

Permitting decisions

Variation

We have decided to grant the variation for Bridge Farm Nursery operated by Bridge Farm Nurseries Limited. The variation number is EPR/UP3205PX/V002.

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.

1 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 checklist to show how all 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. The introductory note summarises what the variation covers.

2 Key issues of the decision

2.1 Overview of the site and scope of this variation

Prior to this variation, the regulated facility consisted of one waste biomass boiler [emission point A1] (permitted to accept less than 3 tonnes per hour of untreated wood waste as a fuel) and a standby gas oil boiler [emission point A2]. The facility was permitted as an activity falling under EPR Schedule 1 Ch5 5.1 Part B (a)(v) and Schedule 25A – (Medium Combustion Plant).

This variation application is to add two new waste biomass boilers on-site [emission points A3 and A4]. These boilers are both fired on waste biomass and are associated with the same non-regulated business activity as the existing waste biomass boiler: the units are used to generate heat for the operator's greenhouses to maintain correct indoor growing conditions when ambient temperature is insufficient. Since all the units serve the same activity, on the same site and are operated by the same operator, we have considered them in aggregation. This is in accordance with RGN2 'Understanding the meaning of regulated facility'.

After this variation, the aggregated capacity on-site exceeds 3 tonnes per hour for the co-incineration of non-hazardous waste.

Due to this, the on-site waste biomass boilers are now considered a Chapter 5 Section 5.1 Part A(1)(b) activity for waste co-incineration and the permit is being varied to a bespoke installation permit, subject to the requirements of the Industrial Emissions Directive.

We have listed the pre-existing stand-by diesel boiler (emission point A2), previously permitted as a Medium Combustion Plant under Schedule 25A of EPR, as an activity directly associated (DAA) with the scheduled activity Chapter 5 Section 5.1 Part A(1)(b). Since this gasoil boiler is used as a standby to the biomass boilers covered by the scheduled activity, and both the combustion processes serve the same activity, we consider that the use of the gasoil boiler is an activity technically connected to scheduled activity and meets the DAA test criteria set out in our guidance RGN2 'Understanding the meaning of regulated facility – Appendix 2'.

2.2 Waste specification, pre-acceptance and acceptance

The application is to co-incinerate untreated wood waste, meeting the specification of waste code 19 12 07: 'wood from waste management facilities, other than wood containing hazardous substances 19 12 06'. The description of the permitted waste biomass is further restricted to specify that it will consist only of visible clean waste wood streams segregated at the source where no chemical treatments have been applied and to exclude post segregation of mixed waste wood streams from civic amenity sites or skip hire operators (reference: application document titled 'Types of waste accepted and restrictions', received 29/10/2019).

We have also specified that the waste wood shall not originate from construction and demolition activities and that it shall not contain melamine faced wood or plywood, chipboard and fibreboard woods, as confirmed by the applicant in response to a Schedule 5 Notice served on 24/01/2020. We have included the waste code, further restricted as described above, in Table S2.2 of the permit as follows:

Waste code	Description
19	Wastes from waste management facilities, off-site waste water treatment plants and the preparation of water intended for human consumption and water for industrial use
19 12	wastes from the mechanical treatment of waste (for example sorting, crushing, compacting, pelletising) not otherwise specified
19 12 07	Wood other than wood containing hazardous substances (19 12 06) from waste management facilities, further restricted as follows: <ul style="list-style-type: none">- Only visibly clean waste wood is permitted, meeting the requirements of the Industrial Emissions Directive Article 3 (31) 2010/75/EU, where no chemical

Waste code	Description
	<p>treatments have been applied and originating from streams segregated at the source (such as waste wood from pallets);</p> <ul style="list-style-type: none"> - The post segregation of mixed wood streams from civic amenity sites or skip hire operators is not permitted; - The use of waste wood originating from construction and demolition activities is not permitted; - The use of waste wood chips from sources containing melamine faced wood is not permitted; - The use of waste wood chips originating from plywood, chipboard and fibreboard is not permitted.

Waste wood meeting these requirements does not contain halogenated organic compounds or heavy metals as a result of treatment with wood preservatives or coating and therefore its incineration is not subject to the requirements of Chapter IV of the Industrial Emissions Directive.

The application document titled 'Grade A Waste Wood Acceptance Procedure' (version received 24/03/2020) provides details of the waste pre-acceptance and acceptance procedures implemented within the site Environmental Management System (EMS) by the Applicant. The purpose of this procedure is to ensure that only untreated clean waste wood, compliant with the EWC waste code 19 12 07, as described and restricted in Schedule 2 of the environmental permit, is accepted on site. This document commits the Applicant to carry out regular audits of their suppliers, with the objective of verifying that the source and segregation practices in place at the suppliers' site ensure compliance of the supplied materials with the waste code specified in Schedule 2 of the permit, including the specified restrictions in the waste description.

We have included the site waste acceptance procedure in the operating techniques that the operator must follow (table S1.2 of the permit).

We consider that the implementation of a robust waste pre-acceptance and acceptance process will ensure compliance with the waste description specifications of the permit. We have imposed an improvement condition, requiring the Operator to report out to the Environment Agency on the detailed implementation of the site EMS, including the implementation of the waste acceptance procedure and the details of the waste wood suppliers audits therein described, within the first 6 months of operations.

2.3 Use of best available techniques (BAT)

Waste wood meeting the description specified in table S2.2 of the permit is not subject to the requirements of Chapter IV of the Industrial Emissions Directive. The BAT conclusions for incineration of waste and the associated BREF note do not apply to this activity, since the type of wastes incinerated are not in the scope of these documents. There is not a BAT conclusion document or BREF note that covers the scope of the activities carried out at the installation.

Article 14(6) of the Industrial Emissions Directive requires that, where an activity or a type of production process carried out within an installation is not covered by any of the BAT conclusions or where those conclusions do not address all the potential environmental effects of the activity or process, the Environment Agency, as the Competent Authority, shall, after prior consultations with the operator, set the permit conditions on the basis of the best available techniques that it has determined for the activities or processes concerned, by giving special consideration to the criteria listed in Annex III of the IED, which include, among others, comparable processes, facilities or methods of operation which have been tried with success on an industrial scale, and 'information published by public international organisations'.

We have therefore determined BAT according to the requirement of Article 14(6) of the IED, taking into account the relevant criteria set in the Directive. In line with these criteria, we have reviewed the operating techniques proposed by the operator and summarised in the application document titled 'BAT Assessment', version dated March 2020, against the following comparable sources and standards:

- We have determined BAT for the installation by referring to Environmental Permitting Technical Note 5/1(18), Final Draft, dated 15/08/18, titled 'Reference document for the incineration / combustion of

waste wood'. Although this DEFRA guidance is statutorily applicable to Part B permits only, we have taken in consideration the relevant requirements of this guidance to determine BAT for the installation, under the provisions of Article 14(6) of the Industrial Emissions Directive.

- Since the waste biomass boilers are also new Medium Combustion Plants, we have also taken in consideration the requirements stated in the Medium Combustion Plant Directive, to set appropriate emission limits and monitoring requirements for the installation, where the emissions associated with these emission limits were demonstrated to cause non-significant risk to the environment. Although the Medium Combustion Plant Directive does not specify techniques to be used, the emission limits specified in this Directive drive the selection of the operating techniques necessary to achieve compliance with the limits.

The key operating techniques for the installation, as found in the application document titled 'Best Available Technique Assessment' (version of March 2020) are summarised in the following:

- **Selection of furnace type:** moving grate incinerators have been selected for this application. Waste wood is introduced into the combustion chambers in a controlled manner to ensure an even supply of fuel and therefore a high combustion efficiency.
- **Combustion optimisation and control:** a computer based control system monitors oxygen levels within each of the combustion chambers and adjusts the speed / movement of the grate to maintain oxygen levels within set parameters specified to result in highly efficient combustion. In order for the grate to feed evenly, waste wood fuel is supplied into the boilers with a waste feeder, automatically controlled by the computer controller. Fuel is fed in by augers through toploder bays, which are speed controlled. As oxygen levels increase, fuel delivery is also increased to provide more fuel for incineration and therefore increase the demand for oxygen. If oxygen levels drop, then the feed auger slows, reducing fuel input and reducing the demand for oxygen, allowing oxygen levels within the combustion chamber to increase. Oxygen levels within the combustion chamber are also controlled by the computer control system, utilising primary and secondary air fans. The primary air fan is used to provide the bulk of O₂ demand, with the secondary air fan operating when oxygen levels are dropping towards the lower limits, pre-set during the commissioning of the boilers. Incineration temperature, residence time and oxygen content are therefore all continuously controlled by the computerised control system.
- **Automatic removal of incinerator bottom ash:** an automatic system is utilised to move the ash from under the grate and into the bottom ash discharger.
- **Abatement of oxides of nitrogen:** The system for the abatement of oxides of nitrogen (NO_x) consists of Selective Non-Catalytic Reduction (SNCR). Ammonia is injected to react with the oxides of nitrogen and reduce them to elemental nitrogen, at high temperature. The application document explains that the injector is designed to produce a range of suitable droplet sizes, and distribute the droplets evenly over the cross section of the reaction space. This is aimed at achieving good distribution of this additive, since its poor distribution may lead to emissions of non-reacted ammonia in the flue gases (ammonia slip). According to the application documents, the new Phase 2 biomass boilers already have this system installed from the outset, whilst its installation is planned for the existing biomass boiler for May 2020. We have therefore set an improvement condition in the variation notice, requiring the operator to confirm the installation and commissioning of this system in the existing Phase 1 biomass boiler (emission point A1), as committed in the application documents.
- **Double staged abatement of particulate:** the particulate abatement system consists of multi-cyclone and bag filter. The application document states that this system is already installed in Phase 2 biomass boilers (emission points A3, A4), whereas its installation is planned for the existing Phase 1 biomass boiler (emission point A1) for May 2020. We have set an improvement condition in the variation notice, requiring the operator to confirm the installation and commissioning of this system for abatement of particulates in the existing Phase 1 biomass boiler (emission point A1), as committed in the application documents.

- **Minimum turndown and no-idling:** the application document confirm that the biomass boilers are capable of stable operation at a minimum turndown of 25% of their maximum continuous rate and that the boilers will not be operated below this load (idling condition) to prevent higher emissions associated with non-optimised combustion at low load.

Having taken into account the type of waste proposed to be incinerated at the installation (i.e. untreated woody biomass), the pollutants potentially emitted, the environmental risk associated with these emissions and the comparable sources and standards identified above for determination of BAT, we have concluded that the proposed techniques are BAT for this installation. Refer to section 2.4 below for considerations on the energy efficiency of the installation. Refer to section 2.6 below for the risk assessment of emissions to air.

2.4 Energy efficiency

We have considered the issue of energy efficiency in the following ways:

1. The use of energy within, and generated by, the installation which are normal aspects of all EPR permit determinations. In particular, the extent to which the applicant has demonstrated compliance with energy efficiency levels that are consistent with the BAT.
2. The applicability of the combined heat and power ready (CHP-R) guidance to the installation.
3. The extent to which the installation meets (or is required to meet) the requirement of Article 14(5)(c) of the Energy Efficiency Directive (EED) which requires new or substantially refurbished industrial installations with a total thermal input exceeding 20 MWth generating waste heat at a useful temperature level to carry out a cost-benefit assessment to “*assess the cost and benefits of utilising the waste heat to satisfy economically justified demand*”.

1. Use of energy within the Installation

The application document titled ‘BAT Assessment’, version dated March 2020, describes the energy efficiency features of the boilers in the scope of the application: according to this document, the Justsen boilers have been tested to be 89% efficient by utilising recovery of energy from hot flue gases as main design technique. During the combustion process, the majority of heat is transferred into the flue gases. Heat is recovered from the flue gases prior to emission to air, so that local heat demands can be met. The flue gases are passed through various heat jackets and pipe heat exchangers several times, designed to exchange as much heat as possible. Over-cooling of the flue gas is avoided as this may result in corrosive acid gases being condensed, leading to a reduction in the useful life of both the boiler and the flue. Also, a proportion of the flue gas is recirculated back into the combustion chamber to reduce the demand for secondary air feed, which would be fed at a significantly lower temperature.

We consider that the primary configuration of the new proposed and existing biomass boilers at the installation is driven by the technical requirements and configuration of the non-regulated activities carried out at the site and that the operating techniques for energy efficiency for the new proposed boilers and the associated energy efficiency levels stated by the Applicant in the application are consistent with BAT.

The Applicant is required to report energy usage and energy generated under Condition 4.2 and Table S4.3 in Schedule 4 of the permit. This will enable the Environment Agency to monitor energy efficiency at the installation and take action if at any stage the energy efficiency is less than proposed.

There are no site-specific considerations that require the imposition of standards beyond BAT, and so we accept that the Applicant’s proposals represent BAT for this installation.

2. Combined Heat and Power Ready

Our CHP Ready Guidance - February 2013 considers that BAT for energy efficiency for new combustion power plant is the use of CHP in circumstances where there are technically and economically viable opportunities for the supply of heat from the outset. The term CHP in this context represents a plant which

also provides a supply of heat from the electrical power generation process to either a district heating network or to an industrial / commercial building or process.

Since the activities under assessment do not include a power generation plant and there is no power generation in the scope of this variation, given that the purpose of the proposed biomass boilers is only to supply heat to meet process demand of the associated greenhouses, we consider the requirement for CHP readiness not applicable to this application.

3. Compliance with Article 14(5) of the Energy Efficiency Directive

Article 14(5)(c) of the EED requires an assessment of the cost and benefits of utilising waste heat to satisfy economically justified demand for '*new industrial installation with a total aggregated net thermal input of more than 20 MW generating waste heat at a useful temperature level, or an existing such installation where the combustion unit is to be substantially refurbished*'.

By effect of this variation, the installation exceeds 20 MW thermal input and we have therefore considered the applicability of this requirement in the determination of this variation.

In the application document titled 'MCPD Permit Variation Part C2.5 Supplementary Evidence', dated October 2019, the Applicant has provided a justification for the non-applicability of the EED requirement for a cost-benefit analysis, since, according to this document, the proposed biomass boilers are designed to satisfy a specified heat load, and all the heat recovery from the combustion process is maximised so that 'there is no waste heat'. The application document titled 'BAT Assessment', version dated February 2020, explains that the heat recovery design is such to avoid overcooling of flue gases, as this may result in corrosive acid gases being condensed, leading to a reduction in the useful life of both the boiler and the flue.

We have reviewed the information provided in the application and we consider that any waste heat generated by the proposed boilers would unlikely be available at a useful temperature level, when taking into account the technical characteristics of the plant, its design configuration and the usage of heat within the served process. The installation uses energy for internal uses to a level that that we consider consistent with BAT.

In conclusion, we agree with the Applicant that the requirement for a cost benefit analysis for heat recovery is not applicable to this installation. We have referred to our 'Draft guidance on completing cost-benefit assessments for installations under Article 14 of the Energy Efficiency Directive' in making this decision.

2.5 Fire Prevention

Condition 3.7 of the permit reads as follows:

'The operator shall take all appropriate measures to prevent fires on site and minimise the risk of pollution from them including, but not limited to, those specified in any approved fire prevention plan.'

We have a regulatory duty to protect the environment and people. A fire that occurs on a site storing combustible waste materials can have a severe impact on the environment and on local communities. Waste fires can produce smoke that contains a variety of harmful emissions including asphyxiants and irritants. The longer the exposure to smoke the more likely there may be significant pollution or harm to human health. Therefore our approach is first to minimise the risk of a fire occurring and then to recognise that if a fire does occur it should be extinguished as quickly as possible whilst at the same time preventing it from spreading.

The measures set out in the 'Fire prevention plans: environmental permits guidance' (the guidance) have therefore been designed to meet the following three objectives:

- minimise the likelihood of a fire happening;
- aim for a fire to be extinguished within 4 hours; and
- minimise the spread of fire within the site and to neighbouring sites.

We consider that if an operator submits a fire prevention plan (FPP) that includes the measures set out in the guidance we are likely to approve that FPP. If an operator is unable to meet the measures in the guidance

but can propose alternative measures that nevertheless meet the aims of the guidance we can still approve that FPP. It is for the operator to demonstrate these measures, so that we can be satisfied that the alternative measures meet the objectives of the guidance.

The operator has identified the potential risk of fire from the regulated facility due to the storage of combustible non-hazardous wastes on site. The FPP sets out the measures put in place to prevent a fire and the actions that will be taken in the event of a fire occurring.

The FPP did not meet all of the measures as required by our guidance. However the FPP did include alternative measures and so the operator was required to demonstrate that the alternative measures would meet the three objectives of our guidance. The Applicant proposed alternative measures covering the following areas (application reference: 'Fire Prevention Plan for Bridge Farm Nurseries Ltd', v7, document dated 27/02/2020, referred below as 'the FPP').

Maximum pile sizes

Section 9.1 of the guidance specifies that for all waste piles, the maximum height allowed is 4 metres and the maximum length or width allowed (whichever is the longest) is 20 metres. The table in section 9.1 outlines the maximum volumes for each type of waste: for waste wood <50mm chip size the maximum volume stated in the guidance is 430m³.

According to the FPP submitted by the Applicant, Fuel Store Phase 1 is within both the maximum pile dimensions (20m length or width, 2m height) and pile size (for waste wood <50mm chip size has a limit of 430m³). Fuel Store Phase 2 is only just over the maximum pile dimensions (21m Length and 24m Width) but exceeds the maximum pile size limit stated in the guidance (1,008m³).

However, the FPP sets suitable alternative measures, reducing of the overall fire risk of the installation and meeting the three objectives of the guidance. These are based on the fast turnaround and monitoring regime in place, including manual temperature monitoring and a linear heat detection system and the fact that the facility is manned 24hours/7days.

Proportionate detection system

Section 13 of the guidance requires that the design, installation and maintenance of automated detection systems must be covered by an appropriate UKAS-accredited third party certification scheme.

Section 10 of the FPP provides details of the detection systems installed at the site. In particular, the waste stores are fitted with Signaline Linear Heat Automated Detection System, which provides detection of fire conditions, overheating plant, or the surrounding area. Significant rises in temperature above 45 degC will cause this system to trigger, sound the fire alarm and the fire response to be initiated.

The system is not UKAS accredited, however we have reviewed its technical specification and we consider it proportionate to the fire risk at the installation and therefore acceptable according to our criteria.

Proportionate suppression system

Section 14 of the guidance requires that sites storing combustible waste should be fitted with suppression systems proportionate to the risk on site.

According to the Applicant's proposal included in the FPP, there is no suppression system in the fuel stores. However, alternative preventative and active fire-fighting measures mitigating the overall fire risk and meeting the objectives of the guidance have been included in the FPP as summarised below:

- Fast turnaround: short waste storage time of less than 3 days;
- Regardless of the fast turnaround the proposed monitoring regime includes manual monitoring of piles temperatures to further mitigate the risk of self-heating and hot spots;
- Suppression systems are installed on other systems that are linked to or may potentially ignite the fuel stores. These include:
 - A fire suppression system in the biomass boilers: this consists of a sprinkler system triggered by high temperatures in the stoker. This system is designed to provide a safeguard against counterflow combustion from the stoker in the biomass boilers to the fuel stock in the fuel stores.

- A Fire Spark Detection System and Suppression system on the fuel conveyor system, associated with the waste wood toploaders withdrawing the waste wood from the fuel stores;
- FireTrace Electrical Fire Detection and Suppression System fitted is a self-activating fire suppression system injecting nitrogen as a fire suppressant, installed in the toploader and biomass boilers control panels.
- Good accessibility to Fire Services to the waste stores for active firefighting through large doors with roller shutters.

Conclusion

We have considered the operator's proposals in their FPP, including the alternative measures that are listed above. We are satisfied that the proposed alternative measures meet the objectives of the guidance.

We are therefore satisfied that the FPP meets the objectives of the guidance.

We have set the following pre-operational and improvement conditions to allow time for completion of the measures described in the FPP:

Pre-operational condition PO1:

'Prior to accepting on site any waste wood to feed the biomass boilers, the Operator shall submit for approval by the Environment Agency a report confirming that any detection and suppression system described in the Fire Prevention Plan, including fire-fighting hoses and hydrants, have been installed and are fully operational.

The biomass boilers may operate with virgin wood only (non-waste wood) until approval of this pre-operational condition.'

Improvement condition IC3:

'[Within 6 months from issue date of variation V002], the Operator shall submit a written report for approval by the Environment Agency confirming that any works to make impermeable the areas designated for containment of firefighting water, as described in the Fire Prevention Plan, have been completed.'

2.6 Air Quality

We require applicants to submit detailed air dispersion modelling and impact assessment to assess the predicted impacts on both human receptors (for example dwellings, work places and parks) and ecological sites.

A methodology for risk assessment of point source emissions to air is set out in our guidance *Air emissions risk assessment for your environmental permit* and has the following steps:

- Describe emissions and receptors
- Calculate process contributions
- Decide if detailed air modelling is needed
- Assess emissions against relevant standards
- Summarise the effects of emissions.

We use this methodology to assess the impacts on air quality in the determination of applications.

The methodology uses a concept of "process contribution (PC)", which is the estimated concentration of emitted substances after dispersion into the receiving environmental media at the point where the magnitude of the concentration is greatest. The methodology provides a simple method of calculating PC, primarily for screening purposes, and for estimating PCs where environmental consequences are relatively low. It is based on using dispersion factors. These factors assume worst case dispersion conditions with no allowance made for thermal or momentum plume rise and so the PCs calculated are likely to be an overestimate of the actual maximum concentrations. More accurate calculation of PCs can be achieved by mathematical dispersion models, which take into account relevant parameters of the release and surrounding conditions, including local meteorology.

Air dispersion modelling enables the PC to be predicted at any environmental receptor that might be impacted by the emissions from a plant. Once short term and long term PCs have been calculated in this way, they are compared with Environmental Standards (ESs).

PCs are considered insignificant if:

- the long-term PC is less than 1% of the relevant ES; and
- the short-term PC is less than 10% of the relevant ES.

The long term 1% PC insignificance threshold is based on the judgements that:

- It is unlikely that an emission at this level will make a significant contribution to air quality; and
- the threshold provides a substantial safety margin to protect health and the environment.

The short term 10% PC insignificance threshold is based on the judgements that:

- spatial and temporal conditions mean that short term PCs are transient and limited in comparison with long term PCs; and
- the threshold provides a substantial safety margin to protect health and the environment.

Where an emission is screened out in this way, we would normally consider that the applicant's proposals for the prevention and control of the emission to be acceptable. However, where an emission cannot be screened out as insignificant, it does not mean it will necessarily be significant.

For those pollutants which do not screen out as insignificant, we determine whether exceedances of the relevant ESs are likely. This is done through detailed audit and review of the applicant's air dispersion modelling, taking background concentrations and modelling uncertainties into account.

Where the PC is greater than these thresholds, the assessment must continue to determine the impact by considering the predicted environmental concentration (PEC). The PEC is the combination of the PC substance to air and the background concentration of the substance which is already present in the environment.

The PECs can be considered 'not significant' if the assessment has shown that both the following apply:

- proposed emissions comply with associated emission levels (AELs) or the equivalent requirements where there is no AEL; and
- the resulting PECs won't exceed 100% of the ESs.

The operator has provided detailed atmospheric dispersion modelling which predicts the likely impacts of oxides of nitrogen (NO and NO₂) and particulates.

Three of the four boilers on site (which together form one scheduled incineration activity) are fired on untreated clean waste wood chip biomass, and were therefore modelled for NO_x and particulates emissions. The other boiler is fired on gas oil only, and therefore was modelled for NO_x emissions only.

Sulphur dioxide emissions were considered not of potential concern because of the fuel types used by these boilers: this is consistent with the requirements of the Medium Combustion Plant Directive, which states that emissions of SO₂ are not regulated where woody solid biomass is used. Therefore this parameter was not modelled. We agree with this qualitative screening consideration.

Also, emissions of CO were not modelled. Although no justification was provided by the Applicant, taking into account the type of fuel, operating techniques, the size of the operation and the environmental standards for CO, we agree that the risk associated with the emissions of this pollutant is likely to be insignificant and that it can be screened out on a qualitative basis.

Ammonia emissions, due to ammonia slip from the SNCR abatement, have been risk assessed with the H1 methodology, see section below.

The biomass boilers will only be permitted to incinerate untreated waste wood that does not contain heavy metals and halogenated organic compounds as a result of treatment with wood preservatives: we consider that the fuel specification and the robust waste wood pre-acceptance and acceptance assurance specified in the operating techniques table of the permit, along with the implementation of combustion optimisation as

BAT, allows to qualitatively screen out the environmental significance of other potential pollutants, and that therefore the set of pollutants risk assessed by the operator is adequate for the proposed activities.

Applicant modelling

The latest version of the detailed dispersion model BREEZE AERMOD software was used by the Applicant to predict the changes in pollutant concentrations from the permitted activities. This is an appropriate compute model for assessing impact on local air quality.

Only two of the biomass boiler units are new with this variation application, however all on-site emissions were assessed and considered.

The model assumed unlimited hours of operation for the three biomass boilers and the existing standby gasoil boiler, however this assumption is likely to be very conservative because the greenhouses require heating only during the cold months and the gasoil boiler is already permitted for no more than 1,000 hours of operation per annum.

We have conducted our own audit of the assessment submitted by the operator and we agree with the operator's conclusions, summarised in the following.

Impact on human health receptors from the operation of the facility

The operator's modelling has predicted PCs from the boilers at the most sensitive human health receptor locations.

For the most impacted receptor for NO_x (refer to table 1 for all predicted impacts):

- The highest long term PC is 2.91µg/m³ (annual mean) which is 7.3% of the ES (40µg/m³). As this is above the 1% threshold, this long term prediction cannot be considered 'insignificant'.
- The highest short term PC is 45.21µg/m³ (99.79th percentile of 1-hour means) which is 22.6% of the ES (200µg/m³). As this is above the 10% threshold, this short term prediction cannot be considered 'insignificant'.
- Although these predictions cannot be considered insignificant based on the PCs, the PECs for both long term impact and short term impact are less than 100% (29.4% and 31.4%, respectively) of the associated ESs. We agree with the operator that the predicted long term and short term impacts at the sensitive human receptors are 'not significant', and unlikely to be a significant contributor to or cause an exceedance of the ES.

For the most impacted receptors for emissions of particulates (refer to table 1 for all predicted impacts):

- The highest long term PC is 0.26µg/m³ (annual mean) which is 0.65% of the ES for PM₁₀ (40µg/m³). As this is below the 1% threshold, this long term prediction can be considered 'insignificant'.
- The highest short term PC is 0.75µg/m³ (90.41st percentile of 24-hours means) which is 1.5% of the ES for PM₁₀ (50µg/m³). As this is below the 10% threshold, this short term prediction can be considered 'insignificant'.
- Although the application did not include an assessment against the environmental standards for PM_{2.5}, we have used the Applicant's predictions for dispersion of particulates to carry out this assessment. In doing so, we have made the conservative assumption that all the emitted particulate may consist of particle size of less than 2.5µm.

The highest long term PC for particulate is 0.26µg/m³ (annual mean) which is 1.3% of the ES for PM_{2.5} (20µg/m³). As this is slightly above the 1% threshold, this long term prediction cannot be considered 'insignificant'.

Although this prediction cannot be considered insignificant based on the PCs, the PECs is less than 100% (48.1%, respectively) of the associated ESs (based on a background concentration in the area of 9.36). We agree with the operator that the predicted long term and short term impacts at the sensitive human receptors are 'not significant', and unlikely to be a significant contributor to or cause an exceedance of the ES.

- In conclusion, we agree with the operator that the particulates emissions are unlikely to be a significant contributor to, or cause an exceedance of, the ES for PM₁₀ and PM_{2.5}.

Table 1 – Predicted impacts at the most sensitive human receptors						
Pollutant	Environmental Standard (ES)	Background	Process Contribution (PC)		Predicted Environmental Concentration (PEC)	
Unit	µg/m³	µg/m³	µg/m³	PC as % of ES	µg/m³	PEC as % of ES
NO _x annual mean (receptor ER01) ¹	40	8.83	2.91	7.3	11.74	29.4
NO _x 99.79 th percentile of hourly mean (receptor ER01) ¹	200	17.65	45.21	22.6	62.86	31.4
PM ₁₀ annual mean (receptor ER01) ¹	40	16.07	0.26	0.65	16.33	40.8
PM ₁₀ 24 90.41 st percentile of hourly mean (receptor ER07) ¹	50	32.14	0.75	1.5	32.88	65.8
PM _{2.5} annual mean (receptor ER01) ¹	20	9.36	0.26	1.3	9.62	48.1
Notes:						
1. Receptor E1: x=525416 ; y=320521. Receptor E7: x=525136 ; y=320095						
2. Background data derived from DEFRA LAQM background maps.						

Emissions of ammonia

The Applicant provided an assessment of the human health risks associated with the emissions of ammonia due to ammonia slip from the Selective Non-Catalytic Reduction systems installed in the biomass boilers (emission points A1, A3 and A4). The risk assessment was carried out using the Environment Agency H1 tool. We have audited the inputs and assumptions made by the Applicant to populate the H1 tool. In general we agree with the assumptions made and the selection of input data.

However, we have found out that the Applicant made an incorrect use of the stack height required as an input by the software (they used the actual stack height, as opposed to effective stack height required by the H1 methodology and tool) and they made an incorrect entry for the short-term emissions concentrations of ammonia.

We have therefore re-constructed the H1 tool, using the assumptions and selection of input data from the application documents and correcting the above parameters. The results of the tool are shown below:

Number	Substance	Long Term	Short Term	Long Term			Short Term		
		EAL	EAL	PC	% PC of EAL	> 1% of EAL?	PC	% PC of EAL	> 10% of EAL?
		µg/m ³	µg/m ³	µg/m ³	%		µg/m ³	%	
1	Ammonia (human he.	180	2,500	1.44	0.798	No	91.3	3.65	No

The table above shows that the long term and short term PCs are respectively less than 1% (long-term) and less than 10% (short-term) of the relevant environmental standards.

Although we don't agree with all the assumptions made by the Applicant in building up the risk assessment for emissions of ammonia, we have tested the sensitivity of these assumptions and we agree with the Applicant's conclusion that the risks to human health associated with emissions of ammonia from the operations of the site are likely to be insignificant according to the criteria set out in our guidance.

Nature conservation assessment

There are no sensitive European Sites or Sites of Special Scientific Interest (SSSIs) within the relevant screening distances. The Cowbit Wash SSSI is located within the relevant screening distance of 2 kilometres, however it is designated for geological features only, therefore does not represent a habitat sensitive to ecological effects from the emissions of this operation. Therefore the PCs from NO_x, ammonia, nutrient nitrogen and acid deposition from the site are unlikely to be significant at any statutorily protected habitat sites.

We have also reviewed the information in the application documents and supplemented it with additional assessment of emissions of oxides of nitrogen and ammonia, to confirm that the process contributions of these emissions are below the critical levels for these pollutants at the following non-statutory habitat sites located within 2km distance from the installation: Decoy Farm Pit local wildlife site (LWS), Arnold's Meadows LWS, Coronation Channel LWS, New River LWS, River Welland in Spalding LWS, River Welland Corridor LWS, Disused March Line in Spalding LWS. Based on the results of our review, we are satisfied that the emissions from the operations of the site are not likely to cause significant pollution at these ecological receptors.

3 Decision checklist

Aspect considered	Decision
Receipt of application	
Confidential information	A claim for commercial or industrial confidentiality has not been made.
Identifying confidential information	We have not identified information provided as part of the application that we consider to be confidential.
Consultation/Engagement	
Consultation	<p>The consultation requirements were identified in accordance with the Environmental Permitting Regulations and our public participation statement.</p> <p>The application was publicised on the GOV.UK website.</p> <p>We consulted the following organisations:</p> <ul style="list-style-type: none"> - Public Health England - South Holland District Council environmental health department - South Holland District Council planning department - Lincolnshire Fire and Rescue - Food Standards Agency - Health and Safety Executive <p>The comments and our responses are summarised in the consultation section.</p>
The facility	
The regulated facility	<p>We considered the extent and nature of the facility at the site in accordance with RGN2 'Understanding the meaning of regulated facility'.</p> <p>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.</p> <p>The operator has provided the grid reference for the new emission points, and the activities are defined in table S1.1 of the permit.</p> <p>This variation is to add two new boilers on-site. These boilers are both fired on waste biomass and are associated with the same business activity as the existing waste biomass boiler. Therefore the resultant aggregated capacity on-site now exceeds 3 tonnes per hour.</p> <p>The throughput of waste shall not exceed 60,680 tonnes per annum.</p> <p>The two new boilers have net rated thermal inputs of 8.60MWth and 8.00MWth, respectively.</p> <p>Due to this, the on-site waste biomass boilers are now considered a Section 5.1 Part A(1)(b) activity for waste incineration (as opposed to Medium Combustion Plants (MCPs)). By becoming an installations permit, the permit now has a new permit boundary (whereas before there were only emission points).</p> <p>As a result of these additional boilers, the waste biomass storage capacity has increased to 500 tonnes. Whereas, in the existing permit, the waste</p>

Aspect considered	Decision
	wood storage did not exceed 125 tonnes at any time, and therefore did not come into regulation under the Environment Agency Regulatory Position Statement 213.
The site	
Extent of the site of the facility	<p>By becoming an installations permit, the permit now has a new permit boundary, whereas before there were only emission points.</p> <p>The operator has provided a plan which we consider is satisfactory, showing the extent of the site of the facility. The plan is included in the permit.</p>
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.
Biodiversity, heritage, landscape and nature conservation	The application is not within the relevant distance criteria of any sensitive European sites (SPA, SAC), Ramsar sites or SSSIs. See key issues section above for further details.
Environmental risk assessment	
Environmental risk	<p>The facility is not located within a local authority air quality management area and is not included in the local authority's air quality management plan.</p> <p>Nonetheless, air dispersion modelling was undertaken and submitted by the operator.</p> <p>The assessment shows that applying the conservative criteria in our guidance on environmental risk assessment, all emissions may be categorised as environmentally not significant. See key issues section above.</p> <p>The air dispersion modelling assessment of predicted impacts at sensitive receptors is based on the continuous operation for each of the two new biomass boilers, in addition to the emissions from the already permitted existing units.</p> <p>We have reviewed the operator's assessment of the environmental risk from the facility.</p> <p>The operator's risk assessment was mostly satisfactory, however we had to carry out further assessment in certain areas where the risk assessment submitted in the application was incomplete or not fully satisfactory, these are: assessment of the risks associated with emissions of PM2.5, ammonia risk assessment, impacts on local wildlife sites. Based on the information in the application documents, we are satisfied that the emissions from the installation will be environmentally non-significant.</p> <p>Refer to the key issues section for more details.</p>

Aspect considered	Decision
Operating techniques	
General operating techniques	<p>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. See key issues section above for further details.</p> <p>The operating techniques that the applicant must use are specified in table S1.2 in the environmental permit.</p>
Fire prevention plan	<p>The plan sets out alternative measures that we consider meet the objectives of the Fire Prevention Plan guidance. Refer to the key issues section for more information on the approved proposals.</p> <p>We have set pre-operational and improvement conditions to allow the operator time in which to complete the implementation of all the measures of their fire prevention plan.</p>
Permit conditions	
Updating permit conditions during consolidation	We have updated permit conditions to those in the current generic permit template as part of permit consolidation. The conditions will provide the same level of protection as those in the previous permit.
Use of conditions other than those from the template	Based on the information in the application, we consider that we do need to impose conditions other than those in our permit template: condition 3.1.3 and 3.1.5, as numbered in the permit variation notice, are retained from the existing permit, although these conditions are not in our installation permit template, applicable to this variation. The reason for retaining these conditions is that we consider them relevant and necessary to ensure adequate monitoring of emissions to air for the referenced activities / emission points.
Pre-operational conditions	<p>Based on the information in the application, we consider that we need to impose pre-operational conditions.</p> <p>Refer to the key issues for the pre-operational condition imposed in relation to the implementation of the measures stated in the approved Fire Prevention Plan.</p>
Improvement programme	<p>Based on the information in the application, we consider that we need to impose an improvement programme.</p> <p>We have imposed an improvement programme to ensure that site environmental management system is fully detailed and implemented (improvement condition IC1), that the Operator completes the planned installation of the particulate and NOx abatement systems described in this variation application for the existing biomass boiler, emission point A1 (improvement condition IC2), that the operator completes the surfacing works described in the approved Fire Prevention Plan (improvement condition IC3) and that the operator completes the construction works for the bund of the existing gas oil tank (improvement condition IC4).</p>
Emission limits	The following ELVs have been set for each of the two new biomass boilers:

Aspect considered	Decision
	<ul style="list-style-type: none"> - 300mg/Nm³ (at 6% O₂) for oxides of nitrogen; - 30mg/Nm³ (at 6% O₂) for particulates; - 225mg/Nm³ (at 6% O₂) for carbon monoxide; - 30mg/Nm³ (at 6% O₂) for total volatile organic compounds; - 10mg/Nm³ (at 6% O₂) for ammonia; - No visible dark smoke. <p>Emission limits for oxides of nitrogen and particulates have been specified in line with the Medium Combustion Plants Directive. Emission limits for carbon monoxide and total volatile organic compounds have been specified taking into consideration the Environmental Permitting Technical Note 5/1(18), Final Draft, dated 15/08/18, titled 'Reference document for the incineration / combustion of waste wood'. Emission limits for ammonia have been specified according to the proposal made by the Applicant for this pollutant (application document titled 'Emissions, Techniques and Monitoring', version dated March 2020, received 16/03/2020).</p> <p>We are satisfied that compliance with these emission limits will ensure that the aerial emissions from the installation are environmentally non-significant.</p> <p>Refer to key issues for additional details on how we have determined BAT, including the associated emission limits, for this application.</p>
Monitoring	<p>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.</p> <p>These monitoring requirements have been imposed in order for the operator to demonstrate compliance with the emission limits specified in the permit. The operator will carry out monitoring in accordance with the relevant MCERTS methods.</p> <p>We made this decision in accordance with the Medium Combustion Plant Directive, taking into consideration the guidance provided in the Environmental Permitting Technical Note 5/1(18), Final Draft, dated 15/08/18, titled 'Reference document for the incineration / combustion of waste wood'.</p>
Reporting	<p>We have specified reporting in the permit.</p> <p>The emissions from the waste biomass boilers and the gas oil boiler are to be reported every year and every three years, respectively. This will ensure that the operator is compliant with the limits set in table S3.1 of the permit.</p>
Operator competence	
Management system	There is no known reason to consider that the operator will not have the management system to enable it to comply with the permit conditions.
Relevant convictions	The Case Management System has been checked to ensure that all relevant convictions have been declared.

Aspect considered	Decision
	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	
Section 108 Deregulation Act 2015 – Growth duty	<p>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.</p> <p>Paragraph 1.3 of the guidance says:</p> <p>“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.”</p> <p>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.</p> <p>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.</p>

4 Consultation

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
Public Health England, Centre for Radiation, Chemical and Environmental Hazards
Brief summary of issues raised
Public Health England did not raise any significant concerns regarding the risk to the health of the local population from the installation. The consultation response remarked that the permit holder shall take all appropriate measures to prevent or control pollution, in accordance with the relevant sector guidance and industry best practice.
Summary of actions taken or show how this has been covered
Refer to the key issues section for the assessment of the operating techniques proposed by the Applicant and determination of BAT for the installation.

Response received from
South Holland District Council, Environmental Protection Team, 16/01/2020
Brief summary of issues raised
South Holland District Council, Environmental Protection Team confirmed they had not received any complaints of noise, odour or other issues arising from the site and that, having reviewed the application, they had no comments to make.
Summary of actions taken or show how this has been covered
No action taken / not applicable.

Response received from
South Holland District Council Planning Department, 16/01/2020
Brief summary of issues raised
South Holland District Council Planning Department stated they had no objections to this application.
Summary of actions taken or show how this has been covered
No action taken / not applicable.

Response received from
Director of Public Health, Lincolnshire County Council, 15/01/2020
Brief summary of issues raised
The Director of Public Health commented that, taking into account the response from Public Health England and the assessment provided by the Applicant, the risk to human health is considered to be insignificant. Also, that the permit holder must take all the appropriate measures to prevent pollution and nuisance in accordance with the relevant sector guidance and industry best practice, including using BAT.
Summary of actions taken or show how this has been covered
Refer to the key issues section for the assessment of the operating techniques proposed by the Applicant and determination of BAT for the installation.

Representations from individual members of the public.

No representations were received from individual members of the public.