

APPLICANT'S SUMMARY OF ORAL CASE AT ISSUE SPECIFIC HEARING 3 (ISH3)

Drax Bioenergy with Carbon Capture and Storage

The Infrastructure Planning (Examination Procedure) Rules 2010 - Rule 8(1)(c); The Planning Act 2008

Document Reference Number: 8.6.4

Applicant: Drax Power Limited

PINS Reference: EN010120



REVISION: 01 DATE: 28 March 2023 DOCUMENT OWNER: Pinsent Masons AUTHOR: Matthew Fox APPROVER: Richard Griffiths PUBLIC

WRITTEN SUMMARY OF DRAX POWER LIMITED'S ORAL CASE PUT AT ISSUE SPECIFIC HEARING 3: ENVIRONMENTAL MATTERS 22 MARCH 2023

1. **INTRODUCTORY REMARKS**

- 1.1 Issue Specific Hearing 3 was held at 10:00am on 22 March 2023, both in person at The Parsonage Hotel & Spa, Escrick, York, YO19 6LF and using the virtual platform of Microsoft Teams.
- 1.2 Issue Specific Hearing 3 took the form of running through the items listed in the agenda published by the Examining Authority ("**The ExA**") on 6 March 2023 (the "**Agenda**"). The discussion predominantly focused on the following environmental considerations in relation to the proposed Drax Bioenergy with Carbon Capture and Storage ("**BECCS**") project (the "**Scheme**"):
 - 1.2.1 biodiversity;
 - 1.2.2 design, landscape and visual considerations;
 - 1.2.3 highways; and
 - 1.2.4 noise and vibration.

2. AGENDA ITEM 1 – INTRODUCTION OF THE SPEAKING PARTICIPANTS

- 2.1 The ExA: Caroline Jones and Ben Northover.
- 2.2 Drax Power Limited (the "**Applicant**"):
 - 2.2.1 Speaking on behalf of the Applicant: Richard Griffiths (Partner at Pinsent Masons LLP).
 - 2.2.2 Present from the Applicant: Jim Doyle (Planning and Consents Manager) and Chris Summers (Technical Manager Operations).
 - 2.2.3 The Applicant's consultants and legal advisors: Alexis Coleman (Senior Associate at Pinsent Masons LLP), Matthew Fox (Associate at Pinsent Masons LLP), Bethan Tuckett-Jones (Air Quality, Technical Director, WSP), Philip Peterson (Ecology, Technical Director, WSP), Stuart Ireland (Ecology, Technical Director, WSP), Graham Lee (Landscape and Urban Design, Technical Director, WSP), Andrew Williams (Landscape and Urban Design, Technical Director, WSP), Vinny Holden (Transport, Technical Director, WSP), Esteban Olmos (Noise, Associate Director, WSP) and Nicola Ashworth (EIA, Associate Director, WSP).

- 2.3 North Yorkshire County Council and Selby District Council: Kelly Dawson (representing both organisations, together the "Local Planning Authorities").
- 2.4 North Yorkshire County Council: Michael Reynolds, Julia Casterton, John Wainwright and Paul Roberts.
- 2.5 Selby District Council: Jenny Tyreman and Jack Hopper.
- 2.6 National Highways: Simon Jones.
- 2.7 Biofuelwatch: Katy Brown and Mary Dickinson.

3. AGENDA ITEM 2 – PURPOSE OF ISSUE SPECIFIC HEARING 3

3.1 **The ExA** set out the purpose of Issue Specific Hearing 3 to all parties.

4. **AGENDA ITEM 3 – BIODIVERSITY**

Internationally and Nationally Designated Sites

Loss of functionally linked land

- 4.1 **The ExA** requested an update in relation to air quality, querying if Natural England have received the information provided in the Applicant's technical note. **Richard Griffiths** noted that the Applicant has indeed provided this information to Natural England and discussions remain ongoing between the parties.
- 4.2 **Richard Griffiths** noted that, per the Applicant's Statement of Common Ground ("**SoCG**") with Natural England (REP-020), the parties are now agreed that the disturbance of habitats during habitat creation activities in the Off-site Habitat Provision Area will not lead to significant effects on qualifying interests of European Sites or citation features of Sites of Special Scientific Interest. This follows the provision of additional information from the Applicant, which is summarised in Table 3.3 of the Habitats Regulation Assessment ("HRA") Report (REP2-101). This is reflected in row 4.3.4 of Table 4.3 of the SoCG with Natural England (REP-020).
- 4.3 Natural England have requested additional assessment of the potential for loss or disturbance of functionally-linked land associated with Work Number 8. The Applicant has provided additional assessment in response to this request in item 4.5 of the Applicant's Responses to Issues Raised at Deadline 2 (REP3-020) and understands that Natural England is reviewing this additional information and will respond to it by Deadline 4.
- 4.4 **Richard Griffiths** added that the Applicant has been in discussions with statutory undertakers in relation to overhead line telecommunications, with detailed design for undergrounding now in place. This involves less land take for these works. The Applicant is confirming the reduction in

land necessary for these works with the statutory undertakers, with a view to submitting a change application to reduce the area of land required. This would go before Natural England to assist them with their assessment. The ExA gueried the timescales for this, which Richard Griffiths confirmed would be approximately mid-April. This will involve a reduction in land, but Richard Griffiths noted that the Infrastructure Planning (Compulsory Acquisition) Regulations 2010 will be invoked, because whilst there would be a reduction in the redline boundary (particularly regarding functionally-linked land), there will be a step-up in the powers sought over a small number of plots (specifically seeking to impose rights over plots where it has to date only been proposed that existing rights should be extinguished). This needs to be built into the timetable. The ExA noted its previous advice regarding changes applications, which Richard Griffiths noted it will have due regard to, but mindful of the engagement that has been undertaken to date and will continue to be undertaken with land interests for these plots. This was discussed further at the Compulsory Acquisition Hearing the following day.

Impacts of acid deposition

- 4.5 **The ExA** noted that Natural England have requested updates to the HRA Report and queried if the most recent HRA Report includes these. **Philip Peterson** confirmed that it does, noting in particular Appendices 7 and 8 to the HRA Report.
- 4.6 The Applicant has concluded that the impacts of the Scheme on aerial acid deposition, both alone and in-combination, will not lead to adverse effects on the integrity of European Sites.
- 4.7 Since the Application was submitted, the Applicant has provided additional information in relation to this issue to Natural England and into the Examination through the updates to the HRA documentation.
- 4.8 The Applicant would highlight that the air quality impacts of the Scheme (and other plans and projects) have been reduced since the Application, as reported in Air Quality Technical Note 2 (REP2-065) and the updated Appendix 6.5: Operational Phase Air Quality Results Tables: Ecological Receptors (REP2-034).
- 4.9 Key references include the updated HRA Report (REP2-101), Appendix 7 (REP2-107) and Appendix 8 (REP3-009) of the HRA Report, with additional supporting material in the updated dispersion (air quality) modelling as reported in Air Quality Technical Note 2 (REP2-065) and the updated Appendix 6.5: Operational Phase Air Quality Results Tables: Ecological Receptors.
- 4.10 The Applicant's conclusion has been reached on the following basis:
 - In relation to Lower Derwent Valley SAC: that Natural England Long Term Monitoring Protocol data for Breighton Meadows SSSI (this

SSSI is part of the Lower Derwent Valley SAC) supports the use of the 'calcareous grassland' rather than 'acid grassland' critical load for acid deposition. 'Calcareous grassland' habitats are less sensitive to acid deposition than 'acid grassland habitats; the conservatism of the assessment in light of historical declines of acid deposition; national SO2 emissions reduction targets; and in relation to the Lower Derwent Valley SPA the lack of sensitivity of the affected bird features.

- In relation to the River Derwent SAC, as per the HRA Report and Appendices 7 and 8, the features present are of limited sensitivity and the River Derwent has a high acid buffering capacity, as reported in Environment Agency monitoring data. The receiving habitat is therefore considered not sensitive.
- At Thorne Moor SAC: the conservatism of the assessment in light of substantial historical declines of acid deposition; national SO2 emissions reduction targets; and in relation to Thorne Moor SPA the lack of sensitivity of the affected bird features.
- 4.11 **Philip Peterson** also noted that correspondence with Natural England is ongoing, particularly in relation to Lower Derwent Valley and Thorne Moor. The Applicant's position is that there is no adverse effect on the integrity of those sites either in-combination or alone, from acid deposition in the Proposed Scheme scenario. The Applicant has responded to clarification requests and expects Natural England to respond at Deadline 4.
- 4.12 **Richard Griffiths** noted that mitigation measures will be secured in the Applicant's Environmental Permit.
- 4.13 **Philip Peterson** confirmed that impacts from the Proposed Scheme are now predicted to be below the 1% screening threshold for the abovementioned sites, for the Scheme alone.

Impacts of nitrogen deposition

- 4.14 **The ExA** again queried the position in relation to the River Derwent, which **Philip Peterson** confirmed is the same response from the Applicant in relation to Appendix 7 of the HRA Report above.
- 4.15 **The ExA** then queried the position in relation to Thorne Moor, noting that Natural England have concerns in relation to the conservation objective for air quality. **Philip Peterson** confirmed that discussions are ongoing, with the additional information on this point having been put into the latest iteration of the HRA Report.
- 4.16 **The ExA** noted that Natural England have requested the monitoring of nitrogen deposition to be secured via a requirement. **Philip Peterson** confirmed that the Applicant has noted this request, with the Environmental Permit intended to be used to complete the monitoring of

emissions from the main stack. Natural England have made reference to the monitoring of nitrogen deposition, acid deposition, and ammonia concentrations at the individual sites. **Dr Bethan Tuckett-Jones** confirmed that the Applicant has noted many times that there are no available survey techniques that would allow it to detect the nitrogen (or acid deposition or ammonia concentrations) contribution from the Scheme and reliably separate these from the background contribution. The deposition rate/concentration of these pollutants is heavily influenced by weather conditions, to the extent that weather-induced variations would outweigh variations arising from the Proposed Scheme. Monitoring of emissions from the Proposed Scheme at the designated sites themselves cannot practically be achieved. This matter was also discussed in the Applicant's response to FWQ 1.27 [REP2-060].

- 4.17 **The ExA** asked if discussions relating to this point had taken place with Natural England. **Philip Peterson** confirmed that whilst there has been no direct response from Natural England on this point thus far, the Applicant expects this in their Deadline 4 submissions and further engagement is being sought.
- 4.18 **Richard Griffiths** noted that Natural England's request in relation to monitoring was made before they saw the updated air quality information, in which it was concluded that there would be no adverse effects. Therefore, if Natural England agree with this assessment, then the extra monitoring may no longer be requested. The Applicant hopes to receive confirmation of this at Deadline 4.
- 4.19 **Katy Brown** raised a concern of the lack of reference to uncertainty in the Applicant's modelling, noting that Natural England should consider this if critical loads are being exceeded. **Richard Griffiths** responded that a reasonable worst-case scenario is inherently taken into account in the modelling, with the Applicant having responded to Biofuelwatch's comments in its late submission at Deadline 3 the Applicant will provide an updated document at Deadline 4 which shows the consideration of uncertainty.
- 4.20 **Katy Brown** also noted that a comment has been made from the Environment Agency in relation to modelling and nitrogen deposition which indicates they have no concerns. **Katy Brown** sought to ask Natural England if they agreed with the Environment Agency's position and whether the monitoring has been validated before the Application was submitted. This point will be put into Biofuelwatch's written submissions.
- 4.21 **Richard Griffiths** noted that the Applicant's SoCG with Natural England (REP-020) contains the agreement on the approach. The Applicant will explain how it complies with its Environmental Permit in relation to aerial emissions.
- 4.22 In response to **the ExA's** questions about where impacts to Sites of Special Scientific Interest that are not part of the European sites are

considered, the Applicant notes that this is dealt with in paragraph 8.11.12 and onwards of the Biodiversity chapter of the Environmental Statement (APP-044). The Applicant also highlights that additional assessment of cumulative air quality impacts on SSSI is included in the Ecology section of Table 1.1 of Appendix 18.5: Cumulative Assessment Matrix (REP2-051), in relation to Development 92, and in the updated cumulative assessment documentation submitted at Deadline 4.

Impacts of ammonia

- 4.23 **The ExA** queried if Natural England's concerns related to Thorne Moor, with **Philip Peterson** confirming this and noting that the information is in the latest version of the HRA Report (REP2-101).
- 4.24 With the updates to the dispersion (air quality) modelling as set out in Air Quality Technical Note 2 (REP2-065), no exceedances of the 1% significance screening threshold for ammonia are predicted for any designated site.
- 4.25 This is the case for both the Proposed Scheme alone, and the Proposed Scheme assessed in combination with other plans and projects.
- 4.26 This applies regardless of the application of operational emissions abatement, with results set out in Table 1.15 of the updated Appendix 6.5: Operational Phase Air Quality Results Tables: Ecological Receptors (REP2-034).
- 4.27 **The ExA** noted that Natural England have suggested that ammonia at these sites be monitored. **Bethan Tuckett-Jones** responded that whilst ammonia can be measured, it is again near-impossible to identify the Scheme's contribution from background levels. **The ExA** queried if this could be linked to the monitoring of air emissions as part of the Environmental Permit, but **Bethan Tuckett-Jones** responded that the method to do this would be via modelling, with the problem being that the levels of uncertainty of measurements in the air are too high and the contribution from the Scheme is too small to be ascertainable. The majority of ammonia levels in the air reflect agricultural activities, which are subject to substantial day-by-day, month-by-month, and inter-year variation.

Proposed mitigation for aerial emissions

4.28 **The ExA** queried if this would be covered in the Environmental Permit. **Richard Griffiths** confirmed that it would, with Natural England confirming this approach and noting that this is how the Applicant already monitors pollutants. The Applicant seeks to avoid duplication, meaning the technology and monitoring requirements will be secured in the Environmental Permit. The Applicant is discussing the request for monitoring at individual sites with Natural England.

- 4.29 **The ExA** asked if the Applicant could submit details of this monitoring. **Jim Doyle** responded that the Applicant has a series of monitoring measures in place, these are measured by continuous emissions monitoring systems. The Applicant submits to the Environment Agency a monthly report which identifies the data from these systems. **Bethan Tuckett-Jones** noted that the instruments used by the Applicant in this process are subject to regular calibration. **Richard Griffiths** noted that the existing Environmental Permit is submitted into the examination (REP2-006). **Jim Doyle** confirmed that the Applicant would explain how it carries out the monitoring in its post-hearing submissions. This is contained in **Appendix 1**.
- 4.30 **The ExA** queried what would happen if the Applicant does not reach an agreement with Natural England. **Richard Griffiths** noted that the Applicant is confident of reaching an agreement, but has begun to prepare a without prejudice derogation case on a purely precautionary basis. If necessary, the Applicant would aim to submit this in time for questions from **the ExA** and other parties before the end of examination.

Protected Species

Badgers

- 4.31 **The ExA** noted that the Applicant has stated in its Deadline 3 submissions that no further badger surveys are required. **Philip Peterson** confirmed this and noted that this is a joint understanding with Natural England, with their confirmation on this point expected to come at Deadline 4.
- 4.32 **Katy Brown** noted that the survey data has not yet been released, but stated that it is insufficient for the Applicant to say that it will simply comply with the relocation of badgers, rather it must be specific in more detail (e.g. suitable habitats and avoidance of breeding seasons).
- 4.33 Philip Peterson noted that it is standard good practice not to disclose the locations of badger setts in a public forum, and that specific locations of setts would therefore not be referred to in any of the Applicant's responses on this matter. It is the Applicant's current understanding from survey data gathered to date, that no licences (under the Protection of Badgers Act, 1992) will be required in relation to badgers. This is because surveys to date have recorded no badger setts within 30 m of locations that may be subject to site or vegetation clearance, or other construction activities. However, licencing mechanisms do exist in the event that a new badger sett is discovered after the examination has concluded. The ExA gueried how this would be monitored, with Philip Peterson responding that pre-construction surveys would allow the Applicant to reconfirm the status of badgers prior to the clearance of the Scheme site, which would then allow the Applicant to update the baseline and determine if a licence is required. The Applicant's experience suggests that this is an unlikely scenario, though it was noted that the future movements of wild animals cannot be completely predicted. Richard

Griffiths noted that the Register of Environmental Commitments ("**REAC**") secures these obligations, with a survey to be done at least 7 months in advance of site clearance and again within one week of this. This is secured through Requirement 14 of the DCO.

Biodiversity Net Gain ("BNG")

River BNG and offsite habitat provision area

- 4.34 **The ExA** asked the Applicant to summarise its key changes to the BNG Assessment.
- 4.35 **Philip Peterson** noted that there are a small number of key changes. In relation to river units, the Calder and Colne Rivers Trust ("**CCRT**") Black Brook River and Floodplain Restoration Scheme has been identified by the Applicant as being suitable to deliver at least 10% BNG in relation to the Scheme. Ongoing management and monitoring would be implemented to ensure that the CCRT Scheme is in place for at least 30 years and this will be secured via a Section 106 agreement which is currently being drafted by the Applicant.
- 4.36 Appendix C of the Biodiversity Net Gain Report (REP3-010) includes details of the proposed river habitat enhancements and restoration work proposed by CCRT. These will remove the left bank retaining wall and re-profile the bank to restore floodplain connectivity, expand the footprint and improve the quality of existing floodplain wetland habitat. It will also divert and improve the field boundary ditch to feed floodplain wetlands, and remove a weir to restore sediment flow and habitat connectivity within the river. These interventions will result in an uplift of 2.96 "Other Rivers and Streams" biodiversity units and 0.4 "Ditches" biodiversity units and deliver natural flood management as a co-benefit.
- 4.37 As per the Biodiversity Net Gain Report (REP3-010), the Habitat Provision Area (HPA) has been included in the 'on-site' part of the BM3.1 BNG metric. This is in accordance with Natural England's advice and the recently released Government consultation response to BNG. Proposals for the habitat enhancements in the off-site HPA are contained in the Outline Landscape and Biodiversity Strategy ("OLBS") (AS-094) and shown on Figure 2 of that report (APP-182).
- 4.38 The Applicant and Natural England are largely in agreement regarding the appropriateness of the proposed habitat measures to achieve 10% BNG. Residual areas of discussion relate to how 10% BNG is secured and detail relating to the calculation of river units BNG that would be delivered (notwithstanding this, Natural England agree that the proposals for achieving river and streams BNG are appropriate, with the residual query relating to detail of the BM3.1 BNG metric calculations).

How BNG is secured

- 4.39 **The ExA** requested a summary of how BNG is secured. **Richard Griffiths** noted that this is in the OLBS and the draft Section 106 Agreement (REP-030).
- 4.40 The delivery of BNG and the commitment to 30 year delivery has formed part of the Heads of Terms of the Section 106 Agreement that was submitted with the application, and is contained in the Section 106 Agreement. Schedule 1 of the Section 106 Agreement sets out that:
 - 4.40.1 The Developer must update the BNG Assessment for the Project to account for the detailed design of the Scheme and submit this for approval to NYCC.
 - 4.41 Prior to Commencement of the Scheme, and following NYCC's approval of the phasing plan for the Scheme pursuant to Requirement 2(1) of the Development Consent Order ("**DCO**"), the Developer and NYCC must agree when the update to the BNG Assessment required pursuant to paragraph 1 must be submitted for approval to NYCC, having regard to the timing of when the detailed landscaping and biodiversity strategies for phases and numbered works is proposed to be submitted under Requirement 7 of the DCO.
 - 4.42 Paragraph 5 of Schedule 1 confirms that it must be delivered (and thus all consents obtained too) prior to the end of the Construction Period.
 - 4.43 Local Planning Authorities' approval of the BNG Report therefore provides the mechanism for ensuring the delivery of 10% BNG.
- 4.44 Other provisions of the Section 106 Agreement secure delivery and management of habitat enhancements in the off-site HPA and, if required, other areas that are off-site. This includes requiring at least 30 years of management, as per paragraph 8 of the Section 106 Agreement.
- 4.45 **Richard Griffiths** noted that the Applicant will be updating the Section 106 Agreement following discussions with the Councils in relation to these BNG matters. It is considered that with the above mechanisms, and the proposed amendments, all aspects of BNG will be secured appropriately. Whilst it is likely that additional sub-agreements will be needed to regulate the arrangements between all the interested parties, the wording of the Section 106 Agreement will sufficiently secure delivery such that these sub-agreements will not need to be completed before Examination closes to ensure that the ExA and the Councils can be reassured that it is securely delivered.
- 4.46 In relation to on-site BNG within the Order Limits (in addition to the Offsite HPA), detailed proposals would be set out in the LBS, which would be approved and secured via Requirement 7 of the draft DCO (REP2-008). This does not cover river BNG, as this is outside the Applicant's ownership.

- 4.47 In their written representation, Natural England requested clarity be provided regarding how all on-site and off-site BNG is to be secured. The Applicant considers the summary provided above addresses this request.
- 4.48 **The ExA** queried if the OLBS needs to be updated to reflect the work done by the Applicant. **Richard Griffiths** noted that the Applicant can commit to updating this by Deadline 5.
- 4.49 <u>Post-Hearing Note:</u> at the hearing, the Applicant noted that as the BM4.0 BNG metric is about to be released, the Applicant would wish to take this into account, hence waiting until Deadline 5 for these updates. However, the Applicant has subsequently received correspondence from Natural England stating that the Applicant does not need to adopt the new BM4.0 BNG metric and can instead continue to use the existing BM3.1 BNG metric. Updates to the BNG Assessment will therefore not make any changes in this regard.

Mitigation

Detailed in the OLBS and the REAC and secured via the DCO

- 4.50 **The ExA** sought an explanation for the updated wording used in Requirement 7 of the draft DCO. **Matthew Fox** noted that the idea of the amendments was to link this requirement to the phasing process, so the strategies align with that. Works 5, 6 and 8 are different as they are particularly specific, so different strategies are required for these. The Applicant maintains that this strategy can be updated as time progresses and more details are revealed, noting that it is likely to be fewer than 8 strategies eventually submitted. **Kelly Dawson** noted a preference for one strategy, but no objection to the multiple strategy approach.
- 4.51 **The ExA** noted a concern regarding the consistency of the wording across the draft DCO, the REAC and the OLBS. **Matthew Fox** responded that the Applicant would undertake a review of the REAC and OLBS to align wording on this point, for Deadline 5.
- 4.52 **The ExA** queried whether mitigation schemes for particular items should be linked to particular works, in order for the Local Planning Authorities to have certainty. **Matthew Fox** responded that landscape and biodiversity are linked, so the strategy needs to perform both functions and align with the phasing. In addition, timescales will be developed as the project development progresses. The Applicant will consider this point in undertaking the aforementioned review of the documents.
- 4.53 **The ExA** queried how the implementation timetable would work alongside this. **Richard Griffiths** responded that this strays into detailed design and that it is too early for the Applicant to produce an overarching timetable as no contractor has yet been appointed. The Applicant will, in its Requirement discharge submissions, set out a timetable of how each element of landscape and biodiversity will be progressed, with the Local

Planning Authorities having the ability to approve this and request further information under the mechanisms in the draft DCO.

5. AGENDA ITEM 4 – DESIGN, LANDSCAPE AND VISUAL CONSIDERATIONS

Maximum size parameters of the absorber columns

- 5.1 **The ExA** noted that the Applicant's response to its first written question DLV 1.4 stated that the maximum height is 95m above ground level for the absorber columns, which is lower than the current boiler house. **Jim Doyle** noted that this is a typographical error, with the absorber columns to be higher than the boiler house (which itself is 76m above ground level).
- 5.2 **The ExA** sought clarification of the height of the indicative model of absorber columns used in the photomontages. **Chris Summers** responded that the indicative model is 76m and noted that the photomontages are still an appropriate representation of the Scheme.
- 5.3 **The ExA** queried if the maximum parameters are in place for the absorber columns to allow for the possibility of either a wider, shorter structure or a taller, thinner structure, or both. **Chris Summers** noted that the columns are designed to optimise the contact time with the solvent, with the maximum height only appropriate if additional trays were used in the column. This is an indicative representation which will be progressed during detailed design.

Design approach for the larger structures of the scheme (absorber columns and regenerator columns)

- 5.4 **The ExA** asked if there is a functional need for the structural pipework components to be publicly visible, referencing the principles in the Weddle strategy and contrasting those to the architectural form of the Petra Nova CCS project shown in the Applicant's Design Framework **(APP-195)**. **Chris Summers** noted that the design of the columns is equivalent to an exoskeleton, with complications arising when structures are boxed in. The pipework connections are necessary throughout the height of the absorber columns, which cannot be closed in to the structure and/or enclosed, meaning these are kept separate in order for the pipework to operate effectively.
- 5.5 **The ExA** queried if there is a maintenance requirement for this structure. **Chris Summers** responded that there is a periodic maintenance regime, which would have problems if the structure was boxed in. The maintenance is being finalised in detailed design, but it is anticipated that small, fixed lifting points would be in place across the structure for maintenance purposes.
- 5.6 **The ExA** noted that item D1 in the REAC **(REP3-007)** references the proposed colouring of the larger structures of the Scheme and queried if

there was a possibility that certain parts of the exposed structure of the absorber columns would not have the same colour applied, resulting in a patchy appearance compared to other components that can be painted. **Chris Summers** confirmed that the majority of the structure will be colour coded to blend in with the buildings behind it, with very little area that would be patchy.

Landscape impact and mitigation measures

- 5.7 **The ExA** requested an update on the Applicant's position in relation to whether Selby District Council ("**SDC**") local plan policies SP15, SP18 and SP19 require mitigation of minor adverse landscape effects.
- 5.8 **Richard Griffiths** noted that the Local Planning Authorities agree, in their submissions, that there are no significant adverse landscape and visual effects associated with the operation of the Proposed Scheme (ES, Vol. 1, Ch. 9, 9.9.5). Therefore, minor adverse effects which are not significant are being discussed. The overarching policy is the National Policy Statements, which clarify that most, if not all, Nationally Significant Infrastructure Projects will have an effect on landscape and visual impacts (NPS EN-1, paragraph 5.9.8). The fact that the Scheme contains only impacts which are not significant shows that it is going beyond the National Policy Statement requirements.
- 5.9 In relation to SDC's policies, SP15 seeks to promote sustainable development and encourages development to consider planting to create habitats. The OLBS requires the Applicant to put landscaping into the Scheme, alongside commitments to retained vegetation which are secured in the REAC. SP18 requires the safeguarding and enhancement of the natural environment, including landscape character. It is important to consider the relevance of this policy in the context of the existing power station site. The Local Planning Authorities have referred to gradual erosion, but this is not a consequence of the Scheme which is a very important piece of infrastructure; rather, it is the result of the evolution of the existing power station since the 1960s, a process in which the Local Planning Authorities have been involved for decades. The Applicant has put the appropriate work into the Design Framework and OLBS. SP19 refers to high quality design in the local areas, which incorporates new landscaping design. The Applicant meets this requirement as part of the BNG process described above. The Applicant, whilst working within the confines of an existing power station, meets these policy tests. Jim Doyle added that the existing power station has evolved significantly since the 1960s and the Scheme is designed to fit into the context of the existing power station. Jim Doyle noted that the power station has evolved beyond the principles of the Weddle strategy, citing the examples of the biomass domes as structures that do not align with the original 1960's principles of straight, horizontal lines. Richard Griffiths directed the ExA to Appendix B of the Planning Statement (APP-032) where the Applicant has addressed the SDC policies referenced at pages 170-174.

- 5.10 In response to comments made by NYCC, **the ExA** noted that in item D1 of the REAC certain principles from the Design Framework are included. **John Wainwright** responded that it is unclear to NYCC which principles will come forward and sought clarification on how these will be tied to the OLBS. **Richard Griffiths** noted that the Applicant has worked hard in the Design Framework and the OLBS to balance the landscape and visual impacts with efficient and sustainable design. The Applicant will consider the Design Framework principles and the regard for these in the REAC and the OLBS for Deadline 5, for example, **Graham Lee** suggested that requirements in the Design Framework relating to both the Indicative Soft Landscape Palette and the Indicative Hard Landscape Palette could be included in either the REAC or OLBS.
- 5.11 **Graham Lee** noted that, in relation to the SDC policies discussed above, new hedgerows are being proposed which will address some of the minor adverse effects and connectivity issues. This also links to some of the Design Framework principles, hence it is an example of where the Applicant's proposals are responding to and delivering upon the Design Framework. NYCC will always have the opportunity to be involved within the detailed design stage, including to review and approve the final landscape design, pursuant to the DCO requirements.
- 5.12 **The ExA** noted that the Design Framework principles are welcomed by NYCC, with some of these included in item D1 of the REAC and secured by Requirement 6. The Applicant will consider which other principles can be included in the REAC, whilst the Local Planning Authorities will consider the list in item D1 of the REAC and advise whether there are further principles that should be included in the REAC. The Local Planning Authorities agreed to do this by Deadline 4 in order that the Applicant could respond at Deadline 5.
- 5.13 **Richard Griffiths** noted that item D1 of the REAC is not the only place in which Design Framework principles are secured. For example, Requirement 7 refers to measures for the retention of existing vegetation, which corresponds to the principle in paragraph 4.2.15 of the Design Framework. The Applicant will review whether a signposting document is required to clarify where the relevant Design Framework principles are secured.
- 5.14 **Katy Brown** expressed concern regarding the error in the calculation of the building height, as referenced above. **Richard Griffiths** responded that this is merely a typographical error, with the assessment being based on the baseline, which contains the correct height.
- 5.15 **The ExA** noted that the retained vegetation plan **(APP-183)** contains an area covered in solid light green to the northern edge of the woodyard area, which is indicated as an area to accommodate a carbon dioxide compound. The Local Planning Authorities have suggested an amendment to this wording. When comparing this plan to the construction laydown areas plan, it does not appear that the areas overlap, so **the ExA** queried if there are other construction activities happening in this

area. **Graham Lee** noted that the current vegetation is the only vegetation which may be affected by the proposed construction activities. This is shown as light green to demonstrate that the Applicant's intention is to retain as much vegetation as possible, or replant it if it needs to be removed for construction. There will be some areas that may not be able to be replanted for operational reasons, including in relation to pipelines, access and overhead pylons, but the Applicant's intention is to retain as much as possible.

- 5.16 **Graham Lee** also noted that areas shown dark green represent vegetation that is to be retained. **Richard Griffiths** added that this process is secured in item G8 of the REAC, and through the OLBS approval process the Applicant will have to identify and explain its approach to vegetation.
- 5.17 Andrew Williams noted that where the Applicant can retain vegetation, that provides the greatest ability to keep the original design and also represents the best mitigation strategy for keeping the construction area screened, therefore the Applicant's efforts would be focussed on retaining the vegetation to keep the low level screening, unless that was in conflict with operational or technical requirements of the Scheme. Graham Lee added that the area in question is an area of trees and shrubs immediately adjacent to the site boundary. It is therefore reasonable to assume that the Applicant will need to place some infrastructure through this boundary, with some vegetation being unable to be replanted. However, the majority will be retained and/or enhanced, as part of the future development proposals.
- 5.18 **Richard Griffiths** explained that the retention of planting is being secured through the DCO and this therefore cannot be removed through other applications. The only way this could be removed in the future would be to amend the vegetation retention plan, which is another hurdle for the Applicant to go through, which is an additional benefit of the plan being secured.
- John Wainwright noted that the plan shows the vegetation to be 5.19 retained, not the vegetation to be removed. Suggesting that this is an example of ongoing erosion and represents a loss of valuable vegetation, as there is a footpath adjacent to the site boundary. Richard Griffiths responded that vegetation would not be indiscriminately removed, with the Applicant needing to go through the process of approval under Requirement 7 and compliance with item G8 of the REAC. There is a commitment across the Scheme site for retention of existing vegetation where possible, plus the OLBS will be submitted to the Local Planning Authorities for approval. The OLBS contains the commitment of item G8 of the REAC at paragraph 3.8.2, and the Applicant would need to demonstrate in the LBS submitted for approval why it cannot retain vegetation and set out if and where it would be replanted, including justification for its approach. The Local Planning Authorities would need to be satisfied that the Applicant had justified its approach in this respect. Richard Griffiths reiterated that there was not an "indiscriminate"

approach to vegetation removal as suggested by NYCC, rather there would be a very clear process in place via Requirement 7.

5.20 **The ExA** queried if this area is dependent on the progression of either Work No. 2A or 2B, and whether there is a process in securing the detailed design of Work No. 2 whereby the vegetation is confirmed and discussed with the Local Planning Authorities before approval. **Richard Griffiths** confirmed that this is the case.

6. **AGENDA ITEM 5 – Highways**

Passenger car unit assumptions, including any effect on the findings of the assessment

- 6.1 **The ExA** requested an updated on the agreement in relation to passenger car unit assumptions. **Richard Griffiths** noted that the Applicant, Local Highway Authorities and National Highways are all in agreement in relation to the passenger car unit values that have been used in all assessments undertaken. The Applicant's SoCG with National Highways will be submitted at Deadline 4.
- 6.2 **The ExA** queried which guidance is appropriate. **Vinny Holden** responded that the passenger car unit values are used in the traffic modelling software within the 'Traffic Signs Manual Chapter 6 Traffic Control', published by the Department for Transport and 'Traffic Modelling Guidelines Version 4.0', published by Transport for London. **Simon Jones** noted that National Highways agree that this guidance is appropriate.

Monitoring of mitigation measures for the construction phase

- 6.3 **The ExA** asked whether it is proposed to agree this monitoring before or after the commencement of construction. **Vinny Holden** responded that the Applicant's proposed approach is to monitor and manage the impacts of the Scheme through the Construction Traffic Management Plan (REP2-028) and the Construction Worker Travel Plan (REP2-029). The Applicant and Local Highway Authorities are all in agreement in relation to the monitoring of mitigation measures through the Construction Traffic Management Plan.
- 6.4 **The ExA** queried if the arrangements to monitor construction traffic will be agreed prior to the commencement of construction. **Vinny Holden** confirmed that this can be done beforehand. The Travel Plan Steering Group will be set up before construction. The final Construction Worker Travel Plan will be largely consistent with the iteration submitted with the DCO, in which measures for monitoring will be set out.
- 6.5 **The ExA** asked National Highways if they were satisfied with these arrangements. **Simon Jones** responded that National Highways are also in agreement with the Construction Traffic Management Plan and the

Construction Worker Travel Plan, subject to the amendment to Requirement 16 of the draft DCO shown in bold below:

16.— (1) No part of numbered works 1 and 2 of the authorised development is to commence until a construction worker travel plan has, for that part, been submitted to and, after consultation with National Highways, approved by the relevant planning authority.

- 6.6 **Richard Griffiths** indicated that this amendment would be acceptable to the Applicant and will be made in the next iteration of the DCO.
- 6.7 National Highways is content to agree to the proposed requirements in Requirements 15, 16 and 19 of the DCO, subject to the amendment to Requirement 16 as shown above. The Construction Worker Travel Plan holds equal importance to the construction Traffic Management Plan in managing the potential traffic impact, hence the request from National Highways that they are involved in the consultation on this document prior to its submission to the Local Planning Authorities for approval.
- 6.8 **The ExA** noted that NYCC are reviewing the updated Construction Traffic Management Plan and the Construction Worker Travel Plan and requested an update in relation to this. **Paul Roberts** confirmed that discussions with the Applicant are ongoing, but NYCC is comfortable that both documents are satisfactory. There will be a future discussion on these before construction commences, but at this stage NYCC are content with the documents.
- 6.9 **Richard Griffiths** noted that an action plan containing steps to be taken by the Applicant in the 6 months prior to commencement of construction is contained in the Construction Traffic Management Plan, with this document to be approved prior to commencement. There will be checkpoints in place throughout the programme, as this is a live document that will assess if monitoring processes are being implemented effectively.
- 6.10 **Simon Jones** noted that National Highways is now content to note that all matters are agreed in its SoCG with the Applicant. The only outstanding matter to be the protective provisions, which are being discussed at Issue Specific Hearing 4.

7. AGENDA ITEM 6 – NOISE AND VIBRATION

Residual noise impact on residential receptors during the operational phase and the effectiveness of Requirement 17 in securing appropriate mitigation measures

7.1 **The ExA** noted that, in relation to NV 1.6 of its written questions, there appeared to be a difference of opinion in relation to the night-time operational noise impacts on residential receptors, and queried if point LT4 is an appropriate measurement location for defining the measured noise levels at Receptor 14. **Esteban Olmos** confirmed that the Applicant

considers this to be appropriate as LT4 is located near to the relevant receptor, whilst **Jack Hopper** confirmed that SDC would check this and respond in writing.

- 7.2 The ExA noted that the operational noise rating level in Requirement 7 is 34 decibels for Receptor 6 and 35 decibels for Receptor 14, representing a moderate magnitude of impact. The ExA queried if, in defining the level of effect significance, any factors are taken into consideration for the contextual considerations defined in guidance. Esteban Olmos noted that the Applicant undertook an assessment in line with Clause 11 of British Standard 4142:2014+A1:2019.
- 7.3 **Post hearing note:** To summarise and repeat the Applicant's findings in this respect, Section 7.9 of Chapter 7 of the Environmental Statement **(APP-043)** presents the noise assessment for the operational phase in accordance with British Standard 4142:2014+A1:2019. An initial estimate of the assessment shows an adverse noise impact at two noise sensitive receptors during night-time. Following guidance in BS4142, contextual considerations have also been presented to demonstrate that:
 - 7.3.1 No change in ambient noise levels is expected;
 - 7.3.2 Internal noise levels will be below the noise guidelines in British Standard 8233:2014; and
 - 7.3.3 Analysis undertaken on the background noise level reveal that the values used in the noise assessment correspond to a reasonably worst-case noise assessment.
- 7.4 The assessment outcome of the initial estimate combined with the contextual considerations demonstrate the operational noise effects will be not significant.
- 7.5 The noise assessment presented in the Environmental Statement was undertaken by a suitably qualified acoustician in close liaison with the design team. As part of the preliminary design, efforts were made to optimise an example of a package of noise mitigation measures that could be delivered but also that could be revisited as part of the evolution of the design. This process included investigation of layout changes, noise screening by intervening elements such as noise barriers and earth bunds and noise control at specific noisy equipment.
- 7.6 **The ExA** noted that in the SDC's response to its written question NV 1.6, it was recommended that the noise levels are reduced to 33 decibels, and queried if SDC considers that the levels secured in Requirement 17 of the DCO be considered a significant effect. **Jack Hopper** responded setting out their position in terms of the Applicant's assessment, in particular around having an opportunity to scrutinise the acoustic design. **Jack Hopper** noted that the Applicant has provided reassurance that this will come at a later stage, but it remains a key consideration and it is difficult for SDC to accept the adverse impact at the two receptors without

understanding the acoustic design itself. (Please also see further post hearing note below at paragraph 7.13)

- 7.7 **The ExA** queried whether SDC has a position as to what can be included as contextual considerations, to which **Jack Hopper** responded by reiterating that this would be acoustic design. **The ExA** queried whether the demonstration of good acoustic design comes through the discharging of Requirement 17 of the DCO by the Applicant and asked how design could form part of the contextual considerations. **Jack Hopper** responded that different equipment could be used, noise sources could be oriented differently and the Applicant should demonstrate an ability to minimise and mitigate, rather than accepting the adverse impacts.
- 7.8 **Esteban Olmos** noted that there is guidance on contextual considerations, per his points above, and that mitigation measures were presented in para 7.5.53 of the relevant Environmental Statement chapter. This is in line with the overarching energy NPS, both current and draft. **The ExA** requested that the guidance on contextual considerations be submitted at Deadline 4, which the Applicant agreed to do. **Post hearing note:** This guidance on contextual considerations is provided at **Appendix 2** to this note.
- 7.9 **Jack Hopper** added that regardless of the contextual considerations, the element of acoustic design remains and impacts should not be offset with contextual consideration. SDC would prefer to look further down the line and reduce the impact, rather than accepting it in the DCO.
- 7.10 **Richard Griffiths** noted that the primary mitigation embedded in the design will be implemented to ensure that the operational noise effects are not significant and that the rating levels do not exceed the values presented in Table 7.26 of the Environmental Statement (APP-043). Requirement 17 in the draft DCO (REP2-007) commits the Applicant to prepare and submit a Noise Mitigation Scheme, prior to starting operations, demonstrating via noise modelling how the design will incorporate mitigation measures to achieve the rating levels in Table 7.26 of the Environmental Statement 17 as Table 1. Requirement 17 also commits the Applicant to include, in the Noise Mitigation Scheme, a set of noise limits at 5m from the post combustion equipment considered to be relevant for noise. These two elements of Requirement 17 will be approved by the Local Planning Authorities before commencement of operation.
- 7.11 **Post hearing note:** In the dDCO submitted at Deadline 4, the Applicant has proposed a slight amendment to Requirement 17(1) to make clear that rating levels are not intended to be met by noise mitigation alone (that is, good acoustic design would form part of achieving those levels).
- 7.12 A suitably qualified acoustician will collaborate with the design team ensuring that a hierarchy of noise mitigation is followed through an iterative design process. The suitably qualified acoustician will produce

the technical evidence necessary to comply with Requirement 17. As confirmed at paragraph 7.9.20 of Environmental Statement Chapter 7 (APP-043), once the identified contextual factors have been considered (see paragraphs 7.5.46 and 7.5.63), the initial impact estimations indicated in Table 7.26 are held to be not significant. Notwithstanding the above conclusion based on embedded mitigation, Requirement 17 of the draft DCO 'Control of noise during operation' commits the Applicant to prepare a noise mitigation scheme to be submitted to and approved by the Local Planning Authorities. The Applicant is also obliged to implement the mitigation scheme, as approved, so the Local Planning Authorities will have an opportunity to ensure that a good acoustic design is achieved during the detailed design stage. The Applicant believes that this demonstrates good acoustic design at the appropriate stage of the Scheme. Reducing the Operational Rating Noise Limits shown in Table 1 of Requirement 17 has the potential to cause onerous design implications.

- 7.13 By way of further post hearing update, a meeting was held between the Applicant and the Senior Environmental Health Officer at SDC on 23 March 2023, after ISH3, and the good acoustic design process followed during the ES was discussed. This discussion focused on paragraph 7.5.3 of the ES Chapter 7 (Noise and Vibration) (APP-043) and Appendix 7.2 (Operational Noise Assumptions) (APP-131). It is the Applicant's understanding that SDC welcomed and agreed with its description of the good acoustic design process and that this does therefore not need further scrutiny or amendments to Requirement 17.
- 7.14 **The ExA** asked for a justification of the Saturday construction working hours from the Applicant, citing the approaches taken on Drax Repower and Keadby 3 to construction working hours.
- 7.15 **Richard Griffiths** responded that the conclusions of the noise assessment have shown no significant effects throughout the construction hours proposed and assessed against. Given the outcomes of the assessment, there is no justification to adopt the hours of any other project. Any restriction on working hours should be based on impact, with there being no impacts here. In addition, any shortened working hours would have the effect of lengthening the construction timeframe.
- 7.16 In response to comments from NYCC, **Richard Griffiths** reiterated that the Applicant has stated its position and added that this is a Nationally Significant Infrastructure Project and an operational power site, rather than a standard project, so the Applicant considers its proposals in terms of construction working hours to be acceptable in terms of impact.
- 7.17 **The ExA** queried if, in relation to Requirement 14, temporary means of enclosure and site security are requested in the permitted preliminary works because of noise considerations. **Jack Hopper** made comments in relation to noise from construction compounds and SDC wanting to agree the location of the construction compounds in advance. **The ExA** queried if this information would be found in the construction laydown

areas plan, which **Richard Griffiths** confirmed to be correct. **Richard Griffiths** also clarified that construction laydown areas are captured by Requirement 14, so they cannot be created without a CEMP being in place. Temporary means of enclosure should not be caught by the CEMP, hence being excluded from Requirement 14. If construction laydown areas require acoustic fencing, that will be covered by the CEMP. **Post hearing note:** the Applicant confirms that the construction laydown areas are shown on Figure 2.3 (**APP-061**), accompanying Chapter 2 of the ES, and the areas shown on that Figure are reflected in the area within which Work Number 5 (temporary construction laydown) would be located on the Works Plans (which is a certified document) (**AS-073**).

8. AGENDA ITEM 7 – REVIEW OF ISSUES AND ACTIONS ARISING

- 8.1 **The ExA** clarified the actions arising from the hearing as follows:
 - 8.1.1 Applicant to provide response to Biofuelwatch observations on uncertainty regarding nitrogen deposition and comments on amine modelling, at Deadline 4. This response is contained within the Applicant's update to its Response to Deadline 2 submissions document (document reference 8.10.2 Rev 02), also submitted at Deadline 4 (Action Ref. ISH3-AP1);
 - 8.1.2 **Applicant** to submit a document setting out how emissions monitoring is currently undertaken at the existing power station and how the Environmental Permit is complied with, in regard to aerial emissions, at Deadline 4. **This is set out in Appendix 1** (Action Ref. ISH3-AP2);
 - 8.1.3 **Applicant** to review and provide updated versions of the OLBS and the REAC to ensure that wording ties in and correctly reflects the wording in Requirement 7 of the DCO, the BNG Assessment, the Section 106 Agreement and the design principles within the Design Framework, at Deadline 5 (Action Ref. ISH3-AP3 & 4);
 - 8.1.4 **Applicant** to update the BNG Assessment, taking into account the BM4.0 BNG metric, at Deadline 5. **Post-Hearing Note:** the Applicant has subsequently received correspondence from Natural England stating that the Applicant does not need to adopt the new BM4.0 BNG metric and can instead continue to use the existing BM3.1 BNG metric. This means that the BNG document will no longer need to be updated by the Applicant at Deadline 5, however the Applicant will review this document alongside the review of the other documents considered in action 3. This was confirmed by the Applicant to the ExA at ISH4 on Friday 24 March 2023;
 - 8.1.5 **NYCC / SDC** review the design principles that are currently included within the REAC and consider whether more principles from the Design Framework need to be included, at Deadline 4;

- 8.1.6 **NYCC / SDC** to confirm whether monitoring location LT4 is an appropriate location for receptor R14; and
- 8.1.7 Applicant and NYCC / SDC to provide extracts from guidance documents on what should be included in contextual considerations, at Deadline 4. Post hearing note: this is provided at Appendix 2. (Action Ref. ISH3-AP6)

9. AGENDA ITEM 8 – ANY OTHER BUSINESS

9.1 **The ExA** noted that nothing was raised in relation to this agenda item and brought the hearing to a close.

drax

Appendix 1 - Appendix 1 - ISH3-AP2 - Monitoring Emissions and the Environmental Permit

| DATE: | 28 March 2023 | CONFIDENTIALITY: | Public | | | | | |
|---|----------------|------------------|--------------------|--|--|--|--|--|
| PROJECT NAME: | Drax BECCS DCO | PROJECT NUMBER: | EN010120 | | | | | |
| DOCUMENT NO. REV. NO: | 8.6.4 1 | DOCUMENT OWNER : | Drax Power Limited | | | | | |
| AUTHOR: | J. Doyle | APPROVER : | C. Fountain | | | | | |
| SUBJECT: Response to Action Point ISH3 – Information on Monitoring Emissions in Drax Environmental Permit | | | | | | | | |

The monitoring undertaken at Drax Power Station is undertaken pursuant to the terms of permit reference number EPR/VP3530LS ("the Permit"), as has previously been submitted to the Examination at (REP2-066).

The Permit includes the following text:

3.5 Monitoring

- 3.5.1. The operator shall, unless otherwise agreed in writing by the Environment Agency, undertake the monitoring specified in the following tables in schedule 3 to this permit:
 - a) point source emissions specified in tables S3.1, 3.1a, 3.2, S3.2a and S3.3;
 - b) surface water or groundwater specified in table S3.4; and
 - c) process monitoring specified in table S3.5; and
- 3.5.2. The operator shall maintain records of all monitoring required by this permit including records of the taking and analysis of samples, instrument measurements (periodic and continuous), calibrations, examinations, tests and surveys and any assessment or evaluation made on the basis of such data.
- 3.5.3. Monitoring equipment, techniques, personnel and organisations employed for the emissions monitoring programme and the environmental or other monitoring specified in condition 3.5.1 shall have either MCERTS certification or MCERTS accreditation (as appropriate), where available, unless otherwise agreed in writing by the Environment Agency.
- 3.5.4. Permanent means of access shall be provided to enable sampling/monitoring to be carried out in relation to the emission points specified in schedule 3 tables S3.1, S3.1a, S3.2, S3.2a and S3.3 unless otherwise agreed in writing by the Environment Agency.

3.6 Monitoring for Large Combustion Plant

- 3.6.1. All monitoring required by this permit shall be carried out in accordance with the provisions of Annex V of the Industrial Emissions Directive and the Large Combustion Plant Best Available Techniques Conclusions.
- 3.6.2. If the monitoring results for more than 10 days a year are invalidated within the meaning set out in condition 3.6.7, the operator shall:
 - (a) within 28 days of becoming aware of this fact, review the causes of the invalidations and submit to the Environment Agency for approval, proposals for measures to improve the reliability of the continuous measurement systems, including a timetable for the implementation of those measures; and
 - (b) implement the approved proposals.
- 3.6.3. Continuous measurement systems on emission points from the LCP shall be subject to quality control by means of parallel measurements with reference methods at least once every calendar year.
- 3.6.4. Unless otherwise agreed in writing by the Environment Agency in accordance with condition 3.6.5 below, the operator shall carry out the methods, including the reference measurement methods, to use and calibrate continuous measurement systems in accordance with the appropriate CEN standards.
- 3.6.5. If CEN standards are not available, ISO standards, national or international standards which will ensure the provision of data of an equivalent scientific quality shall be used, as agreed in writing with the Environment Agency.
- 3.6.6. Where required by a condition of this permit to check the measurement equipment, the operator shall submit a report to the Environment Agency in writing, within 28 days of the completion of the check.
- 3.6.7. Where Continuous Emission Monitors are installed to comply with the monitoring requirements in schedule 3, table(s) S3.1 and S3.1a; the Continuous Emission Monitors shall be used such that:
 - (a) for the continuous measurement systems fitted to the LCP release points defined in table(s) S3.1 and S3.1a the validated hourly, monthly, daily and yearly averages shall be determined from the measured valid hourly average values after having subtracted the value of the 95% confidence interval;
 - (b) the 95% confidence interval for nitrogen oxides and sulphur dioxide of a single measured result shall be taken to be 20%;
 - (c) the 95% confidence interval for dust releases of a single measured result shall be taken to be 30%;
 - (d) the 95% confidence interval for carbon monoxide releases of a single measured result shall be taken to be 10%;
 - (e) an invalid hourly average means an hourly average period invalidated due to malfunction of, or maintenance work being carried out on, the continuous measurement system. However, to allow some discretion for zero and span

gas checking, or cleaning (by flushing), an hourly average period will count as valid as long as data has been accumulated for at least two thirds of the period. Such discretionary periods are not to exceed more than 5 in any one 24-hour period unless agreed in writing. Where plant may be operating for less than the 24-hour period, such discretionary periods are not to exceed more than one quarter of the overall valid hourly average periods unless agreed in writing; and

(f) any day, in which more than three hourly average values are invalid shall be invalidated.

The Applicant complies with these requirements in operating the existing Drax Power Station and would do similar under the permit variation relating to the installation of CCS.

The Applicant has included with this Appendix examples of the compliance forms which are submitted on a monthly basis to the Environment Agency, which provide the data derived from the Continuous Emissions Monitoring Systems (CEMS) for the relevant pollutants listed in the permit. The data submitted conforms with the relevant requirements of the IED and applies the necessary correction factors and reports against the appropriate percentile for the relevant species and emission limit value (ELV). The operator is required to report against Daily, Monthly and Annual Means and also to correctly apply the reference conditions for the specific fuel type.

| Version | Issue date | Comments/changes |
|---------|------------|--|
| 2.8 | Aug-20 | First issue. |
| 2.9 | Jan-21 | Intermediate draft. |
| 3.0 | Mar-21 | Form AR1 deleted. This is supplied directly by the Environment Agency when requesting the annual return or on request. Form CON2 corrected as follows: Annual mean: Original footnote (g) deleted; Original footnote (h) becomes new footnote (g). Annual percentiles: New footnote (h): For each pollutant, report the Annual 95th percentile of hourly means in the first column and the Annual 95th percentile ELV in the second column. However, if there is an in-year reduction of the percentile ELV then it is not mandatory to enter the ELV as compliance assessment will commence in the following year. Form CON1 corrected as follows: Addition to footnote f): However, if there is an in-year reduction of the percentile ELV then it is not mandatory to enter the ELV as compliance assessment will commence assessment will commence assessment will commence the ELV then it is not mandatory to enter the ELV as a follows: |

| Permit | Title | NOTE THAT MANUAL |
|--------------------|--|-------------------------------|
| IED/LCPBREF HR1 | ANNUAL OPERATING HOURS RETURN | PREPARATION AND SUBMISSION |
| | For each LCP: Annual operating hours. For each LCP with a Limited Lifetime Derogation or a 10,000h | OF REPORTING FORMS THAT ARE |
| | monitoring derogation: cumulative operating hours from 1 Jan 2016. For each Unit or LCP with an IED Annex | DATA ACQUISITION AND HANDLING |
| | subsequent vears) and five vear running average from entry month. For a combined cycle gas turbine that | SYSTEM (DAHS) IS PERMITTED |
| | operates with a bypass stack in normal operation, the bypass hours during normal operation are included in | PROVIDED THAT THESE ARE |
| | the plant hours but are also reported separately. | ERRORS ACCORDING TO SITE |
| | recorded on this form. This is the sum of excluded hours relating to all submissions of Form LCPBREF BS1 | PROCEDURES. THIS APPLIES TO |
| | within the reporting year or, when these emissions are aggregated within Form IED/LCPBREF MF1, a manual | THE FIRST REPORTING YEAR |
| | estimate of Black Start hours within the calendar year. | (2021) ONLY. |
| IED/LCPBREF AR1 | ANNUAL RETURN OF ENERGY INPUT AND TOTAL EMISSIONS (DELETED) | |
| | thermal input. (This form is supplied annually by the Environment Agency or on request) | |
| IED/LCPBREF CON1/2 | QUARTERLY RETURN: MONTHLY MEAN, MAXIMUM DAILY MEAN, ANNUAL MEAN AND ANNUAL PERCENTILE CONCENTRATIONS | |
| | Continuous monitoring results. Quarterly return for each LCP (noting that Unit(s) with a 1,500h provision under | |
| | either the IED or the LCP BREF are regarded as a separate LCP). Validated concentration data: Monthly mean: Maximum Daily mean within month: Annual mean, for plants with | |
| | an Annual ELV, and Annual 95th percentile of hourly means. | |
| | Version 1 (IED/LCPBREF CON1) Utility Boilers; Version 2 (IED/LCPBREF CON2) Gas turbines. | |
| IED/LCPBREF PM1 | PERIODIC MONITORING RESULTS (AS REQUIRED) | |
| | Periodic monitoring return (e.g., six monthly NO _x , SO ₂ , Dust or CO test results) or Alternative monitoring return (as agreed by the Competent Authority). Required when these species are not monitored continuously and at | |
| | the frequency specified by the Permit. | |
| IED/LCPBREF PM2 | PERIODIC MONITORING RESULTS (AS REQUIRED) | |
| | assessment, typically guarterly or annual monitoring. Periodic monitoring return for NH ₂ and SO ₂ for plants | |
| | fitted with Non-Selective or Selective Catalytic Reduction (SNCR/SCR), typically annual monitoring. | |
| IED/LCPBREF PM3 | PERIODIC MONITORING RESULTS (AS REQUIRED) | |
| | Periodic monitoring return for trace metals, and mercury, for solid fuel fired boilers operating \ge 500 h/y. | |
| | i ypically annual monitoring. For coal fired boilers subject to sufficiently stable monitoring provisions, periodic mercury monitoring is reported on Form PM4. | |
| IED/LCPBREF PM4 | ANNUAL RETURN OF MERCURY RETENTION FACTOR RESULTS | |
| | Annual return for coal fired plants subject to sufficiently stable emissions criteria, operating ≥ 500h/y. Periodic | |
| | flue gas monitoring results are combined with the fuel mercury contents to give calculated Retention Factors. | |
| | I nese R values are adjusted, to give a maximum possible Retention Factor, R _{max} , using the Uncertainties of the flue are and fuel Ha measurements. If the average R is greater than the Declared Retention Factor | |
| | then a re-test is required or the Declared Retention Factor and the fuel Hg limit are updated to the measured R | |
| | value. | |
| IED/LCPBREF FUEL1 | QUARTERLY RETURN: MONTHLY MEAN HALOGEN AND MERCURY 'AS RECEIVED' FUEL CONCENTRATION | |
| | Quarterly return for each coal fired LCP, subject to sufficiently stable emissions criteria, for the demonstration | |
| | chlorine and fluorine contents of the fired fuel. | |
| IED/LCPBREF FUEL2 | ANNUAL RETURN OF FUEL BASED MONITORING APPROACH (< 500h/y only) | |
| | Annual return for each coal fired LCP operating < 500 h/y. Contains Annual average mercury, chlorine and fluoring contents of fired fuel and the associated calculated flue ass concentrations | |
| IED/LCPBREF BD1 | QUARTERLY RETURN OF CUMULATIVE ANNUAL ROLLING MALFUNCTION AND BREAKDOWN | |
| | For each LCP fitted with abatement, return the cumulative Malfunction and Breakdown hours as a rolling | |
| IED/LCPBREF MF1 | average (12 monarily period) that is updated on a monarily Dasis. RETURN OF MALFUNCTION AND BREAKDOWN DATA (AS REQUIRED) | |
| | Validated concentration data for each day affected by Malfunction or Breakdown. | |
| IED/LCPBREF BS1 | RETURN OF BLACK START DATA (AS REQUIRED) | |
| | Validated concentration data for each day affected by Black Start running. | |
| IED/LCPBREF AQRA1 | AIR QUALITY RISK ASSESSMENT FOR OTNOC - UTILITY BOILERS (AS REQUIRED) | |
| | Basic air quality risk assessment for valid concentration excursions related to Other Than Normal Operating | |
| ED/LCPBREF AORA2 | Conditions (Mairunction/Breakdown or Black Start running). Select pollutants from: SO ₂ ; NO ₂ ; Dust AIR QUALITY RISK ASSESSMENT FOR OTNOC - GAS TURBINES (AS REQUIRED) | |
| BILLI AGAAZ | Basic air quality risk assessment for valid concentration excursions related to Other Than Normal Operating | |
| | Conditions (Malfunction/Breakdown or Black Start running). Select pollutants from: NO2; CO | |
| IED/LCPBREF REM1 | ANNUAL RETURN OF RESOURCE EFFICIENCY METRICS | |
| | Energy consumption and production; water consumption and discharge; waste disposal and recovery. | |
| IED/LCPBREF CEM1 | CONTINUOUS EMISSIONS MEASUREMENT SYSTEMS (CEMS) INVALIDITY LOG | |
| | This form is submitted in the event that the CEMS unavailability exceeds 10 days in a given calendar year. | |

| Year: | LCP1 (hours) | Bypass (hours) | LCP2 (hours) | B (ł |
|---|-----------------|-------------------|-----------------|---------|
| Operator: Drax Power Limited Location: Drax Power Station Permit/Variation Number: VP3530LS | | | | |
| OPERATING HOURS | | | | |
| ANNUAL RETURN | | | | |
| RELEASES TO AIR | | | | |
| | | | | |

LCP3 LCP4 **Bypass Bypass** vpass nours) (hours) (hours) (hours) (hours) 8607.33 Annual Operating Hours (a), (b) Cumulative Operating Hours (c),(d) Annual Operating Hours 1,500 Unit (e) Enter start date below hours in brackets e.g., (1/7/20) or (1/8/21) Five year rolling average (f) Black start hours (h)

NOTES:

(a) Annual operating hours for <u>every LCP from 1-Jan in calendar year</u>, excluding Start-Up and Shut-down (SU-SD). (For gas turbines with a Bypass stack, include the Bypass stack operating hours, excluding SU-SD, even though these are reported separately).

(b) For gas turbines with a Bypass stack, report Bypass operating hours <u>from 1-Jan in calendar year</u>, excluding SU-SD, in the adjacent column (labelled Bypass) which may be deleted if not applicable.

(c) Cumulative operating hours <u>from 1-Jan-2016</u> for LCP subject to a Limited Lifetime Derogation or a 10,000h monitoring derogation, excluding SU-SD. (For gas turbines with a Bypass stack, include the Bypass stack operating hours, excluding SU-SD, even though these are reported separately).

(d) For gas turbines with a Bypass stack, report Bypass Cumulative operating hours from 1-Jan-2016 if subject to a separate 10,000h monitoring derogation, in the adjacent column (labelled Bypass), excluding SU-SD.

(e) Annual operating hours in the given calendar year from the entry month into the 1,500 h/yr provision (in the first year as applicable) or from 1-Jan in subsequent calendar years, for either the whole LCP or the part of the LCP with emission limits that are applicable for <1500 h/yr operation, excluding SU-SD. For example, a plant that enters a 1,500 h/yr derogation when entering the LCP BREF compliance period would commence reporting the calendar year total hours counting from 1/8/2021.

(f) Five year rolling average hours from entry month for either the whole LCP or the part of the LCP with emission limits applicable for <1500 h/yr operation, excluding SU-SD. For example, a plant that enters a 1,500 h/yr derogation when entering the LCP BREF compliance period would commence reporting the rolling average hours from 1/8/2021.

(g) General note: hours of normal operation, excluding SU-SD, are reported as a decimal number to two decimal places.

(h) Hours of excluded emissions data associated with Black Start running (total excluded hours from all in-year submissions of Form IED/LCPBREF BS1 or a manual estimate if only Form MF1 is used to report Total OTNOC).

Signed on behalf of the Operator by:

Date of return:

.....

Form: Vers./date:

V3.0 Mar 2021

IED/LCPBREF HR1

RELEASES TO AIR QUARTERLY RETURN MONTHLY MEAN, MAXIMUM DAILY MEAN, ANNUAL MEAN AND ANNUAL PERCENTILE CONCENTI Operator: Drax Power Limited Form: HU/LCPBREF CON1 (Utility boilers) Vers./date: V3.0 Mar 2021

Location: Drax Power Station

Permit/Variation Number: VP3530LS

| Year: LCP: | : SO ₂ (mg/m ³) | | NO _x (n | NO _x (mg/m ³) | | Dust (mg/m ³) | | CO (mg/m ³) | | g/m³) ^(g) | NH ₃ (mg/m ³) ^(h) | |
|--|--|-------------------|----------------------|--------------------------------------|----------------------|---------------------------|----------------------|-------------------------|----------------------|----------------------|---|-------------------|
| Month | Monthly Mean | Max Daily Mean | Monthly Mean | Max Daily Mean | Monthly Mean | Max Daily Mean | Monthly Mean | Max Daily Mean | Monthly Mean | Max Daily Mean | Monthly Mean | Max Daily Mean |
| January | 16.1 | 21.3 | 141.7 | 157.6 | 8.2 | 10.4 | | | 3.30 | 5.10 | | |
| February | 15.0 | 29.3 | 147.9 | 165.9 | 8.7 | 11.8 | | | 4.60 | 6.20 | | |
| March | 18.0 | 36.4 | 141.1 | 159.0 | 6.7 | 12.9 | | | 4.60 | 8.40 | | |
| April | 10.4 | 31.9 | 133.3 | 152.1 | 4.6 | 7.9 | | | 2.60 | 4.60 | | |
| Мау | 14.1 | 30.6 | 141.3 | 168.5 | 5.1 | 8.5 | | | 2.70 | 6.50 | | |
| June | 9.7 | 19.7 | 139.4 | 157.5 | 6.9 | 10.1 | | | 3.00 | 5.40 | | |
| July | 4.8 | 10.5 | 141.4 | 161.3 | 7.4 | 14.1 | | | 1.20 | 2.40 | | |
| August | 4.6 | 8.6 | 133.6 | 156.3 | 5.6 | 8.4 | | | 1.80 | 3.20 | | |
| September | 2.7 | 8.1 | 137.2 | 160.8 | 7.6 | 11.3 | | | 1.10 | 4.20 | | |
| October | 7.5 | 32.3 | 127.2 | 148.9 | 5.3 | 9.7 | | | 2.20 | 7.90 | | |
| November | 3.0 | 8.1 | 139.5 | 158.6 | 8.2 | 12.8 | | | 1.40 | 4.30 | | |
| December | 12.6 | 26.5 | 146.7 | 165.0 | 8.7 | 13.2 | | | 2.40 | 4.10 | | |
| Monthly ELV & Daily ELV: (Period 1) ^(d) | 200 | 165 | 200 | 200 | 20 | 16 | | | 0 | 0 | | |
| Monthly ELV & Daily ELV: (Period 2) ^(d) | | | | | | | | | | | | |
| | Annual Mean | Annual ELV | Annual Mean | Annual ELV | Annual Mean | Annual ELV | Annual Mean | Annual ELV | Annual Mean | Annual ELV | Annual Mean | Annual ELV |
| Annual Mean & ELV (e) | 12.6 | 100 | 134.5 | 160 | 6.2 | 10 | 112.9 | 400 | 2.90 | 10 | -0.40 | 5 |
| | Annual Percentile | Percentile ELV | Annual Percentile | Percentile ELV | Annual Percentile | Percentile ELV | Annual Percentile | Percentile ELV | Annual Percentile | Percentile ELV | Annual Percentile | Percentile ELV |
| Annual 95 th Percentile & ELV (f) | 31.1 | | 163.5 | | 12.7 | | 269.5 | | 5.70 | | 0.05 | |

NOTES:

(a) All concentration data are based on validated hourly mean concentrations excluding start-up and shut-down periods of Malfunction or Breakdown of abatement equipment or Black Start operation. Repeat the report for each LCP as required.

LCP as required. (b) Daily, Monthly and Annual means, and Annual percentile concentrations, are calculated from the validated hourly means defined in (a). The qualifying periods for Hourly, Daily, Monthly and Annual means are 40m, 6h, 72h or 3d, and 500h, respectively. Annual means, for plants with an Annual ELV, and Annual Percentile concentrations, are submitted with the final return (Quarter 4).

(c) Reference conditions. Solid fuel: 6% O2 (dry) Liquid fuel: 3% O2 (dry) at 273K, 101.3 kPa.

(d) When there is an in-year change of ELV, record both ELVs in consecutive rows. For example, compliance with the LCP BREF begins in August 2021 therefore replace 'Period 1' with 'Jan - Jul' and 'Period 2' with 'Aug - Dec'. Otherwise, replace 'Period 1' with 'Jan - Dec' and delete or blank out the row containing 'Period 2'.

(e) For plants with an Annual ELV, for each pollutant, report the Annual mean in the first column and the Annual ELV (e) roy parties with an Annual ELVs are not applicable, and are not entered on the form, when the plant operates less than 1500 hours within the reporting year or tor plant with a 1500 h/yr five-year rolling average provision. Otherwise, reporting of the Annual mean begins in 2021 but compliance assessment with the Annual ELV segins in 2022 (incorporating plant operation from 1 January 2022); the Annual ELV is therefore not entered on the form for 2021 reporting.

(f) For each pollutant, report the Annual 95th percentile of hourly means in the first column and the Annual 95th percentile ELV in the second column. However, if there is an in-year reduction of the percentile ELV then it is not mandatory to enter the ELV as compliance assessment will commence in the following year. Delete columns containing pollutants that are not applicable to the plant type.

(g) Continuous HCl monitoring is always required for boilers fired by solid biomass (> 100 MWth), unless the emissions are recognised as being 'sufficiently stable' by the Competent Authority (delete columns if not required). Monthly and Annual Percentile ELVs are not specified since HCI was not regulated previously under the IED.

(h) Continuous NH₃ monitoring is required for processes fitted with Selective Catalytic Reduction (SCR) or Non-Selective Catalytic Reduction (SNCR) (delete columns if not required). In the case of SCR only, continuous monitoring is not required if the emissions are recognised as being 'sufficiently stable' by the Competent Authority. Only an Annual ELV is specified.

Signed on behalf of the Operator by:



Year:

Date(s)

RETURN OF PERIODIC MONITORING RESULTS^(a)

Operator: Drax Power Limite

Location: Drax Power Station

Permit/Variation Number: **VP3530LS**

LCP: Period:^(b) NO_x SO₂ Dust СО **Measurement details** (mg/m^3) (mg/m^3) (mg/m^3) (mg/m^3) Measurement 1^(c) (Duration in HH:MM) Measurement 2 (c) (Duration in HH:MM) Measurement 3^(c) (Duration in HH:MM) Average result Measurement Uncertainty^(d) Operational data^(e) Load (%MCR) Fuel 1 name (%) Fuel 2 name (%) Fuel 3 name (%) Alternative approach (f), (g)

NOTES:

Method Result

(a) Periodic monitoring when continuous monitoring is not required. Reference conditions for mg/m³ are 15% O₂ CCGT, 6% O₂ solid fuels, 3% O₂ for oil and gas, dry, 273K, 101.3 kPa.

(b) Period, e.g., Jan - Mar for Quarterly, Jan - Jun for Six-Monthly or Jan - Dec for Annual.

(c) Enter the measurement result followed by the sampling duration in parentheses,

e.g., 50.5 (1:05).

Emission Limit Value

(d) Expanded measurement uncertainty (95% confidence) declared by the Test Laboratory in concentration units. The maximum allowed uncertainty for compliance assessment is specified by the competent authority.

(e) Operational data for the test period. Declare fuel split if another fuel is co-fired. (MCR = Maximum Continuous Rating)

(f) Alternative approach to periodic monitoring by agreement with the Competent Authority.

(g) Use abbreviation for Method: NF for agreed NOx factor, FS for fuel sulphur content, CS for agreed CO factor, DF for agreed dust factor. The flue gas concentration calculated using this method is the Result.

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Signed on behalf of the Operator by:

Date of return:

Form: IED/LCPBREF PM1

V3.0 Mar 2021

RELEASES TO AIR RETURN OF PERIODIC MONITORING RESULTS ^{(a), (b)}

Operator: Drax Power Limited

Location: Drax Power Station

Permit/Variation Number:

Form: IED/LCPBREF PM2

V3.0 Mar 2021

VP3530LS

| Year: | LCP: | | | | | | | | | |
|---|-----------------------------|---------------------------------|--|--|--|--|--|--|--|--|
| Period: ^(c) | | | | | | | | | | |
| Measurement details | HCI (mg/m ³) | HF (mg/m ³) | NH ₃ ^(e) (mg/m ³) | SO ₃ ^(e) (mg/m ³) | | | | | | |
| Date(s) | | 27/09; 04/10; 05/10; 11/1022 | | | | | | | | |
| Unit 1 Measurement 1 ^(d) (Duration in HH:MM) | | 0.32 | | | | | | | | |
| Unit 1 Measurement 2 ^(d) (Duration in HH:MM) | | 0.53 | | | | | | | | |
| Unit 1 Measurement 3 ^(d) (Duration in HH:MM) | | 0.03 | | | | | | | | |
| Unit 2 Measurement 1 ^(d) (Duration in HH:MM) | | 0.07 | | | | | | | | |
| Unit 2 Measurement 2 ^(d) (Duration in HH:MM) | | 0.09 | | | | | | | | |
| Unit 2 Measurement 3 ^(d) (Duration in HH:MM) | | 0.1 | | | | | | | | |
| Unit 3 Measurement 1 ^(d) (Duration in HH:MM) | | 0.06 | | | | | | | | |
| Unit 3 Measurement 2 ^(d) (Duration in HH:MM) | | 0.88 | | | | | | | | |
| Unit 3 Measurement 3 ^(d) (Duration in HH:MM) | | 0.1 | | | | | | | | |
| Unit 4 Measurement 1 ^(d) (Duration in HH:MM) | | 0.12 | | | | | | | | |
| Unit 4 Measurement 2 ^(d) (Duration in HH:MM) | | 0.09 | | | | | | | | |
| Unit 4 Measurement 3 ^(d) (Duration in HH:MM) | | 0.11 | | | | | | | | |
| Average result (mg/m³) | | 0.21 | | | | | | | | |
| Measurement Uncertainty (mg/m ³) ^(f) | | 0.02 | | | | | | | | |
| Annual ELV (mg/m ³) | | 0 | | | | | | | | |
| Operational data ^(g) | | | | | | | | | | |
| Load (%MCR) | | Steady | | | | | | | | |
| Fuel 1 name (%) | | Biomass | | | | | | | | |
| Fuel 2 name (%) | | Biomass | | | | | | | | |
| Fuel 3 name (%) | | Biomass | | | | | | | | |

NOTES:

(a) Periodic monitoring at the frequency required by the Permit. For coal fired plants only, and for HCl and HF only, for operation < 500h/y, use Form IED/LCPBREF FUEL2 instead.

(b) Reference conditions for reporting concentrations: 6% O₂, dry, 273K, 101.3 kPa.

(c) Period, e.g., Jan - Mar for Quarterly, Jan - Jun for Six-Monthly or Jan - Dec for Annual.

(d) Enter the measurement result followed by the sampling duration in parentheses, e.g., 5.52 (1:33)

(e) For processes fitted with Selective Catalytic Reduction (SCR) only. Annual monitoring of SO₃. Annual monitoring of NH₃ if the emissions are recognised as being 'sufficiently stable' by the Competent Authority. Delete columns if not required.

(f) Average Expanded measurement uncertainty (95% confidence) reported by the Test Laboratory. The maximum allowed uncertainty for compliance assessment is specified by the competent authority.

(g) Operational data for the test period. Declare Load as % of MCR (Maximum Continuous Rating). Declare fuel split when mixed fuels are fired.

Signed on behalf of th

RELEASES TO AIR ANNUAL RETURN OF MERCURY RETENTION FACTOR RESULTS (a)

Operator: Drax Power Limited Location: Drax Power Station

Form: IED/LCPBREF PM4 VP3530LS Permit/Variation Number: V3.0 Mar 2021

| Year: | | LCP ^(k) | | | | | | | | | | | |
|--|------------|--------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|---------|
| Measurement number | 1 | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | Average |
| Unit | Unit 1 | Unit 1 | Unit 1 | Unit 2 | Unit 2 | Unit 2 | Unit 3 | Unit 3 | Unit 3 | Unit 4 | Unit 4 | Unit 4 | |
| Test Date | 28/09/2022 | 28/09/2022 | 28/09/2022 | 04/10/2022 | 04/10/2022 | 04/10/2022 | 05/10/2022 | 05/10/2022 | 05/10/2022 | 11/10/2022 | 11/10/2022 | 11/10/2022 | |
| Test Duration (HH:MM) | 00:30 | 00:30 | 00:30 | 00:30 | 00:30 | 00:30 | 00:30 | 00:30 | 00:30 | 00:30 | 00:30 | 00:30 | 00:30 |
| Flue gas concentration, Hg ^T (µg/m ³) | <0.7 | <0.7 | <0.8 | <0.7 | <0.7 | <0.7 | <0.8 | <0.6 | <0.7 | <0.8 | <0.8 | <0.8 | 0.73 |
| Measurement Uncertainty, U _{FLUE} (µg/m ³) ^(c) | 0.07 | 0.07 | 0.08 | 0.07 | 0.07 | 0.07 | 0.08 | 0.06 | 0.07 | 0.08 | 0.08 | 0.08 | 0.07 |
| Operational data ^(d) | 1 | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | Average |
| Plant load (%MCR) | | | | | | | | | | | | | |
| Fuel 1 (% by mass) | | | | | | | | | | | | | |
| Fuel 2 (% by mass) | | | | | | | | | | | | | |
| Fuel 3 (% by mass) | | | | | | | | | | | | | |
| Annual Fuel Hg Limit (µg/kg _{ar}) | 1 | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | |
| Fuel 1 Hg (µg/kg _{ar}) ^(e) | | | | | | | | | | | | | |
| Fuel 2 Hg (µg/kg _{ar}) | | | | | | | | | | | | | |
| Fuel 3 Hg (µg/kg _{ar}) | | | | | | | | | | | | | |
| Average Fuel Hg (µg/kg _{ar}) ^(t) | | | | | | | | | | | | | |
| Measurement Uncertainty, U _{FUEL} (µg/kg) ^(g) | | | | | | | | | | | | | |
| Retention Factor ^(h) | 1 | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | Average |
| Measured R (-) | | | | | | | | | | | | | |
| R _{max} ⁽ⁱ⁾ (-) | | | | | | | | | | | | | |
| Declared R (-) | | | | | | | | | | | | | |

NOTES: (a) This form applies to coal fired plants only when subject to 'sufficiently stable' emissions criteria. Operation 2 500 h/y only. For operation - 500 h/y only constraint of the stable' emissions criteria. Operation 2 500 h/y only. For operation - 500 h/y only concentrations: 6% O₂, dry, 273K, 101.3 kPa. (c) Expanded measurement uncertainty (9% confidence) declared by the Test Laboratory, U_{RLE} (µg/m²). The maximum allowed uncertainty for compliance assessment is specified by the completent authority. (d) Operational data for the test period. Declare Load as % of MCR (Maximum Continuous Rating). Declare fuel split if other fuels are co-fired with coal. Declare average fuel mercury content for each test period.

(e) Fuel mercury in µg/kg = parts per billion (ppb) by mass (from book values or based on sampling and measurement).

(f) For multiple fuel types report the weighted average fuel mercury content, e.g., Coal 95% by mass with Hg 12 μ g/kg,, Biomass 5% with Hg 0.7 μ g/kg, then Average = 0.95 * 12 + 0.05 * 0.7 = 11.44 μ g/kg,

(g) Average expanded uncertainty (95% confidence) for the fuel mercury measurement. Analysis by ISO15237: U_{FUEL} = (0.25 * Hg + 20) μ g/kg Analysis by ASTM 6722-11: U_{FUEL} = (0.13 * Hg + 7) μ g/kg

(h) Record the current Declared Retention Factor and calculate the Measured Retention Factor: R = 1 - [8.76 * Hg⁷ (µg/m³) / Hg_{FUEL} (µg/kg_w)]

(i) Calculate the maximum Retention Factor (R_{max}) considering the measurement uncertainties in flue gas Hg emissions (U_{RUE}) and fuel Hg content (U_{REE}): $R_{max} = 1 - [8.76 * Hg^{2} (\mu g/m^{3}) / Hg_{RUE} (\mu g/k_{ga}) * (1 - U_{P})]$ where $U_{\mu} = 1 ([U_{RUE} / Hg^{2})^{2} + (U_{RUE} / Hg_{RUE})^{2}]$ If average R_{max} is less than Declared R then repeat the test or re-calculate a new fuel mercury limit using the Measured Retention Factor: Fuel Hg Limit ($\mu g/k_{ga}$) = 35.04 / [1 - R]

Signed on behalf of the Operato Date of return:

QUARTERLY RETURN

MONTHLY MEAN HALOGEN AND MERCURY 'AS RECEIVED' FUEL CONCENTRATION ^{(a), (b), (c)}

Operator: Drax Power Limited

Form: IED/LCPBREF FUEL1

Location: Drax Power Station

V3.0 Mar 2021

Permit/Variation Number: VP3530LS

| Year: LCP: | Coal (tonnes _{ar}) | Coal C (% | Chlorine ‰ _{ar}) | Coal F (mg/k | luorine (g _{ar}) ^(d) | Coal Mercury (μg/kg _{ar}) ^(e) | |
|-----------------------------|---------------------------------|-----------------|-------------------------------|-----------------|--|---|-----------------|
| Month | Monthly Total | Monthly Mean | Year to date | Monthly Mean | Year to date | Monthly Mean | Year to date |
| January | | | | | | | |
| February | | | | | | | |
| March | | | | | | | |
| April | | | | | | | |
| Мау | | | | | | | |
| June | | | | | | | |
| July | | | | | | | |
| August | | | | | | | |
| September | | | | | | | |
| October | | | | | | | |
| November | | | | | | | |
| December | | | | | | | |
| Annual Fuel Threshold/Limit | | | | | | | |

NOTES:

(a) For coal fired plants subject to 'sufficiently stable' emissions criteria, report fuel concentrations to three decimal places for chlorine (%) and the nearest whole number for fluorine (mg/kg) and mercury (μ g/kg)

(b) To calculate the 'as received' fuel concentration from the 'dry' fuel concentration, multiply by (1 - M) where M is the fractional fuel moisture content

(c) To calculate the 'as received' fuel concentration from the 'dry, ash-free' fuel concentration, divide by $(1 - A_{ar} - M)$ where A_{ar} is the fractional fuel ash content (as received)

(d) mg/kg = parts per million (ppm) by mass

(e) µg/kg = parts per billion (ppb) by mass

Signed on behalf of the Operator by:

Date of return:

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RELEASES TO AIR QUARTERLY RETURN CUMULATIVE ROLLING MALFUNCTION AND BREAKDOWN HOURS (12 MONTH PERIOD)^{(a), (b)} IED/LCPBREF BD1 **Operator: Drax Power Limited** Form: Location: Drax Power Station Vers./date: V3.0 Mar 2021

VP3530LS Permit/Variation Number:

| Year: LCP: | S | 02 | Z | O _x | Du | ust | C | D ^(d) | но |)(^{e)} |
|----------------------|------------------------|----------------------|------------------------|----------------------|------------------------|----------------------|------------------------|----------------------|------------------------|----------------------|
| Month ^(c) | Malfunction (hours) | Breakdown (hours) |
| Month 1 | | | | | | | | | | |
| Month 2 | | | | | | | | | | |
| Month 3 | | | | | | | | | | |
| Month 4 | | | | | | | | | | |
| Month 5 | | | | | | | | | | |
| Month 6 | | | | | | | | | | |
| Month 7 | | | | | | | | | | |
| Month 8 | | | | | | | | | | |
| Month 9 | | | | | | | | | | |
| Month 10 | | | | | | | | | | |
| Month 11 | | | | | | | | | | |
| Month 12 | | | | | | | | | | |
| Annual cap (hours) | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |

NOTES:

NOTES: (a) Cumulative rolling malfunction and breakdown hours (12 month period) updated monthly (b) Data Acquisition and Handling Systems without the capability to report Black Start hours separately may incorporate Black Start hours on this form provided that a manual estimate of the number of Black Start hours is reported separately on Form IED/LCPBREF HR1.

(c) Insert the relevant months for the preceding 12 month period, e.g., starting with March 2016

(d) Gas turbines with CO abatement only (columns may be deleted for other plant types)
(e) Plants with HCI abatement only (columns may be deleted for other plant types)

Signed on behalf of the Operator by:



RETURN OF DAILY MALFUNCTION AND BREAKDOWN DATA ^{(a), (b), (c), (d)}

VP3530LS

Operator: Drax Power Limited

Location: Drax Power Station Permit/Variation Number:

| LCP: | | | | | | | | | | | |
|-------|--|-------------------|-----------|-------------------|-----------|-------------------|-----------|-------------------|-----------|--------------------|-----------|
| Туре: | Malfunction/Breakdown /Normal Operation | | | | | | | | | | |
| Date: | | SO ₂ | Excluded? | NO _x | Excluded? | Dust | Excluded? | CO ^(e) | Excluded? | HCI ^(f) | Excluded? |
| Hour | Start time | mg/m ³ | Y/N | mg/m ³ | Y/N |
| 1 | 00:00 | | | | | | | | | | |
| 2 | 01:00 | | | | | | | | | | |
| 3 | 02:00 | | | | | | | | | | |
| 4 | 03:00 | | | | | | | | | | |
| 5 | 04:00 | | | | | | | | | | |
| 6 | 05:00 | | | | | | | | | | |
| 7 | 06:00 | | | | | | | | | | |
| 8 | 07:00 | | | | | | | | | | |
| 9 | 08:00 | | | | | | | | | | |
| 10 | 09:00 | | | | | | | | | | |
| 11 | 10:00 | | | | | | | | | | |
| 12 | 11:00 | | | | | | | | | | |
| 13 | 12:00 | | | | | | | | | | |
| 14 | 13:00 | | | | | | | | | | |
| 15 | 14:00 | | | | | | | | | | |
| 16 | 15:00 | | | | | | | | | | |
| 17 | 16:00 | | | | | | | | | | |
| 18 | 17:00 | | | | | | | | | | |
| 19 | 18:00 | | | | | | | | | | |
| 20 | 19:00 | | | | | | | | | | |
| 21 | 20:00 | | | | | | | | | | |
| 22 | 21:00 | | | | | | | | | | |
| 23 | 22:00 | | | | | | | | | | |
| 24 | 23:00 | | | | | | | | | | |
| | Daily | Average | No. Hours | Average | No. Hours |
| | Without data exclusion | | | | | | | | | | |
| | (All of the above data) | | | | | | | | | | |
| | With data exclusion | | | | | | | | | | |
| | (Reportable data only) | | | | | | | | | l | |

IED/LCPBREF MF1

V3.0 Mar 2021

(a) Produce a return for each day which has data exclusion due to Malfunction or Breakdown Notes:

(a) Floate a return to each which the state Activation to be to maintend of the probability of the state activation of the state activati

Form:

Vers/date:

(e) Gas turbines with abatement only (columns may be deleted for other plant types) (f) Plants with HCl abatement only (columns may be deleted for other plant types)

Signed on behalf of the Operator by:



Permit/Variation Number:

RETURN OF DAILY BLACK START DATA ^{(a), (b), (c), (d)} Operator: Drax Power Limited Location: Drax Power Station VP3530LS

| LCP: | | | | | | | | | | | |
|-------|----------------------------------|-------------------|-----------|-------------------|-----------|-------------------|-----------|-------------------|-----------|--------------------|-----------|
| Туре: | Black Start /Normal Operation | | | | | | | | | | |
| Date: | | SO ₂ | Excluded? | NOx | Excluded? | Dust | Excluded? | CO ^(e) | Excluded? | HCI ^(f) | Excluded? |
| Hour | Start time | mg/m ³ | Y/N | mg/m ³ | Y/N |
| 1 | 00:00 | | | | | | | | | | |
| 2 | 01:00 | | | | | | | | | | |
| 3 | 02:00 | | | | | | | | | | |
| 4 | 03:00 | | | | | | | | | | |
| 5 | 04:00 | | | | | | | | | | |
| 6 | 05:00 | | | | | | | | | | |
| 7 | 06:00 | | | | | | | | | | |
| 8 | 07:00 | | | | | | | | | | |
| 9 | 08:00 | | | | | | | | | | |
| 10 | 09:00 | | | | | | | | | | |
| 11 | 10:00 | | | | | | | | | | |
| 12 | 11:00 | | | | | | | | | | |
| 13 | 12:00 | | | | | | | | | | |
| 14 | 13:00 | | | | | | | | | | |
| 15 | 14:00 | | | | | | | | | | |
| 16 | 15:00 | | | | | | | | | | |
| 17 | 16:00 | | | | | | | | | | |
| 18 | 17:00 | | | | | | | | | | |
| 19 | 18:00 | | | | | | | | | | |
| 20 | 19:00 | | | | | | | | | | |
| 21 | 20:00 | | | | | | | | | | |
| 22 | 21:00 | | | | | | | | | | |
| 23 | 22:00 | | | | | | | | | | |
| 24 | 23:00 | | | | | | | | | | |
| | Daily | Average | No. Hours | Average | No. Hours |
| | Without data exclusion | | | | | | | | | | |
| | (All of the above data) | | | | | | | | | | |
| | With data exclusion | | | | | | | | | | |
| | (Reportable data only) | | | | | | | | | | 1 |

IED/LCPBREF BS1

V3.0 Mar 2021

Notes:

(a) Produce a return for each day which has data exclusion due to Black Start running
(b) All data based on hourly average <u>validated</u> concentrations (confidence interval subtracted)
(c) Reference conditions: mg/m³ dry, 273K, 101.3 kPa; Solid fuels 6% Q₂; Liquid and Gaseous fuels 3% Q₂; Gas turbines 15% Q₂
(d) Data Acquisition and Handling Systems without the capability to report Black Start emissions separately may incorporate Black Start emissions on form IED/LCPBREF MF1 provided that a manual estimate of the number of Black Start hours is reported separately on Form IED/LCPBREF HR1.

Form:

Vers/date:

(e) As applicable, e.g., gas turbines (f) Plants with HCl abatement only (columns may be deleted for other plant types)

Signed on behalf of the Operator by:

| Air Quality Risk Assessment | Form: IED/LCPBREF AQRA1 Utility Boilers (V3.0 Mar 2021) |
|---|---|
| Operator: | |
| Contact: | |
| Location: | |
| Permit number: | |
| Pollutant(s) (SO ₂ , NO _x , Dust): | |
| Sulphur Dioxide (SO ₂) | SO ₂ |
| First excluded hour (DD-MM-YYYY HH:MM): | |
| Last excluded hour (DD-MM-YYYY HH:MM): | |
| Notification period commenced (DD-MM-1111 00:00): | |
| Number of excluded nours | |
| Maximum doily average valid concentration (mg/m ³): | |
| | |
| Number of running units: | |
| Local Air Quality Assessment: | |
| Note any relevant observations from local air quality monitoring | |
| stations and comment on weather conditions, including prevailing wind | |
| speed (maximum and average) and direction. | |
| | |
| Dispersion Assessment: | |
| Comment on the magnitude of the maximum hourly average | |
| concentration in relation to previous dispersion modelling studies. | |
| | |
| | |
| Further dispersion modelling required (Y/N)? | |
| | NQ |
| First excluded hour (DD-MM-YYYY HH:MM): | |
| Last excluded hour (DD-MM-YYYY HH:MM): | |
| Notification period commenced (DD-MM-YYYY 00:00): | |
| Number of excluded hours | |
| Maximum hourly average valid concentration (mg/m ³): | |
| Maximum daily average valid concentration (mg/m ³): | |
| Daily Emission Limit Value (mg/m ³): | |
| Number of running units: | |
| Local Air Quality Assessment: | |
| Note any relevant observations from local air quality monitoring | |
| stations and comment on weather conditions, including prevailing wind | |
| speed (maximum and average) and direction. | |
| Dispersion Assessment: | |
| Comment on the magnitude of the maximum hourly average | |
| concentration in relation to previous dispersion modelling studies. | |
| | |
| | |
| Further dispersion modelling required (Y/N)? | |
| DUST (as PM ₄₀) | PM ₁₀ |
| First excluded hour (DD-MM-YYYY HH:MM): | |
| Last excluded hour (DD-MM-YYYY HH:MM): | |
| Notification period commenced (DD-MM-YYYY 00:00): | |
| Number of excluded hours | |
| Maximum hourly average valid concentration (mg/m ³): | |
| Maximum daily average valid concentration (mg/m ³): | |
| Daily Emission Limit Value (mg/m ³): | |
| Number of running units: | |
| Local Air Quality Assessment: | |
| Note any relevant observations from local air quality monitoring | |
| speed (maximum and average) and direction. | |
| | |
| Dispersion Assessment: | |
| Comment on the magnitude of the maximum hourly average | |
| concentration in relation to previous dispersion modelling studies. | |
| | |
| | |
| Further dispersion modelling required (V/N)2 | |
| Notas | 1 |
| | |

Reference condition: mg/m^3 at 6% O_2 , dry, 273K, 101.3 kPa.

Valid Concentration Averages incorporate previously excluded data. Air quality objectives are set for SO₂ (15min, Hourly, Daily averages); NO₂ (Hourly) and PM₁₀ (Daily).

| RESOURCE EFFICIENCY METRICS | | 1 | |
|---|-----------|---------------|----------------|
| ANNUAL RETURN YE | AR: | | |
| Form: IED/LCPBREF REM1 Ve | rs./date: | V3.0 Mar 2021 | |
| Operator: | | | |
| Permit/Variation Number: | | [| |
| Parameter | | (a) | Units |
| Electricity Exported | | | GWh |
| Heat Exported | | | GWh |
| Mechanical Power Provided | | | GWh |
| Fossil Fuel Energy Consumption | | | GWh |
| Non-Fossil Fuel Consumption | | | GWh |
| Annual Operating Hours - LCPXXX ^(b) | | | h |
| Water Abstracted from Fresh Water Source | | | m ³ |
| Water Abstracted from Borehole Source | | | m ³ |
| Water Abstracted from Estuarine Water Source | | | m ³ |
| Water Abstracted from Sea Water Source | | | m ³ |
| Water Abstracted from Mains Water Source | | | m ³ |
| Gross Total Water Used | | | m ³ |
| Net Water Used | | | m ³ |
| Hazardous Waste Transferred for Disposal at another Installation | | | t |
| Hazardous Waste Transferred for Recovery at another Installation | | | t |
| Non-Hazardous Waste Transferred for Disposal at another Installation | | | t |
| Non-Hazardous Waste Transferred for Recovery at another Installation | | | t |
| Waste Recovered to Quality Protocol Specification and Transferred Off-Site | | | t |
| Waste Transferred Directly Off-Site for Use under an exemption / position state | ment | | t |

NOTES:

(a) General note: Parameters should be reported as a decimal number to 2 decimal places.(b) Repeat row for each LCP

Signed on behalf of the Operator by:

.....

.....

ANNUAL RETURN

CONTINUOUS EMISSIONS MEASUREMENT SYSTEMS (CEMS) INVALIDITY LOG^{(a),(b)}

Operator: Monitor positioned on release point/LCP Numbe Permit/Variation Number:

LCP:

Form: IED/LCPBREF CEM1

V3.0 Mar 2021

| Year: | Period of Invalidation | Cumulative Invalidated Days in | Comments |
|-------|---------------------------|-----------------------------------|----------|
| Date | (nours) | a rear | |
| | | | |
| | | | |
| | | | |
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| | | | |
| | | | |

NOTES:

(a) This form is returned in the event that the number of days of invalid CEMS performance exceeds 10 days within the calendar year for any individual pollutant.

(b Any day in which more than 3 hourly average values are invalid (due to malfunction or maintenance of the CEMS) is counted as a day of CEMS invalidity. If more than 10 days are invalid over a year the operator shall, within 28 days of becoming aware of this fact, review the causes of the invalidity and submit to the Environment Agency for approval, proposals for measures to improve the reliability of the CEMS, including a timetable for the implementation of those measures, and then implement the approved proposals.

Signed on behalf of the Operator by:

| Date of return: | |
|-----------------|--|
| | |

| Version | Issue date | Comments/changes |
|---------|------------|---|
| 2.8 | Aug-20 | First issue. |
| 2.9 | Jan-21 | Intermediate draft. |
| 3.0 | Mar-21 | Form AR1 deleted. This is supplied directly by the Environment Agency when requesting the annual return or on request. Form CON2 corrected as follows: Annual mean: Original footnote (g) deleted; Original footnote (h) becomes new footnote (g). Annual percentiles: New footnote (h): For each pollutant, report the Annual 95th percentile of hourly means in the first column and the Annual 95th percentile ELV in the second column. However, if there is an in-year reduction of the percentile ELV then it is not mandatory to enter the ELV as compliance assessment will commence in the following year. Form CON1 corrected as follows: Addition to footnote f): However, if there is an in-year reduction of the percentile ELV then it is not mandatory to enter the ELV as compliance assessment will commence in the following year. |

| Permit | Title | NOTE THAT MANUAL |
|--------------------|--|-------------------------------|
| IED/LCPBREF HR1 | ANNUAL OPERATING HOURS RETURN | PREPARATION AND SUBMISSION |
| | For each LCP: Annual operating hours. For each LCP with a Limited Lifetime Derogation or a 10,000h | OF REPORTING FORMS THAT ARE |
| | monitoring derogation: cumulative operating hours from 1 Jan 2016. For each Unit or LCP with an IED Annex | DATA ACQUISITION AND HANDLING |
| | subsequent vears) and five vear running average from entry month. For a combined cycle gas turbine that | SYSTEM (DAHS) IS PERMITTED |
| | operates with a bypass stack in normal operation, the bypass hours during normal operation are included in | PROVIDED THAT THESE ARE |
| | the plant hours but are also reported separately. | ERRORS ACCORDING TO SITE |
| | recorded on this form. This is the sum of excluded hours relating to all submissions of Form LCPBREF BS1 | PROCEDURES. THIS APPLIES TO |
| | within the reporting year or, when these emissions are aggregated within Form IED/LCPBREF MF1, a manual | THE FIRST REPORTING YEAR |
| | estimate of Black Start hours within the calendar year. | (2021) ONLY. |
| IED/LCPBREF AR1 | ANNUAL RETURN OF ENERGY INPUT AND TOTAL EMISSIONS (DELETED) | |
| | thermal input. (This form is supplied annually by the Environment Agency or on request) | |
| IED/LCPBREF CON1/2 | QUARTERLY RETURN: MONTHLY MEAN, MAXIMUM DAILY MEAN, ANNUAL MEAN AND ANNUAL PERCENTILE CONCENTRATIONS | |
| | Continuous monitoring results. Quarterly return for each LCP (noting that Unit(s) with a 1,500h provision under | |
| | either the IED or the LCP BREF are regarded as a separate LCP). Validated concentration data: Monthly mean: Maximum Daily mean within month: Annual mean, for plants with | |
| | an Annual ELV, and Annual 95th percentile of hourly means. | |
| | Version 1 (IED/LCPBREF CON1) Utility Boilers; Version 2 (IED/LCPBREF CON2) Gas turbines. | |
| IED/LCPBREF PM1 | PERIODIC MONITORING RESULTS (AS REQUIRED) | |
| | Periodic monitoring return (e.g., six monthly NO _x , SO ₂ , Dust or CO test results) or Alternative monitoring return (as agreed by the Competent Authority). Required when these species are not monitored continuously and at | |
| | the frequency specified by the Permit. | |
| IED/LCPBREF PM2 | PERIODIC MONITORING RESULTS (AS REQUIRED) | |
| | assessment, typically guarterly or annual monitoring. Periodic monitoring return for NH ₂ and SO ₂ for plants | |
| | fitted with Non-Selective or Selective Catalytic Reduction (SNCR/SCR), typically annual monitoring. | |
| IED/LCPBREF PM3 | PERIODIC MONITORING RESULTS (AS REQUIRED) | |
| | Periodic monitoring return for trace metals, and mercury, for solid fuel fired boilers operating \ge 500 h/y. | |
| | i ypically annual monitoring. For coal fired boilers subject to sufficiently stable monitoring provisions, periodic mercury monitoring is reported on Form PM4. | |
| IED/LCPBREF PM4 | ANNUAL RETURN OF MERCURY RETENTION FACTOR RESULTS | |
| | Annual return for coal fired plants subject to sufficiently stable emissions criteria, operating ≥ 500h/y. Periodic | |
| | flue gas monitoring results are combined with the fuel mercury contents to give calculated Retention Factors. | |
| | I nese R values are adjusted, to give a maximum possible Retention Factor, R _{max} , using the Uncertainties of the flue are and fuel Ha measurements. If the average R is greater than the Declared Retention Factor | |
| | then a re-test is required or the Declared Retention Factor and the fuel Hg limit are updated to the measured R | |
| | value. | |
| IED/LCPBREF FUEL1 | QUARTERLY RETURN: MONTHLY MEAN HALOGEN AND MERCURY 'AS RECEIVED' FUEL CONCENTRATION | |
| | Quarterly return for each coal fired LCP, subject to sufficiently stable emissions criteria, for the demonstration | |
| | chlorine and fluorine contents of the fired fuel. | |
| IED/LCPBREF FUEL2 | ANNUAL RETURN OF FUEL BASED MONITORING APPROACH (< 500h/y only) | |
| | Annual return for each coal fired LCP operating < 500 h/y. Contains Annual average mercury, chlorine and fluoring contents of fired fuel and the associated calculated flue ass concentrations | |
| IED/LCPBREF BD1 | QUARTERLY RETURN OF CUMULATIVE ANNUAL ROLLING MALFUNCTION AND BREAKDOWN | |
| | For each LCP fitted with abatement, return the cumulative Malfunction and Breakdown hours as a rolling | |
| IED/LCPBREF MF1 | average (12 monarily period) that is updated on a monarily Dasis. RETURN OF MALFUNCTION AND BREAKDOWN DATA (AS REQUIRED) | |
| | Validated concentration data for each day affected by Malfunction or Breakdown. | |
| IED/LCPBREF BS1 | RETURN OF BLACK START DATA (AS REQUIRED) | |
| | Validated concentration data for each day affected by Black Start running. | |
| IED/LCPBREF AQRA1 | AIR QUALITY RISK ASSESSMENT FOR OTNOC - UTILITY BOILERS (AS REQUIRED) | |
| | Basic air quality risk assessment for valid concentration excursions related to Other Than Normal Operating | |
| ED/LCPBREF AORA2 | Conditions (Mairunction/Breakdown or Black Start running). Select pollutants from: SO ₂ ; NO ₂ ; Dust AIR QUALITY RISK ASSESSMENT FOR OTNOC - GAS TURBINES (AS REQUIRED) | |
| BILLI AGAAZ | Basic air quality risk assessment for valid concentration excursions related to Other Than Normal Operating | |
| | Conditions (Malfunction/Breakdown or Black Start running). Select pollutants from: NO2; CO | |
| IED/LCPBREF REM1 | ANNUAL RETURN OF RESOURCE EFFICIENCY METRICS | |
| | Energy consumption and production; water consumption and discharge; waste disposal and recovery. | |
| IED/LCPBREF CEM1 | CONTINUOUS EMISSIONS MEASUREMENT SYSTEMS (CEMS) INVALIDITY LOG | |
| | This form is submitted in the event that the CEMS unavailability exceeds 10 days in a given calendar year. | |

| Year: | LCP1 (hours) | Bypass (hours) | LCP2 (hours) | Bypa (hou |
|--|-----------------|-------------------|-----------------|--------------|
| RELEASES TO AIR ANNUAL RETURN OPERATING HOURS Operator: Drax Power Limited Location: Drax Power Station Permit/Variation Number: VP3530LS | | | | |
| | | | | |

| Year: | (hours) | Bypass (hours) | (hours) | Bypass (hours) | (hours) | Bypass (hours) | (hours) | Bypass (hours) |
|--|---------|-------------------|---------|-------------------|---------|-------------------|---------|-------------------|
| Annual Operating Hours ^{(a), (b)} | 8607.33 | | | | | | | |
| Cumulative Operating Hours ^{(c),(d)} | | | | | | | | |
| Annual Operating Hours 1,500 Unit ^(e) Enter start date below hours in brackets e.g., (1/7/20) or (1/8/21) | | | | | | | | |
| Five year rolling average ^(f) | | | | | | | | |
| Black start hours ^(h) | | | | | | | | |

NOTES:

(a) Annual operating hours for <u>every LCP from 1-Jan in calendar year</u>, excluding Start-Up and Shut-down (SU-SD). (For gas turbines with a Bypass stack, include the Bypass stack operating hours, excluding SU-SD, even though these are reported separately).

(b) For gas turbines with a Bypass stack, report Bypass operating hours <u>from 1-Jan in calendar year</u>, excluding SU-SD, in the adjacent column (labelled Bypass) which may be deleted if not applicable.

(c) Cumulative operating hours <u>from 1-Jan-2016</u> for LCP subject to a Limited Lifetime Derogation or a 10,000h monitoring derogation, excluding SU-SD. (For gas turbines with a Bypass stack, include the Bypass stack operating hours, excluding SU-SD, even though these are reported separately).

(d) For gas turbines with a Bypass stack, report Bypass Cumulative operating hours from 1-Jan-2016 if subject to a separate 10,000h monitoring derogation, in the adjacent column (labelled Bypass), excluding SU-SD.

(e) Annual operating hours in the given calendar year from the entry month into the 1,500 h/yr provision (in the first year as applicable) or from 1-Jan in subsequent calendar years, for either the whole LCP or the part of the LCP with emission limits that are applicable for <1500 h/yr operation, excluding SU-SD. For example, a plant that enters a 1,500 h/yr derogation when entering the LCP BREF compliance period would commence reporting the calendar year total hours counting from 1/8/2021.

(f) Five year rolling average hours from entry month for either the whole LCP or the part of the LCP with emission limits applicable for <1500 h/yr operation, excluding SU-SD. For example, a plant that enters a 1,500 h/yr derogation when entering the LCP BREF compliance period would commence reporting the rolling average hours from 1/8/2021.

(g) General note: hours of normal operation, excluding SU-SD, are reported as a decimal number to two decimal places.

(h) Hours of excluded emissions data associated with Black Start running (total excluded hours from all in-year submissions of Form IED/LCPBREF BS1 or a manual estimate if only Form MF1 is used to report Total OTNOC).

Signed on behalf of the Operator by:

| | | | | | |
|--|--|------|------|------|--|
| | | | | | |
| | | | | | |
| | | | | | |

Date of return:

#######

IED/LCPBREF HR1

Vers./date:

Form:

V3.0 Mar 2021

RELEASES TO AIR QUARTERLY RETURN MONTHLY MEAN, MAXIMUM DAILY MEAN, ANNUAL MEAN AND ANNUAL PERCENTILE CONCENTI Operator: Drax Power Limited Form: HU/LCPBREF CON1 (Utility boilers)

Location: Drax Power Station

Vers./date: V3.0 Mar 2021

Permit/Variation Number: VP3530LS

| Year: LCP: | SO ₂ (r | ng/m³) | NO _x (n | IO _x (mg/m ³) Dust (mg/m ³) CO (mg/m ³) HCI (mg/m ³) ^(g) N | | NO _x (mg/m ³) Dust (mg/m ³) CO (mg/m ³) HCI (mg/m ³) ^(g) NH ₃ | | Dust (mg/m ³) CO (mg/m ³) HCI (mg/m ³) ^(g) | | HCI (mg/m ³) ^(g) | | NH ₃ (m | H ₃ (mg/m ³) ^(h) | |
|--|----------------------|-------------------|----------------------|--|----------------------|--|----------------------|---|----------------------|---|----------------------|--------------------|--|--|
| Month | Monthly Mean | Max Daily Mean | Monthly Mean | Max Daily Mean | Monthly Mean | Max Daily Mean | Monthly Mean | Max Daily Mean | Monthly Mean | Max Daily Mean | Monthly Mean | Max Daily Mean | | |
| January | - | 20.5 | - | 139.2 | - | 8.1 | - | 140.2 | - | 7.00 | - | 12.50 | | |
| February | - | 43.2 | - | 181.1 | - | 8.0 | - | 264.3 | - | 17.20 | - | 26.60 | | |
| March | | | | | | | | | | | | | | |
| April | | | | | | | | | | | | | | |
| May | | | | | | | | | | | | | | |
| June | | | | | | | | | | | | | | |
| July | | | | | | | | | | | | | | |
| August | | | | | | | | | | | | | | |
| September | - | 28.2 | - | 161.8 | • | 9.3 | - | 182.7 | - | 11.40 | • | 33.70 | | |
| October | | | | | | | | | | | | | | |
| November | | | | | | | | | | | | | | |
| December | - | 15.1 | - | 160.1 | - | 9.3 | - | 217.4 | - | 4.00 | - | 1.60 | | |
| Monthly ELV & Daily ELV: (Period 1) ^(d) | 200 | 183 | 200 | 247 | 20 | 15 | 0 | 0 | 0 | 0 | 0 | 25 | | |
| Monthly ELV & Daily ELV: (Period 2) ^(d) | | | | | | | | | | | | | | |
| | Annual Mean | Annual ELV | Annual Mean | Annual ELV | Annual Mean | Annual ELV | Annual Mean | Annual ELV | Annual Mean | Annual ELV | Annual Mean | Annual ELV | | |
| Annual Mean & ELV (e) | | 100 | | 160 | | 10 | | 400 | | 10 | | | | |
| | Annual Percentile | Percentile ELV | Annual Percentile | Percentile ELV | Annual Percentile | Percentile ELV | Annual Percentile | Percentile ELV | Annual Percentile | Percentile ELV | Annual Percentile | Percentile ELV | | |
| Annual 95 th Percentile & ELV (f) | 42.1 | | 175.9 | | 12.1 | | 338.7 | | 24.00 | | 22.30 | | | |

NOTES:

(a) All concentration data are based on validated hourly mean concentrations excluding start-up and shut-down periods of Malfunction or Breakdown of abatement equipment or Black Start operation. Repeat the report for each LCP as required.

LCP as required. (b) Daily, Monthly and Annual means, and Annual percentile concentrations, are calculated from the validated hourly means defined in (a). The qualifying periods for Hourly, Daily, Monthly and Annual means are 40m, 6h, 72h or 3d, and 500h, respectively. Annual means, for plants with an Annual ELV, and Annual Percentile concentrations, are submitted with the final return (Quarter 4).

(c) Reference conditions. Solid fuel: 6% O2 (dry) Liquid fuel: 3% O2 (dry) at 273K, 101.3 kPa.

(d) When there is an in-year change of ELV, record both ELVs in consecutive rows. For example, compliance with the LCP BREF begins in August 2021 therefore replace 'Period 1' with 'Jan - Jul' and 'Period 2' with 'Aug - Dec'. Otherwise, replace 'Period 1' with 'Jan - Dec' and delete or blank out the row containing 'Period 2'.

(e) For plants with an Annual ELV, for each pollutant, report the Annual mean in the first column and the Annual ELV (c) for plants within the reporting year or for plant with a 1500 h/yr five-year rolling average provision. Otherwise, reporting of the Annual ELV segins in 2021 but compliance assessment with the Annual ELV begins in 2022 (incorporating plant operation from 1 January 2022); the Annual ELV is therefore not entered on the form for 2021 reporting.

(f) For each pollutant, report the Annual 95th percentile of hourly means in the first column and the Annual 95th percentile ELV in the second column. However, if there is an in-year reduction of the percentile ELV then it is not mandatory to enter the ELV as compliance assessment will commence in the following year. Delete columns containing pollutants that are not applicable to the plant type.

(g) Continuous HCl monitoring is always required for boilers fired by solid biomass (> 100 MWth), unless the emissions are recognised as being 'sufficiently stable' by the Competent Authority (delete columns if not required). Monthly and Annual Percentile ELVs are not specified since HCI was not regulated previously under the IED.

(h) Continuous NH₃ monitoring is required for processes fitted with Selective Catalytic Reduction (SCR) or Non-Selective Catalytic Reduction (SNCR) (delete columns if not required). In the case of SCR only, continuous Only an Annual ELV is specified.

Signed on behalf of the Operator by:

Year:

Date(s)

RETURN OF PERIODIC MONITORING RESULTS^(a)

Operator: Drax Power Limite

Location: Drax Power Station

Permit/Variation Number: **VP3530LS**

LCP: Period:^(b) NO_x SO₂ Dust СО **Measurement details** (mg/m^3) (mg/m^3) (mg/m^3) (mg/m^3) Measurement 1^(c) (Duration in HH:MM) Measurement 2 (c) (Duration in HH:MM) Measurement 3^(c) (Duration in HH:MM) Average result Measurement Uncertainty^(d) Operational data^(e) Load (%MCR) Fuel 1 name (%) Fuel 2 name (%) Fuel 3 name (%) Alternative approach (f), (g)

NOTES:

Method Result

(a) Periodic monitoring when continuous monitoring is not required. Reference conditions for mg/m³ are 15% O₂ CCGT, 6% O₂ solid fuels, 3% O₂ for oil and gas, dry, 273K, 101.3 kPa.

(b) Period, e.g., Jan - Mar for Quarterly, Jan - Jun for Six-Monthly or Jan - Dec for Annual.

(c) Enter the measurement result followed by the sampling duration in parentheses,

e.g., 50.5 (1:05).

Emission Limit Value

(d) Expanded measurement uncertainty (95% confidence) declared by the Test Laboratory in concentration units. The maximum allowed uncertainty for compliance assessment is specified by the competent authority.

(e) Operational data for the test period. Declare fuel split if another fuel is co-fired. (MCR = Maximum Continuous Rating)

(f) Alternative approach to periodic monitoring by agreement with the Competent Authority.

(g) Use abbreviation for Method: NF for agreed NOx factor, FS for fuel sulphur content, CS for agreed CO factor, DF for agreed dust factor. The flue gas concentration calculated using this method is the Result.

.....

Signed on behalf of the Operator by:

Date of return:

Form: IED/LCPBREF PM1

V3.0 Mar 2021

RETURN OF PERIODIC MONITORING RESULTS (a), (b)

VP3530LS

Operator: Drax Power Limited

Location: Drax Power Station

Permit/Variation Number:

Form: IED/LCPBREF PM2

V3.0 Mar 2021

| Year: | LCP: | | | | | | | | |
|---|-----------------------------|----------------------------|--|--|--|--|--|--|--|
| Period: ^(c) | | | | | | | | | |
| Measurement details | HCI (mg/m ³) | HF (mg/m ³) | NH ₃ ^(e) (mg/m ³) | SO ₃ ^(e) (mg/m ³) | | | | | |
| Date(s) | | | | | | | | | |
| Measurement 1 ^(d) (Duration in HH:MM) | | | | | | | | | |
| Measurement 2 ^(d) (Duration in HH:MM) | | | | | | | | | |
| Measurement 3 ^(d) (Duration in HH:MM) | | | | | | | | | |
| Average result (mg/m ³) | | | | | | | | | |
| Measurement Uncertainty (mg/m ³) ^(f) | | | | | | | | | |
| Annual ELV (mg/m³) | | | | | | | | | |
| Operational data ^(g) | | | | | | | | | |
| Load (%MCR) | | | | | | | | | |
| Fuel 1 name (%) | | | | | | | | | |
| Fuel 2 name (%) | | | | | | | | | |
| Fuel 3 name (%) | | | | | | | | | |

NOTES:

(a) Periodic monitoring at the frequency required by the Permit. For coal fired plants only, and for HCl and HF only, for operation < 500h/y, use Form IED/LCPBREF FUEL2 instead.

(b) Reference conditions for reporting concentrations: $6\% O_{2,}$ dry, 273K, 101.3 kPa.

(c) Period, e.g., Jan - Mar for Quarterly, Jan - Jun for Six-Monthly or Jan - Dec for Annual.

(d) Enter the measurement result followed by the sampling duration in parentheses, e.g., 5.52 (1:33)

(e) For processes fitted with Selective Catalytic Reduction (SCR) only. Annual monitoring of SO₃. Annual monitoring of NH₃ if the emissions are recognised as being 'sufficiently stable' by the Competent Authority. Delete columns if not required.

(f) Average Expanded measurement uncertainty (95% confidence) reported by the Test Laboratory. The maximum allowed uncertainty for compliance assessment is specified by the competent authority.

(g) Operational data for the test period. Declare Load as % of MCR (Maximum Continuous Rating). Declare fuel split when mixed fuels are fired.

Signed on behalf of the Operator by:

.....

ANNUAL RETURN OF MERCURY RETENTION FACTOR RESULTS (a)

VP3530LS

Operator: Drax Power Limited

Location: Drax Power Station

Permit/Variation Number:

Form: IED/LCPBREF PM4

V3.0 Mar 2021

| Year: | | | | |
|---|---|---|---|---------|
| Measurement number | 1 | 2 | 3 | Average |
| Test Date | | | | |
| Test Duration (HH:MM) | | | | |
| Flue gas concentration, $Hg^{T}(\mu g/m^{3})$ | | | | |
| Measurement Uncertainty, $U_{FLUE} (\mu g/m^3)^{(c)}$ | | | | |
| Operational data ^(d) | 1 | 2 | 3 | Average |
| Plant load (%MCR) | | | | |
| Fuel 1 (% by mass) | | | | |
| Fuel 2 (% by mass) | | | | |
| Fuel 3 (% by mass) | | | | |
| Annual Fuel Hg Limit (μg/kg _{ar}) | | | | |
| Fuel 1 Hg (µg/kg _{ar}) ^(e) | | | | |
| Fuel 2 Hg (µg/kg _{ar}) | | | | |
| Fuel 3 Hg (µg/kg _{ar}) | | | | |
| Average Fuel Hg (μg/kg _{ar}) ^(f) | | | | |
| Measurement Uncertainty, U _{FUEL} (μg/kg) ^(g) | | | | |
| Retention Factor ^(h) | 1 | 2 | 3 | Average |
| Measured R (-) | | | | |
| R _{max} ⁽ⁱ⁾ (-) | | | | |
| Declared R (-) | | | | |

NOTES:

(a) This form applies to coal fired plants only when subject to 'sufficiently stable' emissions criteria. Operation \geq 500 h/y only. For operation < 500h/y use Form LCPBREF FUEL2.

(b) Reference conditions for reporting concentrations: 6% O₂ dry, 273K, 101.3 kPa.

(c) Expanded measurement uncertainty (95% confidence) declared by the Test Laboratory, U_{FLUE} (µg/m³). The maximum allowed uncertainty for compliance assessment is specified by the competent authority.

(d) Operational data for the test period. Declare Load as % of MCR (Maximum Continuous Rating). Declare fuel split if other fuels are co-fired with coal. Declare average fuel mercury content for each test period.

(e) Fuel mercury in μg/kg = parts per billion (ppb) by mass (from book values or based on sampling and measurement).

(f) For multiple fuel types report the weighted average fuel mercury content, e.g., Coal 95% by mass with Hg 12 μ g/kg_{ar}, Biomass 5% with Hg 0.7 μ g/kg_{ar} then Average = 0.95 * 12 + 0.05 * 0.7 = 11.44 μ g/kg_{ar}

(g) Average expanded uncertainty (95% confidence) for the fuel mercury measurement. Analysis by ISO15237: U_{FUEL} = (0.25 * Hg + 20) µg/kg Analysis by ASTM 6722-11: U_{FUEL} = (0.13 * Hg + 7) µg/kg

(h) Record the current Declared Retention Factor and calculate the Measured Retention Factor: $R = 1 - [8.76 * Hg^{T} (\mu g/m^{3}) / Hg_{FUEL} (\mu g/kg_{ar})]$

(i) Calculate the maximum Retention Factor (R_{max}) considering the measurement uncertainties in flue gas Hg emissions (U_{FLUE}) and fuel Hg content (U_{FUEL}):

 $R_{max} = 1 - [8.76 * Hg^{T} (\mu g/m^{3}) / Hg_{FUEL} (\mu g/kg_{ar}) * (1 - U_{R})]$

where $U_R = v [(U_{FLUE} / Hg^T)^2 + (U_{FUEL} / Hg_{FUEL})^2]$

If average R_{max} is less than Declared R then repeat the test or re-calculate a new fuel mercury limit using the Measured Retention Factor:

.....

Fuel Hg Limit (μ g/kg_{ar}) = 35.04 / [1 - R]

Signed on behalf of the Operator by:

QUARTERLY RETURN

MONTHLY MEAN HALOGEN AND MERCURY 'AS RECEIVED' FUEL CONCENTRATION ^{(a), (b), (c)}

Operator: Drax Power Limited Location: Drax Power Station

Form: IED/LCPBREF FUEL1

V3.0 Mar 2021

Permit/Variation Number: VP3530LS

| Year: LCP: | Coal (tonnes _{ar}) | Coal Chlorine (% _{ar}) | | Coal Fluorine (mg/kg _{ar}) ^(d) | | Coal Mercury (µg/kg _{ar}) ^(e) | |
|-----------------------------|---------------------------------|-------------------------------------|-----------------|--|-----------------|---|-----------------|
| Month | Monthly Total | Monthly Mean | Year to date | Monthly Mean | Year to date | Monthly Mean | Year to date |
| January | | | | | | | |
| February | | | | | | | |
| March | | | | | | | |
| April | | | | | | | |
| Мау | | | | | | | |
| June | | | | | | | |
| July | | | | | | | |
| August | | | | | | | |
| September | | | | | | | |
| October | | | | | | | |
| November | | | | | | | |
| December | | | | | | | |
| Annual Fuel Threshold/Limit | | | | | | | |

NOTES:

(a) For coal fired plants subject to 'sufficiently stable' emissions criteria, report fuel concentrations to three decimal places for chlorine (%) and the nearest whole number for fluorine (mg/kg) and mercury (μ g/kg)

(b) To calculate the 'as received' fuel concentration from the 'dry' fuel concentration, multiply by (1 - M) where M is the fractional fuel moisture content

(c) To calculate the 'as received' fuel concentration from the 'dry, ash-free' fuel concentration, divide by $(1 - A_{ar} - M)$ where A_{ar} is the fractional fuel ash content (as received)

(d) mg/kg = parts per million (ppm) by mass

(e) μ g/kg = parts per billion (ppb) by mass

Signed on behalf of the Operator by:

.....

Date of return:

.....

RELEASES TO AIR QUARTERLY RETURN CUMULATIVE ROLLING MALFUNCTION AND BREAKDOWN HOURS (12 MONTH PERIOD)^{(a), (b)} IED/LCPBREF BD1 **Operator: Drax Power Limited** Form: Location: Drax Power Station Vers./date: V3.0 Mar 2021

VP3530LS Permit/Variation Number:

| Year: LCP: | S | 02 | Z | O _x | Du | ust | C | D ^(d) | но |)(^{e)} |
|----------------------|------------------------|----------------------|------------------------|----------------------|------------------------|----------------------|------------------------|----------------------|------------------------|----------------------|
| Month ^(c) | Malfunction (hours) | Breakdown (hours) |
| Month 1 | | | | | | | | | | |
| Month 2 | | | | | | | | | | |
| Month 3 | | | | | | | | | | |
| Month 4 | | | | | | | | | | |
| Month 5 | | | | | | | | | | |
| Month 6 | | | | | | | | | | |
| Month 7 | | | | | | | | | | |
| Month 8 | | | | | | | | | | |
| Month 9 | | | | | | | | | | |
| Month 10 | | | | | | | | | | |
| Month 11 | | | | | | | | | | |
| Month 12 | | | | | | | | | | |
| Annual cap (hours) | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |

NOTES:

NOTES: (a) Cumulative rolling malfunction and breakdown hours (12 month period) updated monthly (b) Data Acquisition and Handling Systems without the capability to report Black Start hours separately may incorporate Black Start hours on this form provided that a manual estimate of the number of Black Start hours is reported separately on Form IED/LCPBREF HR1.

(c) Insert the relevant months for the preceding 12 month period, e.g., starting with March 2016

(d) Gas turbines with CO abatement only (columns may be deleted for other plant types)
(e) Plants with HCI abatement only (columns may be deleted for other plant types)

Signed on behalf of the Operator by:

RETURN OF DAILY MALFUNCTION AND BREAKDOWN DATA ^{(a), (b), (c), (d)}

VP3530LS

Operator: Drax Power Limited

Location: Drax Power Station Permit/Variation Number:

| LCP: | | <u>ــــــــــــــــــــــــــــــــــــ</u> | | | | | | | | | |
|-------|--|---|-----------|-------------------|-----------|-------------------|-----------|-------------------|-----------|--------------------|-----------|
| Туре: | Malfunction/Breakdown /Normal Operation | | | | | | | | | | |
| Date: | | SO ₂ | Excluded? | NO _x | Excluded? | Dust | Excluded? | CO ^(e) | Excluded? | HCI ^(f) | Excluded? |
| Hour | Start time | mg/m ³ | Y/N | mg/m ³ | Y/N | mg/m ³ | Y/N | mg/m ³ | Y/N | mg/m ³ | Y/N |
| 1 | 00:00 | í | | í | | i | | | | | |
| 2 | 01:00 | 1 | | 1 | | 1 | | | | | |
| 3 | 02:00 | i | | i | | i | | | | | |
| 4 | 03:00 | 1 | | 1 | | 1 | | | | | |
| 5 | 04:00 | í | | i | | | | | | | |
| 6 | 05:00 | i | | i | | i | | | <u> </u> | | |
| 7 | 06:00 | | | | | | | | | | |
| 8 | 07:00 | i | | i | | i | | | <u> </u> | | |
| 9 | 08:00 | 1 | | 1 | | 1 | | | | | |
| 10 | 09:00 | | | | | | | | | | |
| 11 | 10:00 | i | | i | | ı | | L' | | L | |
| 12 | 11:00 | | | | | | | | | | |
| 13 | 12:00 | i | | i | | 1 | | | <u> </u> | | |
| 14 | 13:00 | i | | 1 | | 1 | | | | | |
| 15 | 14:00 | í | | í | | | | | | | |
| 16 | 15:00 | i | | i | | 1 | | | <u> </u> | | |
| 17 | 16:00 | 1 | | 1 | | 1 | | | | | |
| 18 | 17:00 | í | | í | | | | | | | |
| 19 | 18:00 | | | | | | | | | | |
| 20 | 19:00 | í | | í | | | | | | | |
| 21 | 20:00 | i | | 1 | | 1 | | | | | |
| 22 | 21:00 | | | | | | | | | | |
| 23 | 22:00 | 1 | | 1 | | 1 | | | | | |
| 24 | 23:00 | 1 | | 1 | | 1 | | | | | |
| | Daily | Average | No. Hours | Average | No. Hours | Average | No. Hours | Average | No. Hours | Average | No. Hours |
| | Without data exclusion | 1 | | 1 | Т I | 1 | / | ſ ' | | | |
| | (All of the above data) | i | | 1 | | 1 | | <u> </u> | | | |
| | With data exclusion | í | | 1 | , T i | | | (' | | | |
| | (Reportable data only) | 1 | | 1 | | I | 1 1 | 1 | / | 1 | |

IED/LCPBREF MF1

V3.0 Mar 2021

(a) Produce a return for each day which has data exclusion due to Malfunction or Breakdown Notes:

(a) Froduce a return for each day writer has data exclusion due to Maitunction or Beatracadown
 (b) All data based on hourly average <u>validated</u> concentrations (confidence interval subtracted)
 (c) Reference conditions: mg/m³ dry, 273K, 101.3 kPa; Solid fuels 6% O₂; Liquid and Gaseous fuels 3% O₂; Gas turbines 15% O₂
 (d) Data Acquisition and Handling Systems without the capability to report Black Start emissions separately may incorporate Black Start emissions on this form provided that a manual estimate of the number of Black Start hours is reported separately on Form IED/LCPBREF HR1.

Form:

Vers/date:

(e) Gas turbines with abatement only (columns may be deleted for other plant types) (f) Plants with HCl abatement only (column plant types)

Signed on behalf of the Operator by:

Permit/Variation Number:

RETURN OF DAILY BLACK START DATA ^{(a), (b), (c), (d)} Operator: Drax Power Limited Location: Drax Power Station VP3530LS

| LCP: | | | | | | | | | | | |
|-------|----------------------------------|-------------------|-----------|-------------------|-----------|-------------------|-----------|-------------------|-----------|--------------------|-----------|
| Туре: | Black Start /Normal Operation | | | | | | | | | | |
| Date: | | SO ₂ | Excluded? | NOx | Excluded? | Dust | Excluded? | CO ^(e) | Excluded? | HCI ^(f) | Excluded? |
| Hour | Start time | mg/m ³ | Y/N | mg/m ³ | Y/N |
| 1 | 00:00 | | | | | | | | | | |
| 2 | 01:00 | | | | | | | | | | |
| 3 | 02:00 | | | | | | | | | | |
| 4 | 03:00 | | | | | | | | | | |
| 5 | 04:00 | | | | | | | | | | |
| 6 | 05:00 | | | | | | | | | | |
| 7 | 06:00 | | | | | | | | | | |
| 8 | 07:00 | | | | | | | | | | |
| 9 | 08:00 | | | | | | | | | | |
| 10 | 09:00 | | | | | | | | | | |
| 11 | 10:00 | | | | | | | | | | |
| 12 | 11:00 | | | | | | | | | | |
| 13 | 12:00 | | | | | | | | | | |
| 14 | 13:00 | | | | | | | | | | |
| 15 | 14:00 | | | | | | | | | | |
| 16 | 15:00 | | | | | | | | | | |
| 17 | 16:00 | | | | | | | | | | |
| 18 | 17:00 | | | | | | | | | | |
| 19 | 18:00 | | | | | | | | | | |
| 20 | 19:00 | | | | | | | | | | |
| 21 | 20:00 | | | | | | | | | | |
| 22 | 21:00 | | | | | | | | | | |
| 23 | 22:00 | | | | | | | | | | |
| 24 | 23:00 | | | | | | | | | | |
| | Daily | Average | No. Hours | Average | No. Hours |
| | Without data exclusion | | | | | | | | | | |
| | (All of the above data) | | | | | | | | | | 1 |
| | With data exclusion | | | | | | | | | | 1 |
| | (Reportable data only) | | | | | | | | | | 1 |

IED/LCPBREF BS1

V3.0 Mar 2021

Notes:

(a) Produce a return for each day which has data exclusion due to Black Start running
(b) All data based on hourly average <u>validated</u> concentrations (confidence interval subtracted)
(c) Reference conditions: mg/m³ dry, 273K, 101.3 kPa; Solid fuels 6% Q₂; Liquid and Gaseous fuels 3% Q₂; Gas turbines 15% Q₂
(d) Data Acquisition and Handling Systems without the capability to report Black Start emissions separately may incorporate Black Start emissions on form IED/LCPBREF MF1 provided that a manual estimate of the number of Black Start hours is reported separately on Form IED/LCPBREF HR1.

Form:

Vers/date:

(e) As applicable, e.g., gas turbines (f) Plants with HCl abatement only (columns may be deleted for other plant types)

Signed on behalf of the Operator by:

| Air Quality Risk Assessment | Form: IED/LCPBREF AQRA1 Utility Boilers (V3.0 Mar 2021) |
|---|---|
| Operator: | |
| Contact: | |
| Location: | |
| Permit number: | |
| Pollutant(s) (SO ₂ , NO _x , Dust): | |
| Sulphur Dioxide (SO ₂) | SO ₂ |
| First excluded hour (DD-MM-YYYY HH:MM): | |
| Last excluded hour (DD-MM-YYYY HH:MM): | |
| Notification period commenced (DD-MM-YYYY 00:00): | |
| Number of excluded hours | |
| Maximum hourly average valid concentration (mg/m ³): | |
| Maximum daily average valid concentration (mg/m ³): | |
| Daily Emission Limit Value (mg/m ³): | |
| Number of running units: | |
| Local Air Quality Assessment: | |
| Note any relevant observations from local air quality monitoring | |
| stations and comment on weather conditions, including prevailing | |
| wind speed (maximum and average) and direction. | |
| Discussion Assessment | |
| Dispersion Assessment: | |
| concentration in relation to previous dispersion modelling studies | |
| | |
| | |
| | |
| Eurther dispersion modelling required (V/N)2 | |
| Nitragen Oxides (NO, as NO,) | NO |
| First evoluted hour (DD MM)()()() ()() | |
| First excluded hour (DD-MM-YYYY HH:MM): | |
| Last excluded hour (DD-MM-1111 HH:MM): | |
| Number of excluded hours | |
| Maximum bourly average valid concentration (mg/m ³); | |
| Maximum nouny average valid concentration (mg/m): | |
| Maximum daily average valid concentration (mg/m [*]): | |
| Daily Emission Limit Value (mg/m°): | |
| Number of running units: | |
| Note any relevant observations from local air quality monitoring | |
| stations and comment on weather conditions, including prevailing | |
| wind speed (maximum and average) and direction. | |
| | |
| Dispersion Assessment: | |
| Comment on the magnitude of the maximum hourly average | |
| concentration in relation to previous dispersion modelling studies. | |
| | |
| | |
| Eurther dispersion modelling required (Y/N)? | |
| | PM ₁₀ |
| Eirst excluded hour (DD-MM-YYYY HH·MM): | |
| I ast excluded hour (DD-MM-YYYY HH-MM): | |
| Notification period commenced (DD-MM-YYYY 00:00): | |
| Number of excluded hours | |
| Maximum hourly average valid concentration (mg/m ³): | |
| Maximum houry average valid concentration (mg/m ³): | |
| Daily Emission Limit Value (mg/m ³): | |
| Number of running units: | |
| Local Air Quality Assessment: | |
| Note any relevant observations from local air quality monitoring | |
| stations and comment on weather conditions, including prevailing | |
| wind speed (maximum and average) and direction. | |
| | |
| Dispersion Assessment: | |
| Comment on the magnitude of the maximum hourly average | |
| concentration in relation to previous dispersion modelling studies. | |
| | |
| | |
| | |
| Further dispersion modelling required (Y/N)? | |

Notes:

Reference condition: mg/m³ at 6% O₂, dry, 273K, 101.3 kPa. Valid Concentration Averages incorporate previously excluded data. Air quality objectives are set for SO₂ (15min, Hourly, Daily averages); NO₂ (Hourly) and PM₁₀ (Daily).

| RESOURCE EFFICIENCY METRICS | | 1 | |
|---|-----------|---------------|----------------|
| ANNUAL RETURN YE | AR: | | |
| Form: IED/LCPBREF REM1 Ve | rs./date: | V3.0 Mar 2021 | |
| Operator: | | | |
| Permit/Variation Number: | | [| |
| Parameter | | (a) | Units |
| Electricity Exported | | | GWh |
| Heat Exported | | | GWh |
| Mechanical Power Provided | | | GWh |
| Fossil Fuel Energy Consumption | | | GWh |
| Non-Fossil Fuel Consumption | | | GWh |
| Annual Operating Hours - LCPXXX ^(b) | | | h |
| Water Abstracted from Fresh Water Source | | | m ³ |
| Water Abstracted from Borehole Source | | | m ³ |
| Water Abstracted from Estuarine Water Source | | | m ³ |
| Water Abstracted from Sea Water Source | | | m ³ |
| Water Abstracted from Mains Water Source | | | m ³ |
| Gross Total Water Used | | | m ³ |
| Net Water Used | | | m ³ |
| Hazardous Waste Transferred for Disposal at another Installation | | | t |
| Hazardous Waste Transferred for Recovery at another Installation | | | t |
| Non-Hazardous Waste Transferred for Disposal at another Installation | | | t |
| Non-Hazardous Waste Transferred for Recovery at another Installation | | | t |
| Waste Recovered to Quality Protocol Specification and Transferred Off-Site | | | t |
| Waste Transferred Directly Off-Site for Use under an exemption / position state | ment | | t |

NOTES:

(a) General note: Parameters should be reported as a decimal number to 2 decimal places.(b) Repeat row for each LCP

Signed on behalf of the Operator by:

.....

.....

ANNUAL RETURN

CONTINUOUS EMISSIONS MEASUREMENT SYSTEMS (CEMS) INVALIDITY LOG^{(a),(b)}

Operator: Monitor positioned on release point/LCP Numbe Permit/Variation Number:

LCP:

Form: IED/LCPBREF CEM1

V3.0 Mar 2021

| Period of Invalidation | Cumulative Invalidated Days in | Comments |
|---------------------------|--------------------------------------|--|
| (hours) | a Year | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | Period of Invalidation (hours) | Period of Invalidation (hours) Invalidated Days in a Year Invalidated Days in a Year |

NOTES:

(a) This form is returned in the event that the number of days of invalid CEMS performance exceeds 10 days within the calendar year for any individual pollutant.

(b Any day in which more than 3 hourly average values are invalid (due to malfunction or maintenance of the CEMS) is counted as a day of CEMS invalidity. If more than 10 days are invalid over a year the operator shall, within 28 days of becoming aware of this fact, review the causes of the invalidity and submit to the Environment Agency for approval, proposals for measures to improve the reliability of the CEMS, including a timetable for the implementation of those measures, and then implement the approved proposals.

Signed on behalf of the Operator by:

| Date of return: | |
|-----------------|--|
| | |

drax

Appendix 2 – Response to Action Point ISH3 – AP6 – Noise Guidance Extracts

| DATE: | 28 March 2023 | CONFIDENTIALITY: | Public | | | | |
|--|----------------|------------------|--------------------|--|--|--|--|
| PROJECT NAME: | Drax BECCS DCO | PROJECT NUMBER: | EN010120 | | | | |
| DOCUMENT NO. REV. NO: | 8.6.4 2 | DOCUMENT OWNER : | Drax Power Limited | | | | |
| AUTHOR: | EO | APPROVER : | NA | | | | |
| SUBJECT: Response to Action Point ISH3 – AP6 – Noise Guidance Extracts | | | | | | | |

INTRODUCTION

During the Issue Specific Hearing 3 (ISH3) on 22 March 2023, the ExA queried if, in defining the level of effect significance, any factors were taken into consideration for the contextual considerations defined in guidance (ISH3-AP6). The Applicant noted that the assessment was undertaken in line with Clause 11 of British Standard 4142:2014+A1:2019. This, along with further guidance on contextual considerations, is set out below.

BS4142:2014+A1:2019 'METHODS FOR RATING AND ASSESSING INDUSTRIAL AND COMMERCIAL SOUND'

BS4142:2014+A1:2019 'Methods for rating and assessing industrial and commercial sound' provides advice in relation to contextual consideration in Clause 11. It is noted that the Standard lists some of the contextual matters that should be considered following the initial estimate. The text below has been extracted from page 16 of the Standard:

Where the initial estimate of the impact needs to be modified due to the context, take all pertinent factors into consideration, including the following.

 The absolute level of sound. For a given difference between the rating level and the background sound level, the magnitude of the overall impact might be greater for an acoustic environment where the residual sound level is high than for an acoustic environment where the residual sound level is low.

Where background sound levels and rating levels are low, absolute levels might be as, or more, relevant than the margin by which the rating level exceeds the background. This is especially true at night.

Where residual sound levels are very high, the residual sound might itself result in adverse impacts or significant adverse impacts, and the margin by which the rating level exceeds the background might simply be an indication of the extent to which the specific sound source is likely to make those impacts worse.

2) The character and level of the residual sound compared to the character and level of the specific sound. Consider whether it would be beneficial to compare the frequency spectrum and temporal variation of the specific sound with that of the ambient or residual sound to assess the degree to which the specific sound source is likely to be distinguishable and will represent an incongruous sound by comparison to the acoustic environment that would occur in the absence of the specific sound. Any sound parameters, sampling periods and averaging time periods used to undertake character comparisons should reflect the way in which sound of an industrial and/ or commercial nature is likely to be perceived and how people react to it.

NOTE 3 Consideration should be given to evidence on human response to sound and, in particular, industrial and/or commercial sound where it is available. A number of studies are listed in the "Effects on humans of industrial and commercial sound" portion of the "Further reading" list in the Bibliography.

- 3) The sensitivity of the receptor and whether dwellings or other premises used for residential purposes will already incorporate design measures that secure good internal and/or outdoor acoustic conditions, such as:
 - i) facade insulation treatment;
 - ii) ventilation and/or cooling that will reduce the need to have windows open so as to provide rapid or purge ventilation; and
 - iii) acoustic screening.

BS4142:2014+A1:2019 TECHNICAL NOTE, MARCH 2020 VERSION 1

BS4142:2014+A1:2019 Technical Note, March 2020 Version 1 was prepared by members of the Association of Noise Consultants Good Practice Working Group. The Technical Note provides further advice in relation to Clause 11 of BS4142:2014+A1:2019 and it is relevant for the assessment of operational noise specifically in the selection of contextual factors. The text below in relation to contextual considerations has been extracted from pages 41 to 43 of the Technical Note:

Context

The second part of Clause 11 sets out some of the contextual matters that should be taken into account once the initial numerical estimate has been determined.

Three contextual elements are set out in Clause 11, but it is important to note that the list is not exhaustive and all pertinent factors should be considered.

The three types of context set out in Clause 11 are:

- 1. aspects of the absolute level;
- 2. aspects of character; and
- 3. aspects of the receptor, including physical measures designed to reduce noise.

Some comments on each of the three contextual matters raised in Clause 11 are set out here.

Subclause 11(1)

The standard states that the absolute level of sound can be of significance, where the residual values are low and where they are high, and should be taken into account when determining the overall impact of a particular specific sound source.

The second paragraph notes that absolute levels may be as, or more, important than relative outcomes where background and rating levels are low. It is important to note that both background and rating levels would need to be low for this particular caveat to apply.

BS 4142 does not indicate how the initial estimate of impact should be adjusted when background and rating levels are low, only that the absolute levels may be more important than the difference between the two values. It is likely that where the background and rating levels are low, the absolute levels might suggest a more acceptable outcome than would otherwise be suggested by the difference between the values. For example a situation might be considered acceptable where a rating level of 30dB is 10dB above a background sound level of 20dB, i.e. an initial estimate of a significant adverse impact is modified by the low rating and background sound levels.

There may be situations where the opposite is true, and it is for the assessor to justify any modifications to the initial estimate of impact.

BS 4142 does not define 'low' in the context of background sound levels nor rating levels. The note to the Scope of the 1997 version of BS 4142 defined very low background sound levels as being less than about 30 dB *L*_{A90}, and low rating levels as being less than about 35 dB *L*_{Ar,Tr}.

The WG suggest that similar values would not be unreasonable in the context of BS 4142, but that the assessor should make a judgement and justify it where appropriate.

The third paragraph states that "where residual sound levels are very high, the residual sound might itself result in adverse impacts or significant adverse impacts".

In the ordinary application of BS 4142 the residual sound level is not compared with the background sound level to determine the level of impact. The third paragraph is therefore taken to mean that the level of impact caused by the residual level has been determined by professional judgement or with reference to another document, such as the Noise Insulation Regulations 1975 (as amended 1988). Where professional judgement is used, it should be appropriately justified.

Where the residual sound levels are very high, a significant adverse impact might be declared in a situation where the rating level exceeds the background sound level by, say, 4dB, i.e. since the residual sound levels are already considered to cause a significant impact, any worsening of the situation would be considered a significant adverse impact, even if the difference between the rating level and background sound level would not suggest this to be the case.

Subclause 11(2)

The second aspect of context described in BS 4142 relates to the character and level of the specific sound. In essence, whether or not the character of the sound is distinguishable from the character of the ambient or residual acoustic environment, or is incongruous.

BS 4142 does not provide instruction as to how to treat the assessment outcomes in these circumstances, nor does it explain how to distinguish between this contextual consideration and the process for applying **rating penalties**. The latter is itself informed by the distinctive characteristics of the specific sound in the context of the residual sound environment.

It is the WG's view that where character-based contextual matters are taken into account, the assessor should make it clear how these matters are distinct from those that informed the **rating level** corrections, and what the implications of these further character assessments should be.

For example; new deliveries on an estate entailing rating penalties for reversing alarms and impulsive noise but these types of noise are already present at other existing premises, so contextually the impact is reduced. Conversely, where the residual level is largely comprised of natural sounds, such as the sea or birdsong, so the impact from the specific source might be increased.

Subclause 11(3)

The third contextual matter described in Clause 11 relates to the receptor itself. It is important to note that the reference at the start of this section of BS 4142 to **'the sensitivity of the receptor'** refers to a generic receptor type, i.e. a dwelling, and not to the particular attitudes or responses of a particular person (although if the residential receptor type is specific it may have a bearing e.g. student accommodation).

The WG notes that this part of BS 4142 allows the internal noise environment to be considered, despite BS 4142 excluding such matters from its Scope (Subclauses 1.1, 1.2 and 1.3). The WG considers that the consideration of the internal noise environment is only valid in a BS 4142 assessment where it relates to the contextual elements of the assessment.

It is not necessarily required to refer to other standards or guidance to inform this issue. However, where other standards or guidelines are referenced, e.g. BS8233: 2014 or WHO Guidelines, the assessor should make clear any limitations of those documents and the extent to which they can be relied upon.

Other Contextual Matters

The assessor may also wish to consider matters such as the:

- · character of a particular neighbourhood;
- · former uses at or close to a site;
- · legitimacy of the industrial use, e.g. planning permissions or environmental permits;
- · implementation of best practicable means for a given process or activity; or
- · local convention or perceptions.

When relying on such matters, it is incumbent on the assessor to make clear all elements of context.