KEEPING BRITAIN TRADING

IMMINGHAM EASTERN RO-RO TERMINAL

Applicant's Response to Natural England's Deadline 9 Submissions
Document Reference: 10.2.106
APFP Regulations 2009 – Regulation 5(2)(q)
PINS Reference – TR030007
January 2024

Document Information

Document Information		
Project	Immingham Eastern Ro-Ro Terminal	
Document Title	Applicant's Response to Natural England's Deadline 9 Submissions	
Commissioned by	Associated British Ports	
Document ref	10.2.106	
APFP Reg 2009	Regulation 5(2)(q)	
Prepared by	IERRT Project Team	
Date	**Version**	**Revision Details**
18/01/2024	01 Deadline 10	Submitted at Deadline 10

Contents

1 Executive Summary

1.1 At Deadline 9 Natural England provided their delayed comments on the Applicant's Derogation Report and related matters. Deadline 10, therefore presents as first and ironically the last opportunity for the Applicant to respond to Natural England's comments.

1.2 Set out below, therefore are the Applicant's response to the submissions provided by Natural England (NE) at Deadline 9 [**REP9-018**], namely their Response to EXQ4 - Summary of designated sites potentially affected by this application and comments on impacts to intertidal habitat in response to BNE4.05.

2 Introduction

2.1 This document provides the Applicant's response to the new information submitted by NE at Deadline 9 [**REP9-018**], namely their Response to EXQ4, Summary of designated sites potentially affected by this application and comments on impacts to intertidal habitat in response to BNE4.05.

3 Appendix 1: Natural England's response to the Examining Authority's (ExA's) fourth written questions / question reference EXQ4

3.1 Table 1 of **[REP9-018]** provides NE's response to the ExA's fourth written questions. The Applicant has already responded to NE's responses to BNE.4.01, BNE.4.08 and BNE.4.09 in **[REP9-013]**.

3.2 With respect to BNE.4.05 relating to the in-combination assessments of habitat loss and change, NE cross-refer the ExA to Appendices 2 and 3 of its response. The Applicant's response to these is provided in Section 4 and Section 5 below.

3.3 In its response to BNE.4.12 on in-combination air quality effects, NE state that it does not consider it likely that there will be adverse effect on integrity (AEoI) on the Humber Estuary SAC (H1330. Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) feature) as a result of air quality impacts from the IERRT project in-combination with other consented projects. The Applicant welcomes NE's view on this point. Whilst NE go on to say that it does not agree that the in-combination assessment for air quality is sufficiently detailed, NE also consider that additional information would not lead to a material impact on the outcome of the assessment. The Applicant considers that its assessment is sufficiently detailed but, given that NE has made it clear that they consider additional information would not lead to any material impact on the outcome of the assessment and such disagreement on that issue is academic. On that basis, Applicant understands this point is resolved.

4 Appendix 2: Summary of designated sites potentially affected by this application

4.1 Table 2 of **[REP9-018]** sets out NE's End of Examination position on AEoI for each National Site Network site feature with all impact pathways included.

4.2 Firstly, the Applicant recognises and welcomes NE's view that an AEoI can be excluded both alone and in-combination for the following features:

- Humber Estuary SAC
    - H1110 – Sandbanks which are slightly covered by sea water all the time; Subtidal sandbanks
    - H1330 – Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)
    - S1099 – River lamprey (*Lampetra fluviatilis*)
    - S1095 – Sea lamprey (*Petromyzon marinus*)
    - S1364 – Grey seal (*Halichoerus grypus*)
- Humber Estuary Ramsar
    - River lamprey (*Lampetra fluviatilis*)
    - Sea lamprey (*Petromyzon marinus*)
    - Grey seal (*Halichoerus grypus*)
    - Subtidal sandbanks
- The Wash and North Norfolk Coast SAC
    - Harbour Seal (*Phoca vitulina*)

4.3 The Applicant notes that NE suggest that an AEoI cannot be ruled out in relation to:

- In-combination effects with other plans and projects on the 'H1140 - mudflats and sandflats not covered by seawater at low tide' feature and A2.2 and A2.3 sub features of the 'H1130 – Estuaries' feature of the Humber Estuary SAC; and
- Effects of construction disturbance on the Humber Estuary SPA bird features.

4.4 The Applicant strongly disagrees with this position and NE has not provided any evidential basis for this statement. The Applicant has set out in detail on multiple occasions, with reference to detailed evidence, why it considers this not to be the case. Rather than repeat all of that evidence again here, the Applicant refers the ExA to its previous submissions:

- Applicant's Response to Relevant Representations [**REP1-013**];
- Applicant's Response to Natural England's Written Representation [**REP3-014**];
- Applicant's Response to Natural England's Deadline 6 submission [**REP7-027**];
- Applicant's Response to Natural England's Deadline 7 submission [**REP8-024**]; and
- Applicant's Response to Natural England's Deadline 8 submission **[REP9-013]**.

4.5 The Applicant has also provided information and evidence in multiple updates to the Habitats Regulations Assessment Report (HRAr) to satisfy NE's request for further information **[APP-115**, **REP5-020**, **REP7-014**, **REP8-014]**.

4.6 As well as the above, ten meetings and presentations have been given to NE from relevant experts in the field, with supporting signposting documents and meeting notes[1], to explain the findings of the assessments (see Table 2.1 in SoCG **[REP6-010]**).

4.7 Despite this engagement with NE, the Applicant highlights its frustration that it is not until Deadline 9 that NE has articulated a view on these matters with respect to AEoI – and that view now submitted, as noted above, is unsupported by any substantive evidence sufficient to rebut the comprehensive information and material that has been provided by the Applicant.

4.8 The Applicant deals with both residual points below, but it notes that NE's view that an AEoI cannot be ruled out in relation to construction disturbance on the Humber Estuary SPA bird features is not a view that has been expressed by NE at any point throughout the examination.

4.9 As the ExA will appreciate, clear and constructive advice on these issues has been lacking from NE throughout the process. It has 'sat on the fence' on many key issues in the process and NE did not attend *any* of the Issue Specific Hearings (ISH). This has been both surprising and unhelpful particularly as it has now seemingly decided to take issue with the detailed evidence that the Applicant has presented.

4.10 The ExA should also be aware that a number of key comments made by NE in its Deadline 9 response do not correctly represent or reflect the evidence that has been provided to NE throughout the course of the examination and demonstrates that NE has misunderstood the position in expressing these residual views. Points relating to noise and visual disturbance to coastal waterbirds are dealt with below. NE provide detailed comments at Appendix 3 **[REP9-018]** in relation to question BNE4.05 on intertidal loss, to which a response is provided in Section 5 below.

4.11 As a preliminary point, however, it will be seen that it is only these two residual points that are being raised by NE, the first of which relates only to the question of what construction distance should be included in a requirement which is dealt with below and the second which relates to an "in combination" effect if another scheme were also to proceed (Immingham Green Energy Terminal (IGET)). As far as this latter point is concerned, the examination in respect of that project has only recently commenced and it has already been made clear that if and to the extent that there is any "in combination" effect from the Proposed Development and the IGET scheme, it is the IGET scheme that will be addressing any consequences in terms of derogation. It is without prejudice to that position that, at the request of the Examining Authority, the Applicant has submitted a Derogation Report in respect of the IERRT scheme.

[1] The information contained in these signposting documents and meeting notes has been submitted to the examination in the revisions to the HRAr or in the Applicant's submissions at each deadline.

Noise and visual disturbance to coastal waterbirds

4.12 In Table 2 of **[REP9-018]**, NE claim that '*we have not been provided with the previously requested evidence to demonstrate that 200 m disturbance buffer is sufficient to mitigate impacts of noise and visual disturbance from construction, particularly for the approach jetty, linkspan, innermost pontoon, and inner finger pier*'.

4.13 The Applicant categorically refutes this suggestion and is concerned that it has been made by NE h given the amount of evidence it has been provided with (as noted above). The Applicant would have expected NE to specifically address the evidence it has been given, as it demonstrates robustly and empirically (including with reference to studies that NE themselves suggested) that there is a high degree of confidence that the 200 m disturbance buffer is more than sufficient to address such construction effects.

4.14 The Applicant has referenced numerous scientific papers, site-specific bird disturbance monitoring, grey literature, and anecdotal evidence from ornithologists to demonstrate that a 200 m disturbance buffer is sufficient to mitigate impacts of noise and visual disturbance from construction to a level that would not be considered an AEoI (acknowledging even if some disturbance may occur, it would only be of limited consequence and not constitute an AEoI) when considered against the site's conservation objectives.

4.15 It should also be noted that NE previously acknowledged in **[REP6-048]** that a 200 m disturbance distance is an '**acceptable disturbance distance for most construction activities within a port environment where birds will show some habituation to human activity'** but had also asserted that 'a precautionary approach is taken to noise disturbance distances for piling'. As the Applicant has previously stated in **[REP7-027]** and **[REP9-013]**, the assessment of piling effects has been based on established noise criteria and advice provided by NE taking into account existing background noise levels. The Applicant also provided further recent and specific evidence that any bird responses to piling activities are also likely to be limited at distances greater than 200 m with the mitigation proposed (**see Table 1 of [REP7-027]**).

4.16 In stark contrast to this scientifically evidenced assessment and conclusion, NE has not provided a single reference or evidential basis to support the contention that a 300 m disturbance distance is appropriate or necessary **within a port environment where birds are already habituated to anthropogenic disturbance** (other than to point to references used in the Applicant's assessment, which had already been accounted for and addressed in reaching the conclusions in the HRAr). NE has not articulated how any AEoI could occur even if limited disturbance were to occur in the context of the site's conservation objectives.

4.17 The Applicant also cannot explain or reconcile NE's position with the fact that recreational activities and wildfowling in the Humber Estuary are regularly undertaken within much closer distances than 300 m of the foreshore. Such activities cause regular disturbance to SPA qualifying species yet these activities are considered by NE to be below a threshold that will not cause an AEoI. It is impossible to reconcile that position, let

alone provide a reasonable basis for contending that limited construction activity proposed within a dynamic marine and port environment that is subject to the 200 m distance and with all the mitigation proposed might cause disturbance constituting an AEoI - and that a precautionary 300 m mitigation zone is required. This despite the robust evidence that has been provided by the Applicant to the effect that responses are likely to be limited at distances of more than 200 m for construction activity specifically associated with IERRT in any case.

4.18 NE also mistakenly contend: '*the Applicant has indicated that they are requesting permission to work throughout the year (including the winter period which is the most sensitive time for non-breeding waterbirds)*'. This is a very significant misunderstanding or misinterpretation of what is proposed together with a serious misunderstanding mitigation measures proposed for coastal waterbirds. To repeat, once again, the IERRT construction programme has in fact been specifically designed to avoid activities that have the greatest potential to disturb birds from taking place in winter (see **[REP1-009]**, Appendix 9). As stated in paragraph 4.10.38 of the HRA **[REP8-014]** and in **[REP7-027]**, the winter marine construction restriction from 1 October to 31 March (for the approach jetty and the inner finger pier) will ensure that the disturbing activities including **piling as well as all other construction activity on or near the foreshore** (within 200 m of exposed intertidal) **will not take place during the winter months**. Less disturbing works, such as construction activity far away enough so as not to significantly disturb birds (i.e., works on the outer finger pier), or works behind the acoustic barrier/visual screens installed on the semi-completed approach jetty structure, will instead be undertaken in these months.

4.19 NE refer to not having been provided with the monitoring report for the bird disturbance monitoring undertaken for the IERRT ground investigation works. The Applicant has set out the key findings of the monitoring on numerous occasions in the Applicant's submissions provided to NE **[REP1-013, REP7-027, REP9-013]** and it is also presented in the HRAr **[REP8-014]**, paragraph 4.10.19 onwards] and no request was made in response to those submissions for the report itself. However, in light of this recent comment, the Applicant has provided the full report directly to NE by email on 18 January 2023 which fully supports the key findings that have already been set out in the Applicant's material. The full report is provided at **Appendix 1** to this document.

4.20 The Applicant, therefore, remains firmly of the view, based on full scientific expert advice from its ecological consultants and specifically its expert coastal ornithologist, having regard to all of the available scientific evidence and data, that the proposed 200 m distance is entirely appropriate in a port environment and more than sufficient to address any construction noise impacts on birds. This will ensure, with high confidence, that there will not be an AEoI when considered against the site's conservation objectives. As explained above, the Applicant does not understand NE's contrary position which is not supported by substantive evidence or analysis which in any way rebuts the objective evidence that has been provided as to disturbance. It has not been justified why an AEoI cannot be ruled out even if any disturbance from such activity between 200 m – 300 m rather than beyond 300 m were in fact to occur. The Applicant, therefore, rebuts the notion that the relevant requirement

requires adjusting to refer to a 300 m distance, or that any other derogation is required if a 200 m distance is retained.

5 Appendix 3: Natural England's detailed comments on impacts to intertidal habitat in response to BNE4.05

Natural England's position on AEoI in-combination

5.1 As noted above, is it clear that NE is satisfied that there is no AEoI arising in respect of the effect on intertidal habitat from the Proposed Development alone. In Appendix 3 of **[REP9-018]**, NE claim that an AEoI cannot be ruled out in-combination with other plans and projects due to direct and indirect intertidal habitat loss due to piling and capital dredging. The works in-combination with other plans and projects are predicted to result in the combined direct and indirect loss of 0.044ha (~440 m²) of the intertidal habitat feature/sub-features.

5.2 As a matter of principle, the Applicant agrees with the approach described by NE that any appreciable lasting and/or irreparable loss of National Site Network habitat is considered capable of having AEoI unless it can be demonstrated that the loss would be ecologically inconsequential, and it has applied that principle to its assessment. NE go on to say that it does not consider that '*the Applicant has provided sufficient evidence to demonstrate that the area due to be lost is impoverished and/or ecologically inconsequential, thereby satisfying their* 'de minimis' *argument and enabling AEoI to be ruled out'.* However, the Applicant does not consider that any proper basis is provided for taking that view or to deal with the evidence that the Applicant has provided. The Applicant fundamentally disagrees with NE on this and considers that more than sufficient evidence *has* been provided to enable an AEoI to be ruled out due to intertidal loss (as summarised below) and NE's position again appears to reflect a misunderstanding of the evidence.

5.3 NE say that based on the Applicant's surveys, the wider intertidal within which the area of loss is situated is used by a variety of bird species for foraging. NE also state that whilst it agrees it is likely that these birds will be able to feed elsewhere, NE consider that the presence of birds in these numbers indicates that the area is not of 'negligible' ecological value.

5.4 The Applicant would fully agree with NE that the **wider mudflat** is not of negligible ecological value for its foraging resource, and it has never suggested otherwise. It is, however, very important to distinguish this from the area of loss in question which NE has not done and has therefore misunderstood the position. Key information is provided in Sections 4.3, 4.5 and 4.14 of the HRAr **[REP8-014]**. Specifically, the key points that should be taken into consideration are:

- The predicted intertidal losses relating to the capital dredging (direct) and changes in hydrodynamics (indirect), which make up the majority of intertidal loss for both IERRT and IGET, consist of very narrow strips on the lower shore around the sublittoral fringe – explained in paragraphs 4.3.9, 4.3.16, and 4.5.9, as well as Table 37 to Table 39;

- Based on tide gauge data at Immingham in 2020, these areas of loss were completely submerged for over 99% of the time – so in fact these areas of direct and indirect loss, therefore, currently

provide almost no feeding opportunities for coastal waterbirds (in other words, the numbers of birds using the wider mudflat are in fact simply unable to use or access the area of loss at virtually any time throughout the tidal cycle) – explained in paragraphs 4.3.18, 4.4.23 and 4.5.11;

- The spatial extent of loss represents a barely measurable and inconsequential reduction in available habitat for these mobile species even at a local scale– explained in paragraphs 4.3.18 and 4.5.11, as well as Table 38 and Table 39; and

- Moreover, this potential loss is considered to be of a similar scale to that which can occur due to natural background changes in mudflat extent in the local region anyway (e.g., due to sea level rise, inter-annual tidal cycles (e.g., the 18.6 year lunar nodal cycle), seasonal patterns in accretion and erosion or following storm events)[2] and therefore it is completely unrealistic to suggest that its loss would represent AEoI – explained in paragraphs 4.3.9, 4.3.16, 4.5.9, as well as Table 37 to Table 39.

5.5 It should also be noted that the assessment of intertidal habitat loss is very much considered a worst case, as explained in the HRAr **[REP8-014]**. With respect to direct losses from capital dredging, it is in fact anticipated that the existing slope will remain stable and will not require further dredging to maintain navigational safety, resulting in no direct habitat loss from the capital dredge (see paragraph 4.3.4). With respect to indirect losses, these are likely to be immeasurable against the context of natural variability (see paragraph 4.5.6).

5.6 NE also refer to many anthropogenic pressures already operating or under construction across a considerable proportion of Humber Estuary SAC (e.g., Able Marine Energy Park, Stallingborough 3 flood risk management scheme), in addition to several planned activities (e.g., Immingham Green Energy Terminal, Humber Low Carbon Pipeline), which it says will further add to the pressures on the interest features of the SAC. Again, this reveals a further misunderstanding that has as a consequence misinformed NE's position. The Applicant stresses that these have all been considered in the in-combination assessment in the HRAr **[REP8-014]** and in-combination effects are either considered insignificant or have already been (or will be) compensated for (in the case of Able Marine Energy Park, Stallingborough 3 flood risk management scheme). It is noteworthy that activities such as wildfowling and recreation take place on the Humber, which clearly have far greater impacts on the SPA and SAC, yet those are not considered to result in an AEoI.

5.7 The Applicant would also highlight that **NE state that it does not consider that there will be an AEoI on SPA features resulting from direct or indirect loss of supporting habitat** (sixth row of Table 2 **[REP9-018]**). However, as noted above, NE's view of AEoI on the SAC hinges on supporting habitat for birds and functional value. NE's view on this is therefore mutually inconsistent.

[2] For context, natural variation in tidal water elevations between 2018 and 2022 equated to 37 cm (between measured lowest astronomical tide elevations). Over a 900 m stretch of foreshore between the Eastern Jetty and the IOT for which bathymetric data is available, this equates to a natural variation in intertidal habitat area (between these years) of approximately 0.3 ha.

5.8 Accordingly, having considered NE's position the Applicant can see that NE has misunderstood the key evidence and, in any event, does not have a basis for suggesting that an AEoI cannot be ruled out. Based on the expert advice from its own ecologists and the detailed assessments that have been undertaken, the Applicant remains very clearly of the view that the area of intertidal loss caused by the IERRT project (not just on its own, but also in-combination with other projects) is of negligible ecological value, is not significantly contributing towards the conservation objectives of the site, and does not constitute an AEoI.

Habitats Regulations Assessment Derogation Report

5.9 As noted above, even if any in-combination effects of the type identified above could not be ruled out, the Applicant notes that the IGET proposed scheme would address any such in-combination effects if they were to arise and therefore does not consider that there is any need to consider derogation in respect of the Proposed Development. Without prejudice to that position, the Applicant has provided a Derogation Report as requested by the ExA in the event that a different view is reached by the Secretary of State.

5.10 The Applicant notes that in the final part of **[REP9-018]**, NE provides its advice on the Habitats Regulations Assessment Derogation Report **[REP8-033]**. NE is of the view that the proposed compensation is likely to be appropriate in terms of its nature, scale and deliverability to address the adverse effects on the intertidal habitat feature of the Humber Estuary SAC. Without prejudice to the Applicant's position that the IERRT project has no potential result in AEoI on any European site, the Applicant welcomes NE view on the appropriateness of the proposed compensation.

5.11 As a final note, the Applicant would reiterate that environmental enhancement measures will be provided regardless of the view reached by the Secretary of State with respect to AEoI. As stated in Chapter 2 of the ES **[AS-063]** a suite of terrestrial enhancements will be delivered within an existing area of woodland, owned by ABP, south of Laporte Road named Long Wood.

5.12 Further, as referenced in the Derogation Report **[REP8-033]** and in Chapter 2 **[AS-063],** ABP also intends to allocate or 'ring fence' the environmental benefits and enhancements generated by an area of one hectare of intertidal habitat that is being created through an already approved (and currently under construction) realignment scheme known as the Outstrays to Skeffling Managed Realignment Scheme (OtSMRS), which is located on the north bank of the Humber Estuary. If, contrary to the Applicant's assessment, the Secretary of State were to conclude following Appropriate Assessment of the IERRT project that compensation is required because an AEoI on the European Sites cannot be ruled out, the compensation will be delivered out of this allocated hectare of intertidal habitat.

Appendix 1: Immingham Eastern Ro-Ro Terminal (IERRT) - Ground Investigation Works: Ornithology Monitoring

Technical Note

Subject: Immingham Eastern Ro-Ro Terminal (IERRT)- Ground Investigation Works: Ornithology Monitoring

1. Introduction

1.1. Marine Ground Investigation (GI) works were required to inform the design of the infrastructure of the proposed Immingham Eastern RoRo Terminal (IERRT). This technical note summaries the results of coastal waterbird monitoring undertaken from January to March 2023 to understand potential disturbance effects associated with the GI works.

1.2. The GI works involved collecting borehole samples from a jack-up barge. The location of the borehole sampling stations is shown in Figure 1 and the dates that the jack-up barge was at different borehole stations is provided in Appendix A. During the works acoustic 'echo barriers' were installed on the jack-up barge. The GI works were focused along the footprint of the proposed IERRT jetty and pontoon structures with approximately 65% of the GI works undertaken at borehole sampling locations on or within approximately 200 m of the foreshore.

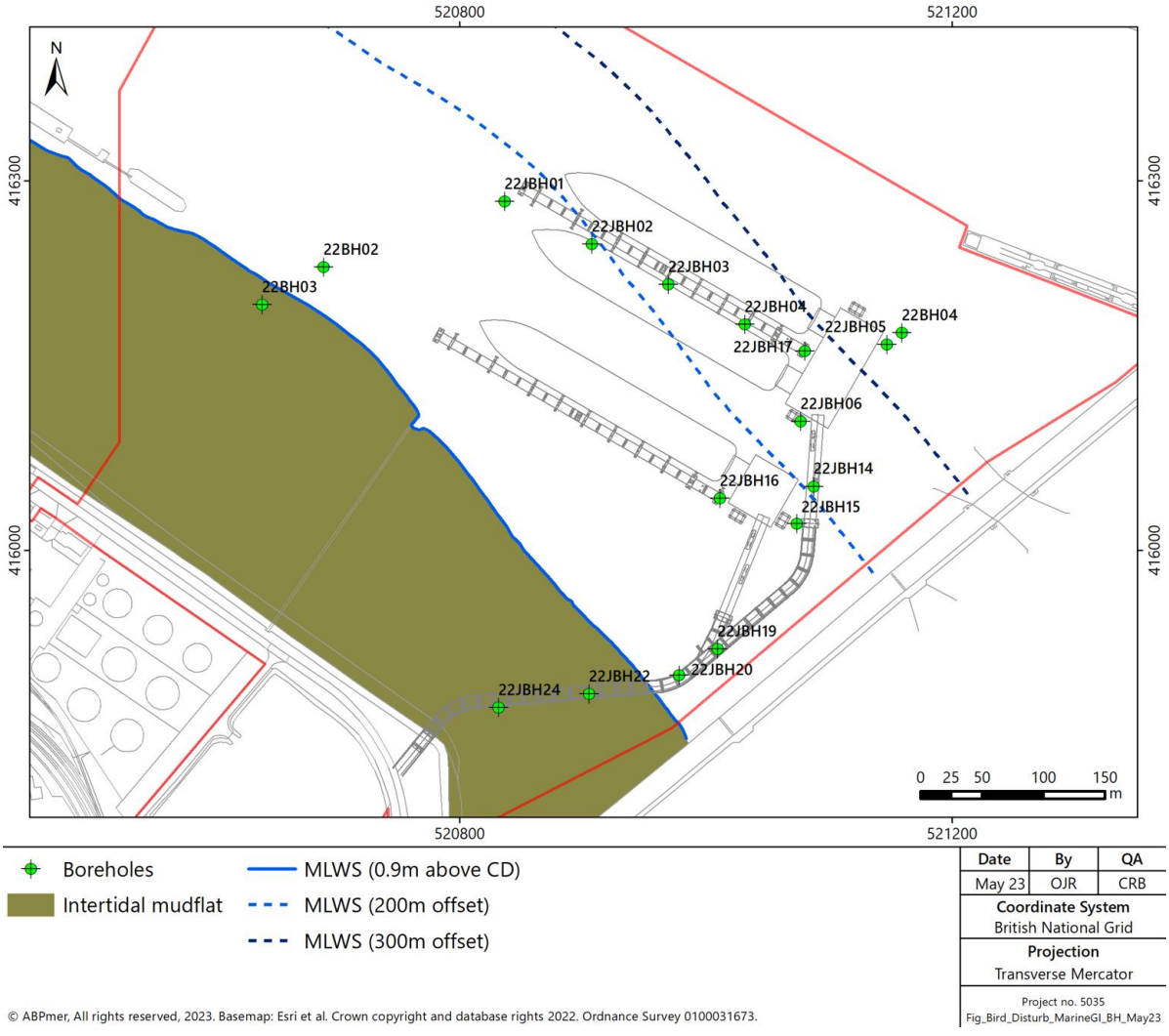

Figure 1. Location of boreholes for IERRT Ground Investigation works and distances from Mean Low Water Springs (MLWS) (please note – scheme layout represents a previous iteration of the scheme)

2. Methods

2.1. The ornithology monitoring involved two separate components:

- The recording of waterbird abundance and distribution data; and
- A standardised recording approach for the monitoring of any disturbance events associated with the GI works.

2.2. Each component is described in more detail in the sections below.

Abundance and distribution count data

2.3. Bird abundance and distribution data was recorded based on the same broad approach as undertaken as part of the Immingham Outer Harbour (IOH) Ornithology Surveys which have been undertaken annually since winter 1997/98.

2.4. Ornithology surveys were conducted over 17 separate dates when the barge was present (mid-January and throughout February 2023). In addition, surveys were also undertaken on a further 13 dates when the barge was not present (nine prior to the barge arriving and four after the barge had left). The dates of the surveys are provided Appendix B.

2.5. For this study, the survey area focused on the foreshore fronting the Port of Immingham that was within or near the footprint of the IERRT development and GI borehole station (Figure 2). It should be noted that this area is smaller in extent than the overlapping IOH Ornithology Surveys count sector (see Sector B in Figure 2). However, broad comparisons can still be made between these two areas in terms of bird data as the majority of birds typically recorded in Sector B occur on the intertidal mudflats within the GI monitoring area with only very low numbers occurring west of the Port of Immingham lock gates.

2.6. Key parameters were recorded within the survey area (Figure 2) as follows:

- Species and number;
- Activity: feeding/loafing or roosting;
- Location mapped on field survey sheet; and
- Time of count.

2.7. Counts were undertaken every two hours within an eight-hour survey day resulting in four counts each day. Surveys used a combination of binoculars and spotting scopes to cover the survey area.

Figure 2. Survey area used for the GI waterbird surveys (red polygon) and IOH bird survey Sector B

Disturbance monitoring

2.8. Disturbance events were recorded on a standardised recording form as follows:

- Time: The time of the disturbance event;
- Species: The species of waterbird disturbed;
- Activity: The specific GI activity causing the disturbance response based on the criteria in Table 1;
- Nearest distance species observed from activity (pre disturbance) based on the criteria in Table 2;
- Disturbance response: The disturbance response observed was recorded using the levels highlighted in Table 3 as well as any other useful notes;
- Number disturbed: The number of that species disturbed; and
- Noise Level: The noise level in decibels recorded from the noise monitor.

2.9. Weather conditions were recorded at the start and end of each survey day including information on wind direction, wind strength, cloud cover and air temperature.

2.10. Noise levels were collected during the disturbance monitoring using a CEL-240/K1 sound level meter kit. On each day regular recordings were taken of the background noise level and the noise level at each disturbance event. In addition to the field surveyors on the land collecting noise level data, operatives on the barge collected noise level recordings on seven dates between the 21 and 27 January 2023. These daily recordings provided useful information on noise levels and included both background levels and working noise on the barge.

Table 1. Activity

Activity Code	Activity Details
GI (JB)	GI works (movement of jack up barge).
GI (JBL)	GI works (positioning of jack up barge/ deployment of legs).
GI (D)	GI works (drilling).
GI (H)	GI works (presence of personnel).

Table 2. Distance away from activity (pre disturbance)

Distance Band	Distance and behaviour
A (F)	0-50 m (Feeding/loafing)
B (F)	50-100 m (Feeding/loafing)
C (F)	100-200 m (Feeding/loafing)
D (F)	200-300 m (Feeding/loafing)
E (F)	300 + m (Feeding/loafing)
A (R)	0-50 m (Roosting)
B (R)	50-100 m (Roosting)
C (R)	100-200 m (Roosting)
D (R)	200-300 m (Roosting)
E (R)	300 + m (Roosting)

Table 3. Disturbance response

Level	Disturbance Response
0	No change in behaviour at all.
1	Head movements, increased awareness of surroundings and pausing of original behaviour, before recommencing without leaving the original area.
2	Cessation of original behaviour and a short movement away from original area (< 50 m), e.g., walking/running away or short flight before recommencing behaviour.
3	Cessation of original behaviour and a movement away from original area via flight before resuming behaviour (within Sector B with flight responses at distances of 50 to 200 m from activity).
4	Cessation of original behaviour and a movement away from original area via flight (within Sector B with flight responses at distances of more than 200 m from activity).
5	Cessation of original behaviour and a large movement away from original area via flight (outwith Sector B).

3. Results

3.1. This section has been structured with information on disturbance responses described initially followed by an assessment of potential displacement effects as a result of the GI works.

Disturbance responses

3.2. The only disturbance events recorded during the monitoring were when the jack-up barge was at borehole stations on the foreshore and birds were in relatively close proximity to the jack-up barge. Specifically, several disturbance responses were recorded to low numbers of Dunlin and a single Black-tailed Godwit (for very short periods of time) on one day. These occurred when birds were feeding within 20-25 m of the jack-up barge and once when Dunlin were within 100 m of the jack-up barge (Table 4). Both species, when disturbed, flew to the opposite side of the barge and quickly resumed feeding in the local area. The only other disturbance event recorded was when the jack-up barge was being moved by vessel between locations on the foreshore and a flock of Teal loafing on the water were briefly disturbed (Table 4).

3.3. No disturbance was recorded to birds at distances of more than 100 m away from the jack-up barge on the foreshore. In addition, no disturbance events were recorded when the jack-up barge was at borehole stations away from the foreshore (including those within 50 m – 100 m of the intertidal).

3.4. In summary, the disturbance events recorded are all considered relatively mild responses (i.e., localised with birds quickly resuming activity relatively near the original location). In addition, disturbance responses were also considered to be highly infrequent. To put this into perspective, approximately 80 hours of monitoring was undertaken between the 19 of January 2023 and 1 March 2023 when the jack-up barge was on or near the foreshore (within approximately 200 m). The total time of all disturbance event responses only lasted a few minutes (i.e., from response to resuming behaviour and accounted for less than 0.5% of the total monitoring time within this area). This was despite the barge causing ongoing sources of potential noise and visual stimuli at these distances.

Table 4. Disturbance responses recorded during the IERRT GI works

Date	Species	Disturbance Activity		Nearest distance species observed from activity & behaviour (pre disturbance)		Disturbance Response		Number disturbed by activity
		Activity	Noise	Behaviour	Notes	Level	Notes	
24/01/23 10:30	Dunlin and Black-tailed godwit	Drilling (GI-D) and presence of workers on barge (GI-H)	84Db	Feeding	Observed c 20-25m away from the barge	3	Stopped feeding. Flushed to the opposite side of the barge and resumed feeding	25 Dunlin and 1 Black-tailed Godwit
24/01/23 12:21	Dunlin	Shouting from workers on barge (GI-H)	/	Feeding	Observed c 100m away	3	Ceased feeding. Flushed around 100 m further away before resuming feeding	45
24/01/23 13:25	Dunlin	Drilling. (GI-D) – noise same as background levels	80Db	Feeding	Observed < 20m away from the barge	3	Ceased feeding. Flushed around 100 m further away before resuming feeding	55
25/01/23 08:30	Teal	Movement of jack Up barge – on vessel (GI-J)	/	Loafing	Loafing on water near barge path	3	Flew around 100 m. Four teal returned 50 m away from barge before resuming feeding	36

3.5. When the jack-up barge was present on the foreshore, the surveyors regularly recorded waterbirds (including Shelduck, Black-tailed Godwit, Mallard, Teal, Redshank, Black-headed Gull, Herring Gull, Turnstone, and Dunlin) moving to feed within 50 – 60 m (and on some occasions nearer than 30 m) of the jack-up barge (Image 1). This was observed even if there was loud noise (above ambient background levels[1]) coming from the barge with birds typically appearing tolerant of the barge (i.e., eliciting no disturbance responses and continuing to feed or loaf). The small numbers of disturbance events that did occur (as described above) were only recorded when birds were nearer than 30 m to the jack-up barge.

3.6. These observations suggest that any displacement effects were highly localised. However, in order to further understand potential displacement effects, data from the ongoing IOH Ornithology Surveys for Sector B which overlaps with the GI borehole locations (Figure 2) has been analysed. Specifically, data for the most recent 5-years of winter data (2019 to 2023) for the months that the GI works were undertaken (January and February) and the month following (March) have been analysed (Appendix C).

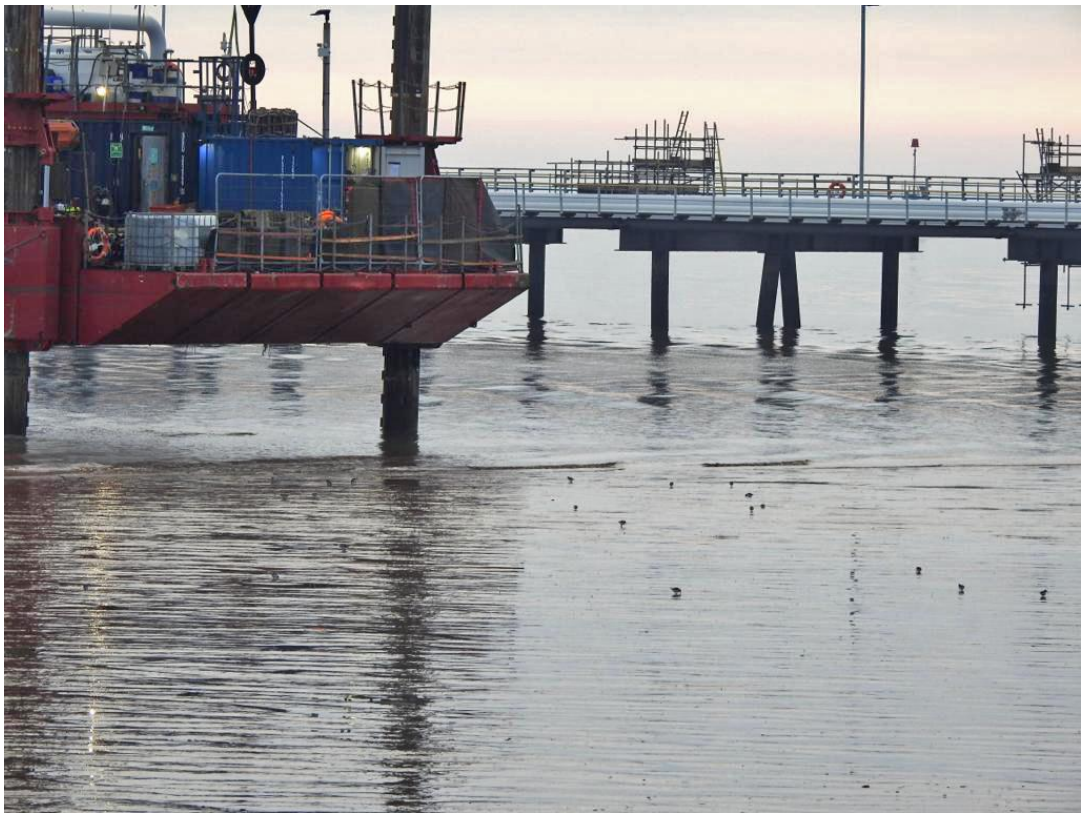

Image 1. Waders feeding in close proximity to the jack-up barge

[1] Noise levels collected at the jack-up barge recorded levels which typically ranged from 52 to 91 dB. Background ambient noise recorded as part of the bird monitoring for general port operations between 2 January – 17 March 2023 ranged from 60 to 90 dB. Unattended noise measurements over five days in July 2022 on the foreshore around the Port of Immingham suggest a range of 42 to 58 dB LAeq,1hr and the existing range of Lmax noise levels is 48 to 84 dB Lmax (ABPmer, 2022).

3.7. Table 5 compares the peak count recorded during the period that the GI works were being undertaken against the 5-year mean peaks (2019 to 2023) recorded in January and February for Sector B. Table 6 then compares the peak count recorded during monitoring undertaken in March following completion of the GI works against the 5-year mean peaks (2019 to 2023) recorded in March for Sector B.

3.8. In summary, there was no evidence to suggest any wider or longer-term displacement of birds from the foreshore fronting the Port of Immingham during the GI works. Interestingly, the counts of Dunlin, Shelduck, Mallard and Teal recorded during the GI works were all higher than than the largest count recorded in the IOH surveys in Sector B over the last five years in January/February. Peak counts of other species recorded during the GI works were broadly comparable (and in the range of variation) recorded in the IOH surveys for Sector B (Table 5 and Appendix C). Counts in March following when the GI works were completed were also comparable to counts in March recorded in the previous IOH surveys in this area (Table 6 and Appendix C).

Table 5. The peak count recorded during the GI works compared against 5-year mean peaks from 2019 to 2023 recorded in January and February for Sector B

Species	GI disturbance surveys: Peak count recorded during the GI works (19/01/2023 to 01/03/2023)	IOH Sector B: 5-year mean peak (2019 to 2023)	
		January	February
Redshank	137	110	116
Black-tailed Godwit	151	343	46
Bar-tailed Godwit	5	4	3
Dunlin	643	287	202
Shelduck	77	57	48
Curlew †	23	11	11
Oystercatcher	7	1	5
Turnstone †	8	14	23
Mallard †	30	1	2
Teal †	101	12	28

SPA qualifying species ae highlighted in **bold.**

† Species with this symbol are included within the SPA waterfowl assemblage.

Table 6. The peak count recorded during monitoring undertaken in March following completion of the GI works compared against 5-year mean peaks from 2019 to 2023 recorded in March for Sector B

Species	GI disturbance surveys: Peak count recorded after the GI works were completed (07/03/2023 to 17/03/2023)	IOH Sector B: 5-year mean peak (2019 to 2023) recorded in March
Redshank	158	169
Black-tailed Godwit	337	328
Bar-tailed Godwit	3	1
Dunlin	185	148
Shelduck	54	32
Curlew †	25	11
Oystercatcher	7	9
Turnstone †	22	26
Mallard †	4	1
Teal †	81	27
SPA qualifying species ae highlighted in **bold.** † Species with this symbol are included within the SPA waterfowl assemblage.		

4. Conclusions

4.1. The ornithology monitoring found that disturbance associated with the GI works was limited with only mild responses (i.e., localised and short-term with birds quickly resuming original behaviour) recorded on several occasions. These events only occurred when the jack-up barge was on the foreshore and birds were in close proximity to it (involving a single Black-tailed Godwit and small flocks of Dunlin and Teal). Disturbance events were considered to be highly infrequent (occurring for less than 0.5% of the time that surveyors were monitoring the GI works at borehole stations on or near the foreshore (i.e., within <200 m of exposed intertidal mudflat)).

4.2. These findings are consistent with previous disturbance literature which suggests that most disturbance responses to anthropogenic activities such as construction and the presence of people (such as workers) on or near the foreshore are most commonly observed at distances between 20 and 100 m from activity with responses limited at distances over 200 m, particularly in areas subject to already high levels of existing anthropogenic activity (as found in the Port of Immingham area) (ABPmer, 2002; IECS, 2009; Wilson, 2009; Dwyer, 2010; IECS, 2013; Ross and Liley, 2014; Goodship and Furness, 2022; Collop *et al.,* 2016; Goodship and Furness, 2019; ABPmer, 2013; Gill *et al*., 2001; Burton *et al*., 2002).

4.3. Coastal waterbird species (including Dunlin, Redshank, Turnstone, Black tailed Godwit, Mallard, Shelduck, Herring Gull, Common Gull and Black-headed Gull) were all recorded actively feeding within 50-60 m of the jack-up-barge and

closer on occasions. In addition, bird numbers on the foreshore fronting Immingham Docks recorded during the GI works were also broadly comparable to that recorded in ongoing waterbird surveys in this area over the last five years during the same monthly periods. On this basis, there was no evidence to suggest any wider or longer-term displacement of birds from the foreshore fronting the Port of Immingham occurred during the GI works.

4.4. Therefore, in summary, while it is acknowledged that some very localised avoidance of the jack-up barge occurred, coastal waterbirds generally appeared tolerant to noise and visual stimuli associated with the GI works. Only very limited disturbance was observed with birds continuing to utilise the foreshore in Sector B in similar numbers to previous years.

References

ABPmer. (2002). ABP Teignmouth Quay Development Environmental Statement. ABP Marine Environmental Research Ltd, Report No. R.984a.

ABPmer. (2013). Bury Marsh Bird Monitoring 2012-2014: Interim Report. ABP Marine Environmental Research Ltd, Report No. R.2123.

ABPmer, (2022). Immingham Eastern RoRo Terminal, Environmental Statement. A report produced by ABPmer for Associated British Ports, December 2022.

Burton, N. H. K., Armitage, M. J. S., Musgrove, A. J. and Rehfisch, M. M. (2002). Impacts of man-made landscape features on numbers of estuarine waterbirds at low tide. Environmental Management 30: 857-864.

Collop, C., Stillman, R.A., Garbutt, A., Yates, M.G., Rispin, E., and Yates, T. (2016). Variability in the area, energy and time costs of wintering waders responding to disturbance. Ibis, 158(4), pp.711-725.

Dwyer, R.G. (2010). Ecological and anthropogenic constraints on waterbirds of the Forth Estuary: population and behavioural responses to disturbance. Thesis submitted as candidature for the degree of Doctor of Philosophy Centre for Ecology and Conservation.

Gill, J.A., Norris, K. and Sutherland, W.J. (2001). The effects of disturbance on habitat use by black-tailed godwits Limosa limosa. Journal of Applied Ecology 38: 846-856.

Goodship, N. & Furness, R.W. (2019). Seaweed hand-harvesting: literature review of disturbance distances and vulnerabilities of marine and coastal birds. Scottish Natural Heritage Research Report No. 1096

Goodship, N.M. and Furness, R.W. (MacArthur Green) (2022). Disturbance Distances Review: An updated literature review of disturbance distances of selected bird species. NatureScot Research Report 1283.

Institute of Estuarine and Coastal Studies (IECS). (2009). Construction and Waterfowl: Defining Sensitivity, Response, Impacts and Guidance. Institute of Estuarine and Coastal Studies Report to Humber INCA.

Institute of Estuarine and Coastal Studies (IECS) (2013). Waterbird Disturbance Mitigation Toolkit Informing Estuarine Planning and Construction Projects.

Ross, K., Liley, D., (2014) Humber Winter Bird Disturbance Study. Unpublished report for the Humber Management Scheme by Footprint Ecology.

Wilson, S. (2009). Estuarine Bird Monitoring (05 Dec 2008-19 Jan 2009) - TERRC Facility. Prepared for Hartlepool Borough Council.

Appendix A: Borehole Dates

Boreholes	Start	Finish
22JBH14	19/01/2023	21/01/2023
22JBH22	21/01/2023	23/01/2023
22JBH24	23/01/2023	25/01/2023
22JBH20	26/01/2023	27/01/2023
22JBH06	27/01/2023	29/01/2023
22JBH02	29/01/2023	31/01/2023
22JBH04	01/02/2023	05/02/2023
22JBH17	05/02/2023	07/02/2023
22JBH19	07/02/2023	08/02/2023
22BH03	08/02/2023	11/02/2023
22JBH03	11/02/2023	13/02/2023
22BH02	13/02/2023	14/02/2023
22JBH01	14/02/2023	16/02/2023
22JBH16	16/02/2023	22/02/2023
22BH04	22/02/2023	23/02/2023
22JBH05	23/02/2023	26/02/2023
22JBH15	26/02/2023	01/03/2023

Appendix B: Disturbance Monitoring Survey Details

DATE	COUNT	COUNT TIMES	TIDE/TIME	WEATHER
02/01/2023	1	08:30	LT 08:10 2.19M HT 14:33 5.89M	Dry, Cloud 5/8, Temp 5℃, Wind WSW F0-1, Visibility >2km
02/01/2023	2	10:30	LT 08:10 2.19M HT 14:33 5.89M	Dry, Cloud 5/8, Temp 5℃, Wind WSW F0-1, Visibility >2km
02/01/2023	3	12:30	LT 08:10 2.19M HT 14:33 5.89M	Dry, Cloud 5/8, Temp 5℃, Wind WSW F0-1, Visibility >2km
02/01/2023	4	14:30	LT 08:10 2.19M HT 14:33 5.89M	Dry, Cloud 5/8, Temp 5℃, Wind WSW F0-1, Visibility >2km
03/01/2023	5	09:30	LT 09:09 2.19M HT 15:27 6.04M	Dry, Cloud 8/8, Temp 10-12℃, Wind SW F5-7
03/01/2023	6	11:30	LT 09:09 2.19M HT 15:27 6.04M	No change
03/01/2023	7	13:30	LT 09:09 2.19M HT 15:27 6.04M	Light rain, Cloud 8/8, Temp 12℃, Wind SW F4
03/01/2023	8	15:30	LT 09:09 2.19M HT 15:27 6.04M	Light rain, Cloud 8/8, Temp 12℃, Wind SW F5
04/01/2023	9	08:15	LT 09:59 2.11M HT 16:13 6.23M	Sunny, Cloud 3/8, Temp 12℃, Wind SW F6
04/01/2023	10	10:15	LT 09:59 2.11M HT 16:13 6.23M	Sunny, Cloud 5/8, Temp 12℃, Wind SW F6
04/01/2023	11	12:15	LT 09:59 2.11M HT 16:13 6.23M	Sunny, Cloud 2/8, Temp 13℃, Wind SW F6
04/01/2023	12	14:15	LT 09:59 2.11M HT 16:13 6.23M	Sunny, Cloud 1/8, Temp 13℃, Wind SW F6
05/01/2023	13	09:00	LT 10:44 2.01M HT 16:52 6.43M	Dry, Cloud 3/8, Temp 9℃, Wind SSW F2-3
05/01/2023	14	11:00	LT 10:44 2.01M HT 16:52 6.43M	Light rain, Cloud 6/8 at 11:15-11:50. Occasional sun from 12:00. Cloud 7/8, Temp 10℃
05/01/2023	15	13:00	LT 10:44 2.01M HT 16:52 6.43M	Temp 11℃
05/01/2023	16	15:00	LT 10:44 2.01M HT 16:52 6.43M	
06/01/2023	17	09:30	LT 11:24 1.93M HT 17:28 6.58M	Dry, Cloud 5/8, Temp 7℃, Wind SW F5-6. At 11:00 8℃ and some sun
06/01/2023	18	11:30	LT 11:24 1.93M HT 17:28 6.58M	Sunny, Cloud 4/8, Wind SW 5-6. At 12:00 Temp 9℃, Wind SW F3-4.
06/01/2023	19	13:30	LT 11:24 1.93M HT 17:28 6.58M	Change: Cloud 7/8. At 14:00 Light rain, Cloud 8/8. Rain stopped at 14:30 8℃, Cloud 7/8
06/01/2023	20	15:30	LT 11:24 1.93M HT 17:28 6.58M	

07/01/2023	21	08:00	LT 12:01 1.87M HT 18:03 6.68M	Light rain, Cloud 8/8, Temp 11℃, Wind S F 5-7
07/01/2023	22	10:00	LT 12:01 1.87M HT 18:03 6.68M	No change
07/01/2023	23	12:00	LT 12:01 1.87M HT 18:03 6.68M	Overcast and light rain. Wind dropping to F 4-5
07/01/2023	24	14:00	LT 12:01 1.87M HT 18:03 6.68M	Overcast and light rain. Dry at 14:30
08/01/2023	25	08:45	HT 06:34 6.39M LT 12:35 1.86M	Dry, Cloud - variable, Wind S F 4, Temp 6-8℃.
08/01/2023	26	10:45	HT 06:34 6.39M LT 12:35 1.86M	At 12:00 Cloud 8/8, Wind SW F4
08/01/2023	27	12:45	HT 06:34 6.39M LT 12:35 1.86M	At 13:00 Cloud clearing 4/8. Sunny
08/01/2023	28	14:45	HT 06:34 6.39M LT 12:35 1.86M	No change
09/01/2023	29	09:15	HT 07:11 6.38M LT 13:07 1.88M	Sunny, Cloud 5/8, Temp 5℃, Wind SW F4. Good visibility. Change at 10:15, Cloud 7/8
09/01/2023	30	11:15	HT 07:11 6.38M LT 13:07 1.88M	At 12:00 Cloud 5/8, Wind SW F4
09/01/2023	31	13:15	HT 07:11 6.38M LT 13:07 1.88M	At 14:00, Cloud 6/8, Temp 8℃
09/01/2023	32	15:15	HT 07:11 6.38M LT 13:07 1.88M	
12/01/2023	33	09:00	HT 08:54 6.16M LT 14:46 2.13M	Dry, Cloud 8/8, Wind SW F 4, Temp 10℃.
12/01/2023	34	11:00	HT 08:54 6.16M LT 14:46 2.13M	No change
12/01/2023	35	13:00	HT 08:54 6.16M LT 14:46 2.13M	Occasional sun, Cloud 7/8, Wind SW F 6, Temp 11℃. At 14:00, Sunny intervals, Cloud 5/8, 12 ℃
12/01/2023	36	15:00	HT 08:54 6.16M LT 14:46 2.13M	Sunny intervals, Cloud 5/8, 12 ℃
18/01/2023	37	08:45	LT 08:10 2.27M HT 14:27 5.86M	Dry, Cloud 2/8, Wind W F 4, Temp 3℃. At 09:15 sunny.
18/01/2023	38	10:45	LT 08:10 2.27M HT 14:27 5.86M	At 11:00, Sunny, Cloud 1/8, Temp 4℃.
18/01/2023	39	12:45	LT 08:10 2.27M HT 14:27 5.86M	At 13:30, Temp 5℃, Wind WNW.
18/01/2023	40	14:45	LT 08:10 2.27M HT 14:27 5.86M	
19/01/2023	41	09:45	LT 09:20 2.06M HT 15:30 6.17M	Sunny, Cloud 0/8, Temp 2℃, Wind WSW F2-3. Changed to Cloud 1/8, Temp 3℃ at 11:15
19/01/2023	42	11:45	LT 09:20 2.06M HT 15:30 6.17M	

19/01/2023	43	13:45	LT 09:20 2.06M HT 15:30 6.17M	
19/01/2023	44	15:45	LT 09:20 2.06M HT 15:30 6.17M	At 15:00, mostly sunny, Cloud 3/8
20/01/2023	45	08:33	LT 10:20 1.80M HT 16:25 6.53M	Dry, Cloud 0/8, Temp 1℃, Wind NW F3.
20/01/2023	46	10:33	LT 10:20 1.80M HT 16:25 6.53M	Changed to sunny Cloud 0/8, Temp 3℃, Wind NW F4 at 10:00
20/01/2023	47	12:33	LT 10:20 1.80M HT 16:25 6.53M	At 12:00 Changed to sunny intervals, Cloud 4/8, Temp 5℃, Wind NNW. At 13:30 Cloud 7/8 and light rain. Stopped at 13:40
20/01/2023	48	14:33	LT 10:20 1.80M HT 16:25 6.53M	
24/01/2023	49	07:45	HT 7:37 7.05M LT 13:37 1.32M	Dry, Cloud 2/8, Temp 0℃, Wind WSW F2. At 09:00 Cloud 7/8, Temp 2℃, Wind SW
24/01/2023	50	09:45	HT 7:37 7.05M LT 13:37 1.32M	No change
24/01/2023	51	11:45	HT 7:37 7.05M LT 13:37 1.32M	At 12:00 Temp 4℃
24/01/2023	52	13:45	HT 7:37 7.05M LT 13:37 1.32M	No change
25/01/2023	53	08:30	HT 08:24 6.95M LT 14.21 1.39M	Dry, Cloud 3/8, Temp 5 ℃, Wind SW F3.
25/01/2023	54	10:30	HT 08:24 6.95M LT 14.21 1.39M	Dry, Cloud 8/8, Temp 6 ℃, Wind SW F3/4.
25/01/2023	55	12:30	HT 08:24 6.95M LT 14.21 1.39M	Rain, Cloud 8/8, Temp 6 ℃, Wind SW F3/4.
25/01/2023	56	14:30	HT 08:24 6.95M LT 14.21 1.39M	Cloud 7/8, Temp 8 ℃, Wind W 4.
26/01/2023	57	09:15	HT 09:09 6.75M LT 15:03 1.56M	Sunny, Cloud 2/8, Temp 6 ℃, Wind N F3. Changed at 10:30 to Cloud 8/8, Temp 7 ℃ and overcast.
26/01/2023	58	11:15	HT 09:09 6.75M LT 15:03 1.56M	11:27 light rain, Wind F3. Rain stopped 11:40, 7/8 Cloud. At 12:30 Wind F4
26/01/2023	59	13:15	HT 09:09 6.75M LT 15:03 1.56M	
26/01/2023	60	15:15	HT 09:09 6.75M LT 15:03 1.56M	
01/02/2023	61	09:00	LT 08:33 2.72M HT 14:53 5.61M	Sunny, Cloud 1/8, Temp 8℃, Wind W F6.
01/02/2023	62	11:00	LT 08:33 2.72M HT 14:53 5.61M	
01/02/2023	63	13:00	LT 08:33 2.72M HT 14:53 5.61M	Overcast, Cloud 7/8, Temp 9℃

01/02/2023	64	15:00	LT 08:33 2.72M HT 14:53 5.61M	
02/02/2023	65	07:45	LT 09:37 2.56M HT 15:49 5.90M	Overcast, Cloud 7/8, Temp 9℃, Wind W F4-5.
02/02/2023	66	09:45	LT 09:37 2.56M HT 15:49 5.90M	At 09:50 light rain. Stopped 10:00. At 11:00 Temp 10℃
02/02/2023	67	11:45	LT 09:37 2.56M HT 15:49 5.90M	At 12:30 occasional sun, Cloud 5/8
02/02/2023	68	13:45	LT 09:37 2.56M HT 15:49 5.90M	Unchanged
05/02/2023	69	10:00	LT 12:00 1.87M HT 15:55 - 6.64M	Cloud 2/8, Temp 8℃, Wind NW F1, Vis > 2km
05/02/2023	70	12:00	LT 12:00 1.87M HT 15:55 - 6.64M	Weather change - Wind NW F0-1
05/02/2023	71	14:00	LT 12:00 1.87M HT 15:55 - 6.64M	No change
05/02/2023	72	16:00	LT 12:00 1.87M HT 15:55 - 6.64M	Weather change - Cloud 4/8, Temp 6℃
06/02/2023	73	08:30	HT 06:18 6.39M LT 12:20 1.80M	Sunny, Cloud 0/8, Temp 1℃, Wind SW F3.
06/02/2023	74	10:30	HT 06:18 6.39M LT 12:20 1.80M	At 10:30 Temp 3℃
06/02/2023	75	12:30	HT 06:18 6.39M LT 12:20 1.80M	At 12:30 Temp 5℃
06/02/2023	76	14:30	HT 06:18 6.39M LT 12:20 1.80M	No change
07/02/2023	77	09:00	HT 06:50 6.46M LT 12:52 1.75M	Overcast, Cloud 3/8, Temp 3℃, Wind SW F3. Changing to Temp 4℃ and sunny at 10:00
07/02/2023	78	11:00	HT 06:50 6.46M LT 12:52 1.75M	Changing to Temp 5℃ and sunny. At 12:00 Temp 6℃
07/02/2023	79	13:00	HT 06:50 6.46M LT 12:52 1.75M	Sunny Cloud 1/8 Temp 7℃
07/02/2023	80	15:00	HT 06:50 6.46M LT 12:52 1.75M	No change
16/02/2023	81	10:00	HT 14:00 5.60M LT 07:42 2.59M	Cloud 8/8, Temp 7℃, Wind SSW F3-4. Changing to Temp 8 ℃ at 11:00
16/02/2023	82	12:00	HT 14:00 5.60M LT 07:42 2.59M	Temp 9 ℃ rising to 10℃ at 13:00. Cloud 5/8 and occasional sun
16/02/2023	83	14:00	HT 14:00 5.60M LT 07:42 2.59M	Temp 11 ℃ at 14:30, Cloud 8/8 changing to 6/8 at 15:20 with occasional sun.
16/02/2023	84	16:00	HT 14:00 5.60M LT 07:42 2.59M	No change

17/02/2023	85	09:15	HT 15:17 5.98M LT 09:07 2.34M	Cloud 3/8, mostly sunny, Temp 13 ℃, Wind W F6-7. Changing to Cloud 6/8 and overcast at 10:30. Wind W F5
17/02/2023	86	11:15	HT 15:17 5.98M LT 09:07 2.34M	Wind F 3-4 changing to Cloud 2/8 and sunny at 12:30
17/02/2023	87	13:15	HT 15:17 5.98M LT 09:07 2.34M	No change
17/02/2023	88	15:15	HT 15:17 5.98M LT 09:07 2.34M	No change
22/02/2023	89	09:30	HT 07:21 7.14M LT 13:22 1.11M	Dry, Overcast, Temp 10 ℃, Wind W F3.
22/02/2023	90	11:30	HT 07:21 7.14M LT 13:22 1.11M	No change
22/02/2023	91	13:30	HT 07:21 7.14M LT 13:22 1.11M	No change
22/02/2023	92	15:30	HT 07:21 7.14M LT 13:22 1.11M	Cloud 8/8
23/02/2023	93	08:15	HT 08:01 7.04M LT 14:01 1.15M	Sunny, Cloud 2/8, Temp 6 ℃, Wind N F5. Later changing to Cloud 1/8, Wind NNE at 10:00.
23/02/2023	94	10:15	HT 08:01 7.04M LT 14:01 1.15M	No change
23/02/2023	95	12:00	HT 08:01 7.04M LT 14:01 1.15M	Temp 8 ℃, Wind N F3 - 4. Later changing to Cloud 4/8 and sunny spells at 12:15. At 13:15 5/8 Cloud and light shower.
23/02/2023	96	14:15	HT 08:01 7.04M LT 14:01 1.15M	No change
28/02/2023	97	09:30	HT 11:27 5.39M LT 17:31 2.78M	Occasional shower, Cloud 6/8, Wind NE F3. No temp given
28/02/2023	98	11:30	HT 11:27 5.39M LT 17:31 2.78M	Change: Wind NNE F 5
28/02/2023	99	13:30	HT 11:27 5.39M LT 17:31 2.78M	
28/02/2023	100	15:30	HT 11:27 5.39M LT 17:31 2.78M	Change: Showers, Cloud 7/8, Wind F6, Temp 8 ℃
01/03/2023	101	09:00	HT 12:56 5.20M LT 06:18 3.03M	Overcast, Cloud 7/8, Wind NNE F 3-4, Temp 6 ℃. Change to rain at 09:45 & Cloud 4/8 at 10:05. Rain at 10:30
01/03/2023	102	11:00	HT 12:56 5.20M LT 06:18 3.03M	Sunny spells. At 12:35 rain and back to sunny spells at 12:50
01/03/2023	103	13:00	HT 12:56 5.20M LT 06:18 3.03M	No change
01/03/2023	104	15:00	HT 12:56 5.20M LT 06:18 3.03M	No change

07/03/2023	105	10:15	HT 05:54 6.47M LT 12:02 1.71M	Sunny, Cloud 2/8, Wind NNW F 3, Temp 4 ℃
07/03/2023	106	12:15	HT 05:54 6.47M LT 12:02 1.71M	No change
07/03/2023	107	14:15	HT 05:54 6.47M LT 12:02 1.71M	No change
07/03/2023	108	16:15	HT 05:54 6.47M LT 12:02 1.71M	Wind NW otherwise no change
09/03/2023	109	09:15	HT 06:55 6.63M LT 12:59 1.55M	Light rain, Wind ESE F 3, Temp 2 ℃
09/03/2023	110	11:15	HT 06:55 6.63M LT 12:59 1.55M	Rain heavier, Wind E F4, Temp 1 ℃
09/03/2023	111	13:15	HT 06:55 6.63M LT 12:59 1.55M	No change
09/03/2023	112	15:15	HT 06:55 6.63M LT 12:59 1.55M	No change
14/03/2023	113	09:45	HT 09:38 6.03M LT 15:48 2.09M	Sunny, Cloud 1/8, Wind WNW F 4, Temp 6 ℃
14/03/2023	114	11:45	HT 09:38 6.03M LT 15:48 2.09M	Changed to Temp 7 ℃. AT 12:45 Wind W.
14/03/2023	115	13:45	HT 09:38 6.03M LT 15:48 2.09M	At 14:45 Cloud 4/8, Temp 6 ℃
14/03/2023	116	15:45	HT 09:38 6.03M LT 15:48 2.09M	No change
17/03/2023	117	09:45	HT 13:45 5.51M LT 07:31 2.81M	Sunny, Cloud 2/8, Wind SSW F 2, Temp 12 ℃ changing to 13 ℃
17/03/2023	118	11:45	HT 13:45 5.51M LT 07:31 2.81M	14 ℃. At 13:00 Cloud 5/8 and sunny spells
17/03/2023	119	13:45	HT 13:45 5.51M LT 07:31 2.81M	At 14:00 back to Cloud 2/8 and sunny.
17/03/2023	120	15:45	HT 13:45 5.51M LT 07:31 2.81M	No change

Appendix C: Monthly Peak count for qualifying SPA and waterbird assemblage species in Sector B over 5 years (2019 -2023)

Month	Year					MP
	2019	2020	2021	2022	2023	
Black-Tailed Godwit						
Jan	6	370	8	1300	30	342.8
Feb	33	147	10	10	32	46.4
Mar	286	563	18	341	430	327.6
Shelduck						
Jan	69	48	45	67	55	56.8
Feb	74	56	28	24	58	48
Mar	38	45	21	23	35	32.4
Redshank						
Jan	63	115	76	105	189	109.6
Feb	84	144	104	101	148	116.2
Mar	204	166	125	142	209	169.2
Dunlin						
Jan	218	0	402	340	474	286.8
Feb	270	2	299	215	226	202.4
Mar	199	0	220	169	151	147.8
Golden Plover						
Jan	0	0	0	0	0	0
Feb	0	0	0	0	0	0
Mar	0	0	0	0	0	0
Avocet						
Jan	0	0	0	0	0	0
Feb	0	0	0	0	0	0
Mar	0	0	0	0	0	0
Bar-Tailed Godwit						
Jan	0	6	12	0	3	4.2
Feb	0	9	6	1	0	3.2
Mar	2	3	0	0	0	1
Ruff						
Jan	0	0	0	0	0	0
Feb	0	0	0	0	0	0
Mar	0	0	0	0	0	0
Knot						
Jan	0	6	0	0	0	1.2
Feb	0	2	1	0	0	0.6
Mar	0	2	0	0	0	0.4
Curlew						
Jan	12	12	7	11	11	10.6
Feb	12	11	11	11	12	11.4
Mar	10	10	11	12	10	10.6
Grey Plover						

Jan	1	0	1	1	1	0.8
Feb	0	0	0	0	0	0
Mar	0	0	1	1	0	0.4
Lapwing						
Jan	0	1	0	0	1	0.4
Feb	0	0	0	0	0	0
Mar	0	0	0	0	0	0
Mallard						
Jan	4	0	0	2	0	1.2
Feb	6	2	0	0	0	1.6
Mar	2	2	0	2	4	2
Oystercatcher						
Jan	0	0	0	1	1	0.4
Feb	4	4	6	5	4	4.6
Mar	8	10	8	12	7	9
Greenshank						
Jan	0	0	0	0	0	0
Feb	0	0	0	0	0	0
Mar	0	0	0	0	0	0
Snipe						
Jan	0	0	0	0	0	0
Feb	0	0	0	0	0	0
Mar	0	0	0	0	0	0
Wigeon						
Jan	0	0	0	0	0	0
Feb	0	0	0	0	0	0
Mar	0	0	0	0	0	0
Teal						
Jan	8	8	5	21	19	12.2
Feb	5	21	9	27	78	28
Mar	11	7	4	25	88	27
Ringed Plover						
Jan	4	0	0	0	2	1.2
Feb	0	0	0	0	0	0
Mar	0	1	0	0	0	0.2
Turnstone						
Jan	3	14	20	24	9	14
Feb	20	33	16	26	22	23.4
Mar	27	26	22	25	31	26.2