



WQ1 APPENDIX 4 - NOTE IN RELATION TO WQ EN1.8 25 YEAR DESIGN LIFE

Drax Bioenergy with Carbon Capture and Storage

The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations, 2009 - Regulation 5(2)(k)

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Appendix 4 – Note in relation to WQ EN1.8

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SUBJECT: The Applicant’s Response to Written Question 1: EN1.8 on 25 Year Design Life

THE APPLICANT’S RESPONSE TO WRITTEN QUESTION 1: EN1.8 – 25 YEAR DESIGN LIFE

WQ1 EN1.8 Given the uncertainty over the Proposed Development’s 25-year operational lifespan, can the Applicant justify how the assessments represent a worst-case scenario in light of the potential for an investment decision to extend the operational lifespan?

As set out in paragraph 4.5.1 (d) of Chapter 4 (EIA Methodology) of the ES (APP-040) the EIA has been carried out in line with the operation and maintenance scenario design life of 25 years, in line with paragraph 2.5.1 of Chapter 2 (Site and Project Description) of the ES (APP-038). Each ES individual topic assessment has identified and assessed a reasonable worst case, and, as described within this note, if the Proposed Scheme were to be in operation longer than 25 years, the environmental effects are not expected to be any be worse than those assessed in the ES. Furthermore, the assumed design life of 25 years has been used in similar projects, including Keadby 3. Operational activities will be regulated through a variation of the existing Environmental Permit and will be managed via the Applicant’s EMS which is certified to ISO14001:2015, both of which will be in place for the lifetime of the Proposed Scheme.

Each assessment has been carried out in accordance with the methodologies detailed in each of the respective ES topic chapters, Chapters 5 – 18 of the ES (APP-041 – 054).

The individual topic assessments are carried out in accordance with these methodologies which follow industry standards and guidance, good practice and are informed by professional knowledge and experience. It is these methodologies that define how the assessment is carried out including, where appropriate, the assessment year. In general terms the assessments have considered an assessment of the potential environmental impacts “with the Proposed Scheme” in comparison with the baseline, both current and future, “without the Proposed Scheme”. Whilst the future baseline takes into account future conditions without the Proposed Scheme and aims to align with the period for which the Proposed Scheme is anticipated to operate for, there are inherent uncertainties in predicting future conditions and this is discussed, where appropriate, within the topic chapters.

The text below provides additional detail on a topic-by-topic basis in relation to how the assessments represent a worst-case scenario. Reference should be made to each of the

individual ES topic Chapters as the text below has been simplified for the purposes of this Written Question response.

TRANSPORT

As set out in the Transport Assessment (APP-041 para 5.9.83) traffic flows will be very low once the Proposed Scheme is operational. The vehicle numbers generated will be significantly lower than experienced during the construction phase (which has been assessed as the worst case). There will be an overall net reduction of circa 180 people in the workforce required to operate Drax Power Station compared to the 2018 baseline traffic data. The overall effects during the operational phase are therefore considered to be negligible (not significant). Any extension to the operational lifespan is not expected to increase the numbers of staff on-site, or generate additional deliveries to and from the site. Therefore, the worst case assessment of the Proposed Scheme during construction represents the worst case scenario for transport at any time during the construction or operation of the Proposed Scheme.

AIR QUALITY

In accordance with the Environment Agency 'Air emissions risk assessment for your environmental permit' (2021) guidance, both the short-term (hourly / daily) and long-term (annual) assessments are carried out and the processed model outputs comprise concentration data for each pollutant. In accordance with the guidance, for the long-term assessment the worst case year, out of a five year period, is assessed. The assessment considers the baseline along with the "with Proposed Scheme" and the "with Proposed Scheme and Other Projects". As detailed in ES Chapter 5: Air Quality, section 6.5.55 (b), in the core model scenarios, the non-BECCS Biomass Units at Drax Power Station are assumed to operate at full load for up to 4,000 hours per annum (i.e., a 'mid-merit' operating regime), representing a robust and realistic projection for future baseline operation. The BECCS units are assumed to operate continuously at baseload for all hours of the year. However, further sensitivity model scenarios have been completed, as reported in ES Appendix 6.3 (APP-127), whereby the non-BECCS units also operate continuously at baseload for all hours of the year which represents the "worst case emissions profile" profile from the Proposed Scheme. In relation to future baseline without the Proposed Scheme it is anticipated that air quality would remain unchanged or would slightly improve (due to the expected reduction in vehicle emissions as older, more polluting vehicles are replaced by cleaner vehicles), however, no improvement in air quality in the future baseline has been assumed for the assessment which makes it inherently conservative. Overall, the design life of the Proposed Scheme is not a factor in the assessment and the worst case, as detailed above, has been assessed.

NOISE

In basic terms, the noise assessment compares the background sound level with the rating level of the sound source as described in BS4142:2014+A1:2019 (British Standards Institute, 2014). Within the assessment, the future baseline without the Proposed Scheme for noise is not anticipated to be substantially different to the current. Overall, the design life of the Proposed Scheme is not a consideration in the noise assessment. It should be noted that, as agreed with the LPA, operational vibration was scoped out of the assessment.

ECOLOGY

The assessment of significance on Important Ecological Features has been carried out in accordance with Chartered Institute of Ecology and Environmental Management (CIEEM) Ecological Impact Assessment (EclA) Guidelines (CIEEM, 2018). Each significant effect is assessed based on a number of factors including the magnitude of impact (incorporating intensity, frequency and spatial range) and the sensitivity of habitats and species to developmental changes. The assessment, whilst taking into account changes over time, does not specifically look at the design life of the Scheme as a factor. The future ecological baseline is expected to remain similar to the existing baseline for at least the next five to 10 years, with no significant changes anticipated. In relation to the future baseline without the Proposed Scheme, the climate in the UK is expected to change over the next 50 years with hotter summers, dryer land and rainfall patterns more variable which could lead to a decline in some water reliant habitats. Whilst it is likely that there may be changes in population numbers and distribution of species in the long term within the Order Limits and Off-site Habitat Provision Area, it is problematic to assess the potential impacts of climate warming on ecological features including analysing their population trends as these are also influenced by other environmental factors. The changing of land use as a result of the Proposed Scheme is likely to have a greater influence on biodiversity specifically during construction which is when the majority of effects would take place. Overall, the outcome of the assessment is not informed by the “design life” of the Scheme.

LANDSCAPE AND VISUAL AMENITY

The assessment has been carried out in accordance with the ‘Guidelines for Landscape and Visual Impact Assessment’ 3rd Edition (2013), (GLVIA3) (Landscape Institute and the Institute of Environmental Management and Assessment (IEMA), 2013). Accordingly an assessment of impacts is carried out for years 0 (opening year), 5 and 15. It is considered in landscape and visual amenity terms that year 0 is considered the worst case as mitigation planting is not yet established and does not yet contribute to the screening and integration of the Scheme. In respect of future baseline without the Proposed Scheme, defined as 2044 for the purposes of the assessment, it is considered that this would be comparable to the present day. In conclusion, the design life is not considered a relevant factor in the assessment of landscape and visual amenity and the worst case for the Proposed Scheme been considered.

HERITAGE

Operational impacts from the Proposed Scheme were scoped out as it is considered that impacts would only take place during construction. As such, design life is not a factor in the assessment.

GROUND CONDITIONS

The assessment of impacts on ground conditions is informed by Design Manual for Roads and Bridges (DMRB) Sustainability & Environmental Appraisal, LA 109 Geology and Soils (Table 3.11) (Highways England, 2019) in addition to professional experience. In terms of temporal scope for the assessment, long term, permanent impacts consider a period of 10 to 15 years or more. Impacts during operation were all assessed as being not significant prior to the

implementation of mitigation, and operational activities will be regulated through a variation of the existing Environmental Permit and will be managed through the Applicant's Environmental Management System which is certified to ISO14001:2015, both of which will be in place for the lifetime of the Proposed Scheme. In respect of future baseline without the Proposed Scheme, it is considered that it is likely to be unchanged from the current baseline. As such the design life of the Proposed Scheme is not considered a relevant factor in the assessment of ground conditions and the worst case for the Proposed Scheme has been considered.

WATER ENVIRONMENT

The Flood Risk Assessment (AS-088 and AS-090) for the Proposed Scheme has considered both a 25 year design life and a 60 year design life as agreed with the Environment Agency. With regards to water quality, the Proposed Scheme will be designed to contain pollutants in accordance with relevant legislation (refer to ES Chapter section 12.10 for further details). A Surface Water Drainage Strategy (APP-162) has been produced for the Proposed Scheme and a surface water drainage scheme for the Proposed Scheme is secured via Requirement (10) Surface water drainage of the draft Development Consent Order (AS-025). Potential effects on the water environment during operation would also be controlled by via the requirements in the Environmental Permit and adherence to other legislative requirements which would apply to the Proposed Scheme for as long as it is in operation. Groundwater was scoped out of the assessment during operation. As such the worst case in relation to the water environment has been assessed which takes into consideration the potential for the Proposed Scheme to operate beyond the 25 year design life.

MATERIALS AND WASTE

The IEMA Guide to Materials and Waste in EIA ('IEMA Guide') (Institute of Environmental Management and Assessment, 2020) has been used to assess the potential impacts of the Proposed Scheme, using the process and significance criteria it sets out. Method W1 (Void Capacity, as detailed in the IEMA Guide) has been used to best reflect the scale and nature of the Proposed Scheme. The assessment considers the disposal and recovery of waste associated with the Proposed Scheme beyond the first year of operation to assess the potential impacts of the Proposed Scheme on existing landfill capacity. It should be noted that an assessment of materials associated with the Proposed Scheme during operation was scoped out.

The North Yorkshire Minerals and Waste Joint Plan (adopted by North Yorkshire County Council (NYCC) in February 2022) (NYCC, 2022) considers the availability of waste management facilities in the region up to 2030. It is noted in the MWJP that a shortfall of remaining landfill capacity has been identified and development of additional landfill sites is proposed. However, at this stage, the volume of any additional (proposed) capacity is not known. Accordingly the data is not available to compare landfill capacity beyond 2030.

However, the guidance states that when assessing the magnitude of operational waste it should be assessed over the course of any one full year and justifiable representative year within the first three years of commission, and therefore a longer design life is not a consideration in the assessment and the worst case has been assessed.

CLIMATE CHANGE RESILIENCE

The assessment of climate resilience has been carried out in accordance with the DMRB LA 114 Climate (Highways England, 2021) and IEMA Environmental Impact Assessment guide to Climate Change Resilience and Adaptation (2020). In line with the methodology the assessment considers the consequence and the likelihood of potential impacts associated with changes in climate variables on the Proposed Scheme.

As detailed in paragraph 14.5.7 of Chapter 14 (Climate Resilience) (APP-050) “There are inherent uncertainties associated with climate projections and they are not predictions of the future. It is possible that future climate will differ from the future baseline climate against which the resilience of the Proposed Scheme has been assessed, depending on global emissions over the next century. A ‘high’ emissions scenario (RCP (Representative Concentration Pathways) 8.5) using the 2050s time slice (2040 – 2059*) has been used to develop the baseline against which resilience has been assessed. This is consistent with the precautionary principle (i.e., ‘worst case’ scenario).” [*Note: within the ES Chapter the 2050s time slice was incorrectly identified as 2040 – 2059. This is a typo and the correct range is 2040 – 2069 as used above.] With regards to baseline to identify the anticipated climate conditions over the life of the Proposed Scheme (design life of 25 years) the future baseline is presented for the 2020s (2010-2039) and the 2050s (2040-2069) using the reference period of 1981-2010. These results are presented for the 50th percentile which is in accordance with the IEMA guidance which recommends the use of the 50th percentile of the RCP 8.5 climate scenario. Whilst the chapter refers to a 25 year design life it should be noted that the time slice used for future baseline considers climate change resilience of the Proposed Scheme up to 2069 which is a design life of up to 42 years (based on the first BECCS unit being operational by 2027 as detailed in section 2.3.7 of Chapter 2: Site and Project Description (APP-038)).

As detailed in section 14.9.7, those factors that were identified as having the potential for significant effects were: flooding, extreme temperatures resulting in material degradation and wind loading on the Main Stack.

In relation to extreme temperatures and wind loading, as detailed in sections 14.10.6 and 14.10.7 of ES Chapter 14: Climate Resilience, the Proposed Scheme will be designed and (and maintained) in accordance with UK Building Regulations and BS EN design codes for both wind loading and extreme temperatures and will be realigned to any changes to UK Regulations and BSI updates to codes during subsequent design phases. Any new buildings will also be designed to accommodate temperatures up to 35 degrees with no risk to health and safety of occupants and components for worst-case scenario temperatures up to 2069. Additionally fire protection standards as detailed in Appendix 14.2 (APP-167) would be followed. It is also important to note that the Proposed Scheme is made up of numerous components which each have a different life span and would undergo planned preventative maintenance so that these are maintained and replaced accordingly. With regards to flooding, refer to the response relating to the “Water Environment” above.

In conclusion it is considered that the climate resilience assessment has considered a “worst case” with regards to design life which is proportionate given the inherent uncertainties involved

in climate change predictions, but which also goes beyond the defined 25 year design life and which incorporates mitigation via both the design and maintenance of the Proposed Scheme.

GREENHOUSE GASES

As detailed in ES Chapter 15 Greenhouse Gases sections 15.11.5 and 15.11.6 (APP-051), in the future baseline (without the Proposed Scheme), operational emissions would include emissions from the biomass fuels for electricity generation, as well as their supply chain for two operational units which totals 558,778 tCO₂e. With the Proposed Scheme, operational emissions are anticipated to total minus 7,975,620 tCO₂e. However, certain assessed GHG emissions, such as supply chain emissions, are likely to reduce over time (such as transport) therefore increasing the carbon savings achieved by the Proposed Scheme.

Taking into account the lifecycle impacts, the Proposed Scheme scenario is considered to be significantly more beneficial when compared to the future baseline without the Proposed Scheme due to the operational sequestration of carbon.

POPULATION, HEALTH AND SOCIO-ECONOMICS

During operation, this assessment considers generation of indirect and induced employment opportunities. There is no formal guidance to assess the generation of employment opportunities, so the assessment is based on professional judgement and knowledge and experience of similar schemes, applying the approaches outlined in the English Partnerships Additionality Guide (Homes and Communities Agency, 2014) (the “Additionality Guide”). The effects of indirect and induced employment opportunities were deemed to be a direct, permanent, long-term, slight beneficial (not significant) effect on the regional economy prior to the implementation of mitigation measures and were therefore not subject to further assessment. Should the design life of the Proposed Scheme be extended it is considered that a slight beneficial effect would equally apply as indirect and induced employment opportunities would be generated for as long as the Proposed Scheme is in operation.

CUMULATIVE

The methodology detailed within Planning Inspectorate Advice Note Seventeen: Cumulative effects assessment relevant to nationally significant infrastructure projects (2019) has been used to assess the cumulative effects of the Scheme. Intra project effects consider the worst case inherently as topic assessments have considered this in their individual assessments. In respect of the assessment of inter project effects, existing ‘other existing development and/or approved development’ are assessed. The assessment is therefore carried out on the information available for ‘other existing development and/or approved development’ to enable an appropriately focussed and proportionate assessment to be carried out, rather than being defined by a temporal scope. It is noted in the advice note that for developments that are considered to be “Tier 3” there is a diminishing degree of certainty which can be assigned to each development. Plans and projects that extend beyond the medium term e.g. 5 – 10 years are likely to fall into “Tier 3” due to information not being available to enable an assessment to be carried out. As such it is the availability of the information that defines the temporal scope of the assessment rather than the design life of the Proposed Scheme. An appropriately focussed

and proportionate assessment has been carried out, in line with Planning Inspectorate guidance, and accordingly a worst case has been assessed.

CONCLUSION

As set out above each topic and the cumulative effects assessment has considered the worst case situation. Generally worst case situations for the Proposed Scheme either occur during construction or at the year of opening when mitigation has not yet taken effect.

Where assessments have been undertaken for years after opening of the Proposed Scheme these either:

- Consider a period greater than 25 years. These assessments relate to climate change predictions (e.g. flood risk and climate change resilience); or
- Consider shorter future year periods. For these assessments they are carried out in accordance with accepted good practice / standards. Any future year impacts past those assessed are likely to be similar to and no worse than those assessed.

In summary, the assessments represent the worst-case scenario and, accepting the inherent uncertainty with future forecasting, are unlikely to worsen if the operational lifespan were to be extended.