Sol Environment Limited
Unit 5.3, Paintworks, Bristol,
BS4 3EH

t. +44 (0) 1179 372811
enquiries@sol-environment.co.uk

Mark Jones,
Environment Agency
Quadrant 2,
99 Parkway Avenue,
Sheffield,
S9 4WF

15th October2026

Our Ref: SOL_25_P007_ENG

Dear Mark,

RE: ENGIE RENEWABLE GASES UK LTD, HOME FARM GRANGE AD FACILITY – EPR/NP3829LW/A001

Further to your letter dated 11th August 2026, please find below a response to each of your questions in turn.

1. *Propose measures to reduce nitrogen deposition impacts from the proposed installation at the following ecological sites:*
   a) *Sherburn Willow SSSI*
   b) *Ash Tree Dike Ponds LWS*

Response: Please see attached revised Air Quality Assessment (AQA). The revised assessment utilises alternative meteorological data and updated information on the sites combustion sources. The assessment indicates that while maximum process contribution is slightly above the insignificance threshold of 1% at some locations within the Sherbon Willows SSSI, ecological review concludes that impacts would be considered acceptable. Predicted process contributions at the Ash Tree Dike Ponds LWS were below the Environment Agency threshold across the site and considered insignificant.

As such, based on the updated AQA, no further measures to reduce nitrogen deposition impacts are considered necessary.

2. *Provide an updated dispersion modelling report based on the additional measures proposed in response to question 1. The updated modelling shall also :*
   a) *include an isopleth for nitrogen deposition impacts that shows impacts across the SSSI and LWS.*
   b) *take account of the notes below*

NOTES

Air dispersion modelling

Our audit found higher impacts for nitrogen deposition at Sherburn Willow SSSI and Ash Tree Dike Ponds LWS. In our audit we found that the PC at the SSSI could be up to 5% with background exceeded and the PC likely to exceed the critical load at the LWS. This is because weather data used in the modelling is not representative of the location of the proposed installation. Leeds/Bradford airport has a very different elevation, topography and is 30km north-west of the proposed installation. Church Fenton (6km north is likely to be more representative

Response: Please see attached revised Air Quality Assessment.

Should you have any further questions in relation to the above please do not hesitate to contact me.

Yours sincerely,



Emily Hingston

Annex A – Revised Air Quality Assessment

Revised Ecological Sites Assessment

Proposed Agricultural Anaerobic Digestion Facility, Land East of A162, Home Farm, Bond Ings, Sherburn in Elmet, LS25 6FW

Halstow Energy Limited

SHF.0174.006.AQ.R003.P01

Planning
Architecture
Geoenvironmental
Hydrology
Ecology
Landscape
Transport
Permitting
Noise
Air Quality
Arboriculture

Contact Details

Enzygo Limited (Manchester Office)
4th Floor, Carvers Warehouse,
77 Dale Street,
Manchester,
M1 2HG

Tel: 0161 416 6444
Website: www.enzygo.com
Contact email: conal.kearney@enzygo.com

Ecological Sites Assessment

Project	Proposed Agricultural Anaerobic Digestion Facility, Low Farm
For	Halstow Energy Limited
Reference	SHF.0174.006.AQ.R003.P01
Date	14 October 2026
Author	Conal Kearney BEng (Hons) MSc MIAQM MIEnvSc - Director of Air Quality
Reviewer	Josh Davies BSc (Hons) – Principal Air Quality Consultant

Revision	Date	Status	Reason for Revision
P01	14/10/2026	Draft	-

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Registered Office: Gresham House, 5-7 St. Pauls Street, Leeds, England, LS1 2JG

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1 Introduction

1.1 Background

1.1.1 Enzygo Limited (Ltd) was commissioned by Halstow Energy Limited to undertake an Air Quality Assessment (AQA) to support proposals for an anaerobic digestion (AD) facility at Land East of A162, Home Farm, Bond Ings, Sherburn in Elmet, LS25 6FW.

1.1.2 An air quality assessment (AQA) had been provided by Enzygo [1] to consider impacts from emissions associated with the AD facility at human and ecological sensitive receptors.

1.1.3 Following an audit, the Environment Agency (EA) has requested that the assessment is revised to consider impacts on Sherburn Willows (SSSI) and Ash Tree Dike and Ponds (LWS) using model predictions based on alternative meteorological data:

1 Propose measures to reduce nitrogen deposition impacts from the proposed installation at the following ecological sites:

- *Sherburn Willow SSSI*
- *Ash Tree Dike Ponds LWS*

2 Provide an updated dispersion modelling report based on the additional measures proposed in response to question 1. The updated modelling shall also :

- *include an isopleth for nitrogen deposition impacts that shows impacts across the SSSI and LWS.*
- *take account of the notes below*

NOTES

Air dispersion modelling

Our audit found higher impacts for nitrogen deposition at Sherburn Willow SSSI and Ash Tree Dike Ponds LWS. In our audit we found that the PC at the SSSI could be up to 5% with background exceeded and the PC likely to exceed the critical load at the LWS. This is because weather data used in the modelling is not representative of the location of the proposed installation. Leeds/Bradford airport has a very different elevation, topography and is 30km north-west of the

[1] SHF.0174.006.AQ.R.001.P01 - Air Quality Assessment, Enzygo, January 2026

proposed installation. Church Fenton (6km north) is likely to be more representative.

1.1.4 Whilst Church Fenton meteorological station is located closer to the site the most recent 5 years data available is from the period 2009 to 2013 which arguably sensitive to variations in climate which could introduce a further aspect of uncertainty in the predictions.

1.1.5 As such it was considered that a more accurate representation of site meteorological data would be provided by using Numerical Weather Prediction (NWP) data. NWP data is derived from numerical weather models that simulate atmospheric conditions over the specific geographic area of the site. The data used was also based on the most recently available years, 2021 to 2025.

1.1.6 In addition, the original AQA had made assumptions on the emission conditions from the natural gas engines, emergency diesel generator and biogas boiler. In the interim period more Halstow Energy Limited has provided further specific data on these parameters. As such, these parameters have been updated and provided as inputs in the model.

1.1.7 The AQA used a "rich fen" habitat to describe the Ash Tree Dike Ponds LWS, to use a worst case assessment this revised assessment has considered a 'Broadleaved deciduous woodland' habitat for nitrogen deposition purposes. The N deposition critical load range is 10-15 Kg N/ha/year with a background deposition of 25.06 Kg N/ha/year.

1.1.8 All other modelling inputs, operating assumptions and nitrogen critical loads have remained unchanged from the January 2026 AQA.

1.1.9 The results of the assessment are presented with accompanying isopleths showing nitrogen deposition process contributions (PC) at Sherburn Willow SSSI and Ash Tree Dike Ponds LWS.

2 Revised Inputs

2.1 Combustion Source Process Conditions

2.1.1 The revised process conditions associated with the proposed combustion processes, as provided by Halstow Energy Limited, are detailed in Table 1.

Table 1 Boiler Stack Conditions

Parameter	Unit	800 kW Engine	360 kW Engine	Diesel Gen	Biogas Boiler
Stack Height	m	7.85	7.5	1.232	7.84
Stack diameter	m	0.3	0.2	0.13	0.35
Exit Temperature	˚C	120	150	530	170
Volumetric Flow Rate (at 0°C)	Nm^3/h	3341.31	1498.07	-	800
Volumetric Flow Rate	m^3/s	1.336	0.645	1.150	0.330
Flue gas efflux velocity	m/s	18.90	20.52	93.71	3.43
Oxygen Content	%	9	9	9	9
Moisture Content	%	11	11	11	11

2.1.2 A second 800 kW natural gas engine would be provided on site but only used as a backup to the first engine.

2.2 Combustion Source Emissions

2.2.1 NOx emission rates from natural gas engines were calculated from maximum permitted emission concentrations as defined in medium combustion plant limits. The biogas boiler emissions were based on information provided by Halstow Energy. The specific diesel generator emissions were based on typical plant emissions on the proposed Cummins Generator (Appendix 1).

Table 2 Engine Emission Rates

Pollutant	Emission Concentrations (mg/Nm^3)	Mass Emission Rate (g/s)
800 kW	190[(a)]	0.353
360 kW	190[(a)]	0.158

a) Based on MCPD regulations Referenced at STP, dry gas, 15% O_2

Table 3 Diesel Generator Emission Rates

Pollutant	Emission (g/kWh)[a]	Mass Emission Rate (g/s)
NO_x	5.341	0.653

a) maximum standby power rate 440 kW

Table 4 Biogas Boiler Emission Rates

Pollutant	Emission Concentrations (mg/Nm³)[a]	Mass Emission Rate (g/s)
NO_x	80[(a)]	0.012

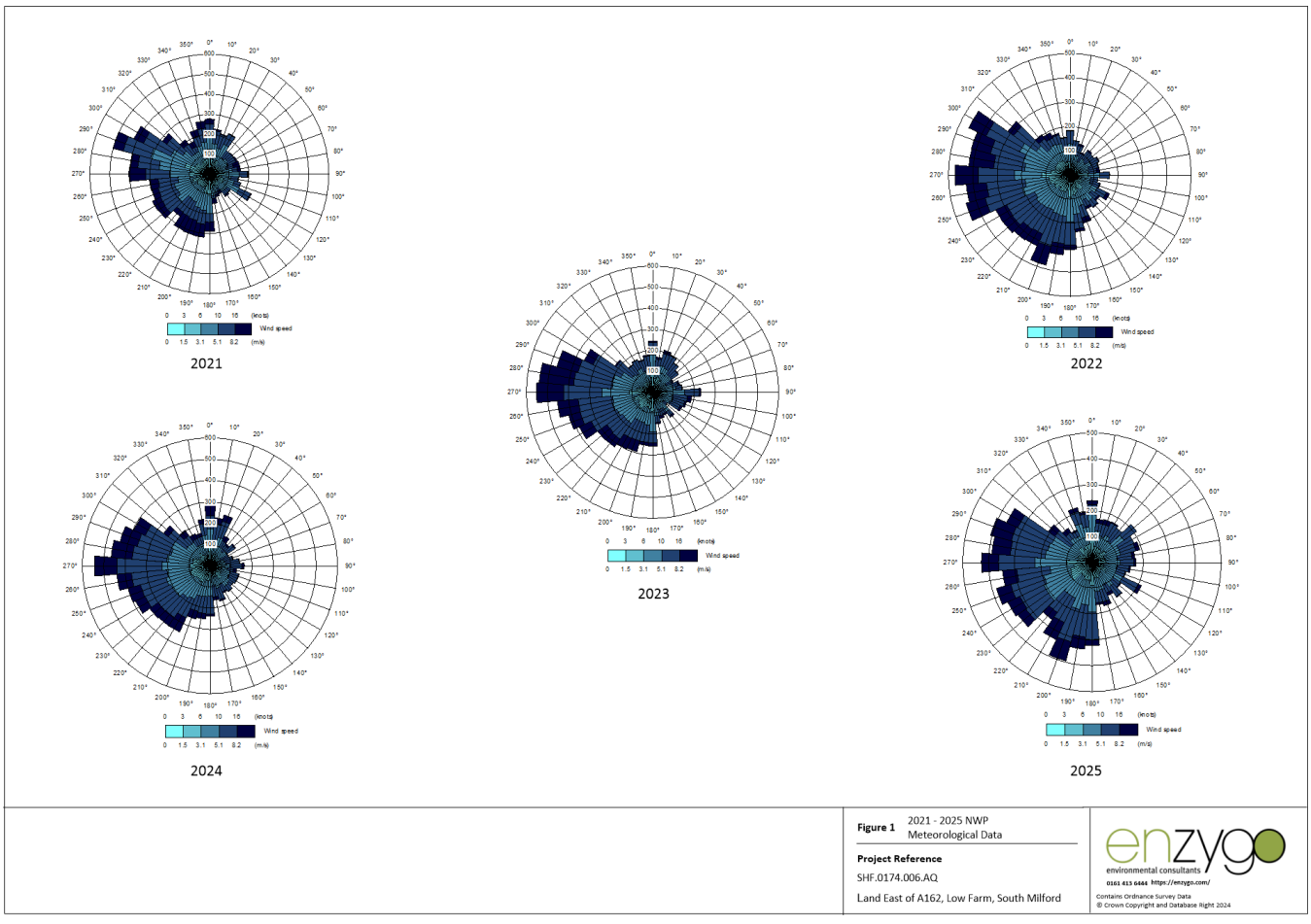
a) Provided by Halstow Energy Referenced at STP, dry gas, 3% O_2

2.3 Meteorological Data

2.3.1 Hourly sequential NWP data used in the assessment was calculated at the site. Maximum emissions across the five years of meteorological data was utilised to ensure a worse case assessment. All meteorological data was provided by ADM Ltd.

2.3.2 Figure 1 shows the wind rose for this data.

Figure 1 NWP Site Meteorological Wind Roses



3 Assessment

3.1 Nitrogen Deposition

3.1.1 Maximum predicted nitrogen deposition at Sherburn Willows (SSSI) and Ash Tree Dike and Ponds (LWS) over a 5-year meteorological datasets for the NWP and the original AQA using Leeds/Bradford airport data are shown in Table 5.

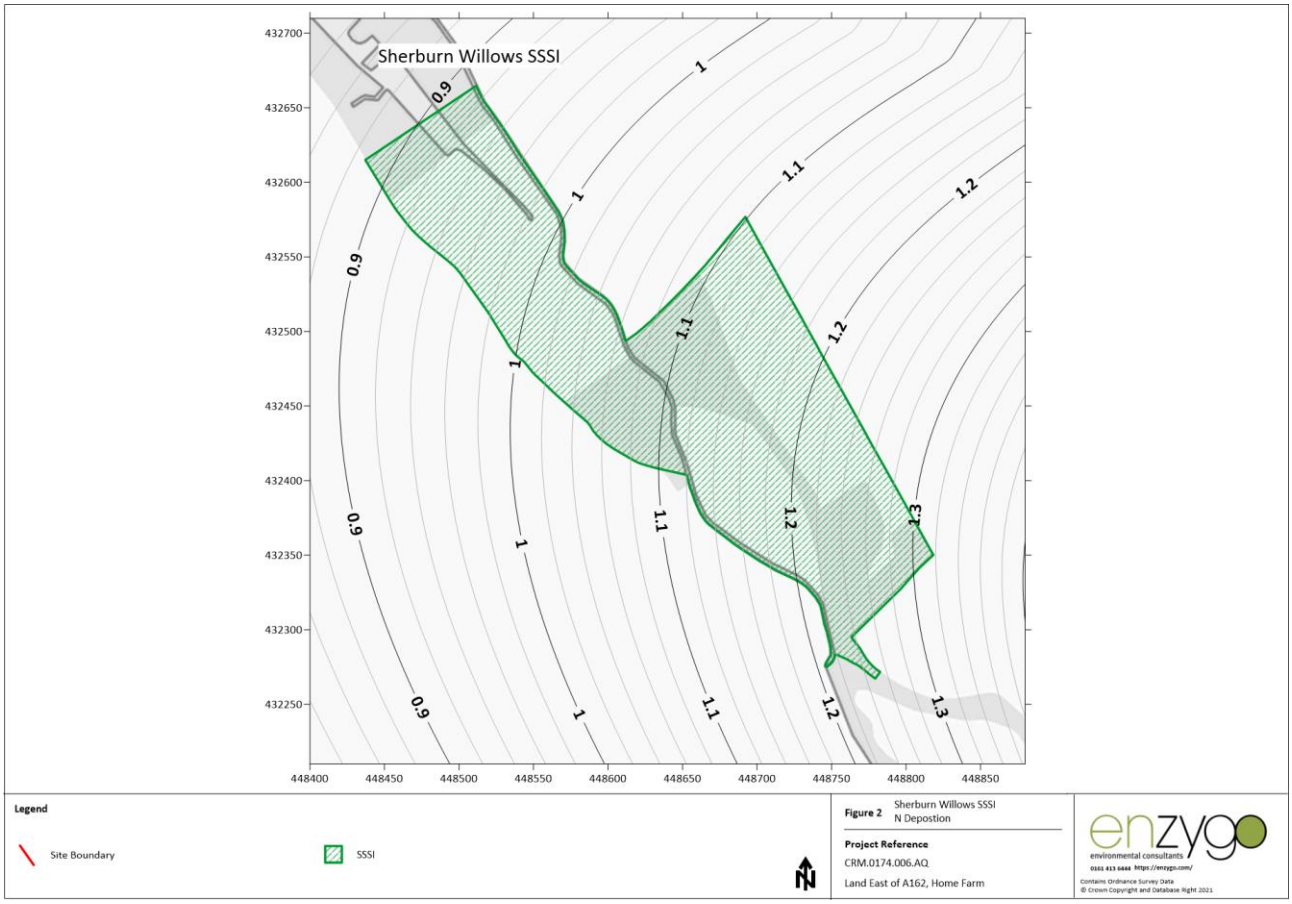
Table 5 Predicted Nitrogen Deposition Impacts

Meteorological Data	Receptor	Predicted Annual Mean Nitrogen Deposition Rate (kgN/ha/yr)		Proportion of CLD (%)			
				Low EQS		High EQS	
		PC	PEC	PC	PEC	PC	PEC
NWP	Sherburn Willows SSSI	0.13	14.0	1.3	140	0.7	70
	Ash Tree Dike and Ponds LWS	6.63	31.7	66.3	317	33.2	158
Leeds/Bradford	Sherburn Willows SSSI	0.14	14.0	1.4	140	0.7	70
	Ash Tree Dike and Ponds LWS	5.20	19.9	34.7	132	20.8	79

3.1.2 The maximum predicted PC proportion of the EQS at Sherburn Willows SSSI using the lower critical load is 1.3% and PEC 140% of the critical which is similar to the previous AQA. The PC measured against the upper critical is below the screening threshold for insignificance and PEC below the critical load.

3.1.3 Figure 2 shows an isopleth for maximum nitrogen deposition at the Sherburn Willows SSSI.

Figure 2 Maximum PC Nitrogen Deposition Isopleth at Sherburn Willows SSSI

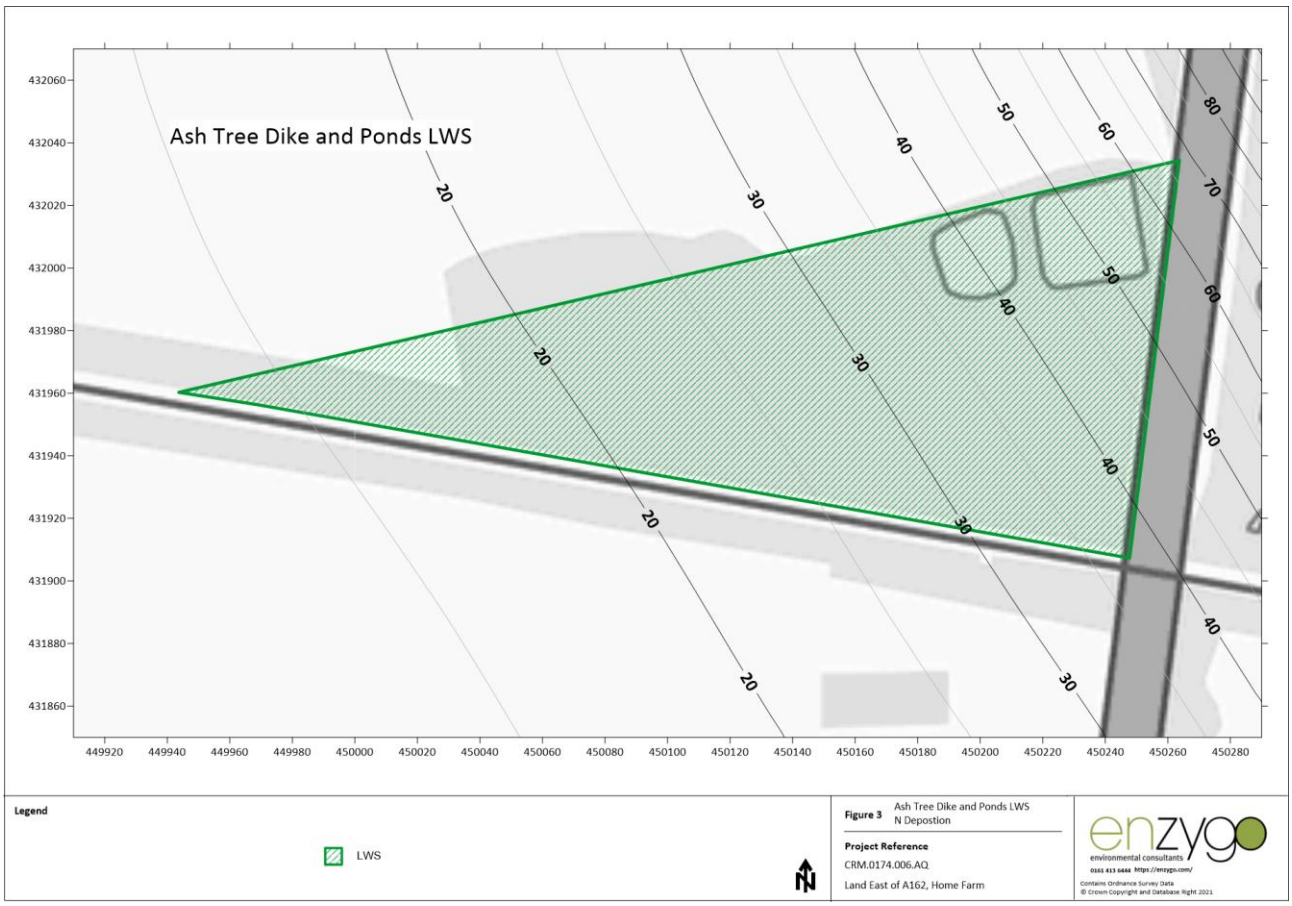


3.1.4 The predictions are based on maximum deposition and maximum likely operating conditions and emissions and, as such, predictions are likely to be an overestimate of actual impacts.

3.1.5 1%PC is the threshold for insignificant impacts but does not infer significance. Similar to the initial AQA further discussion on the impacts at Sherburn Willlows by an ecologist is provided in Appendix 2. This indicates that development impacts remain as not significant at this location.

3.1.6 The maximum predicted PC at the Ash Tree Dike and Ponds LWS is 66.3% of the lowest critical load. This is below the EA's impact insignificance threshold of 100% for local designations and, as such, impacts can be considered as acceptable. Figure 3 shows the isopleth of N deposition and confirms that the PC does not exceed the critical load across the designation.

Figure 3 Maximum Nitrogen Deposition PC Isopleth at Ash Tree Dike and Ponds LWS



3.2 Mitigation

3.2.1 Significant nitrogen emissions controls have been incorporated into the proposed facility most notably through the designed containment of emissions from the lagoon, reception hall and OCU stack.

4 Conclusion

4.1.1 Enzygo Limited was commissioned by Halstow Energy Limited to undertake further air quality assessment work in support of the facility's proposals.

4.1.2 Following an audit, the Environment Agency has requested that the assessment is revised to consider nitrogen deposition impacts at Sherburn Willows SSSI and Ash Tree Dike and Ponds LWS using model predictions based on alternative meteorological data.

4.1.3 Dispersion modelling was undertaken using the most recent site specific NWP meteorological data and using updated information on combustion sources.

4.1.4 The results indicated that the maximum process contribution was slightly above the insignificance threshold of 1% at some locations at the Sherburn Willows SSSI and technical analysis was provided by an ecologist to indicate that impacts should be considered as acceptable.

4.1.5 Predicted process contributions at the Ash Tree Dike and Ponds LWS were below the EA threshold across the site and considered as insignificant.

Appendix 1 Diesel Generator Emissions

Dongfeng Cummin
Techical Operations

Engine Model： QSZ13-G3

Curve and Datasheet： FR20322

EMISSIONS

Gaseous Emissions per GB 20891-2007, at 1500rpm：

- Weight-Specific Nox: ..... - g/kW.h 5.341
- Weight-Specific HC: ..... - g/kW.h 0.124
- Weight-Specific CO: ..... - g/kW.h 0.393
- Weight-Specific Particulates: ..... - g/kW.h 0.026

Appendix 2 Ecological Technical Note

Your Ref: Date: 12th October 2026

Our Ref: SHF.0174.006.EC.R.001 Email: chris.schofield@enzygo.com

RE: Home Farm – Ecology Technical Note

Introduction and Background

The Air Quality Assessment has been revisited and associated air quality emissions remodelled. This remodelling focused on predicted Nitrogen deposition at Sherburn Willows SSSI, with the Process Contribution (PC) proportion of the EQS (Environmental Quality Standard) at this receptor recorded as 1.3%, and the PEC (Predicted Environmental Concentration) exceeding the critical load.

This Technical Note presents further assessment of any potential likely significant effects of N deposition on the interest features of Sherburn Willows SSSI utilising desk-based tools and professional judgement.

Further Assessment of Likely Significant Effects

As detailed within the SSSI citation, the interest features of Sherburn Willows SSSI are its Magnesian limestone (i.e. calcareous) grassland, and its fen, marsh and swamp habitat. The Air Pollution Information System (APIS) website (see Air Pollution Information System) confirms that both these habitats are sensitive to Nitrogen deposition, with calcareous grassland that more sensitive of the two and with lower minimum and maximum critical loads, and therefore the habitat which has been used within the Air Quality screening assessment.

APIS details to effects and implications of Nitrogen deposition on calcareous grasslands which in summary comprise enriching the grassland, favouring fast-growing grasses over specialist wildflowers and reducing species diversity, as well as altering soil chemistry and competitive balance, degrading habitat quality even under traditional management.

Natural England provide details of the condition of the SSSI features, and in relation to Sherburn Willows SSSI confirm both the calcareous grassland and fen, marsh and swamp habitats were most recently recorded as in favourable condition (see Sherburn Willows SSSI feature condition). The most recent condition assessment for calcareous grassland was 2014, and fen, marsh and swamp was 2010. The published condition assessment comments for the calcareous grassland state the following:

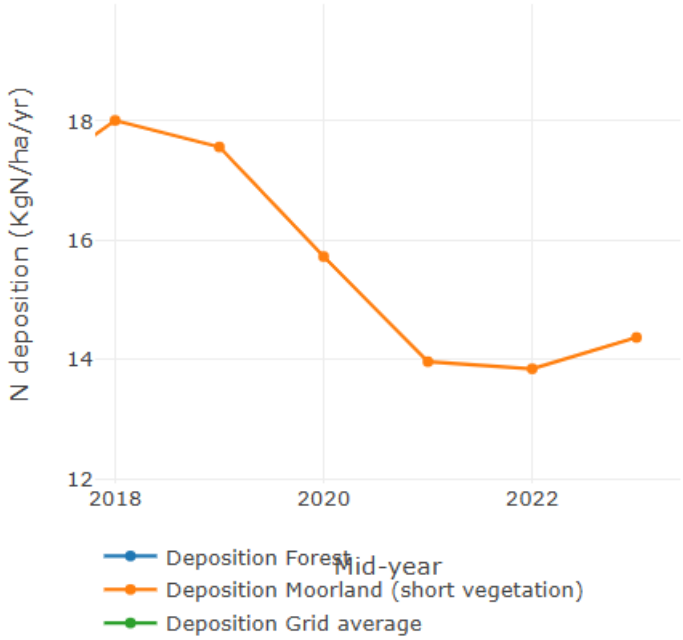
“Continued problems with grazing as at last assessment but cutting regime is adequately managing the sward. Scrub species present throughout but this years

growth only. Calcareous grassland very diverse including following indicator species: Common bird's-foot trefoil, Cowslip, Devil's-bit scabious, Fairy flax, Greater Knapweed, Mouse-ear hawkweed, Oxeye daisy, Hawkbits, Salad burnet, Small scabious, Tor-grass and Upright brome. Other species found: Agrimony, Burnet-saxifrage, Common Restharrow, Field scabious, Harebell, Orchid, Quaking grass, Small sedges and Wild basil"

This does not include any mention of any existing air quality related issues, nor any details related to those effects of Nitrogen deposition as reported by APIS and summarised above (e.g. no mention of favouring fast-growing grasses, alteration of soil chemistry, degradation of habitat quality, and the grassland is described as "very diverse" with numerous indicator species). The only concern is raised in relation to grazing levels. This is an important factor as this indicates there was no reported adverse effects on the SSSI habitats from the background N deposition levels which exceed the low nitrogen critical load value given by APIS for this habitat.

In addition, in review of the Air Quality Assessment it is recognised that the maximum increase in N deposition at Sherburn Willows SSSI is 0.13 kg N/ha/y which is 1.3% of the low critical load of 10 kg N/ha/y. This critical level is presented as a range with the N deposition at only 0.7% of the upper critical load of 20 kg N/ha/y, and if a mid-point were taken of 15 kg N/ha/y, the N deposition would by 0.9% of the critical load and therefore below the 1% screening threshold where impacts can be screened out as insignificant. This confirms the only exceedance of this threshold is at the lower and more precautionary end of this critical load range, and an indication of the low margin of the exceedance.

It is also noted that there has been a recent trend of decline of the background N deposition levels at this receptor, with particularly notable decline since 2018. This trend is illustrated in the chart below taken from APIS.



Insert 1: N Deposition at Sherburn Willows SSSI between 2012 and 2023

The year of the most recent Natural England condition assessment was 2014 and at which time the background N deposition level was 16.22 kg N/ha/y. In 2021, the most recent available year of data, this background deposition was 13.87 kg N/ha/y. The Air Quality Assessment confirms the total maximum annual N deposition including this proposed development, would be 14 kg N/ha/y. This is therefore far below the levels recorded in 2014, and which was the year the condition of the habitats within the SSSI were assessed as favourable. This gives a clear indication the predicted PEC from the development would not cause adverse effects and revised proposal impacts can be considered to be not significant.

It should also be noted that the above recent decreasing trend indicates that current 2025 background levels are very likely below those 2014 levels, and there is no reason to expect that future background levels would not continue to follow this trend. Predicted increases associated with this proposal are so minor that it is assessed as significantly unlikely they would serve to counter this trend.

Through a combination of the above factors it is reasonably assessed that the notably minor exceedance of the 1% screening threshold for Nitrogen deposition is significantly unlikely to result in any adverse effects on the interest features of Sherburn Willows SSSI.

Conclusion

Following the further assessment presented in this document, it is confirmed there is no change in the conclusions from the previous Air Quality assessment, that impacts ecological receptors, including Sherburn Willows SSSI, remain not significant.

I trust this satisfies your requirements. Please let me know if any further information is required.

Your Sincerely



Chris Schofield MSc BSc (Hons) MCIEEM CEnv – Principal Ecologist

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Design & Access Statements

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Baseline and Compliance Monitoring
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Arboriculture
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Tree Surveys and Tree Constraints Plans
Tree and Woodland Management Plans

Air Quality
Air Quality Assessments and Monitoring
Dust Assessment and Management Plans
Odour Assessment and Management Plans

SHEFFIELD

Fox House
1 Fox Valley Way
Stocksbridge
Sheffield
S36 2AA

BELFAST

City East
Business Centre
68 -72 Newton Road
Belfast
BT4 1GW

MANCHESTER

4th Floor
Carvers Warehouse
77 Dale Street
Manchester
M1 2HG

CAMBRIDGE

168 Cowley Road
Cambridge
CB4 ODL

CARDIFF

Regus House
Malthouse Avenue
Cardiff Gate
Buisness Park
CF23 8RU

CROMHALL

The Byre
Woodend Lane
Cromhall
Gloucesterhire
GL12 8AA

CENTRAL BRISTOL

Origin Workspace
40 Berkeley Square
Bristol
BS8 1HP

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