flows respectively.

The effluent data from 2014 provided by the operator is as follows:

Substance	Measurement Method	Operating Mode (if relevant)	Data Relating to Long Term Effects (EQS – Annual Averages)		Data Relating to Short Term Effects (EQS – Max Allowable Conc)		Annual Rate (kg/yr)	Benchmark Conc. (mg/l)
			Conc. (mg/l)	Measurement Method	Conc. (mg/l)	Measurement Method		
Mercury and its components	UKAS accredited method		<0.00001	Measured	<0.00001	Measured	0.0219	0.05
Antimony	UKAS accredited		<0.001	Measured	<0.001	Measured	2.19	-
Cadmium and its components	UKAS accredited method		<0.0001	Measured	<0.0001	Measured	0.219	0.2
Lead and its components	UKAS accredited method		<0.002 <sup>3</sup>	Measured	<0.002 <sup>3</sup>	Measured	4.38	0.5
Selenium	UKAS accredited method		<0.001	Measured	<0.001	Measured	2.19	-
Arsenic	UKAS accredited method		<0.001	Measured	<0.001	Measured	2.19	-

The operator has carried out a monitoring exercise from September 2019 to February 2020 to obtain current data in order to assess their compliance with the BAT-AELs. We have used this new data in the H1 screening for the following substances:

Substance	Mean µg/l	Maximum µg/l
Chromium	0.86	1.1
Copper	5.5	12
Nickel	1.2	1.3
Zinc	28	49

The River Ouse is tidal at Selby, so the riverine transitional and coastal (TraC) category has been selected in the H1 tool, with the appropriate screening tests carried out accordingly.



## Test 1

Substance	Annual Avg EQS			MAC EQS		
	Release µg/l	EQS	Release conc < 100% EQS	Release µg/l	EQS	Release conc < 100% EQS
e.g.			Test 1			Test 1
[W1] Arsenic (River Duse)	1	25	Pass	1		N/A
[W1] Cadmium and its compounds (≥ 200 mg/l CaCO3) (River Duse)	0.1	0.2	Pass	0.1	1.5	Pass
[W1] Chromium VI (95%ile) (dissolved) (River Duse)	0.86	0.6	Fail	1.1	32	Pass
[W1] Copper (River Duse)	5.5	3.6	Fail	12		N/A
[W1] Lead and it's compounds (River Duse)	2	1.3	Fail	2	14	Pass
[W1] Mercury and its compounds (River Duse)	0.01		N/A	0.01	0.07	Pass
[W1] Nickel and its compounds (River Duse)	1.2	8.6	Pass	1.3	34	Pass
[W1] Zinc (River Duse)	28	6.8	Fail	49		N/A

Arsenic, cadmium, mercury and nickel screen out, with concentrations of the pollutants in the discharge below the EQS.

## Test 2

Substance	Annual Avg EQS				MAC EQS			
	Annual Avg EQS	PC	% PC of EQS	PC < 4% of EQS?	MAC EQS	PC	% PC of MAC	PC < 4% of MAC?
				Test 2				Test 2
Cadmium and its compounds (≥ 200 mg/l CaCO3) (River Duse)	0.25	0.0018	0.71	Pass	1.5	0.0025	0.163	Pass
Chromium VI (95%ile) (dissolved) (River Duse)	0.6	0.0152	2.54	Pass	32	0.0279	0.0871	Pass
Copper (River Duse)	1	0.0975	9.75	Fail		0.3040	-	Pass
Lead and it's compounds (River Duse)	1.2	0.0355	2.96	Pass	14	0.0507	0.362	Pass
Mercury and its compounds (River Duse)		0.0002		Pass	0.07	0.0003	0.362	Pass
Nickel and its compounds (River Duse)	4	0.0213	0.53	Pass	34	0.0329	0.0969	Pass
Zinc (River Duse)	6.8	0.4965	7.30	Fail		1.2414	-	Pass

Lead and chromium have also screened out, with a process contribution (PC) of less than 4% of both the annual average (AA) and maximum allowable concentration (MAC) EQSs.

## Tests 3 and 4

Number	Substance	Bkgnd Conc.	Annual Avg EQS				MAC EQS					
			PC	PEC	(PEC - BC)/ EQS	% PEC >10% AA EQS	PEC >100% AA EQS	PC	PEC	% PEC of MAC	PEC >100% MAC	
e.g.												
						Test 3			Test 4a			Test 4b
7	Copper (River Duse)	0.5	0.0976	0.598	9.8%	Pass	59.8	Pass	0.305	0	-	Pass
8	Zinc (River Duse)	3.4	0.497	3.90	7.3%	Pass	57.4	Pass	1.25	0	-	Pass

All substances pass tests 3, 4a and 4b, with no significant deterioration of downstream water quality and the predicted environmental concentrations (PEC) are below the AA and MAC EQSs. (The background concentration has been set at 50% of the EQS, in line with our guidance.)

## Significant loads

Discharge Proportion:	Substance:	Annual Load:  Kg	Significant Load for Substance:  Kg	Part B Significant Load Test:
River Duse	Cadmium and its compounds (≥ 200 mg/l CaCO3)	0.15768	5	Pass
River Duse	Mercury and its compounds	0.015768	1	Pass

Cadmium and mercury are below the significant load thresholds, so do not require emission limit values under this test either.

## Conclusion

We have taken a precautionary approach with the inputs to the H1 screening tests. In particular, the upstream flow estimate from Tadcaster is likely to be a significant underestimate of the dilution available at Selby. Nonetheless, all substances screen out from further assessment and detailed modelling is not necessary. Hazardous pollutant emission limit values are not required for environmental protection of the River Ouse at Selby. See Annex 1 for details of the applicability of any BAT-AELs.

## 3 The legal framework

The consolidated variation notice will be issued under Regulations 18 and 20 of the EPR. The Environmental Permitting regime is a legal vehicle which delivers most of the relevant legal requirements for activities falling within its scope. In particular, the regulated facility is:

- an *installation* as described by the IED;
- subject to aspects of other relevant legislation which also have to be addressed.

We consider that in issuing the consolidated variation notice, it will ensure that the operation of the installation complies with all relevant legal requirements and that a high level of protection will be delivered for the environment and human health.

We explain how we have addressed specific statutory requirements more fully in the rest of this document.

We have set emission limit values (ELVs) in line with the BAT Conclusions, unless a tighter, i.e. more stringent, limit was previously imposed and these limits have been carried forward. For emissions to each relevant environmental receptor (i.e. air, or surface water), the emission limits and monitoring requirements have been incorporated into the consolidated variation notice via tables with notes in Schedule 3 – Emissions and Monitoring for

- a) the existing ELVs and monitoring requirements which are effective from the date of issue of the notice; and
- b) amended ELVs where a BAT-AEL is specified in the BAT conclusions, and any associated monitoring requirements which will take effect from 7<sup>th</sup> December 2021.

## **Annex 1: decision checklist regarding relevant BAT Conclusions**

BAT Conclusions for the Large Volume Organic Chemicals industry sector were published by the European Commission on 07 December 2017. There are 19 General BAT Conclusions and a further 71 BAT Conclusions in 10 subsector-specific sections. Where appropriate, we also considered other relevant BAT Conclusions published prior to this date but not previously included in a permit review for the Installation; 23 BAT Conclusions for Common Waste Water and Waste Gas Treatment/Management Systems in the Chemical Sector. This annex provides a record of decisions made in relation to each relevant BAT Conclusion applicable to the installation. This annex should be read in conjunction with the consolidated variation notice.

BAT Conclusion No	Summary of BAT Conclusion requirement for Production of Large Volume Organic Chemicals	Status NA/ CC / FC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement
	BAT Conclusions that are not applicable to this installation	<b>NA</b>	<p>LVOC BAT Conclusions 1, 3, 4, 5 and 6 are not applicable because no process furnaces/heaters are installed on site.</p> <p>LVOC BAT Conclusion 7 is not applicable because no SCR or SNCR for the abatement of NOx emissions are performed on site.</p> <p>LVOC BAT Conclusion 13 is not applicable because there is no thermal oxidiser on site.</p> <p>LVOC BAT Conclusion 15 is not applicable because no catalysts are used on site.</p> <p>LVOC BAT Conclusion 16 is not applicable because no organic solvents are used on site.</p> <p>LVOC BAT Conclusions 20 to 23 inclusive are not applicable as there is no production of lower olefins at this installation.</p> <p>LVOC BAT Conclusions 24 to 30 inclusive are not applicable as there is no production of aromatics at this installation.</p> <p>LVOC BAT Conclusions 31 to 44 inclusive are not applicable as there is no production of ethylbenzene and styrene monomer at this installation.</p> <p>LVOC BAT Conclusions 45 to 47 inclusive are not applicable as there is no production of formaldehyde at this installation.</p>

			<p>LVOC BAT Conclusions 48 to 55 inclusive are not applicable as there is no production of ethylene oxide and ethylene glycols at this installation.</p> <p>LVOC BAT Conclusions 56 to 60 inclusive are not applicable as there is no production of phenol at this installation.</p> <p>LVOC BAT Conclusions 61 to 63 inclusive are not applicable as there is no production of ethanolamine at this installation.</p> <p>LVOC BAT Conclusions 64 to 74 inclusive are not applicable as there is no production of toluene diisocyanate(TDI) and methylene diphenyl diisocyanate (MDI) at this installation.</p> <p>LVOC BAT Conclusions 76 to 85 inclusive are not applicable as there is no production of ethylene dichloride and vinyl chloride monomer at this installation.</p> <p>LVOC BAT Conclusions 86 to 90 inclusive are not applicable as there is no production of hydrogen peroxide at this installation.</p>
	BAT Conclusions where we accept the operator's Reg 61 notice response that they are currently compliant and no further explanation is required.	<b>CC</b>	See rows below.
	BAT Conclusions where improvements will be undertaken on site within the 4 year period in order to achieve compliance with the narrative and/or BAT-AEL prior to the 4 year deadline	<b>FC</b>	See rows below.
2	Monitor channelled emissions to air other than from process furnaces/heaters in accordance with the described standards and minimum frequencies	<b>CC</b>	The operator carries out monitoring of emissions to air as required by their Environmental Permit according to the BS EN 14792 for Oxides of Nitrogen, BS EN 15058 for carbon monoxide, BS EN 13284-1 for particulates and BS EN 12619 for VOC for all of the emission points

			<p>listed. They have provided monitoring data and reviewed their emissions inventory.</p> <p>The emissions to air of NO<sub>x</sub>, CO and dust are from activities related to the combustion plant (not a thermal oxidiser) and the processing of vegetable matter (S6.8 listed activities).</p> <p>We are satisfied that the emissions to air are either not associated with the LVOC process, the pollutants are not present or not at significant concentrations in the discharge (e.g. SO<sub>2</sub> from combustion of natural gas is minimal), or are sufficiently stable to maintain annual monitoring. In addition, the emissions of VOC from the wet scrubber (A21) are subject to an improvement condition under BAT 8 (Improvement Condition 13).</p> <p>As such, no changes to the existing monitoring requirements are necessary.</p>
8	Increase resource efficiency/reduce the pollutant load on final waste gas treatment by using one or a combination of the described techniques on process off-gas streams (8a/b take precedence over 9)	<b>FC</b>	<p>Waste gases from the fermentation tanks are processed by a wet scrubber and Sedamyl have provided VOC speciation. The site intends to achieve the 75 mg/m<sup>3</sup> benchmark for VOCs by improving the performance of the existing wet scrubber. Process changes and engineering modifications have not yet achieved this benchmark and trials involving hired equipment have been delayed by the Covid-19 pandemic.</p> <p>Improvement condition 13 is included in the permit to ensure the operator continues with their action plan and provides updates.</p>
9	Increase energy efficiency/reduce the pollutant load on final waste gas treatment by sending process off-gas streams of sufficient calorific value to a combustion unit	<b>NA</b>	<p>Off-biogas from the waste water treatment plant has insufficient calorific value and is too low in quantity to sustain a combustion unit. If the production of biogas from the waste water treatment plant increases, the evaluation of a small combustion unit will be undertaken.</p>

10	Reduce channelled emissions of organic compounds to air by using one or a combination of the described techniques.	<b>CC</b>	The site uses wet scrubbing as abatement on the main VOC outlet.
11	Reduce channelled dust emissions to air, by using one or a combination of the described techniques.	<b>CC</b>	The site uses fabric filters on all outlets on all powders.
12	Reduce emissions to air of sulphur dioxide and other acid gases (e.g. HCl), by using wet scrubbing.	<b>NA</b>	There are negligible concentrations of acid compounds present in the small biogas emission.
14	Reduce the waste water volume, the pollutant loads discharged to a suitable final treatment (typically biological treatment), and emissions to water, by using appropriate techniques based on the information provided by the inventory of waste water streams specified in the CWW BAT conclusions.	<b>CC</b>	<p>Operations limit product losses from cleaning, spillages etc. As these losses are treated within the waste water treatment plant (WWTP), the losses are benchmarked and targeted for action as kg COD/tonne wheat.</p> <p>Operations optimise the amount of water used and recycled throughout the process, water usage and water recycled are benchmarked against industry standards and within the group. Dry cleaning procedures are used wherever possible with the wet and dry processes separated as part of the design. CIP activities and wet washing are limited to the wet mill and the distillery area with all waste liquid streams physically collected, equalised and fed to the WWTP. It is considered that the segregated design of the installation minimises the amount of water required for cleaning purposes.</p>
17	Prevent, or where not practicable reduce, waste for disposal by using a combination of the described techniques.	<b>CC</b>	By-products are recovered from distillation.

18	Prevent or reduce emissions from equipment malfunctions, by using all the described techniques.	<b>CC</b>	The site has identified their critical equipment based on outputs from the EMS (ISO 14001). This undergoes calibration and periodic maintenance.
19	Prevent or reduce emissions to air and water occurring during other than normal operating conditions, by implementing measures commensurate with the relevance of potential pollutant releases for: i) Start up and shutdown operations ii) Other circumstances	<b>CC</b>	The system is covered by regular maintenance schedule, readiness of spare parts for emergency situations and repair, and ability for temporary storage of emissions.



BAT Conclusion No	Summary of BAT Conclusion requirement for Common Waste Water and Waste Gas Treatment/ Management Systems in the Chemical Sector	Status NA/ CC / FC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement
	BAT Conclusions that are not applicable to this installation	<b>NA</b>	See rows below.
	BAT Conclusions where we accept the operator's Reg 61 notice response that they are currently compliant and no further explanation is required.	<b>CC</b>	See rows below.
	BAT Conclusions where improvements will be undertaken on site within the 4 year period in order to achieve compliance with the narrative and/or BATAEL prior to the 4 year deadline	<b>FC</b>	See rows below.
1	To improve overall environmental performance implement and adhere to an EMS incorporating all the described features.	<b>CC</b>	Sedamyl operate an EMS certified to ISO:14001 that covers all of the points.

BAT Conclusion No	Summary of BAT Conclusion requirement for Common Waste Water and Waste Gas Treatment/ Management Systems in the Chemical Sector	Status NA/ CC / FC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement
2	To facilitate reduction of emissions to water and air and water usage, establish and maintain an inventory of waste water and waste gas streams as part of BAT1 EMS incorporating the described features.	<b>CC</b>	The site has complete data collection on production processes, waste water streams and the waste biogas stream.
3	For relevant emissions to water monitor key process parameters at key locations.	<b>CC</b>	Continuous monitoring takes place covering influent and effluent to/from the wastewater treatment plant, measuring pH, COD and TSS as a 24hr composite and temperature. Daily lab samples are collected and analysed. In addition, a flow meter allows continuous and cumulative totals, there is inline pH monitoring, a TOC analyser inline and also a temperature probe.
4	Monitor emissions to water in accordance with the described standards and minimum frequencies.	<b>CC</b>	Nitrogen, phosphorus, halogens and metals are not added during the process, so the installation does not generate any additional emissions above those existing within the water supply. The site does not routinely monitor for these substances, however a monitoring exercise completed in February 2020 has shown that the mass emissions of these substances do not exceed the BAT-AEL thresholds. There is significant headroom, and the BAT-AEL concentrations are not exceeded, so we

BAT Conclusion No	Summary of BAT Conclusion requirement for Common Waste Water and Waste Gas Treatment/ Management Systems in the Chemical Sector	Status NA/ CC / FC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement
			do not consider it necessary to set monitoring requirements for these substances. The permit already includes daily monitoring for COD and TSS, which will be maintained.
5	Periodically monitor diffuse VOC emissions to air from relevant sources using a combination (or for large amounts – all) of the described techniques.	<b>FC</b>	Sedamyl currently performs weekly boundary odour assessment which does not represent BAT for fugitive emissions control. Sedamyl commits to undertake periodic fugitive emission surveys to identified sources using one of the techniques mentioned in BAT5 in order to satisfy the requirement by the compliance date of 07/12/2021. Improvement condition 13 is included to address this.
6	Periodically monitor odour emissions from relevant sources using the described standards.	<b>CC</b>	Sedamyl carries out periodical sniff testing at the relevant receptors in order to monitor odour emissions. The monitoring plan is part of the EMS through its procedure “SED EWI-008 Internal odour and noise monitoring”. Records are kept with the usage of forms suggested by the M4 Odour Management.

BAT Conclusion No	Summary of BAT Conclusion requirement for Common Waste Water and Waste Gas Treatment/ Management Systems in the Chemical Sector	Status NA/ CC / FC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement
7	Reduce usage of water and the generation of waste water, by reducing the volume and/or pollutant load of waste water streams, enhancing the reuse of waste water within the production process and recovery and reuse of raw materials.	<b>CC</b>	Process water is recovered from a dedicated evaporator and recirculated to reduce waste water output.
8	Prevent the contamination of uncontaminated water reduce emissions to water, by segregating uncontaminated waste water streams from waste water streams that require treatment.	<b>CC</b>	There is separate collection of foul, process and surface waters.
9	Prevent uncontrolled emissions to water by providing an appropriate buffer storage capacity for waste water incurred during other than normal operating conditions based on a risk assessment, and taking appropriate further measures.	<b>CC</b>	There is an emergency collection buffer tank on site.

BAT Conclusion No	Summary of BAT Conclusion requirement for Common Waste Water and Waste Gas Treatment/ Management Systems in the Chemical Sector	Status NA/ CC / FC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement
10	Reduce emissions to water, by using an integrated waste water management and treatment strategy that includes an appropriate combination of the described techniques (in the priority order given).	<b>CC</b>	The amount of water is optimised and recycled throughout the process. CIP and wet washing will be limited to the wet mill and the distillery area. All waste liquid streams are collected, equalised and fed to the wastewater treatment plant.
11	Reduce emissions to water, by pre-treating waste water that contains pollutants that cannot be dealt with adequately during final waste water treatment using appropriate techniques as part of an integrated waste water management and treatment strategy.	<b>NA</b>	Sufficient treatment is provided by the final waste water treatment.
12	Reduce emissions to water, by using an appropriate combination of the described final waste water treatment techniques.	<b>CC</b>	The following treatment techniques are used: equalisation, neutralisation, physical separation, activated sludge and filtration. Emissions to water are monitored for TSS, COD, BOD and hydrocarbon oil index.

BAT Conclusion No	Summary of BAT Conclusion requirement for Common Waste Water and Waste Gas Treatment/ Management Systems in the Chemical Sector	Status NA/ CC / FC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement
	<p><b>BAT-AELs</b></p> <p>Table 1 – Total organic carbon (TOC), chemical oxygen demand (COD), total suspended solids (TSS)</p> <p>Table 2 – nutrients</p> <p>Table 3 – Adsorbable organically bound halogens (AOX) and metals</p>	<b>CC</b>	<p>The operator has provided monitoring data to demonstrate compliance with the BAT-AELs for COD (34 mg/l) and TSS(12 mg/l) .</p> <p>The permit has existing limits on TSS (maximum 60 mg/l, 95 percentile 30 mg/l), which are tighter than the BAT-AEL, so will be maintained. The BAT-AEL for COD will be added to the permit.</p> <p>The applicant has provided data and calculations to demonstrate that they do not exceed the threshold annual masses for the nutrients, AOX or metals BAT-AELs. As such, these are not applicable to the discharge, so will not be included in the permit. (See key issues for data.)</p>
13	Prevent or, where this is not practicable, reduce the quantity of waste being sent for disposal by setting up and implementing a waste management plan as part of the environmental management system (see BAT 1) that, in order of priority, ensures that waste is prevented, prepared for reuse, recycled or otherwise recovered.	<b>CC</b>	There is a waste management system in place in accordance with the EMS.

BAT Conclusion No	Summary of BAT Conclusion requirement for Common Waste Water and Waste Gas Treatment/ Management Systems in the Chemical Sector	Status NA/ CC / FC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement
14	Reduce the volume of waste water sludge requiring further treatment or disposal, and reduce its potential environmental impact, by using one or a combination of the described techniques.	<b>CC</b>	Re-use of process water is maximised and product losses and water use are limited in order to minimise the volume of waste water sludge for treatment/disposal. Stabilisation techniques are used (aerobic and anaerobic digestion). Sedimentation is used to reduce the volume of filter cake in the AD facility.
15	Facilitate the recovery of compounds and the reduction of emissions to air, by enclosing the emission sources and treating the emissions, where possible.	<b>CC</b>	The waste gas sources are fully enclosed. The biogas from the Waste Water Treatment Plant is then flared. Fermentation waste gases are collected from the anaerobic reaction, so the system is fully enclosed, and gases are sent to treatment.
16	Reduce emissions to air, by using an integrated waste gas management and treatment strategy that includes process-integrated and waste gas treatment techniques.	<b>CC</b>	Waste gas is burnt with a flare system because it is currently not efficient to feed it back into the combustion systems, due to the low volume of gas created, its location within the facility and the processing energy required to make it suitable for the turbines. Waste gases from fermentation tanks are treated by wet scrubbing and there is periodical monitoring of the emission.

BAT Conclusion No	Summary of BAT Conclusion requirement for Common Waste Water and Waste Gas Treatment/ Management Systems in the Chemical Sector	Status NA/ CC / FC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement
17	Prevent emissions to air from flares, by using flaring only for safety reasons or non-routine operational conditions (e.g. start-ups, shutdowns) using one or both of the described techniques.	<b>CC</b>	Flaring at this site is a routine operation rather than one associated with 'other than normal operating conditions'. The operator collects biogas from the waste water treatment plant (in compliance with BAT 15) and it is routinely flared because it is not of sufficient calorific value or volume to enable it to be used in a gas engine. Flaring is accepted as a routine part of the site operations and the operator is required to report annually on their hours of operation of the flare. The operator has committed to assess the installation of an engine or gas-fired boiler if gas production increases to a level where it may represent an efficient option. Improvement Condition 14 is included in the permit to address this.
18	Reduce emissions to air from flares when flaring is unavoidable, by using one or both of the described techniques.	<b>CC</b>	The operator undertakes monitoring and recording of flows, quantities and flare events.
19	Prevent or, where that is not practicable, reduce diffuse VOC emissions to air, by	<b>CC</b>	The number of potential emission sources is limited. Maintenance schedules and enclosed systems are designed to maximise the containment of potential diffuse VOC emissions.



BAT Conclusion No	Summary of BAT Conclusion requirement for Common Waste Water and Waste Gas Treatment/ Management Systems in the Chemical Sector	Status NA/ CC / FC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement
	using a combination of the described techniques.		Waste gas streams are collected and treated.
20	Prevent or, where that is not practicable, reduce odour emissions, by setting up, implementing and regularly reviewing an odour management plan, as part of the environmental management system (see BAT 1), that includes all of the described elements:	<b>CC</b>	Odour prevention, monitoring and response is managed within the EMS and a system is in place to follow up and track any agreed action plans.
21	Prevent or, where that is not practicable, reduce odour emissions from waste water collection and treatment and from sludge treatment, by using one or a combination of the described techniques.	<b>CC</b>	Residence times are kept under control. The system is fully enclosed.
22	Prevent or, where that is not practicable, reduce noise emissions, by setting up and implementing a noise management plan,	<b>CC</b>	Noise prevention, monitoring and response is managed within the EMS and a system is in place to follow up and track any agreed action plans.

BAT Conclusion No	Summary of BAT Conclusion requirement for Common Waste Water and Waste Gas Treatment/ Management Systems in the Chemical Sector	Status NA/ CC / FC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement
	as part of the environmental management system (see BAT 1), that includes all of the described elements:		
23	Prevent or, where that is not practicable, reduce noise emissions, by using one or a combination of the described techniques.	<b>CC</b>	At project phase, the layout of the plant takes into consideration noise issues. Periodic maintenance is in place. Low noise motors are preferred. Noise screens or attenuation enclosures are installed on critical equipment. The site is surrounded by embankments on the SE boundary.

### **Key Issues**

The operator has used their theoretical maximum annual discharge and concentration results from a monitoring exercise completed in February 2020 to assess whether they exceed the annual mass emission thresholds for nutrients, metals and AOX. We are satisfied that none of the BAT-AELs in the following table are applicable because the annual mass emission thresholds are not exceeded.

	Total Nitrogen		Phosphorus	Chromium	Copper	Nickel	Zinc	Adsorbable organically bound halogens
	Inorganic	Total	P	Cr	Cu	Ni	Zn	AOH
BAT-AEL applies if emission exceeds	2.0 t/yr	2.5 t/yr	300 kg/yr	2.5 kg/yr	5.0 kg/yr	5.0 kg/yr	30 kg/yr	100 kg/yr
Volume when at theoretical max discharge allowance 4320 (m3/day) 1,543,950 (m3)	0.002315925 tonnes	0.00245874 tonnes	0.925 kg	0.001 kg	0.009 kg	0.002 kg	0.044 kg	0.067 kg

The permit has existing limits on TSS (maximum 60 mg/l, 95 percentile 30 mg/l), which are tighter than the BAT-AEL, so will be maintained.

The BAT-AEL for COD will be added to the permit.

### **Large Combustion Plant (LCP)**

The operator has submitted a review of their operations against the BAT conclusions for LCP. The combustion changes under application EPR/KP3030TZ/V007 led to the introduction of a new Section 1.1 Part A (1) (a) scheduled activity, as the aggregated total of the combustion facilities is 77.9 MW after the variation changes. An assessment has been carried out of the maximum aggregated thermal input capacity for each common stack (windshield). It is concluded that the installation combustion facilities do not fall within the requirements of Industrial Emissions Directive Chapter III compliance (Large Combustion Plant Directive).

## Annex 2: Improvement Conditions

Based on the information in the Operator's Regulation 61 Notice response and our own records of the capability and performance of the installation at this site, we consider that we need to set improvement conditions so that the outcome of the techniques detailed in the BAT Conclusions are achieved by the installation. These improvement conditions are set out below - justifications for them is provided at the relevant section of the decision document (Annex 1).

If the consolidated permit contains existing improvement conditions that are not yet complete or the opportunity has been taken to delete completed improvement conditions then the numbering in the table below will not be consecutive as these are only the improvement conditions arising from this permit variation.

Table S1.3 Improvement programme requirements		
Reference	Requirement	Date
13	<p>The operator shall submit, for approval by the Environment Agency, a report setting out progress to achieving the 'Narrative' BAT where BAT is currently not achieved, but will be achieved before 07/12/2021. The report shall include, but not be limited to, the following:</p> <ul style="list-style-type: none"> <li>• Methodology for achieving BAT</li> <li>• Associated targets / timelines for reaching compliance by 07/12/2021</li> <li>• Any alterations to the initial plan (in progress reports).</li> </ul> <p>The report shall address the following BAT Conclusion:</p> <ul style="list-style-type: none"> <li>• Production of Large Volume Organic Chemicals <b>BAT 8</b> (pollutant load on final waste gas treatment)</li> <li>• Common waste water and waste gas treatment/management systems in the chemical sector <b>BAT 5</b> (periodic monitoring of diffuse VOC emissions to air).</li> </ul> <p>Refer to BAT Conclusions for a full description of the BAT requirement.</p>	<p>Progress reports by:</p> <p>30/04/2021</p> <p>31/08/2021</p>
14	<p>The operator shall submit, for approval by the Environment Agency, a report on their management of flaring to minimise emissions to air. This shall include, but not be limited to, the following:</p> <ul style="list-style-type: none"> <li>• Monitoring data of the biogas and flaring events.</li> <li>• Number of hours of operation of the flare.</li> <li>• Any actions taken in the previous 12 months to minimise the impact of flaring.</li> </ul>	<p>31/01/2022 and annually thereafter</p>

<b>Table S1.3 Improvement programme requirements</b>		
<b>Reference</b>	<b>Requirement</b>	<b>Date</b>
	<ul style="list-style-type: none"> <li>• An assessment of the feasibility of installing a flare gas recovery system to minimise baseline flaring, or any other possible improvements.</li> <li>• A timetable for implementation of any improvements planned.</li> <li>• Progress against any improvement proposals identified in previous reports.</li> </ul>	

### **Annex 3: Review and assessment of changes that are not part of the BAT Conclusions derived permit review.**

The operator informed us that Sedalcol UK Limited changed its legal name with companies house to Sedamyl UK Limited as from 15th October 2019. The permit variation reflects this administrative update. The company registration number remains 07023586.

The permit variation also includes the details of a minor operational change that was agreed to allow the production of a small amount of ethanol based hand sanitiser following WHO formulation 1. This will involve using ethanol produced on site and existing vessels within bunded areas.