Permitting Decisions- Bespoke Permit

We have decided to grant the permit for Three Maids AD Plant operated by Acorn Bioenergy Operations Limited.

The permit number is EPR/BP3326SD.

The permit was granted on 01/08/2025.

The application is for an installation activity - recovery or a mix of recovery and disposal of non-hazardous waste with a capacity exceeding 100 tonnes per day involving biological treatment of waste. This falls under Schedule 1, Part 2, Section 5.4 A1 (b)(i) of the Environmental Permitting Regulations 2016. In addition to the main installation activity, the site is also permitted to undertake the following Directly Associated Activities (DAAs): storage of waste pending recovery or disposal, physical treatment for the purpose of recycling, steam and electrical power supply, emergency flare operation, gas upgrading, raw material storage, gas storage, digestate storage, carbon dioxide (CO_2) capture and storage, surface water collection and storage and odour abatement.

The AD plant is designed to treat up to 94,000 tonnes per year feedstocks, consisting of energy crops (primarily maize and whole-crop silage), straw, animal manures and non-hazardous liquid wastes.

There are 2 Combined Heat and Power (CHPs) plants at the site, with an aggregated thermal input of 5.69 MWth; one will be used to burn biogas and the other natural gas to produce heat and electricity. Heat from the CHPs is used to maintain the temperature of the digesters and to provide heat to the pasteurisers. There is also a dual fuel emergency boiler (0.66MWt) which can burn biogas or biomethane (or natural gas) to provide heat for the AD process, if one or more of the CHPs is non-operation.

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:

- summarises the decision making process in the decision considerations section to show how the main relevant factors have been taken into account

- highlights key issues in the determination
- 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.

Key issues of the decision

Air Quality Impact Assessment

- The biogas CHP 1 engine (emission point A1) and natural gas CHP 2 engine (emission point A2) are proposed to operate 8,760 and 7,500 hours per year, respectively. The emergency dual-fuel boiler (emission point A4) and emergency flare (emission point A3) operate less than 15% (1,314 hours) and 10% (876 hours) of the year, respectively, during maintenance and/or emergency. The emergency diesel generator (A5) did not form part of their assessment as it is to operate less than 50 hours in a year.
- For long-term impacts, the applicant assumed continuous operation of the CHP engines associated with A1 and A2, and 15% and 10% operation of A4 and A3 in a year. For short-term impacts, they conservatively assumed that all combustion sources will operate every hour of the year to capture worst case meteorological conditions.
- The applicant considered the impacts of oxides of nitrogen (NO_X), carbon monoxide (CO), sulphur dioxide (SO_2), total volatile organic compounds (TVOC as benzene) and ammonia (NH_3).
- They provided source parameters based on the manufacturer's specifications in Appendix E to G of their report, calculated emission rates based on the Medium Combustion Plant Directive (MCPD) emission limit values (ELVs) for CHP units and the emergency boiler, and the guidance for monitoring enclosed landfill gas flares for the emergency flare.
- The applicant assessed NH_3 emissions from other point sources - Odour Abatement Plant stack (A6), Leachate tank vent (A13), digestate storage lagoon vent (A19), liquid feedstock tank vent (A20), and liquid digestate offtake vent (A21).
- They derived and modelled NH_3 emissions from A6 based on a constant emission concentration of 20 mg/m^3 from the manufacturer specifications which represents the upper range of the BAT AEL (0.3 - 20 mg/Nm^3) at standard conditions.
- They assumed that emissions are continuously emitted at this constant rate over a year. They also stated that the Emissions Abatement Plant is

expected to achieve 95% reduction to release through A6 at approximately 3.5 mg/m^3.

- The main contributor of NH_3 emissions is the A6 stack (approximately 90% of the total ammonia emissions).
- Emission points A13, A19, A20, A21 are tank vents. There is a degree of uncertainty associated with these sources and their characterisation for modelling purposes. The control of the fugitive NH_3 emission sources is within the scope of the odour management plan.
- For all pollutants, the applicant predicted no exceedances any of the relevant Environmental Standards (ES) at the discrete human health receptor locations as well as no exceedances of the critical levels and nutrient nitrogen and acid deposition critical loads at any ecological site locations.

EA conclusions and actions

We have undertaken check modelling and sensitivity analysis using the observed meteorological data at Middle Wallop and Boscombe Down meteorological sites, and Numerical Weather Prediction (NWP) data extracted at the application site location. We agree that the contributions from the site are not likely to exceed any of the ES at any location of exposure for human health assessment.

We have included the relevant BAT AELs and monitoring requirement as well as Improvement Condition in the permit to ensure that the modelling outcome is verified and kept under review.

Habitat Impact Assessment

The applicant modelled air emissions which included ammonia and nutrient deposition. This modelling was conducted for the River Itchen SAC. Although the SSSI is outside of the screening distance of 2km from the proposed activities, it was identified during the Habitat Risk Assessment of the River Itchen SAC that there may be features within the SSSI site that may be sensitive to ammonia and nitrogen deposition at or near some of the receptors.

As part of the Air Quality Impact Assessment (AQIA), the applicant used modelled meteorological data to estimate process contributions rather than observed data. The outputs of the checks that was conducted for both a worst-case scenario and a more realistic operating scenario suggest determined there was the potential for impact on the River Itchen SSSI from ammonia and nutrient deposition.

The critical level (CLe) and critical load (CLo) for deciduous woodlands were used for the checks, with the conservative assumption that lichens and bryophytes were present and so the lower CLe for ammonia was used. The lower CLo of 10kg/N/ha/yr was used for nutrient deposition, again as a conservative measure.

The results do not apply to all features of the SSSI; only those associated with, or that may indirectly depend upon woodland habitats were scoped into this assessment.

For nutrient deposition, the process contributions (PC) are insignificant against a CLo of 15kg/N/ha/yr and 10kg/N/ha/yr (realistic scenario). For ammonia, the worst case scenario check showed a PC greater than 1% of the CLe and then a predicted environmental concentration (PEC) greater than the CLe. The check using realistic operating conditions showed the PC to be <1% of the CLe and therefore insignificant.

EA conclusions and actions

We agree that the contributions from the site are not likely to exceed any of the relevant critical levels and loads at River Itchen Special Areas of Conservation (SAC) and any local nature sites. o For River Itchen SAC at location of maximum PC (presented as E10a in their report), we applied the NH_3 critical level of 3µg/m^3 and no nutrient nitrogen deposition critical load because there are no habitats present that are sensitive to air emission

In addition to the above and to ensure that no damage occurs to the SSSI, an Improvement Condition, IC5 has been included in the permit which requires the applicant to adhere to the parameters dictated by AQIA checks, including monitoring of the emissions. The wording of the IC is included below:

The operator shall carry out a review of the abatement plant on site, in order to determine whether the measures have been effective and adequate to prevent and where not possible minimise emissions released to air from the and the abatement stacks/vents (A6, A19, A20, A21), including but not limited to, hydrogen sulphide, odour and ammonia.

The operator shall submit a written report to the Environment Agency following this review for assessment and approval.

The report shall include but not limited to the following aspects:

- Full investigation and characterisation of the waste gas streams.
- Abatement stack monitoring results (not limited to odour and ammonia)
- Abatement process monitoring results (not limited to odour and ammonia)
- an assessment report on the impact of the emissions on the habitat and SSSI sites
- Details of air quality quantitative impact assessment including modelling and a proposal for site-specific “action levels” (not limited to odour concentration, hydrogen sulphide and ammonia). If the modelling shows potential long or short-term impacts from the emissions is having significant/adverse impact on any of the receptors (including habitat and SSSI sites), the operator shall submit improvement plan to reduce the

impacts of the substances identified to the Environment Agency for approval.

- Odour monitoring results at the site boundary
- Records of odour complaints and odour related incidents
- Recommendations for improvement including the replacement or upgrading the abatement plant
- Timescales for implementation of improvements to the abatement plant.

The operator shall implement the improvements in line with the timescales as approved by the Environment Agency.

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.

The application was publicised on the GOV.UK website.

We consulted the following organisations:

- Local Authority – Environmental Protection Department
- Local Authority – Planning
- Director of PH/UKHSA
- Health and Safety Executive
- Food Standards Agency

The comments and our responses are summarised in the consultation responses section.

Operator

We are satisfied that the applicant (now the operator) is the person who will have control over the operation of the facility after the grant of the permit. The decision was taken in accordance with our guidance on legal operator for environmental permits.

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’, and Appendix 1 of RGN 2 ‘Interpretation of Schedule 1’.

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 plans which we consider to be satisfactory.

These show the extent of the site of the facility.

The plan is included in the permit.

Site condition report

The operator has provided a description of the condition of the site, which we consider is satisfactory. The decision was taken in accordance with our guidance on site condition reports and baseline reporting under the Industrial Emissions Directive.

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 within our screening distances for these designations.

We have assessed the application and its potential to affect sites of nature conservation, landscape, heritage and protected species and habitat designations identified in the nature conservation screening report as part of the permitting process.

We consider that the application will not affect any site of nature conservation, landscape and heritage, and/or protected species or habitats identified. See Key Issues Section above for detail.

We have not consulted Natural England.

The decision was taken in accordance with our guidance.

Environmental risk

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

The operator's risk assessment is satisfactory.

General operating techniques

We have reviewed the techniques used by the operator and compared these with the relevant guidance notes 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.

Operating techniques for emissions that screen out as insignificant

Emissions of NO_X, CO, SO_2, TVOC (as benzene) and NH_3 have been screened out as insignificant, and so we agree that the applicant's proposed techniques are Best Available Techniques (BAT) for the installation.

We consider that the emission limits included in the installation permit reflect the BAT for the sector.

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'.

Noise and vibration management

We have reviewed the noise and vibration management plan (NMP) in accordance with our guidance on noise assessment and control. A NMP was not required to be submitted or reviewed as part of the application, as the site screened out as being likely low risk for noise.

We have not approved the NMP as it was not required for the site, and has not been developed based upon a reviewed BS4142 noise impact assessment. We have included the NMP in Table S1.2 of the permit, as a general operating technique.

We consider it to be appropriate measures based on information available to us at the current time.

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'.

Raw materials

We have specified limits and controls on the use of raw materials and fuels. We have included limits and controls for the following:

- Vegetable matter (energy crops) - substantially free of non-vegetable matter.
- Maize silage - substantially free of non-vegetable matter.

Waste types

We have specified the permitted waste types, descriptions and quantities, which can be accepted at the regulated facility.

We are satisfied that the operator can accept these wastes for the following reasons:

- they are suitable for the proposed activities
- the proposed infrastructure is appropriate; and
- the environmental risk assessment is acceptable.

We made these decisions with respect to waste types in accordance with WM3 – guidance on waste classification.

Pre-operational conditions

Based on the information in the application, we consider that we need to include pre-operational conditions PO1 – PO4 in the permit.

The pre-operational conditions and the reasons for including them are detailed in Table S1.4 of the permit.

Improvement programme

Based on the information on the application, we consider that we need to include an improvement programme.

We have included an improvement programme (IC1 – IC3) to ensure that the application proposals and assumptions in the risk assessment are reviewed and verified.

Emission Limits

We have decided that emission limits are not required in the permit.

Emission Limit Values (ELVs) and/or equivalent parameters or technical measures based on Best Available Techniques (BAT) have been added for the following substances:

- Oxides of Nitrogen (NO and NO_2 expressed as NO_2)
- Sulphur dioxide
- Carbon monoxide
- Odour concentration
- Ammonia

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 included in order to ensure that emissions to air are kept under checks

We made these decisions in accordance with reference the relevant technical guidance.

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.

We made these decisions in accordance with Biological waste treatment: appropriate measures for permitted facilities.

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.

We only review a summary of the management system during determination. The applicant submitted their full management system. We have therefore only reviewed the summary points.

A full review of the management system is undertaken during compliance checks.

Technical Competence

Technical competence is required for activities permitted.

The operator is a member of the CIWM/WAMITAB scheme.

We are satisfied that the operator is technically competent.

Previous performance

We have assessed operator competence. There is no known reason to consider the applicant will not comply with the permit conditions.

No relevant convictions were found. The operator satisfies the criteria in our guidance on operator competence.

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.

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.

Consultation Responses

The following summarises the responses to consultation with other organisations, our notice on GOV.UK for the public and the way in which we have considered these in the determination process.

Responses from organisations listed in the consultation section:

Response received from Environmental Health.

Brief summary of issues raised: EH reviewed the noise management plan and noted that the applicant has taken into account the noise conditions for the site. They stated that they do not have any adverse comments. Given that the site is not operational, they stated also that they do not have any records of complaints regarding the site.

Summary of actions taken: We have included noise and vibration conditions in the permit to ensure that there are no significant impact of noise and vibration on public health as a result of the permitted site's activities.

Response received from UK Health Security Agency (UKHSA).

Brief summary of issues raised: The UKHSA identified main emissions of potential concern as bioaerosol, NO_2, SO_2, CO, NH_3, Benzene, PM_{10}, dust from operation of the collection of digestate and operation of the plant and emissions to water.

Key recommendations from the UKHSA:

Emissions to air

- Considering the presence of sensitive receptors within 250m of the site boundary, we recommend the EA to ensure that the operator has in place bioaerosol monitoring provision according to the technical guidance M9: environmental monitoring of bioaerosols at regulated facilities.
- The applicant screens PM_{10} emissions out. Considering the dust generating potential of onsite activities and the potential presence of particulate matter in the point source emissions (e.g. CHPs, flare emissions), the EA may wish to be satisfied that particulates can be screened out and not included in the H1 assessment and air dispersion modelling.

Emissions to water

- The applicant notes that run-off is restricted to clean surface water and under normal operating conditions there will be no point source emissions. We suggest the EA to ensure that also in case of abnormal operating

conditions, spillages or abnormal weather events there would be no potential point source emissions.

Odour

- Considering that the site is located in a rural area, there might be further sources of odour such as from spreading of liquid digestate on surrounding fields, and from other aspects of farming such as the pig farm. Harestock Wastewater Treatment Works is also 1.5km SSE. The receptors impacted by the highest odour concentrations, i.e. 2.69ouE/m^3 at the proposed Instavolt Restaurant and 2.58ouE/m^3 that at the proposed Instavolt Playground (outdoor location), could be affected by cumulative odour concentrations higher than the 3ouE/m^3 'moderately offensive' threshold depending on surrounding activity and wind direction, although the odour from the WWTW and AD plant are not likely to impact the proposed restaurant at the same time.

Accidents

- We recommend that the human impact from adverse weather events is assessed as potential incident scenario.

UKHSA also requested that *'any information arising from these recommendations should be sent to UKHSA for consideration when it becomes available. Such information could affect the comments made in this response'*.

Summary of actions taken: We have taken into consideration the key recommendations from the UKHSA in assessing the risk associated with the site operations and is satisfied that the proposed control measures in the application represent BAT and that the permit conditions are robust enough to ensure that there are no significant impact on public health as a result of the permitted site's activities.

The odour modelling provided by the applicant was not used for our determination. We do not accept odour modelling for permit applications. We considered the Risk Assessment and the Odour Management Plan for this application.

We have considered that the additional information received from the operator does not require re-consultation with the UKHSA, as the information is in line with the initial submission, and no significant new information was received.