27 March 2024

Attention: Suffolk County Council

SLR Ref.: 404.V11923.00004

RE: SLR response to Natural England consultation comments - SCC/0045/23SE – Construction and operation of an Anaerobic Digestion Facility on land to the north of Spring Grove Farm, Withersfield, Suffolk, CB9 7SW

Overview

Following the receipt of comments from Natural England (NE) (Ref. 451923) dated 23rd October 2023, we have had a meeting with the applicant and our technical team, to provide a response to all the matters raised.

NE have stated that without additional information, they *"may need to object to the proposal"*. The key passages have been transposed below:

> *"As submitted, the application could have potential significant effects on Over and Lawn Woods Site of Special Scientific Interest (SSSI). Natural England requires further information in order to determine the significance of these impacts and the scope for mitigation.*
>
> *The following information is required:*
>
> - *[A] Further information to demonstrate that the assumptions of the Air Quality Assessment are based on robust scientific evidence in order for your authority to have sufficient certainty in any mitigation measures proposed.*
> - *[B] Assessing the proposal for air quality impacts to the SSSI in-combination with other plans or projects."*

This letter provides a response in denoted sections and additional information, where appropriate to the requests.

Responses to Request for Additional Information

[A] Further information to demonstrate that the assumptions of the Air Quality Assessment are based on robust scientific evidence in order for your authority to have sufficient certainty in any mitigation measures proposed.

Air Quality Impacts Alone

NE State:

"The proposed development is within the Impact Risk Zone of Over and Lawn Woods Site of Special Scientific Interest (SSSI) which is sensitive to changes in air quality….The conclusion of the Air Quality Assessment (AQA) (SLR, May 2023) is that the process contribution of pollutants at the SSSI will be under 1% of the critical load/level threshold and therefore there will be no negative impacts to the site. However we have the following concerns about the assumptions in the report:

1. *Ammonia Emissions Sources*

Natural England highlight that the results of the AQA are based on the processing of 92,000 tonnes of feedstock per year, consisting of 70% silage (rye, maise, oat and grass) and 30% poultry litter and farmyard manure (Section 6.1). Therefore, we advise that should planning permission be granted for this application, appropriate planning conditions, or obligations are attached to any planning permission to secure this as the total amount, and composition, of feedstock that can be processed by the proposal, in order for the results of the AQA to remain valid."

Your authority should be confident that the current AQA considers all emissions arising from the project. The ammonia sources, and their associated ammonia emission rate, currently included within the AQA are detailed within Table 6-17. But Table 6-17 does not include emissions from the silage feedstocks stored prior to the AD process as a potential ammonia source. Therefore, it is unclear whether this source has been considered within the modelling scenarios, and it is advised that this should be clarified, as well as ammonia emissions from any other reception/processing areas."

SLR Response Comment to [A] 1 – Ammonia Emissions

For clarification silage feedstocks are stored within Clamp 1, 2 and 3, covered by weighed-down sheeting (comprising an oxygen barrier). This is not considered to be a significant source of ammonia. SLR make reference of the EMEP/EEA air pollutant emission inventory guidebook '5.B.2 Biological treatment of waste – anaerobic digestion at biogas' where it it states *"Agricultural crops used for biogas production (energy crops) are commonly stored as silage. As the pH of silage is low for conservation purposes, NH3 emissions resulting from the storage of energy crops before anaerobic digestion are negligible."*

It should be noted that NE do not provide alternative reference or scientific evidence to counter this assumption, therefore this is interpreted as NE opinion only.

It should be assumed that the clamp(s) will be maintained and operated in accordance with SSAFO Regulations and an Environmental Permit, and therefore the assumptions in the AQA remain valid.

NE State:

2. *"Emissions Abatement*

    i) Digestate Lagoons

Natural England advise there is currently insufficient evidence to support an 95% ammonia emission reduction from the digestate store covers, and further evidence is required to demonstrate that this is achievable.

We advise that the detailed specification of the digestate lagoon covers should be provided, including what material the covers will consist of, if they will be entirely sealed and whether this cover will be rigid, or floating. Consideration should also be given to how your Authority will legally secure the covers (and their replacement, if necessary) to ensure they remains effective in perpetuity for the lifetime of the development.

The 95% ammonia emission reduction has been made in reference to Tomlinson et al., (2018) and Misselbrook et al. (2008) (Table 6-17: Table notes B and E). However, we advise that these studies do not provide evidence that digestate store covers result in a 95% ammonia emission reduction, and further evidence is required to demonstrate that this is achievable[1]*.*

We also note that the emission rate from the digestate lagoons appears to have been based on "the anticipated peak volume of liquid digestate stored over the year" (20,000 tonnes) (Table 6-17, Table Note C), rather than the maximum storage capacity of digestate lagoons. You should be confident that this assumption is valid and in order for the modelling of the AQA to be justified, you should consider that if planning permission is granted for this application, appropriate planning conditions, or obligations are attached to any planning permission to ensure that the peak volume (20,000 tonnes) of liquid digestate stored in the lagoons is not exceeded."

SLR Response Comment to [A] 2 i) Abatement Measures] - Digestate Lagoons

Tomlinson (Ammonia emissions from UK non-agricultural sources in 2017: contribution to the National Atmospheric Emission Inventory, 2018) states; "*Post-AD storage incorporates an emission reduction factor of 95% (Cumby et al., 2005)*" This infers that the 95% emissions reduction factor can be applied to material resulting from the AD process, which is digestate, stored in a lagoon or tank. It also infers the NAEI have applied this factor to determine losses from lagoons.

Irrespective of the interpretation of emissions reduction, the Applicant has adopted enhanced mitigation options to address these specific concerns and to demonstrate that the proposed development would not have a significant adverse impact at sites of ecological significance. The mitigation includes internal gas capture system that will incorporate a series of 'floats' which rest on the digestate within the lagoon and capture emissions from the digestate. They are a standard industry design to prevent ammonia losses from storage lagoons and a number of designers/installers provide products to the market.

The planning application has omitted details of abatement supplier and design because information can be commercially sensitive. For the benefit of transparency the applicant can confirm the abatement system will be industry standard such as supplied by https://enviroseal.co.uk/. As a result of the covered lagoon gas captured system, potential ammonia emissions would be effectively controlled at source, leading to a ~100% reduction, meaning the AQA assumptions are already conservative.

As the gas capture system will be a bespoke design, and the lead design contract has not yet been made, we request that the detail of the proposed gas capture system is requested via a planning

condition, to be provided in due course. This would also form part of the Environmental Permit from the Environment Agency, with monitoring to ensure compliance.

Regarding the lagoon capacity, the AQA has been undertaken assuming normal site operations, which is an appropriate approach for planning purposes. The volume of digestate stored within the lagoons would be variable across the year, with a peak volume of 20,000 tonnes anticipated to occur over a period of two months (January and February - in line with feedstock production / export cycles). The assessment has considered storage of the peak volume (20,000m^3) yearlong, reflecting a conservative approach. While the lagoons have a capacity of up to 52,500m^3, this is for contingency purposes only, aligned to standard engineering design. Therefore, should a planning condition be sought regarding this, then it would seem more appropriate to consider the *average* lagoon capacity over the year, as opposed to setting a maximum.

NE State:

ii) "Digestate Solids

Natural England advises that currently not enough information has been included within the AQA to justify an 80% ammonia reduction for "Digestate Solids" (Table 6-17). The specific mitigation measure(s) proposed to reduce emissions from the digestate solids should be clearly specified, as well as the supporting evidence to justify this, as this is not currently clear within the AQA.

It is stated within the AQA that the digestate solids will be stored within an designated area within a separator building, which will be enclosed with passive ventilation (Table 6-16). The 80% ammonia emission reduction has been made in reference to the Misselbrook et al., (2008) study, previously mentioned, however, as this study does not refer to a reduction in emissions from digestate solids achieved by passive ventilation, this reduction is not justified with credible evidence, and further information should be provided to clarify this. "

SLR Response Comment to [A] ii) – Abatement Measures - Digestate Solids

Misselbrook et al (Ammonia Mitigation User Manual, 2008) states *"A rigid store cover has been shown to reduce emissions from slurry storage by 80%"*. Whilst this is stated in relation to storage of pig slurry, as opposed to digestate solids, both have a similar Nitrogen content and therefore in the context of NH_3 emissions pig slurry is considered a suitable surrogate for digestate.

The digestate storage building proposed is a rigid metal structure operating under passive ventilation from a number of lurves. The aforementioned paper does not reference 'active' or 'drawn' ventilation methods for rigid store as referenced elsewhere in the document, therefore it is inferred that the 'rigid cover' considered is passively ventilated. From this it can be considered that the likely reduction in ammonia emissions from a 'rigid store' (passively ventilated and containing slurry) would be the same as that achieved by the digestate storage building (a passively ventilated rigid metal structure containing digestate). As such, application of an 80% reduction in NH_3 emissions as a result of storing solid digestate in the enclosed and passively ventilated digestate storage building is considered appropriate.

NE State:

iii) "Manure Shed Abatement Unit

Natural England advises that currently not enough information has been included within the AQA to justify the ammonia emission reduction achieved by the manure shed abatement unit (Tables 6-17 and 6.18).

The emissions parameters for the abatement unit have been included within Table 6-18, and it is stated, "[the] emission concentration determined in consideration of an assumed performance criteria" (Page 45), however, evidence of this performance criteria has not been provided. In order for you to be satisfied with this reduction, this information should be provided to ensure any reduction is valid."

SLR Response Comment to [A] 2 iii) – Abatement Measures - Manure Shed Abatement Unit

The planning application has omitted details of abatement supplier and design because information can be commercially sensitive. For the benefit of transparency, the applicant can confirm that an odour/NH3 abatement stack system will be installed on the manure shed building. The abatement system will be industry standard such as supplied by https://centriair.com/case/.

The guaranteed performance criteria is provided within Table 6-18 as 0.25 ppm (0.177mg/Nm3) NH3 from the stack.

The applicant would be happy to commit to this performance standard and is expecting that this would also form part of the Environmental Permit from the Environment Agency, with monitoring to ensure compliance. This approach is within the norms of good industry practice, and it is atypical to provide propriety information of abatement design at planning application stage when a performance standard is supplied.
