

## Permitting Decisions - Variation

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We have decided to grant the variation for Stoke Bardolph Sewage Treatment Works operated by Severn Trent Water Limited.

The variation number is [EPR/ZP3898EL/V004](#).

The variation is for the recovery and disposal of non-hazardous waste with a capacity exceeding 100 tonnes per day involving biological treatment (Section 5.4 Part A (1)(b)(i)). This permit variation is for the Installation of a thermal hydrolysis plant (THP) and associated equipment for the pre-treatment of indigenous and imported sewage sludge prior to digestion within the existing anaerobic digesters. This permit variation is also for the installation of a new biogas upgrade plant, two biogas fuelled boilers, an odour control unit (OCU), an auxiliary flare and the refurbishment and relocation of a CHP engine.

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

### Purpose of this document

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

- highlights [key issues](#) in the determination
- summarises the decision making process in the [decision considerations](#) section to show how the main relevant factors have been taken into account
- shows how we have considered the [consultation responses](#)

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

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

# Key issues of the decision

## 1. The Process

The anaerobic digestion (AD) plant is co-located at Stoke Bardolph Sewage Treatment Works (STW), where the operator also carries out treatment of effluent received via the sewerage network under the Urban Waste Water Treatment Directive (UWWTD). Sludge from the STW is also treated in the AD plant. The anaerobic digestion of indigenous (from Stoke Bardolph STW) UWWTD-derived sludge is regulated by different legislation and does not form part of this permit. This permit only relates to the treatment of imported tankered waste including UWWTD derived sludge from other STW, whether owned by the operator or from third party plants.

The addition of a thermal hydrolysis plant (THP) will allow the site to pre-treat indigenous and imported sewage sludge prior to anaerobic digestion through the application of heat and pressure.

Liquid/sludge waste is discharged into a mixing/holding tank. Waste is transferred to one of four primary digesters (21,600 m<sup>3</sup> total capacity) where it undergoes anaerobic treatment for 10 to 12 days. The biogas produced is captured and transferred to a gas storage tank (floating roof).

Biogas is combusted in two existing 2.7 MWth CHP engines that run on biogas only. The heat and power produced is either used on site or is exported to the grid. A third 2.7 MWth CHP engine (refurbished as new) that runs on natural gas will be diverted to the heat exchangers within the THP. Two new 4.4 MWth dual fuel boilers will be installed with one providing steam to the THP and the other acting as a backup. Two existing 2.7 MWth auxiliary diesel boilers provide heat and power for the wider site operations.

Following the biological treatment of waste in the primary digesters, the resultant output (digestate) is stored in four secondary digester tanks before being mixed with a polymer coagulant and dewatered by centrifuge. The supernatant liquor is directed back to the head of the STW for aerobic treatment. The sludge cake is transferred to a cake pad where it is conditioned to achieve pathogen kill.

The addition of a biogas upgrade plant will process biogas produced within the anaerobic digestion process for injection into the National Gas Grid. Prior to injection into the grid, trace contaminants principally VOCs and H<sub>2</sub>S will be removed and the biogas will be separated into biomethane and CO<sub>2</sub> with the calorific value (CV) of the biomethane is adjusted.

The permit also includes 2 waste operations, the import of digested sludge for dewatering and the import of waste into the STW for treatment via the UWWTD route. This permit only covers the import of the waste not the subsequent treatment.

## **2. BAT Conclusions for the Waste Treatment industry sector**

We have reviewed the variation application against the revised BAT Conclusions for the Waste Treatment industry sector which were published by the European Commission on 10 August 2018. The decisions have been made with reference to establishing best available techniques (BAT) conclusions (BATc) for Waste Treatment. There are 53 conclusions included in the BAT Conclusions document but not all of them are applicable to the installation.

We consider that the operator is in compliance with the techniques and standards described in the BAT Conclusions.

### **Improvement Condition (IC16 and IC17) – biogas upgrading plant**

The applicant submitted an H1 assessment to consider the impact of air emissions from the biogas upgrading plant. The emissions of hydrogen sulphide and volatile organic compounds (VOCs) were screened out as insignificant, in that process contributions were <1% of the long term Environmental Standard (ES) and <10% of the short term ES. We conclude that emissions of hydrogen sulphide and VOCs are unlikely to have a significant impact on human health.

The emissions data (H<sub>2</sub>S and VOCs) from the biogas upgrading plant were obtained from the manufacturer and not based on real-time operational monitoring data. We consider it appropriate to set an Improvement Condition (IC16) which requires the operator to undertake a monitoring survey following the commencement of operations at the biogas upgrading plant to obtain actual (real-time) operational monitoring data.

Improvement Condition 2 (IC17) requires the operator to undertake an air emissions impact assessment (H1 software tool) using the results of the monitoring survey and compare the long and short term impacts of pollutants in accordance with the Environment Agency Guidance – Air emissions risk assessment for your environmental permit. Following the review of results from the monitoring survey and impact assessment, the Environment Agency shall consider whether or not emission limits are appropriate at emission point A14. We have used this approach for biowaste treatment facilities proposing to install biogas upgrading plants across England.

**Improvement Condition (IC18) – a review of the effectiveness of abatement plant**

*The operator provided information to support compliance with BATc 34. Biofilter and scrubbers are installed at the facility. As part of the Environment Agency approach to reduce emissions in the biowaste treatment sector, we have included the following improvement condition. Improvement condition 18 requires the operator to review abatement plant on site, in order to determine whether existing measures have been effective and adequate to prevent and /or minimise emissions released to air. Where further improvements are identified, the operator is required to implement these measures.*

**Improvement Condition (IC19) – secondary containment**

During the determination, we asked the operator to provide evidence that the site secondary containment has been designed and constructed in accordance with the “Containment systems for the prevention of pollution (C736)” report or a relevant industry standard and signed off by a qualified engineer. Where the secondary containment does not meet the standards as set out in the CIRIA 736 standard, we asked the operator to provide a detailed justification (supported) by evidence as to how the site secondary containment design and construction is fit for purpose and achieves equivalent protection compared to CIRIA 736.

The operator states that a report has been issued to the Environment Agency at a local level in relation to containment for the anaerobic digestion assets on site. Upon receipt of a response to that report, a similar document will be prepared for the Thermal Hydrolysis Plant (THP) operational area.

We have set improvement condition 19 in the permit to address the deficiencies in the existing site secondary containment.

**Improvement condition (IC20) – assessment of methane slip**

We have removed the need to monitor emissions of volatile organic compounds (VOCs) temporarily. We have included improvement condition 20 in the permit which requires the operator to assess methane slip resulting from the combustion of biogas via the CHP engines. Following an assessment of the data, the Environment Agency shall consider whether or not emission limits for volatile organic compounds are applicable for this installation.

## **Improvement conditions 21 and 22 – risk assessment to prevent soil & groundwater pollution**

The Industrial Emissions Directive (IED) requires that the operator of any IED installation using, producing or releasing “relevant hazardous substances” (RHS) shall, having regarded the possibility that they might cause pollution of soil and groundwater, submit a “baseline report” with its permit application. The baseline report is an important reference document in the assessment of contamination that might arise during the operational lifetime of the regulated facility and at cessation of activities. It must enable a quantified comparison to be made between the baseline and the state of the site at surrender.

At the definitive cessation of activities, the operator has to satisfy us that the necessary measures have been taken so that the site ceases to pose a risk to soil or groundwater, taking into account both the baseline conditions and the site’s current or approved future use. To do this, the operator has to submit a surrender application to us, which we will not grant unless and until we are satisfied that these requirements have been met.

The operator did not submit a site condition report (SCR) during the original application received on 19/09/2014 as the Environment Agency had agreed that a site condition report would not be sought for newly prescribed activities (NPA). However the operator stated in the NPA application that “a SCR will be prepared around the first permit review after 7 July 2015, and following the issue of the BAT Reference (BREF) Document and conclusions expected in 2016/17”. No SCR has been submitted to the Environment Agency to date.

As part of the biowaste treatment permit review for existing sites, we have asked operators to provide evidence of a SCR. Where this has not been provided and or we are not satisfied with the submission, we have inserted improvement conditions requiring operators to submit a SCR at a future date.

Consequently, we have included Improvement conditions 21 and 22 which requires the operator to submit a risk assessment and an updated site condition report which includes baseline soil and groundwater data.

### **3. Emissions to Air**

We carried out an audit of the air quality impacts associated with the proposed variation to this site. We agree with the operator’s conclusions and results presented in their air dispersion modelling report that it is unlikely to be any exceedances of the environmental standards (ES) as a result of the site operations.

- The long-term PCs at human receptors equates is greater than 1% of the EQS, however the PEC is less than 70% of the long-term air quality objective so are insignificant.
- The short-term PCs at human receptors are less than 10% of the relevant short-term EQS so are insignificant.
- The annual mean PCs are less than 100% of the relevant long-term environmental standard for local wildlife sites and so are insignificant.
- Short-term mean concentrations (i.e. the 24-hour mean critical level for NO<sub>x</sub>), the respective PCs are less than 100% of the short-term environmental standard for local wildlife sites and so are insignificant.

## **Decision considerations**

### **Confidential information**

A claim for commercial or industrial confidentiality has not been made.

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

### **Identifying confidential information**

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

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

### **Consultation**

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

We consulted the following organisations:

Local Authority Planning Department Nottingham City Council (LPA)

Local Authority Environmental Health Nottingham City (LAEH)

Fire and Rescue Service (FRS)

Director of Public Health England (PHE)

National Grid

No responses were received

The application was publicised on the GOV.UK website.

## **The regulated facility**

We considered the extent and nature of the facility at the site in accordance with RGN2 'Understanding the meaning of regulated facility', Appendix 2 of RGN2 'Defining the scope of the installation', Appendix 1 of RGN 2 'Interpretation of Schedule 1', [guidance on waste recovery plans and permits].

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

## **The site**

The operator has provided a plan which we consider to be satisfactory.

These show the extent of the site of the facility.

The plan is included in the permit.

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

We have checked the location of the application to assess if it is within the screening distances we consider relevant for impacts on nature conservation, landscape, heritage and protected species and habitat designations. The application is not within our screening distances for these designations.

## **Environmental risk**

We have reviewed the operator's assessment of the environmental risk from the facility.

The operator's risk assessment is satisfactory.

## **Operating techniques**

We have reviewed the techniques proposed by the operator and compared these with the relevant technical guidance and we consider them to represent appropriate techniques for the facility.

The operating techniques that the applicant must use are specified in table S1.2 in the environmental permit.

## Odour management

We have reviewed the odour management plan in accordance with our guidance on odour management.

We consider that the odour management plan is satisfactory and we approve this plan.

We have approved the odour management plan as we consider it to be appropriate measures based on information available to us at the current time. The applicant should not take our approval of this plan to mean that the measures in the plan are considered to cover every circumstance throughout the life of the permit.

The applicant should keep the plans under constant review and revise them annually or if necessary sooner if there have been complaints arising from operations on site or if circumstances change. This is in accordance with our guidance 'Control and monitor emissions for your environmental permit'.

## Improvement programme

Based on the information on the application, we consider that we need to include an improvement programme (See key issues section).

## Emission limits

Emission Limit Values (ELVs) based on BAT have been specified for the following substances:

### **CHP engines** (existing and new MCP)

- Oxides of nitrogen
- Sulphur dioxide
- Carbon monoxide
- Total VOCs

### **Boilers** (existing MCP)

- Oxides of nitrogen
- Sulphur dioxide

### **Auxiliary flare** (New)

- Oxides of nitrogen
- Sulphur dioxide
- Total VOCs

Refer to Table S3.1 of Schedule 3 of the permit.



## **Monitoring**

We have decided that monitoring should be carried out for the parameters listed in the permit, using the methods detailed and to the frequencies specified. These monitoring requirements have been imposed in order to demonstrate compliance with the conditions of the permit requiring the management of emissions to air.

We made these decisions in accordance with the Waste Treatment BREF and BAT Conclusions and our guidance on Medium Combustion Plant and LFTGN 05: Guidance for monitoring enclosed landfill gas flares.

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

## **Reporting**

We have specified reporting in the permit under table S4.1. We have specified reporting in the permit.

Reporting will be required annually in line with the annual emissions monitoring, ensuring the operator is complying with the limits in their permit. We made these decisions in accordance with the Draft Technical Guidance for Anaerobic Digestion (Reference LIT 8737, November 2013).

## **Management system**

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

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

## **Technical competence**

Technical competence is required for activities permitted.

The operator is a member of an agreed scheme

We are satisfied that the operator is technically competent

## **Financial competence**

There is no known reason to consider that the operator will not be financially able to comply with the permit conditions.

## **Growth duty**

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

Paragraph 1.3 of the guidance says:

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

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

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